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The Use of Digital Applications in the Acute Care Setting: Factors affecting Nurses' Perspective

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Abstract

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Digital applications in the acute care setting provide nurses with real-time data, decision support tools, and improved care coordination. However, nurses face concerns about potential negative effects due to technological and operational factors. Proper training and continuous assistance are essential for nurses to effectively utilize new technology in their roles.

The purpose of this study was to describe the use and determine the factors affecting the nurses' perspective in the use of digital applications in the acute care setting. The aim of the study was to produce new knowledge from the perspective of nurses on how to improve the use of digital applications in the acute care setting.

This study is a descriptive literature review, and relevant articles were obtained from two reliable academic databases CINAHL (Cumulative Index of Nursing and Allied Health Literature) and PubMed (Medline). Fourteen (14) articles were available in full text, published in English, and within the ten-year allocated period and were chosen for this study. The principles of inductive content analysis were utilized in analyzing the data that produced categorical representations of the findings. Julkaisufoorumi, a publication forum was employed to assess the quality of research output.

Digital applications in healthcare improved efficiency, reduced assessment time, and enhanced resource allocation. They contribute to the enhanced professional relationship, collaboration, and trust. These available applications supported the acute care nurses in improving communication and promoted patient-centered care.

However, nurses' acceptance of digital applications was influenced by workload, inconsistent utilization, and patient safety concerns. Digital technologies in healthcare, especially in acute care, have improved patient care and outcomes and with this, nurses play a crucial role in utilizing these tools, enhancing efficiency and accessibility. However, continuous use can lead to exhaustion and stress. Hence, healthcare businesses must provide continuous training and support to improve digital technology utilization, balancing benefits, and drawbacks to enhance care quality.

Keywords: digital applications, acute care, registered nurses, nurses' perspective

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Table of Contents

1 Introduction

The integration of digital technology is revolutionizing healthcare systems by facilitating the provision of nursing care and improving patient involvement in health and well-being. Digital health applications have the potential to provide fair and equal access to health services, enhance efficiency and dependability, enhance patient-centered care, address shortages in the healthcare workforce, lower expenses, and ultimately enhance health outcomes. The World Health Organization (WHO) holds the belief that digital health has the potential to significantly transform health outcomes and is a crucial component in attaining universal health coverage. To get these advantages, the nursing field must actively participate and adapt to this change by reframing clinical practice, education, research, and policy in the context of a digital environment (International Council of Nurses, 2023: 1-2.)

Nurses fulfil several roles including coordinating and providing direct care, managing health systems, working with information, and facilitating the exchange of knowledge. It is essential for nurses to comprehend, appreciate, actively participate in, and enhance their proficiency in digital health technology. Digital health comprises a range of technologies including eHealth, Internet of Things (IoT), robots, advanced computing, big data analytics, and artificial intelligence (AI). These technologies have the potential to improve clinical diagnosis, aid in making treatment choices based on data, facilitate digital therapies, streamline clinical trials, empower individuals to manage their own care, and enhance the knowledge, skills, and competence of healthcare professionals to promote evidence-based healthcare (International Council of Nurses, 2023: 1-2.)

Opportunities to significantly enhance the working lives of nurses are made available by digital technology. Health personnel are given the opportunity to broaden their range and scope of responsibilities, therefore enhancing efficiency by saving time and reducing travel requirements in both urban and distant environments. Furthermore, the mobility of these devices provides a higher degree of flexibility and enhances the capacity to coordinate healthcare services. (International Council of Nurses, 2023: 2.) The major objective of this study is to provide a comprehensive description and provide insights that may contribute to the improvement of the healthcare system for nurses working in acute care.

2 Keywords and Background

2.1 Key terms and definitions

2.1.1 Digital applications

Digital applications use technology like telemedicine, EHRs, wearables, mobile health apps, IoMT, and digital phenotype to enhance health outcomes and care. These technologies enable remote consultations, secure access to medical records, real-time health monitoring, personalized recommendations, and improved disease management (Kasoju, Remya, Sasi, Sujesh, Soman, Kesavadas, Muraleedharan, Varma and Behari 2023: 11-12.)

2.1.2 Acute care

Acute care refers to medical treatment for severe or urgent health conditions requiring immediate attention, typically in hospitals or emergency rooms. It involves hospitalization, intensive procedures, timely intervention, and a multidisciplinary approach. Patients can then transition to subacute care, rehabilitation centers, or home care for continued recovery (Jain, Gan and Nguyen 2024: 5.)

2.1.3 Registered nurses

Registered nurses (RNs) are healthcare professionals who provide direct patient care, collaborate with healthcare teams, and advocate for patients' rights. They work in various settings, often specializing in specific areas. RNs face career growth challenges and maintain up-to-date medical advancements (Lukewich, Martin-Misener, Norful, Poitras, Bryant-Lukosius, Asghari, Marshall, Mathews, Swab, Ryan and Tranmer 2022: 30-31.)

2.1.4 Nurses’ perspective

The work environment, personal characteristics, actions connected to the profession, and outside factors all influence nurses' professional self-concept. Nurses' perceptions are largely similar, notwithstanding individual differences. The development of nursing vocations is greatly aided by this complex idea. Nurses must determine what aspects of their own self-concept help or hinder them in order to succeed. Then, individualized

treatments and support may be tailored to meet each individual's needs. (Miao, Liu, Zhou, Zou, Song, Chung, Tan and Li 2024: 7-9.)

2.2 Background

2.2.1 Digital applications in healthcare

Digital applications in healthcare provide many advantages for nurses. These include the ability to access real-time data, utilize decision support tools, facilitate efficient communication, improve coordination of care, enhance documentation processes, optimize medication management, and conduct data trend analysis and monitoring. These mobile or computer-based programs provide prompt retrieval of essential patient information, allowing healthcare practitioners to expeditiously examine vital signs, laboratory findings, prescription logs, and patient medical background (Ventola, 2014: 357-358.) Digital health techniques have the potential to significantly decrease the time it takes for healthcare professionals to make clinical decisions and minimize their workload when caring for critically ill patients in fast-paced environments like the ICU. (Herasevich, Pinevich, Lipatov, Barwise, Lindroth, LeMahieu, Dong, Herasevich and Pickering 2023: 1198) Moreover, studies have indicated that electronic prescribing can decrease patient harm and electronic health records (EHR) one of the digital applications used nowadays have demonstrated benefits in terms of patient safety, particularly in critical care settings, as well as reducing expenses. (Pankhurst, Lucas, Ryan, Ragdale, Gyves, Denner, Young, Rathbone, Shah, McKee, Coleman, Evison, Atia, Rosser, Garrick, Baker, Gallier and Ball 2023: 1.) Effective communication among healthcare providers is vital in acute care settings. Secure texting, electronic handover reports, and collaborative platforms are effective tools for facilitating the interchange of patient information. Utilizing digital applications optimizes the management of medication, while the study of ongoing data trends improves patient results (Ventola 2014: 357-358.)

The widespread adoption of electronic medical records presents an opportunity to utilize time-varying longitudinal data in near real-time. The capacity to utilize such data to forecast the risks of bad events for patients would be highly advantageous for hospital nurses (Cho and Jin 2019: 1650.) Various digital applications are introduced in this study such as Electronic Health Record (EHR), Electronic Patients Record (EPR) and Electronic Medical Record (EMR) (Pankhurst et al. 2023, Lavin, Harper, and Barr

2015, Maillet, Mathieu, and Sicotte 2014, Herasevich et al. 2023, Cho and Jin 2019), Behavioral Resource App for Interventions for Neurocognitive disorders-Translating Research Knowledge (BRAIN-TRK app) (Redley, Richardson, Peel, Ockerby, Rawson, Tomlinson and Hutchinson 2019), Nursing Activity Score App (NAS) (da Silva, Baptista, Serra and Magalhães 2020), End of life care app (EOL care app) (Yang and Shin 2021), Telehealth (Sunner, Giles, Kable, and Foureur 2022) are among several apps that are currently in use in acute care settings.

2.2.2 Use of digital application in acute care

Acute care prioritize timely actions aimed at stabilizing patients, effectively managing serious diseases or injuries, and mitigating the risk of additional health deterioration. These professionals' importance resides in their capacity to promptly provide specialized medical treatments to persons experiencing acute health emergencies, including heart attacks, strokes, injuries, and respiratory failure. The main objectives of acute care include stabilizing patients, identifying underlying etiologies, and initiating suitable therapeutic interventions. The need of delivering healthcare in an efficient and effective manner is paramount when it comes to resolving pressing medical illnesses, maximizing patient outcomes, and managing the ever-changing difficulties that arise in critical care scenarios (Hirshon, 2023: 2-3.) Hence, digital applications in acute care settings improve efficiency, precision, and personalized patient care. EHRs, telemedicine, patient portals, CDSS, and mobile applications are some examples that enhance patient data retrieval, remote consultations, and patient management while predictive analytics and medication alerts improve communication with patients and their families. Overall, these applications enhance overall patient care (Herasevich et al. 2023: 1198-1201.)

2.2.3 Nurses role in acute care

Nurses have a vital role in acute care settings, where they provide patient care, ensure safety, and have an impact on outcomes. Their responsibilities include monitoring physiological markers, administering medicines, and developing thorough treatment programs. Nurses engage in collaborative efforts with interdisciplinary teams, efficiently coordinate services, and advocate for patient rights. They serve as the primary responders in emergency situations, necessitating the use of critical thinking and decision-making abilities. They uphold meticulous patient records and assist in

enhancing the quality of care. Their contributions are vital for the triumph of the healthcare team and the welfare of the patients (Iddrisu, 2018: 3.) Furthermore, in more specific areas such as intensive care units (ICU), ICU nurses should mitigate the feelings of isolation and distress in terminally ill patients by demonstrating empathy, acknowledging their complete humanity, and assisting them and their families in avoiding a traumatic encounter with death. (Yang and Shin 2021: 7.)

2.2.4 Nurses' perspective with the use digital applications in the acute care setting

Nurses often value digital apps due to their efficacy and impact on operational processes, including electronic health records and mobile applications. Furthermore, the healthcare staff also demonstrates a positive reception towards digital technologies as they recognize their value in enhancing communication (Rutanen, 2019.) Nevertheless, nurses expressed concern regarding the potential lack of enhancement in both overall patient care and patient safety. The factors contributing to nurses' uncertainty over the ability of digital application to enhance patient care and safety are likely multifaceted and encompass the level of confidence nurses have in their own ability to connect with digital systems (Pankhurst et al. 2023: 9.) Applications that are designed with a focus on user-friendliness tend to elicit a greater amount of favorable feedback. Digital applications have the potential to augment patient safety via the use of electronic drug administration records and barcode scanning technologies. However, it is important to note that the attainment of proper training and continuous assistance plays a pivotal role in ensuring the effective execution of a certain endeavor. Nurses may articulate apprehensions about their competence in using new technology, underscoring the need of thorough training initiatives (Rutanen, 2019.)

Health information technology initiatives, such as apps, can be classified as ecological momentary interventions (EMI), which traditionally, mobile technology has been used to provide treatments precisely when they are most necessary, in real-world scenarios, as individuals carry out their everyday activities (Redley et al. 2019: 2870). Nurses found that health information technology (HIT) such as BRAIN-TRK App beneficial despite initial challenges with navigation. The app's perceived advantages in patient care increased acceptance and positive intentions for future utilization. Based on the data and feedback from nurses, it is evident that the app has the capacity to enhance

the adoption of optimal procedures and facilitate additional research (Redley et al. 2019: 2877.)

Nursing software enhances the caliber of labor, the level of patient care, and the utilization of scientific evidence in clinical practice. Nurses view it as convenience, dexterity, and functionality, while technological and operational factors may restrict its utilization (da Silva et al. 2020: 1.) Additionally, previous research has documented nurses' encounters with unanticipated unfavorable repercussions resulting from the use of Health Information Technology (HIT). These studies have included nurses as part of the group of physicians who were interviewed or watched. Since 2009, several nursing studies have documented the unanticipated detrimental repercussions experienced by nurses due to the introduction of electronic health records (EHRs) or computerized provider order entry systems (CPOEs) (Lee 2021: 747.)

3 Purpose, aims and research questions

The purpose of this study is to describe the use and determine the factors affecting the nurses' perspective in the use of digital applications in the acute care setting. The aim of the study is to produce new knowledge from the perspective of nurses on how to improve the use of digital applications in the acute care setting. The following questions are set for this study:

1. What are the use of digital applications in the acute care setting?

2. What are the factors affecting the nurses' perspective in the use of digital applications in the acute care setting?

4 Methodology and methods

4.1 Data collection method

This study takes a qualitative approach and employs a descriptive review technique which is considered advantageous in situations where a compilation of quantitative research is necessary, as it employs diverse methodologies to examine distinct theoretical conceptualizations, constructs, and/or correlations. Descriptive literature

reviews deliver a concise overview of the results obtained from individual research investigations, without taking into consideration the statistical significance of the findings. They provide advantages in facilitating the integration of diverse fields of study for the purpose of reevaluating or establishing a novel theoretical framework. Every individual datum under examination possesses inherent value due to its contribution to or evaluation of a broader concept. For instance, the synthesis of diverse bodies of research elucidates the proposition that requires validation in order to be acknowledged as a widely accepted and efficient motivational factor. Additionally, it serves the purpose of providing a comprehensive historical survey of the progression of theoretical frameworks and empirical investigations pertaining to a particular topic (Snyder 2019.)

4.2 Data search and selection

4.2.1 PICo analysis

The qualitative article Population, Interest, Context is the primary focus of the PICo technique. It is frequently employed in research-based research to identify the components of clinical evidence for a systematic review and is endorsed by the Cochrane Collaboration. The PICo analysis of the investigation is provided below. (Methley, Campbell, Chew-Graham, McNally, and Cheraghi-Sohi 2014: 2.)

Our objective is to identify studies that explore digital applications (phenomenon of interest) used in acute care (context) and determining the view of nurses that utilizes them (population). We used the PICo scheme complemented by requirements for the study design to guide search term selection and inclusion criteria. As a result, using this method improves the quality of database information retrieval. The key phrase structures were utilized in the search for relevant articles in the databases. "Registered nurses," "nurs*," "student nurse," "digital applications," “digital health applications,” “digital health intervention,” "benefits in acute care setting,” were significant terms. Additionally, Boolean operators such as "AND,", "NOT," and, “OR” as well as brackets, were utilized to facilitate the search. The PICo framework used in this study is shown in **Table 1**.

Table 1. Facet analysis PICo for searches

Population		Interest		Context
Registered Nurses	**AND**	Digital Applications	**AND**	The use in Acute Care Setting
OR		**OR**		
Nurs*		Digital Health Applications		
NOT		**OR**		
Student Nurse		Digital Health Interventions		

4.2.2 Database search and criteria selection

It is essential to establish a research question and select pertinent databases and in order to conduct a successful literature search for your thesis. Utilize a thesaurus to identify synonyms and conduct a search on Google Scholar or pertinent abstracts to identify alternative terms. Employ Boolean operators, including AND, OR, and NOT, to efficiently combine keywords. Truncation and wildcards can be employed to identify variations of a word stem. Limit the search to peer-reviewed articles by utilizing the title and abstract fields. Refine your search by restricting the results to peer-reviewed articles and specifying date ranges to retrieve articles from a specific time period (Hill 2017: 1.)

The collected publications emphasize the use of the digital applications used in acute care setting as perceived by registered nurses. We employed keyword and phrase searches pertaining to our subject matter, including more sophisticated search techniques and specific queries utilizing the keywords "digital applications or apps or digital uses or digital programs," "nursing practice or nursing intervention or nursing care," and "acute care or acute care setting." For the exploration of multidisciplinary concepts, we have selected a variety of databases and search engines, such as CINAHL, PubMed and Medline. These databases are widely recognized for their extensive collections of dependable and scholarly scientific publications pertaining to healthcare. The keywords "digital applications or apps or digital uses or digital programs," "nursing practice or nursing intervention or nursing care," and "acute care or acute care setting" were utilized to query the databases. Subsequently, the entered keywords prompted the databases to generate a compilation of articles that align with our search parameters, presenting pertinent titles, abstracts, and citation details.

Publication date filters are applied to select articles from the last decade, ensuring that the content is up-to-date and has undergone peer review. In addition, the competency and reputation of the authors are considered to assure the reliability of the references. By utilizing the available sorting options, it is possible to organize the articles based on their level of significance. We ensure the accessibility of whole textual content by facilitating the delivery and retrieval of the entire website containing the article. Finally, bibliographic data for each article is maintained and can be located in the list of references.

Additional search was made to acquire more research articles that can support the research questions, purpose and aims. Search terms were use such as “digital health technology”,” digital health”, “digital medicine”, “electronic health”, “ehealth”, “nurs*”, and “acute care setting”.

Table 2. Results from database searches

Data Search					
Database/Date	**Search phrase**	**Total number of hits/citations**	**Papers/records included based on title***	**Papers/records included based on abstract***	**Papers/records included based on full text***
CINAHL 27/11/2023	((digital application or apps or digital uses or digital programs or digital application) AND (nursing practice or nursing intervention or nursing care)) AND (acute care or acute care setting)	29	10	4	2
PUBMED 27/11/2023	((digital application or apps or digital uses or digital programs or digital application) AND (nursing practice or nursing intervention or nursing care)) AND (acute care or acute care setting)	137	41	16	2
Additional Data Search					
MEDLINE 27/11/2023	((digital application or apps or digital uses or digital programs or digital application) AND (nur*) AND (intensive care unit) NOT (family) NOT (primary health care or primary) NOT (pediatric)	37	13	5	3
CINAHL 06/12/2023	((digital health technology or digital health or digital medicine or electronic health or ehealth) AND (nurs*)) and (acute care setting)	85	33	13	7
RECORDS IN TOTAL		**288**	**97**	38	**14**
Records removed based on duplicates				3	
Records removed after reading the full text based on inclusion and exclusion criteria.					14
Total number of articles included in the study.					**14**

Preliminary search yielded n=29 from CINAHL, n=137 from PubMed, and n= 37 from Medline and a total of (N=203). Additional search was made with different search terms used yielded the result in CINAHL n=85. Based on the inclusion and exclusion criteria, titles and abstracts were assessed and selected for further analysis. The following articles were excluded due to 3 duplicates. The remaining articles were carefully selected based on the inclusion and exclusion criteria.

The articles that have been chosen are determined by the criteria for inclusion and exclusion. To be included in the research, the papers needed to satisfy the following criteria. The aim of this study was to identify contemporary and up-to-date literature pertaining to the benefits of digital applications in acute care setting as perceived by registered nurses. The criteria for inclusion and removal of the studies are outlined below.

Table 3. Inclusion and exclusion criteria

Inclusion	Exclusion
Published between 2013-2023	Published older than 10 years
Digital health applications	Traditional documentations and monitoring
Acute care	Home care and/or outpatient
Registered nurses	Doctors, other allied medical professional and/or student nurses
Published in English	Published in other languages
Peer-reviewed primary studies	Non-peer reviewed secondary studies

4.2.3 Prisma flow chart

The PRISMA flow diagram provides a concise visual representation of the screening process. The system first logs the quantity of articles discovered and then ensures transparency in the selection process by providing updates on choices made at different phases of the review (Subject and Research Guides: Systematic Reviews: Step 6: PRISMA Flow Diagram & Screen n.d.) Refer to **Figure 1**.

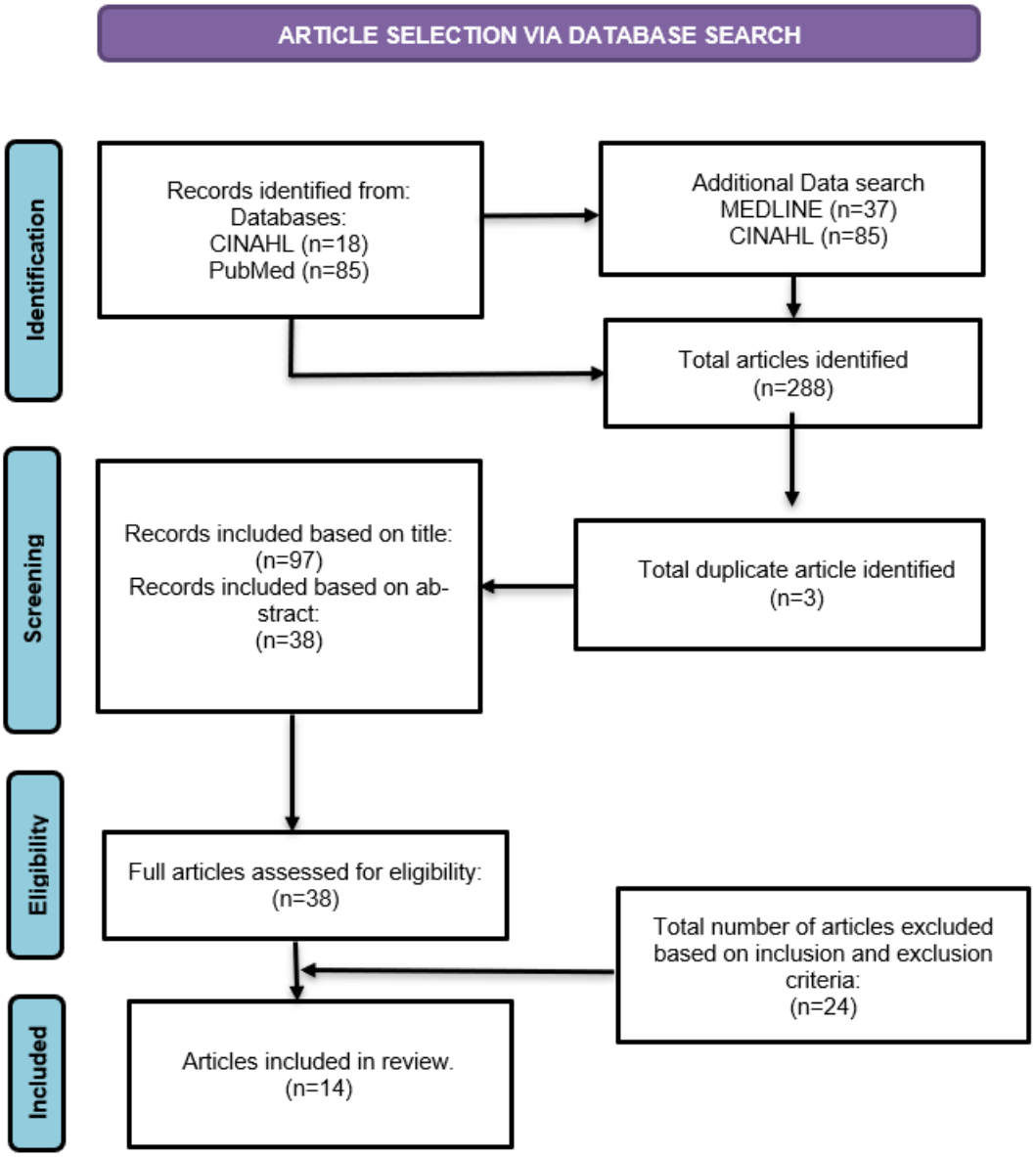

Figure 1. Prisma flow diagram

4.3 Data analysis method

Data analysis is the most efficient activity in the research process. Analysis refers to the meticulous investigation of compiled and categorized data to examine the qualities of a subject and determine the patterns of correlation among the variables associated with it (Murthy and Bhojanna, 2009.)

This study utilized an inductive approach. The primary distinctions between inductive and deductive research approaches lay in their respective interests. A deductive

approach involved formulating a hypothesis based on preexisting theory, whereas an inductive approach involved generating new theory from the data and typically relied on research questions to delimit the study's scope (Gabriel and Gabriel, 2013.)

This review employed the inductive data analysis technique. Following a meticulous selection process of the selected articles, a first reading was performed to acquire crucial information, such as participant quotes and contextual elements. The subsequent procedure entailed establishing an open coding subcategory, which necessitates dissecting the data into significant pieces and allocating codes to precisely depict the substance of the findings (Saldana 2012.) See **Table 4**.

Table 4. The meaning units and coding

Meaning unit	Coding unit
Nurses' ability to use an EHR effectively, by demonstrating critical knowledge and skills, is critical to patient safety, decreased facility expenditures for training, and decreased healthcare costs. (Miller et. al 2014)	Patient safety
	Low facility spending in trainings
The use of information technology products to assist medical material management in clinical practice has a significant effect on the load reduction of nurses and improvement of satisfaction. (Yi Tsao et. al 2022)	Low healthcare costs
The results of our study strongly suggest that professionals should be provided with an EPR that they consider useful for improving their performance and the quality of the care they provide as a major determinant of both EPR use and their satisfaction. Nurses play a major, pivotal role in the care team, ensuring cohesion among the system's various components and the factors involved in patients care. In this respect, a meaningful measure of actual use of an EPR to support their decision-making process, collaborative work and support nursing care. (Maillet et. al 2015)	Improving their performance
	Providing quality care
	Supports their decision-making process
The current work has shown that nurses express high perceptions of usefulness and ease of use of EHRs in Jordan, and are convinced of their advantages, perceiving positively their usefulness and ease-of-use. (Tubaishat 2017)	Collaborative work and support nursing care
The Brain App's acceptability was enhanced by familiarity and perceived benefits, but hindered by perceived increases in workload, inconsistent use, pressure to use the App and resistance to change. Feasibility and usability were enhanced by easy navigation, and clear and useful content, but hindered by unclear expectations, unfamiliarity, and device-related factors. (Redley et. al 2019)	Unfamiliarity and device related factors
	Inconsistent use
	Perceived increase in workload
	Resistant to change
The developed Nursing Activity Score (NAS) APP software presented an interface which allows prospective intervention improving the workload sizing in the ICU and was able to generate monthly/consolidated and patient discharge reports. Functional tests were successfully performed in the system. (Da silva et. al 2020)	Enhances workload sizing
	Reliable database
From a nursing perspective, we hope this article will help empower direct care nurses and the nursing profession to better articulate nursing informatics concerns and also to value and improve the role the EHR plays in making visible the practice of nursing. (Lavin et. al 2015)	Continue using EHR in nursing practice

The codes with similar features were grouped into primary categories, which reflected the common perspectives among the nurses in the study. The data from various research studies was systematically compared to enhance categorization and uncover novel patterns, as well as analyze trends and variations in the findings (Saldana 2012.) See **Table 5**.

Table 5. Subcategories and generic categories

Subcategories	Generic categories
Patient safety	Advantages in using of digital applications (Electronic health record, electronic patient records, Brain app, Nursing Activity Score App)
Building trusting relationship	
Decrease assessment time	
Efficiency in task completion	
Decrease workload	
Proper resource allocation	Long term effect in using digital application in healthcare
Cost effectiveness	
Skill acquisition	Positive factors affecting nurses' perspective
Technical skill training	
Improved nurse knowledge	
Easy to use	
Inability to accept change	Negative factors affecting nurses' perspective
Inconsistent use	

Finally, theme development included the creation of overarching themes that encompassed larger subjects and recurring patterns discovered in the results (Saldana 2012). See **Table 6**.

Table 6. Generic and main categories

Generic categories	Main categories
Advantages in using digital applications (Electronic health record, electronic patients record, Brain app, Nursing Activity Score App)	**Main category 1:** The use of digital applications in acute care
Long term effect in using digital application in healthcare	
Positive factors affecting nurses' perception	**Main category 2:** Factors affecting nurses' perspective in using digital applications in acute care setting
Negative factors affecting nurses' perception	

The primary phases involved in the process of inductive content analysis were shown in figure 2. After these processes, the pertinent extracted units were thoroughly examined and prepared for reporting, including primary categories, general categories, and sub-categories used in this data analysis procedure please see table 7. In total, the authors extracted – seven original expressions (n= 7), thirteen subcategories (n=13), four generic categories (n=4) and two main categories (n=2).

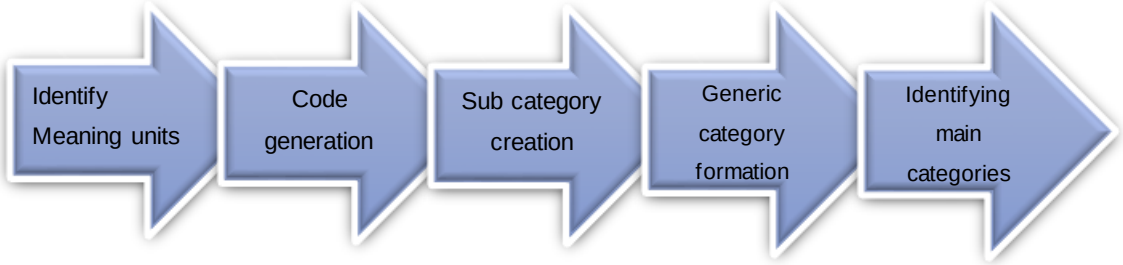

Figure 2. Inductive content analysis procedure

Table 7. The units of analysis are determined by the list of chosen articles

Main category	**The use of digital applications in acute care**		**Factors affecting nurses' perspective in using digital applications in acute care setting**	
Generic Categories:	Advantages in using digital applications (Electronic health record, electronic patients record, Brain app, Nursing Activity Score App)	Long term effect in using digital application in acute care	Positive factors affecting nurses' perspective	Negative factors affecting nurses' perspective
Sub- Categories:	• Patient safety • Building trusting relationship • Decrease assessment time • Efficiency in task completion • Decrease workload	• Proper resource allocation • Cost effectiveness	• Skill acquisition • Technical skill training • Improved nurse knowledge • Easy to use	• Inability to accept change • Inconsistent use
Selected articles	**1, 3, 4, 7, 13, 14**	**4, 12, 14**	**2, 3, 5, 7, 8, 11, 12, 13, 10**	**3, 6, 9, 10**

5 Results

Following an extensive database search and selection process, a total of fourteen (14) papers were acquired for the purpose of conducting this research. The data collecting and analysis used quantitative research designs. The publications included in the research were published in various countries. There are an equal number of articles, namely three (3), from the USA which are studies by Herasevich et al. 2023, Lavin et al. 2015, and Miller et al. 2014; South Korea which are studies done by Lee, 2021, Lee, 2021, and Yang et al. 2021. The UK and Australia each have two (2) articles which were studies by Wynn et al. 2023 and Tanya et al. 2022 for the former and Suner et al. 2022 and Redley et al. 2019 for the latter. While Taiwan a study by Yi-tsao et al. 2022, Brazil a study done by Da Silva et al. 2020, Jordan a study by Tubaishat 2017, and Canada a study by Maillet et al. 2015 each have one (1) article. As illustrated at the table 8 below. Seven (7) of the research are quantitative and make use of randomized control trials, focused groups, surveys, experimental and control groups, and single group pre- and post-test designs. The other five (5) studies are qualitative and use questionnaires, interviews, and case studies. On the other hand, out of the fourteen (14) papers selected, three (3) are mixed methods studies covering methods that include interview and observational studies, clinical trial and interview. See **Table 8**.

Table 8. List of selected articles by country

Country	Year	Author (s)	Methods and Methodology	Participants
USA	2023	Herasevich et al.	Quantitative study – Randomized control trial	Clinicians n = 20
USA	2015	Lavin et al.	Qualitative Study – Questionnaires, Interviews	Direct care nurses
USA	2014	Miller et al.	Quantitative Study - Experimental	Nurses Novice = 222 Managers = 326
South Korea	2021	Lee	Quantitative Study – Focused Group	Nurses n = 160
Korea	2021	Yang et al.	Quantitative study – Experimental and control group	Nurses n = 44
South Korea	2019	Insook, Insoon	Mixed Method - interviews and observational studies	Nurses n = 209
UK	2023	Wynn et al.	Qualitative study – Case study	Trained infection control nurses
UK	2022	Tanya et al.	Mixed method – Clinical trial and interview	First pilot: n = 6 ICU nurses Second pilot: n = Nurses
Australia	2022	Suner et al.	Qualitative Study - Descriptive	Nurses n = 25
Australia	2019	Redley et al.	Qualitative study - interview	Nurse n = 22 Patients n = 14
Taiwan	2022	Yi-tsao et al.	Quantitative study – single group pre and post-test experimental design	Nurses n = 57
Brazil	2020	Da Silva et al.	Quantitative study - experimental	Nurses n = 10 ICU patients n = 4
Jordan	2017	Tubaishat	Qualitative study – questionnaires and survey	Participants n = 2061
Canada	2015	Maillet et al.	Quantitative study - surveys	Nurses n = 616

The purpose of the study was to examine the use of digital apps deployed in the healthcare sector and assess the nurses' perspective of their usage. Inductive content analysis was employed to define categories, resulting in the identification of two primary groups: the use of digital applications in acute care and nurses' perspective in the utilization of digital applications in the acute care setting. These categories were further divided into four (4) generic categories which were: use of the digital applications (electronic health method, electronic patients score, Brain app, Nursing activity score app), long term effect in using digital application in healthcare, positive factors affecting nurses' perspective, and negative affecting the nurses' perspective. As shown in **Figure 3**.

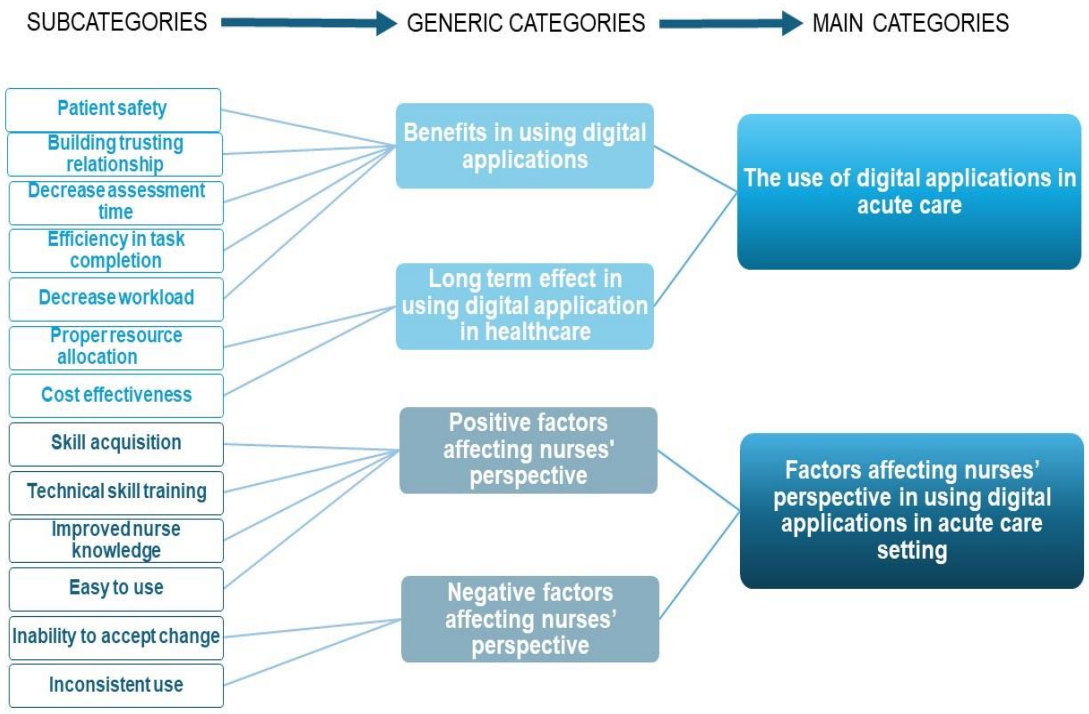

Figure 3. Inductive content analysis

5.1 The use of digital applications in acute care

The primary advantage of patient records was their significant contribution to patient safety, which was the main motivation behind many healthcare programs in the UK. (Pankhurst et al. 2023: 7). Information technology had undergone continual evolution in recent years due to the emergence of numerous technological advances. Mobile

applications had been utilized in different areas of education, including health-related initiatives. The mobile app interventions were found to be effective in enhancing different health practices because of the app's capacity to offer feedback or information through visualization (Yang & Shin 2021: 2.) Various studies discussed the benefits of digital application in acute care such as patient safety (Pankhurst et al. 2023, Miller et al 2014, Lavin, Hamper and Barr 2015, Miller et al. 2014,Cho and Jin 2019, Redley et al. 2019), decreased assessment time and workload (Herasevich et al. 2023), efficiency in task completion (Yang & Shin 2021, Redley et al. 2019), proper resource allocation and being cost effective (Pankhurst et al. 2023, Lavin, Hamper and Barr 2015, Miller et al. 2014).

5.1.1 Advantages in using digital applications in acute care

The advancement and empirical evaluation of innovative digital technologies that facilitate the management of patient populations by clinicians and the prioritization of patients became more crucial as we extended clinical supervision to bigger groups of patients through remote monitoring services (Herasevich et al. 2023: 8). Introducing ICU charts into a healthcare digital application or program could be done effectively and assisted medical professionals such as nurses and doctors by improving efficiency and allowing them to allocate more time for direct patient care. Patients were safeguarded against errors, and the resulting cost savings could be reinvested in other areas of the healthcare system (Pankhurst et al. 2023: 9, Herasevich et al. 2023: 7.) The digital documentation of nursing care had a direct impact on patient-centered care. The reason for this was that nursing documentation enabled immediate contact among all healthcare personnel and electronic documentation allowed for its analysis on a scale that had never been done before. In order to maximize patient safety through the use of electronic health records (EHR), it was essential to establish good collaboration between nurses and health information technology (HIT) workers. Additionally, there had to be a clearer understanding of the patient safety perspective provided by direct care nurses (Lavin, Hamper and Barr 2015, Miller et al. 2014: 2, Pankhurst et al. 2023: 7-8.) The advantages of telehealth support for ED nurses improved the exchange of information and the quality of care. The ISBAR tool in conjunction with telehealth improved communication, fostered trust, and promoted person-centered care. Telehealth was beneficial for older individuals as it helped minimize feelings of loneliness and could be easily expanded, making it a significant resource for clinical treatment (Sunner, Giles, Kable and Foureur 2022: 4707.)

5.1.2 Long term effect in using digital application in health care

Deploying an Electronic Health Record (EHR) system could substantially save healthcare expenditures, enhanced patient safety, and facilitated payment. However, it necessitated adequate training and proficient utilization by healthcare personnel, especially newly graduated nurses (Miller, L., Stimely, Matheny, Pope, McAtee and Miller, K. 2014: 1.)

The implementation of the medical material management system app had the potential to significantly decrease the strain of nurses, thereby enhancing their work-life balance and mitigating the risk of burnout. This decreased burden enabled nurses to concentrate on patient care, leading to improved results and quality of care. However, achieving long-term success was contingent upon maintaining a regular and continuous usage of the application, receiving ongoing training, assistance, and addressing any technical difficulties that might arise. The application could potentially have a positive influence on the overall healthcare business by simplifying procedures and enhancing effectiveness. Hence, it was imperative to maintain consistent acceptance and continuous assistance in order to achieve these advantages (Chen, Chiu, Teng, and Liao, 2022: 8-9.)

In general, the electronic patient record (EPR) should facilitate the retrieval of important information, patient evaluation, health promotion, therapeutic intervention and health management. These qualities are essential for nurses, who play an important role in the healthcare system as a link between information and the key person in the healthcare team (Maillet, Mathieu, and Sicotte, 2015: 37.)

5.2 Factors affecting nurses' perspective in using digital applications in acute care setting

The implementation of VTC improved clinical practice by fostering a patient-centered approach, establishing trust, and facilitating collaboration among the emergency department, medical residents, and family members. This program enhanced the clinical proficiency of emergency department (ED) nurses through visual evaluations, fostered stronger connections between residential aged care facilities (RACF) and ED nurses, and allowed a seamless transfer for residents by already being familiar with their medical history (Sunner, Giles, Kable and Foureur 2022: 4706.)

Telehealth had helped to address the experience gap by helping nurses at all levels in their assessments and decision-making (Sunner, Giles, Kable and Foureur 2022: 4701 - 2). Additionally, emergency department (ED) nurses stated that telehealth had impacted clinical assessment, decision-making, and the process of transferring patients to the ED or residential aged care facilities (RACF). This resulted in greater efficiency for the nurses (Sunner, Giles, Kable and Foureur 2022: 4702.)

The nurses also discovered that the BRAIN-TRK App was beneficial despite initial challenges with navigation. The app's perceived advantages in patient care led to increased acceptance and positive intentions for future utilization. Based on the data and feedback from nurses, it is evident that the app had the capacity to enhance the adoption of optimal procedures and facilitate additional research (Redley et al. 2019: 2877.)

5.2.1 Positive factors affecting nurses perspective

An evaluation was conducted to determine the level of acceptability of the BRAIN-TRK App among nurses. The adoption of the app was influenced by various factors, such as the nurses' judgments of its suitability for their staff, patient cohort, and setting. Additionally, their interaction with the technology and prior experience using the app played a role. Increased knowledge of the application and the perceived advantages of utilizing it in patient care were discovered to improve acceptability. The app was considered advantageous in customizing BPS tactics, tracking effectiveness, and allowing staff to update their understanding of BPS related to neurocognitive diseases (Redley et al. 2019: 2875.)

Also, telehealth enhanced clinical decision-making by facilitating visual assessment and promoting collaboration with medical personnel, particularly emergency department physicians, thereby improving bidirectional communication (Sunner, Giles, Kable and Foureur 2022: 4703.)

The ICE tool could improve comprehension of the effectiveness and financial consequences of outbreak management actions. It serves as a cognitive aid and educational resource for teams, specifically addressing the seven questions of the ICE framework to guarantee that crucial aspects of epidemic control were thoroughly examined and assessed (Wynn, Brady, McKenna, Swanson and George 2022: 49.)

5.2.2 Negative factors affecting the nurses' perspective

Nurses' acceptance of the BRAIN-TRK App was impeded by their sense of increased workload, inconsistent utilization, perceived pressure to utilize it, and the aversion to change. Nurses perceived the app as unnecessary and untrustworthy, and their limited utilization of technology posed challenges in incorporating it into their regular workflow (Redley et al. 2019: 2875-2876.)

Connectivity concerns and equipment accessibility caused telehealth consultations to take longer for nurses in residential aged care facilities (RACF) and emergency departments (ED). RACFs commonly encountered challenges such as unreliable Wi-Fi connections, dependable telephone connections, and inadequate bandwidth. Respondents indicated several issues, such as inadequate bandwidth for a telemedicine platform of good quality (Sunner, Giles, Kable and Foureur 2022: 4704 - 5.)

Nurses were cautious about documentation for fall prevention tasks, fearing it would infer fall risks. The care plan helped efficiency, but they found it burdensome to enter assessment data (Cho and Jin 2019: 1651.) The study found that participants' responses to unintended adverse consequences varied significantly across practice settings, with higher mean values for nursing documentation implementation and concerns about patient safety (Lee 2021: 750-751).

6 Discussion

This study was done to address two research questions: “What are the use of digital applications in the acute care setting?” and “What are the factors affecting the nurses’ perspective in using digital applications in the acute care setting?”. Several studies have shown that digital applications have a beneficial outcome in healthcare, especially in acute care settings namely as for patient safety, efficiency, cost-effectiveness, and teamwork. But not all medical professionals perceived this futuristic approach in a most welcoming manner. Nurses for example struggle to accept these changes because they often struggle with technical issues and lack of proper training. This can have a significant influence on their productivity and the quality of care they provide to patients, emphasizing the importance of comprehensive assistance and resources to facilitate their transition (Sunner, Giles, Kable and Foureur 2022: 4704 - 5.)

Technology has completely changed the healthcare sector, and digital apps are essential to enhancing patient care and facilitating access to healthcare services. Digital applications have revolutionized the way health services are delivered and managed, encompassing telemedicine, health monitoring, electronic health records, and virtual consultations. Information technologies (IT) are increasingly being suggested as solutions to the obstacles encountered in healthcare systems, in order to tackle population health problems and promote the development of innovative healthcare delivery methods (Maillet, Mathieu and Sicotte 2015: 37). Innovations such as electronic health record, electronic patients record, Brain app, Nursing Activity Score App, End of life care app, Fall risk app are among several apps that are currently in use in acute care settings.

According to Herasevitch et al., digital health strategies have the potential to significantly decrease the time it takes for healthcare professionals such as nurses to make therapeutic choices and minimize their workload when caring for critically sick patients. This can be particularly beneficial in fast-paced environments like the ICU. By utilizing technology to accelerate therapeutic decisions, nurses can prioritize direct patient care, eventually increasing efficiency and potentially improving patient outcomes. Moreover, based on the study of Pankhurst et al., another advantage of using digital applications such EHR clinicians, nurses and other healthcare professionals can simultaneously access the same patient's electronic records, interact, and create a discussion on how to manage the patient. This promotes teamwork among all healthcare team members. These tools enhance communication and coordination among practitioners, leading to more efficient and effective patient care delivery.

In addition to this, Sunner et al. stated that visual telehealth has enhanced person-centered care by facilitating remote assessments, promoting trust and rapport, and improving communication between acute care facilities and emergency departments (EDs). Nevertheless, obstacles such as limited technological access and connectivity continue to exist. Examining the experiences of nurses can provide valuable insights for improving practice, making better decisions, and ensuring the safety of telehealth solutions for elderly persons in care. Specifically, the implementation of the Shift Check App resulted in a substantial decrease in the average workload of nurses, especially for those with advanced nursing skills. The application also enhanced the satisfaction of nurses, as evidenced by improved scores on their intention to accept information. This

application has the capacity to improve the job satisfaction, level of care, and management of workload for nurses, particularly in challenging settings with intricate patient circumstances. Utilizing digital health solutions can help alleviate nurse burnout and enhance patient care which has been stated by Chen et. al.

Studies conducted by Redley et al. 2019, Cho & Jin 2019, and Lee 2021 had mostly the factors affecting nurses' negative perception in the use of Digital Applications due to the additional workload and adaptability to the new changes in this application. Training and familiarization to the use of digital apps are needed to have a positive output. Jordanian nurses, Tubaishat et. al. has demonstrated a favorable opinion of Electronic Health Records (EHRs), which is essential for their adoption of the technology. Perception of this is influenced by factors such as gender, professional status, expertise with electronic health records (EHR), and computer proficiency. The study highlights the significance of considering both the perceived utility and ease-of-use when deploying Electronic Health Record (EHR) systems. These aspects can enhance the experiences of nurses and boost patient care in the changing healthcare environment.

On a final note, the study "Novice Nurse Preparedness to Effectively Use Electronic Health Records in Acute Care Settings: Critical Informatics Knowledge and Skill Gaps" by Miller et. al aimed to determine discrepancies between the informatics knowledge and skills reported by nurses and their actual knowledge and skills demonstrated in acute-care settings. Electronic Health Records (EHRs) are essential for ensuring patient safety, reducing costs, and enhancing clinical outcomes. Nevertheless, the integration of Electronic Health Records (EHRs) in the healthcare sector is slower compared to other industries. The process of establishing these systems and providing training to the relevant parties presents additional difficulties for the already overwhelmed U.S. healthcare system. It is essential to address these gaps in knowledge and skills in order to improve the use of Electronic Health Records (EHR) and enhance patient care.

7 Ethics and validity

Throughout the course of this study, the researchers placed a high importance on reliability and are fully dedicated to thoroughly analyzing the other studies contained in this research to guarantee its trustworthiness. The academic research articles included

in this study were acquired from reputable research databases endorsed by the library of Metropolia University of Applied Sciences. These databases include CINAHL (Ebsco) and PubMed. Additional search as done through EBSCO Medline database. To verify the authenticity of the research, it will be subjected to a plagiarism check using the "turn it in" software. The search process was conducted meticulously and comprehensively. Scientific publications are acknowledged by providing legal attribution and acknowledging the researcher's efforts and accomplishments. As a result, all rephrased sentences from this research are accurately referenced in the references. In order to prevent bias and manipulation, researchers also uphold truth and objectivity to guarantee the accuracy of their conclusions and conduct a thorough examination of all sources.

In order to adhere to the appropriate ethical standards, the researchers abided by the fundamental principle of research integrity as outlined in the European Code of Research Integrity. This principle encompasses four key elements: reliability, honesty, respect, and responsibility (Keiski et al. 2023: 11). Researchers also abide by intellectual property rights, guaranteeing that unpublished data is not utilized without authorization, hence preventing any type of plagiarism. The researchers openly disclosed any potential conflicts of interest or previous actions to the Ethics Committee in order to address and resolve any conflicts of interest (Fleming 2018: 211.)

8 Strengths and Limitations

This study aims and objectives have been clarified through the collection of pertinent information. The articles were chosen according to certain criteria, which included being published within the past decade and discussing both new and existing digital applications now utilized in acute care. The data analysis produced noteworthy findings from the chosen publications that effectively tackled the research questions. The results were subsequently combined to provide insight into the use and nurses' perspective on digital applications in acute care. See T**able 7**.

The fourteen (14) articles utilized in this investigation were predominantly published in the United States. The countries mentioned include the United States, United Kingdom (UK), Australia, and several Asian countries. A disadvantage of our study was the absence of publications published in the Nordic and Scandinavian nations. This is unfortunate as such articles could have provided valuable insights into the

distinguishing features of digital applications utilized in these regions. Another constraint of this analysis was the publication year of the article. Given the time needed to carry out and publish the review, there is a chance that the current review may not include the most up-to-date findings. Therefore, it may not precisely depict the most recent advancements in the subject. In order to mitigate these constraints, it is crucial to perform a comprehensive methodological assessment, meticulously choose and assess research, and identify potential biases and limits of the studies that are included. Providing clear and open information about our evaluation methods and criteria can assist our readers in comprehending the thoroughness and dependability of our findings.

9 Recommendations and Conclusions

In recent years, the incorporation of digital technologies in healthcare, specifically in urgent care environments, has grown increasingly widespread. Nurses have a vital role in employing these tools to improve patient care and outcomes. Digital applications, such as electronic health records and telehealth platforms, provide benefits such as enhanced efficiency, communication, and information accessibility, ultimately resulting in improved patient outcomes. Nevertheless, the persistent utilization of these technologies may also result in enduring consequences, such as possible exhaustion and heightened stress among nurses.

Training and support can enhance nurses' confidence and proficiency in properly utilizing digital technologies. Engaging nurses in the creation and execution of these technologies can additionally improve their user experience and adoption. Conversely, unfavorable opinions towards digital applications may arise due to issues such as insufficient instruction, absence of assistance, and apprehensions regarding the security and confidentiality of patient data.

Healthcare businesses must overcome these obstacles by offering continuous training and support to enhance the utilization of digital technologies. Although digital applications have revolutionized the methods by which nurses provide care and communicate, it is crucial to weigh the advantages and potential drawbacks of their ongoing utilization in order to enhance the overall quality of care.

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Appendices

Appendix 1. Summary of reviewed articles

Summary of reviewed articles					
Author(s), year, country	**Title**	**Methodology & Methods**	**Participants**	**Main Outcomes**	**Limitations**
1. Herasevich, et al. 2023 US	Evaluation of Digital Health Strategy to Support Clinician-led Critically ill Patient Population Management: Randomized Crossover Study	Quantitative study- Randomized control trial	Clinicians N=20	The study compared ICU clinician performance using Epic and AMP electronic environments, finding AMP reduced task completion time but not significant differences in adjusted total errors.	The study, conducted in a single facility, may have limited applicability and non-response bias due to participants' interest in digital techniques and uniform conditions.
2. Wynn, et al. 2023 United Kingdom	Implementation of the infection control estimate: A case study on the use of a newly developed digital tool for outbreak management in the acute setting	Qualitative study- Case study	Trained Infection Control Nurses (not mentioned)	The ICE prototype is a digital tool that centralizes data on outbreak management in inpatient hospitals, improving understanding, economic impacts, and cognitive support for teams.	Future tool development aims to improve communication and automated data analysis for effective intervention and rapid outbreak management plans, requiring robust testing for evaluation.
3. Suner, Giles, et al. 2022 Australia	Experiences of nurses working in RACFs and EDs Utilising visual telehealth consultation to assess the need for RACF resident transfer to ED: A qualitative descriptive study	Qualitative study- Descriptive	Nurses = 25	The study highlights the positive benefits of a VTC for RACF residents and nurses, highlighting the need for collaboration between expert ED clinicians and RACF nurses for quality healthcare.	Focus groups with RACF nurses and ED nurses were conducted face-to-face and video-conferencing, varying in dynamics and response to Covid19 restrictions, albeit with less respondent bias.

4. Tanya, et al. 2022 UK	Benefits of electronic charts in intensive care and during a world health pandemic: advantages of the technology age.	Mixed-method- Clinical trial and interview	First pilot: N=6 ICU nurses Second pilot: N=16 nurses.	The study demonstrates the benefits of electronic charts in ICUs, including error reduction, efficiency, cost savings, and positive staff feedback, despite challenges like COVID-19.	This study, a single-center one, focuses on errors in data upload to electronic systems and the impact of automatic data download on staff time, attitudes, error rates, and patient safety.
5. Yi-Tsao, et al. 2022 Taiwan	The effect of medical material management system app on nursing workload and stress	Quantitative study- single-group pre- and post-test experimental design	Nurses N = 57 RCC: 10 MICU: 11 CCU: 25 SICU: 11	The Shift Check App significantly improved information acceptance intention, but older nurses experienced a negative impact on IT product use ability.	The study, initially involving 70 participants, was reduced to 57 due to COVID-19, and future research will utilize the Shift Check App in more units and gather nurses' opinions.
6. Lee 2021 South Korea	Measuring Nurses' Experiences With Unintended Adverse Consequences in EMR Use in Acute Care Settings	Quantitative study- Focused group	Nurses: n=160	The highest mean value was for nursing documentation implementation, while the lowest was for concerns about patient safety. These responses varied across practice settings.	The study had limitations due to a convenience sample and limited generalizability.
7. Yang, et al. 2021 Korea	End-of-life Care Mobile App for Intensive-Care Unit Nurses: A Quasi-Experimental Study	Quantitative Study- Experimental and control group	Nurses N= 44	The study found that a mobile app for end-of-life care improved self-efficacy and compassion among nurses, emphasizing the need for educational initiatives addressing the fourth industrial revolution's impact.	The study evaluates an Android-based end-of-life care application for South Korean nurses, focusing on nursing proficiency and performance, but requires further research to compare aptitudes and achievements.

8. Da Silva, et al. 2020 Brazil	Mobile application for the evaluation and planning of nursing workload in the intensive care unit	Quantitative study- Experimental	Nurses N = 10 ICU Patients N=4	The study compared ICU clinician performance using Epic and AMP electronic environments, finding AMP reduced task completion time but not significant differences in adjusted total errors.	Future research is needed for a pilot study and evaluation of the software in a hospital by health professionals and managers.
9. Insook, Insun 2019 South Korea	Responses of Staff Nurses to an EMR-Based Clinical Decision Support Service for Predicting Inpatient Fall Risk	Mixed method- Interviews and observational studies	Nurses: 209	EMR adoption reveals clinical big data opportunities, necessitating efficient user understanding, knowledge, attitude, and consideration of sociotechnical concerns, workflow, and workaround patterns.	Nurses initially had neutral attitudes towards the Insight risk prediction service, with experienced nurses reporting differing predictions. However, some junior and newer nurses showed positive attitudes, despite initial confusion.
10. Redley, et al. 2019 Australia	Co-development of “BRAIN-TRK”: Qualitative examination of acceptability, usability and feasibility of an App to support nurses' care for patients with behavioural and psychological symptoms of neurocognitive disorders in hospital	Qualitative study- Interview	Nurse N=22 Patients N= 42	The BRAIN-TRK App, a stakeholder-engaged method for translating clinical knowledge, faces challenges like workload, inconsistent use, and resistance to change.	The study's limitations include a limited number of health service wards, potential selection bias, and staff familiarity with the BRAIN-TRK App, potentially limiting its applicability and relevance.
11. Tubaishat 2017 Jordan	Perceived usefulness and perceived ease of use of electronic health records among nurses: Application of Technology Acceptance Model	Qualitative Study- Questionnaires and survey	Total Participants: N: 2061	Healthcare demands computerization for efficient clinical data collection, storage, and analysis. EHRs are useful, but nurses must accept them. Familiarizing nurses with EHR systems and improving computer	The study, valid globally, has limitations due to its self-reported questionnaire, limited inclusion of nurses, and non-random sampling technique, potentially compromising the results' external validity.

				skills can maximize their adoption.	
12. Lavin, et al. 2015 USA	Health Information Technology, Patient Safety, and Professional Nursing Care Documentation in Acute Care Settings	Qualitative Study- Questionnaires, interviews.	Direct care nurses	The Nursing Practice Committee encourages direct care nurses to identify and develop their documentation and informatics skills, focusing on three scenarios: working with vendors, reflecting on inaction, or developing continuing education plans to improve practice and education.	The discussion addressed informatics concerns from both HIT and nursing perspectives, emphasizing interoperability as a significant issue. Vendors and IT departments should be rewarded for responsiveness.
13. Maillet, Mathieu, et al. 2015 Canada	Modeling factors explaining the acceptance, actual use and satisfaction of nurses using an Electronic Patient Record in acute care settings: An extension of the UTAUT.	Quantitative study- Surveys	Nurses: N=616	The study suggests that professionals should be provided with an EPR that enhances their performance and care quality, and that it aligns with their preferred work style, practices, and values. A meaningful measure of EPR use can support decision-making, collaborative work, and nursing care.	The study examines the implementation of Electronic Patient Records (EPR) in healthcare institutions, focusing on nurses, despite the high-risk scenario and its potential generalization.
14. Miller, Steamly, et al. 2014 US	Novice Nurse Preparedness to Effectively Use Electronic Health Records in Acute Care Settings: Critical Informatics Knowledge and Skill Gaps	Quantitative study- Experimental	Nurses Novice = 222 Managers = 326	The study found that 90% and 75% of new nurses and supervisors received EHR training, with age, clinical experience, hospital orientation, and department-specific orientation affecting proficiency.	The study's limitations include a sample of new nurses and nurse managers, insufficient knowledge and skills evaluation, and self-report data collection.

Appendix 2. Database search results

Data Search					
Database/Date	**Search phrase**	**Total number of hits/citations**	**Papers/records included based on title***	**Papers/records included based on abstract***	**Papers/records included based on full text***
CINAHL 27/11/2023	((digital application or apps or digital uses or digital programs or digital application) AND (nursing practice or nursing intervention or nursing care)) AND (acute care or acute care setting)	29	10	4	2
PUBMED 27/11/2023	((digital application or apps or digital uses or digital programs or digital application) AND (nursing practice or nursing intervention or nursing care)) AND (acute care or acute care setting)	137	41	16	2
Additional Data Search					
MEDLINE 27/11/2023	((digital application or apps or digital uses or digital programs or digital application) AND (nur*) AND (intensive care unit) NOT (family) NOT (primary health care or primary) NOT (pediatric)	37	13	5	3
CINAHL 06/12/2023	((digital health technology or digital health or digital medicine or electronic health or ehealth) AND (nurs*)) and (acute care setting)	85	33	13	7
RECORDS IN TOTAL		**288**	**97**	38	**14**
Records removed based on duplicates		3			
Records removed after reading the full text based on inclusion and exclusion criteria.					14
Total number of articles included in the study.					**14**