

Effectiveness of Artificial Intelligence Applications in Nursing Practice and Workflow: An Integrative Literature Review

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Abstract

Background: The emergence of technology such as artificial intelligence in healthcare and the medical field has been rising nowadays necessitating a thorough exploration by nurses to optimize the utilization of artificial intelligence health technologies. This integrative review aims to assess the impact of technology such as artificial intelligence applications in nursing practice and nursing administration, and the influences emerging trends in artificial intelligence health technologies have on the nursing era.

Methods: This study was conducted following the framework of an integrative review. This study methodology included reviewing all English studies retrieved from different databases such as (CINAHL, PubMed, Science Direct, Scopus, and Google Scholar). Searching was carried out using the PRISMA research tool. The search engine phrases were derived via brainstorming, thesaurus, database, and topic knowledge.

Results: A total of 15 studies were identified in the study. The study's results were presented as four themes. seven studies examined how AI affects nursing practice reporting that there were studies that have assessed the implication of artificial intelligence on nursing practice, two investigated the implication of artificial intelligence on nursing administration, three studies mentioned the implication of artificial intelligence on nursing policy, and only three study stated the implication of artificial intelligence on nursing education.

Conclusion: AI is already changing healthcare job definitions, procedures, and nurse-patient relationships. We believe this is the first integrative study to map the evidence on how AI technologies are already and will continue to affect nursing and other caring professions.

Keywords: Artificial Intelligence - AI - Nursing Practice -Nursing Administration - Workflow

Introduction

Research on the impact of technology on the nursing profession has grown in recent years due to the exponential growth of technological capabilities in healthcare systems worldwide (Mathkor et al., 2024). To improve healthcare quality, increase patient satisfaction, and offer a new approach to addressing health challenges in the twenty-first century, nurses should conduct better investigations into the interconnections between humans, technology, and the environment to make effective use of artificial intelligence health technologies (AIHTs) (Nonvignon et al., 2024). Also, nurses are the biggest group working in healthcare, and they do a lot of different jobs in the five areas of nursing practice approved by the Registered Nurses Association of Ontario (RNAO). These are administration, education, clinical practice, policy, and research (Lukewich *et al.*, 2022).

Compassionate care that is centered on the patient and their family is highly appreciated in the nursing profession and is represented in a wide variety of nursing practice frameworks (Torbett et al., 2022; Robinson et al., 2024).

To provide effective treatment, nurses must attend to each patient's unique requirements, foster an environment conducive to healing, and cultivate therapeutic relationships with them, all of which are facilitated by compassionate care (Shaban et al., 2024). The nurse-patient interaction will evolve in response to new developments in AIHTs. In computing, the study of "artificial intelligence" (AI) is referred to as the "AI field" and is concerned with programming machines that approximate human intellect in areas like making decisions, recognizing speech, recognizing images, and language translation.

As the use of AIHTs in clinical settings spreads, it is expected that global investment in these technologies will rise to more than US \$36 billion by 2025 (Mohamed et al., 2022). It is expected that AIHTs will influence the nursing profession both immediately and in the long run due to their ability to improve workflows and lead clinical decision-making (Aggarwal, Bansal, and Goyal, 2024).

An unusual solution to health problems of the 21st century could be provided by AIHTs, which have been increasingly used in clinical practice in response to rising consumer demand for digital health technologies. AIHTs improve workflows and strengthen clinical decision-making (Agnew, 2022; Jiang, and Kong, 2024). Research into how healthcare systems' rapid technological advancements in the last several decades have affected nurses' day-to-day tasks has been more prevalent in recent years (Kamal, Shafiq, & Kakria, 2020).

Finally, the nursing industry is now evaluating or using a large number of AIHTs. Sarkar and Goel (2024) include digital assistants and healthcare robots powered by Machine Learning (ML) as examples of such technologies. A branch of AI, machine learning (ML) allows computers to automatically conclude new data sets without any human input whatsoever. By incorporating fresh data into its learning process, the ML application may enhance its output (Kulhanek, 2022). Predictive analytics solutions powered by ML can exploit patterns in patient data to forecast outcomes like pressure ulcers and other potential problems. The integration of predictive analytics into smart healthcare devices has made it feasible for nurses to have a more proactive role in initiating appropriate therapies for patients in both community and institutional settings (Velikovi *et al.*, 2020).

The current knowledge has little focus on Nursing Practitioners' involvement and experience with AI. Important challenges still have to be met, however, for AI-based systems and applications to be successfully translated from research to advanced nursing practice (Jeyakumar et al., 2023).

This integrative review aims to assess the impact of technology such as artificial intelligence applications in nursing practice and nursing administration, and the influences emerging trends in artificial intelligence health technologies have on the nursing era. How does the implementation of artificial intelligence technologies impact clinical decision-making processes in nursing practice? 2) What are the perceived benefits and challenges of integrating artificial intelligence tools in nursing practice and administration? 3) How does the use of artificial intelligence affect patient outcomes and satisfaction in nursing care? To ensure that no one is left behind in the health system, this study is anticipated to add to the current body of knowledge on the topic of nurse case management.

Methods (Search strategy)

With the help of the literature review, we will be able to discuss and summarize several researches that have looked at the effects of using technologies like AI in clinical and managerial settings for nurses. The data search was done using the Web of Five electronic databases (CINAHL, PubMed, Science Direct, Scopus, and Google Scholar) and only the English language was used. PRISMA, an add-on for conducting integrative reviews, was used

to search. Also, the relevant terms used to search were identified, and then the searches were conducted based on the research question. Below are examples of appropriate database search terms:

Search Terms

The relevant terms used to search were identified, and then the searches were conducted based on the research question. The specific search terms for the database search are listed in the following:

The following MeSH terms and words were combined to construct systemic searches: ‘Artificial, Intelligence OR Intelligence, Artificial OR Artificial Intelligence OR Artificial OR Intelligence OR climate change OR Machine Learning, OR Machine OR learning OR Machine, Intelligence OR Machine intelligence AND ‘effect OR impact OR effects OR result OR results’ AND ‘Applications OR Application OR Interventions OR Procedures OR Practices OR Techniques OR Strategies OR Methods’ AND Nursing Practice OR Clinical Nursing OR Nursing Care AND Administration OR Management OR Supervision OR Direction OR Control OR Oversight’. We also manually searched the reference lists of the included studies and relevant reviews to identify additional records. For specific search strategies, please see Table 1.

TABLE 1. Search methods

#1	Artificial Intelligence [Mesh]
#2	‘Artificial, Intelligence OR Intelligence, Artificial OR Artificial Intelligence, Artificial OR Intelligence OR climate change OR Machine Learning, Machine OR learning OR Machine, Intelligence OR Machine intelligence
#3	‘effect OR impact OR effects OR result OR results’
#4	‘Applications OR Application OR Interventions OR Procedures OR Practices OR Techniques OR Strategies OR Methods’
#5	Nursing Practice OR Clinical Nursing OR Nursing Care
#6	Administration OR Management OR Supervision OR Direction OR Control OR Oversight

They were used in the search engines that were identified through a series of brainstorming and searching a thesaurus, the database, and preexisting knowledge on the topic. The thesaurus helped in finding and using the control terms to ensure accurate and high-level coherency among the terms. Furthermore, the thesaurus helped control the narrowing and broadening of the search. If there were no controlled terms, the search strategy entailed using free text searching either alone or with the controlled terms. In the free search, several broader terms were used and acted as a guide for the accuracy of the search to obtain relevant results. Such terms included the Impacts of Artificial intelligence. In the controlled terms, there was a systematic search using different electronic databases (CINAHL, PubMed, Science Direct, Scopus, and Google Scholar), which were filtered to include only after January 2019. The search was restricted to the English language. Following the studies' selection, some references in the studies were also selected. Subsequently, the results were screened based on the inclusion and exclusion criteria described below. These criteria allowed a broad search to be conducted while keeping the scope as precise as possible. the year of publication was not restricted. However, the rationale was used to exclude papers in these spread hits to maintain the chain of evidence.

Inclusion Criteria

- Articles related to search terms that influence artificial intelligence and nursing practice.

- Published after January 2019
- English language papers

Exclusion criteria

- Systematic reviews.
- Papers that do not use statistical analysis for Artificial intelligence
- Papers do not report Artificial intelligence in their study as the main factor for nursing practice.

Researchers relied on the databases using the Boolean operators (AND, OR, NOT) which included: 8902 citations; 1220 from Science Direct, 3174 from PubMed, 1139 from Scopus, 1123 from CINAHL, and 2246 from Google Scholar, of which 6150 records were excluded after removal of duplicates; 2752 records were excluded following title and abstract screening. A total of 377 studies were included in the full-text screening. An additional 362 studies were then excluded: 150 studies did not meet the research purpose; 112 studies did not meet the study design criteria; 82 reviews did not meet the outcome criterion; and four articles analyzed identical data. 17 studies were excluded after the full-text screening because the author did not respond when asked to provide a critical table that was not listed in the paper and one study excluded because design problems. Ultimately, 15 papers met the inclusion criteria and were incorporated into the study (Figure 2).

Prisma diagram:

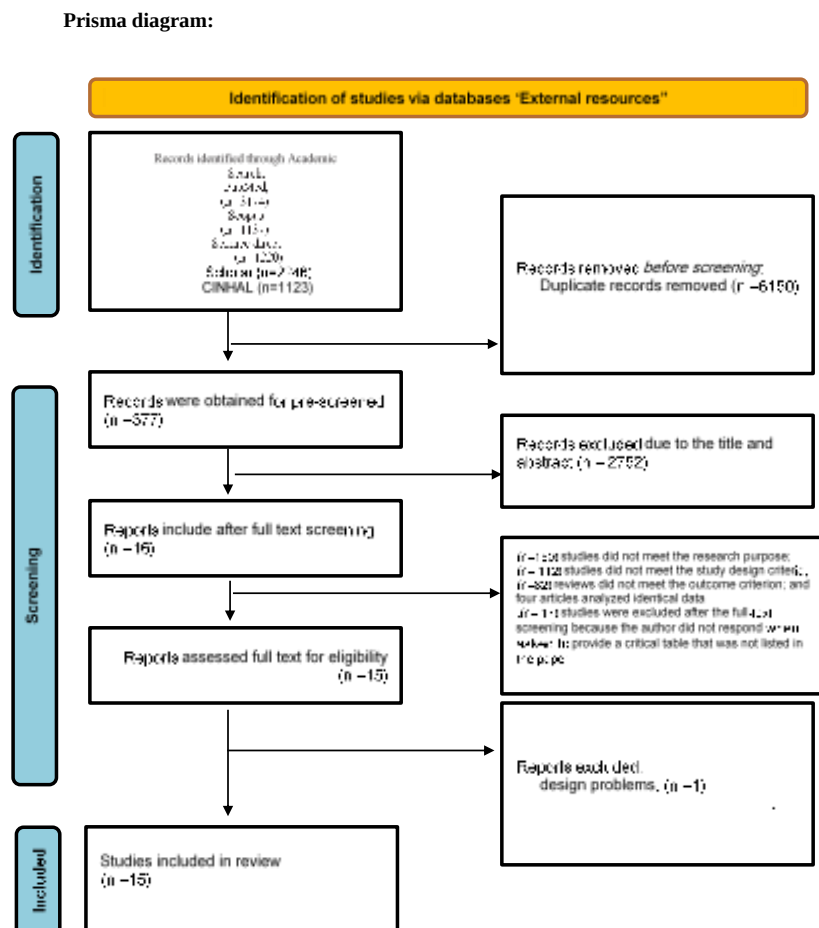


Figure 2. PRISMA tool chart used and designed in this review.

The citation titles and abstracts were independently screened, and potentially relevant articles were fully reviewed after excluding articles that proved irrelevant. An electronic data charting form was developed to determine the most appropriate variables to extract from the articles, and the charting form was continuously updated. Some of the data that were extracted included

the general data (the names of the author, country of study, and year of publication), the methodological data (study design, all sample characteristics of the participants, intervention group, control group, outcome measures. and follow-up) as a study matrix designated.

Articles were selected for relevance based on their titles and abstracts, and those that looked promising were read in full. A computer form for making data charts was made to determine the most appropriate variables to extract from the articles, and the charting form was continuously updated. Some of the data that were extracted included the general data (the names of the author, country of study, and year of publication), the methodological data (study design, all samples. characteristics of the participants, intervention group, control group, outcome measures. and follow-up). The findings were organized into the following categories: implication of artificial intelligence on nursing practice, nursing administration, nursing policy, nursing education, and nursing research., after which the various themes from the studies were presented and a viable conclusion made.

Eligibility Criteria

All included references were original research with a focus on nursing practice roles performed by artificial intelligence, published in peer-reviewed journals, and delivering "access to health care" as the primary finding. The studies could have used quantitative, qualitative, or mixed methods. Studies were not considered for inclusion if they were in the following categories: reviews, editorials, comments, books, policy documents, or government documents; or if they failed to address the responsibilities of nurse practice or artificial intelligence intervention.

Screening

The full-text screening encompassed 377 studies in total. After that, 362 studies were discarded because 150 did not fulfill the research objective; 112 did not adhere to the study design standards; 82 reviews did not satisfy the outcome requirement; and 4 pieces examined the same data. Due to the author's lack of response to the request for a critical table that was not included in the publication, 18 studies were removed following the full-text screening. Figure 2 shows that fifteen papers were finally included in the study since they fulfilled the inclusion criteria.

Data Extraction

Selected studies were charted, compiled, and summarized using narrative tables. According to Putra and Sandhi, (2021), the data charting table was made to help locate commonalities in the research based on the research questions and the goal of the study. Authors, publication dates, samples, designs, the study aims, and results are all part of the data extraction table that was created for specific studies.

Data Analysis

According to Putra and Sandhi, (2021), two writers independently analyzed the data and drew themes and subthemes by summarizing the key findings from the chosen studies. After that, to find the subthemes of the study questions, the writers combined the data analyses and ran joint analyses.

Results

Search Results

Table 2 Characteristics of selected studies

Categories	Details	Total	%
Design of studies	Cross-sectional study	6	40
	Empirical case study	1	6.66
	retrospective data collection	1	6.66
	Qazi- experimental study	3	20
	New innovative research design	2	13.33
	A bibliometric analysis	1	6.66
	case study research design	1	6.66
Year of publication	2019-2021	4	26.66
	2022-2024	11	73.33

Table 2 presents the characteristics of selected studies after the final full-text assessment. The majority of studies are cross-sectional studies, while the remaining articles included quasi-experimental studies, case studies, New innovative research design, bibliometric analysis, Empirical case studies, and retrospective data collection.

Analytical Findings

As seen in Table 3, four components of nursing case management interventions to improve access to health care were deduced, namely: 1) Implication of artificial intelligence on nursing practice, 2) Implication of artificial intelligence on nursing administration, 3) Implication of artificial intelligence on nursing policy, 4) Implication of artificial intelligence on nursing education. Table 3 presents a detailed summary of the final studies selected.in Table 3.

Table 3 Themes and subthemes derived from the selected studies

Studies	Components				Issues
	Implication of artificial intelligence on nursing practice	Implication of artificial intelligence on nursing administration	Implication of artificial intelligence on nursing policy	Implication of artificial intelligence on nursing education.	
Tuisku <i>et al.</i> , 2019	✓				
Lai <i>et al.</i> , 2021	✓				
Fritz & Dermody, 2019	✓				
Ergin <i>et al.</i> , 2023	✓				
Paulauskaite-Taraseviciene <i>et al.</i> , 2023		✓	✓		
Ronquillo <i>et al.</i> , 2021			✓		
Chikhaoui <i>et al.</i> , 2022		✓			
Abdullah Mohamed <i>et al.</i> , 2023	✓				
ÇOBANOĞLU and OĞUZHAN, 2023	✓		✓	✓ ✓	
O'Connor <i>et al.</i> , 2024				✓	
Al-Sabawy, 2023					
De Gagne, 2023.					
Taskiran, 2023					
Chen <i>et al.</i> , 2022					
Civaner <i>et al.</i> , 2022					

Theme 1: Implication of artificial intelligence on nursing practice

These seven studies have assessed the implication of artificial intelligence on nursing practice (Lai et al., 2021; Tuisku et al., 2019; Fritz & Dermody, 2019; Ergin et al., 2023; Paulauskaite-Taraseviciene et al., 2023; O'Connor et al., 2024; Taskiran, 2023). Insufficient research has been conducted into the intersection of AI, nursing, and compassion. The reviewed articles mostly focused on autonomous medical robots, more generally, and the results were divided on the impact, if any, that AIHTs would have on the provision of empathetic nursing care.

As AIHTs become more widely used in the healthcare industry, they will have far-reaching consequences on nurses across the board. Some publications have addressed the possibility that robots could ease the workload of nurses by assisting with activities of daily living. An example, a study by Lai *et al.* (2021) attempted to shed light on the transition process to automated AI-powered chatbots in the context of healthcare services. The study demonstrated that users can be pulled by the responsiveness of healthcare chatbots, while the push factor doesn't seem to exert effects on users' switching intentions. Moreover, identified four significant antecedents for the forming of AI resistance bias among healthcare consumers and explained the mechanisms through which these mooring factors impact switching. The findings of their research can inform academic research on AI usage in healthcare, chatbot service vendors, and many other similar applications.

Nurses may soon be responsible for coordinating the use of artificially intelligent home technologies (AIHTs) like robots to assist with patient care activities or for serving as case managers who remotely monitor a caseload of patients using smart home technology. While the use of robots per se may not be seen as wholly negative, their application in the context of elderly care is a cause for concern. The responses demonstrate that the public needs more knowledge and examples of how robots might be utilized in care for the elderly (Tuisku *et al.*, 2019). There is a lot at stake, too, when artificial intelligence is used to keep tabs on and help aging people handle their health care at home. As health-assistive AI continues to be developed, nurses involved in this field may face novel challenges and opportunities as a result of the fact that many seniors may be forced to move into care facilities too soon without the help of assistive technologies. It has been suggested that nurses working on health-assistive AI could face some novel difficulties as well as opportunities (Fritz & Dermody, 2019). In addition, a geriatric care management system integrates data from a variety of non-contact measurement tools, image recognition algorithms, and wearable sensors to track a patient's health and spot any anomalies. Through the use of deep learning algorithms and the Internet of Things (IoT), this technique can identify the patient and their six most essential poses. Additionally, the algorithm was developed to record the patient's shifting positions over time, which may prove critical in the detection of health problems at an early stage and the administration of appropriate care (Paulauskaite-Taraseviciene *et al.*, 2023). Before the training, the operating room nurses already knew a decent amount about artificial intelligence and robotic nurses, but their understanding of these topics expanded significantly afterward, according to research by Ergin *et al.* (2023). Nurse leaders should support nurses in conducting more digital health research by providing dedicated time, funding, and professional development opportunities, particularly in under-researched clinical areas, technologies, and geographic regions to further evidence-based practice and patient care. More digital nursing data is needed to support nurse-led research in areas like artificial intelligence and data science. The findings supported the national Philips Ives Review by identifying areas of digital nursing research that need more investment in England (O'Connor et al., 2024). It is predicted that artificial intelligence (AI) will transform nursing across all domains of nursing practice, including administration, clinical care, education, policy, and research (Taskiran, 2023). In light of these findings, it is recommended that nurses make greater use of information technologies to ensure cost-

effectiveness, appropriate team communication, and efficient use of the operating room, that patient and employee safety concerning future technologies be improved, and that nurses provide training on artificial intelligence technologies and robotic nurses to operating room nurses, other team members, and patients.

Theme 2: Implication of artificial intelligence on nursing administration

Two studies have investigated the implication of artificial intelligence on nursing administration (Ronquillo *et al.*, 2021; ÇOBANOĞLU and OĞUZHAN, 2023), the use of artificial intelligence (AI) will transform the nursing profession, providing nurses with useful resources to advance the field and enhance population and world health (Ronquillo *et al.*, 2021). Numerous implications for nursing management were revealed in the review. In some of these studies, the use of AIHTs by nurses to facilitate the computerized analysis of patient data was discussed. AIHT computer systems have also been used for administrative purposes, such as in the scheduling of nursing tasks, the reduction of documentation burden, and the assistance of nurses with patient triage. These applications have the potential to enhance clinical workflow and patient outcomes.

The article of Ronquillo and coworkers outlined critical voids where concentrated efforts are needed for nursing to take the lead in influencing the application of artificial intelligence in health systems. Three pressing issues need to be resolved soon: a significant unrealized potential for nursing to contribute to the development of AI technologies for global health and humanitarian efforts; nurses must understand the relationship between the data they collect and the AI technologies they use; nurses must be meaningfully involved in all stages of AI; from development to implementation (Ronquillo *et al.*, 2021). As an inevitable part of technological development and progress, the use of artificial intelligence applications in health services will change health practices and functioning to a great extent, and nurses who take part in this change will have a great deal of work. It can be said that redefining the nature and knowledge of nursing based on developing technology and planning the nursing education curriculum accordingly will have positive effects so that it can exist and strengthen as a profession and practice discipline in this process of change. (ÇOBANOĞLU and OĞUZHAN, 2023).

Theme 3: Implication of artificial intelligence on nursing policy

Three studies stated the implication of artificial intelligence on nursing policy (Abdullah Mohamed *et al.*, 2023; Chikhaoui *et al.*, 2022; Chen *et al.*, 2022). Artificial Intelligence remains an exciting development in healthcare management. As an innovative contribution to health systems development, the process will need ongoing improvements in its implementation and change management practice. There should be more deliberate coordination between nursing management priorities and the development and deployment of artificial intelligence to address those priorities (Chen *et al.*, 2022). In addition, To clarify the role of predictive analytics in nursing practice, regulatory bodies will need to draft or revise standards of practice. The use of digital health technologies like AI is supposed to supplement rather than replace nurses' clinical judgment; professional codes of ethics and standards of practice will need to make this apparent to allay these fears (Abdullah Mohamed *et al.*, 2023).

Additionally, the article by Chikhaoui and colleagues discussed the implementation of AI in the medical field, particularly in Saudi Arabia. Using Vision 2030 as an example, it first demonstrated why it's crucial to implement AI in Saudi healthcare, and then it moved on to discuss the legal and ethical hurdles inherent in this endeavor. Although there are legitimate questions about the legality and morality of AI, addressing these issues is essential for advancing its application in healthcare settings. Medical personnel, government officials, and regulators must work together to streamline the technology's implementation process (Chikhaoui *et al.*, 2022).

Theme 4: Implication of artificial intelligence on nursing education

Three studies stated the implication of artificial intelligence on nursing education (Civaner et al., 2022; Al-Sabawy, 2023; De Gagne, 2023). The nurses pool predominantly consisted of relatively young nurses, mainly in their late 20s and early 30s, with moderate experience, and a high level of education, primarily at the Bachelor's degree level. The decrease in the number of nurses with age and years of experience suggests a higher turnover or transition rate among older and more experienced individuals. The integration of AI in healthcare settings requires a collaborative approach, and nurses, being at the heart of patient care, can play a pivotal role in this transformation, provided they are empowered with the necessary knowledge and resources (Al-Sabawy, 2023). A study also showed that respondents felt the medical curriculum should be modernized to reflect the requirements of an AI-driven healthcare transformation. The revision should also center on teaching the next generation of healthcare practitioners how to make ethical and effective use of AI tools while safeguarding patients' rights and confidentiality (Civaner *et al.*, 2022). The integration of AI technology in nursing education has the potential to revolutionize by providing personalized learning experiences and improving efficiency and outcomes (De Gagne, 2023).

Discussion

The primary objective of this review is to synthesize the results of the study that posed the topic of how AIHTs might affect nurses' daily work and the quality of care they provide over the next decade and beyond. The next sections will talk more about how the results affect clinical practice, policy, administration, education, and research.

AI incorporates numerous healthcare technologies that are reshaping the responsibilities of nurses and improving the quality of care for patients. In medicine, artificial intelligence (AI) is commonly understood to be a computer's capacity to autonomously turn data into knowledge that may then be used to steer decisions or automate actions. It is difficult to pin down exactly what artificial intelligence is due to its many uses; for example, risk prediction algorithms, robots, and speech recognition all improve nursing practice and are poised to revolutionize healthcare as a whole (O'Connor *et al.*, 2023) despite this, defining AI can be difficult.

Most of the papers that talked about how AI might affect nursing practice were about robots and patient care in general. There were mixed results about how AIHTs might affect the sensitive nursing care that is given (Tuisku *et al.*, 2019; Fritz & Dermody, 2019; Ergin *et al.*, 2023; Paulauskaite-Taraseviciene *et al.*, Most of these papers also agreed that AI's role was to keep tabs on and help elderly people take charge of their health care at home; to improve health remotely via tele-assessment, tele-diagnosis, tele-interactions, and tele-monitoring; and to facilitate a shift in the patient's physical location.

The articles that have focused on the role of AI in the practice of nursing administration are crucial and very important in saving the time and effort of the managers in handling the duties throughout the day's activity (Ronquillo *et al.*, 2021). These articles also supported new ways of giving nursing care and new jobs for nursing administrators and gave examples of these, as well as enumerating the many roles of AI in the position of nursing administration, such as assisting nurses with the automated analysis of patient data, scheduling nursing activities through the shift of duty, and reducing documentation burden.

In addition, the studies of Chikhaoui *et al.*, 2022; and Abdullah Mohamed *et al.*, 2023 all mentioned that there were some challenges and barriers to applying AI integrated with the nursing policy. The following is a list of these problems and obstacles: To make new rules and procedures for AI in nursing, there will need to be strong leadership. There will also need to be new care models, ethical considerations, and a deeper knowledge of the topic. Codes of ethics and standards of behavior for professionals need to make it clear that AI is meant to help nurses make decisions, not take their place.

Last but not least the implication of AI in nursing education, the researchers handle the implication of AI in nursing education Civaner *et al.*, (2022) emphasized that AI helps nursing education through online learning. Also, the research lighted on equipping future health providers with the awareness and practice to effectively apply AI and ensure that professional values as

Implications for Nursing Management and Health Policy

Finally, the employment of AI in the medical and healthcare fields has been the subject of both high praise and intense debate in recent years. Recent years have also seen a surge in cross-disciplinary study, political discussion, and social activity surrounding the ethical implications of applying AI to the medical and healthcare fields. So, to optimize the use of biomedical AI, this paper concludes by highlighting the areas in which AI can make a positive impact, identifying the most significant risks associated with its application in this high-stakes and rapidly changing field, and presenting policy options to counteract these risks. This will help the nurses and developers who are responsible for deploying AI-mediated healthcare, and it will also benefit the people who receive it.

Limitations of the Integrative Review

For instance, despite stillbirth risk factors being a new topic in healthcare, the review relied solely on data to be useful. The results' quality wasn't evaluated, either. There may be a decline in study quality as a result of the time pressure to get results out. It's also clear that the policy and scientific literature on the implications of AI has some serious gaps.

The results should be interpreted with caution due to several caveats. Research gaps may exist because databases devoted to computer science and engineering were not examined for this integrative study due to licensing and accessibility difficulties. It is suggested that these databases be used in any future reviews on AI in nursing. This review did not look at studies published in languages other than English, and it did not scour the citation databases of the studies that were included. As a result, some important publications were likely overlooked in this review.

Table: 000 Detailed summary of the final studies selected

AUTHOR YEAR	AIM OF THE STUDY	RESEARCH DESIGN	PARTICIPANTS	KEY FINDING AND IMPLICATIONS
Lai <i>et al.</i> , 2021	They investigated users' switching intentions to AI-powered technologies in the context of healthcare chatbots.	Cross-sectional research design	respondents from China and have varying levels of experience with other forms of chatbot	AI resistance bias hurts intention changes, but the perceived responsiveness of chatbots is a favorable one. This research builds on prior IS work that utilized status quo bias theory and the PPM framework to better understand the potential future effects of AI technology in healthcare.

Tuisku <i>et al.</i> , 2019	They discovered opinions concerning the use of robots in elderly care as well as the arguments and justifications behind those opinions	Empirical case study	The data consists of interviews with personnel who operated Zora.	Using robots is not universally frowned upon, but there is cause for concern when it comes to providing for the needs of the elderly.
Fritz & Dermody, 2019	provide useful advice for nurse researchers considering interdisciplinary work, such as helping develop AI algorithms for "smart" healthcare management and independent senior living.	retrospective data collection	Nurses	There may be both new opportunities and problems for nurses involved in the creation of health-assistive AI. Nurses may be in a great position to make a big difference in the progress of artificial intelligence for health-assistive Smart Homes.
Ergin <i>et al.</i> , 2023	They anticipated providing insight into how well future advances in robotics and AI are being used in operating room care will satisfy the needs of modern nursing theory.	Quazi-experimental study	Women who'd had a history of pregnancy and resided in Jazan	Before the training, the participating operating room nurses knew a little bit about artificial intelligence and robotic nurses; after the training, they knew a lot more.
Paulauskaite-Taraseviciene <i>et al.</i> , 2023	to create a geriatric care management system that can monitor and detect changes in a person's health state by combining data collected by a variety of on-body sensors, non-contact measurement	New innovative research design	The geriatric department working nurses	There was no substantial evidence of a bias in the media. However, the mechanisms linking maternal prenatal mental health issues to an increased risk of stillbirth and infant mortality remain unclear.

		tools, and image recognition software.			
Ronquillo <i>et al.</i> , 2021	et	They aimed to produce a report outlining the broad principles discussed at the meeting.	New innovative research designs	Nurses	Nurses can use AI technology as useful aids in their quest to improve population and world health and advance the nursing profession.
Abdullah Mohamed <i>al.</i> , 2023	et	They investigated the effect of the artificial intelligence enhancement program on head nurses' managerial competencies and flourishing at work.	quasi-experimental design	All head nurses	AI technology, managerial competencies, and job satisfaction of the heads of nursing units indicated that the training had a significant effect.
Chikhaoui <i>et al.</i> , 2022	et	They aimed to show how AI is implicated and used in the Saudi healthcare sector.	case study research design	All healthcare sector personnel	Workers in the healthcare industry are unanimous in their belief that AI improves patient care, and very few respondents express concerns about AI's legal responsibility or accountability.
Civaner <i>et al.</i> , 2022		They examined the perceptions of future physicians about the possible influence of AI on medicine	cross-sectional multi-center study	Medical students' country.	The participants voiced a need for a medical curriculum overhaul in light of the requirements of an AI-driven healthcare transformation. The healthcare workers knew how to utilize AI tools while safeguarding patients' rights and confidentiality responsibly and ethically.
Chen <i>et al.</i> , 2022	et al,	The article aims to outline a contrast between three priorities for nursing management proposed a decade ago and key features of the following 10 years of developments on	Cross-sectional study	health care and nursing management.	Artificial intelligence developers and healthcare nursing managers need to be more engaged in coordinating the future development of artificial intelligence applications with a renewed set of nursing management priorities

	artificial intelligence for health care and nursing management.			
Taskiran, 2023	This study examined the impact of an AI course in the nursing curriculum on students' medical AI readiness.	A Comparative Quasi-Experimental Study	nursing students	It is predicted that artificial intelligence (AI) will transform nursing across all domains of nursing practice, including administration, clinical care, education, policy, and research.
De Gagne, 2023.	This article aims to provide an overview of the state of AI in nursing education by examining its historical roots, current applications, and future directions.	A cross-sectional study	A healthcare student	The integration of AI technology in nursing education has the potential to revolutionize by providing personalized learning experiences and improving efficiency and outcomes.
Al-Sabawy, 2023	This study aimed to explore nurses' attitudes and perceptions toward the implementation of AI that could transform their jobs and patient care delivery.	A cross-sectional exploratory study	Nurses	The findings underscore the need for more comprehensive and accessible AI education, particularly in the nursing practice. It is also crucial to address concerns or discomfort associated with AI to encourage its broader adoption across various fields in nursing.
ÇOBANOĞLU and OĞUZHAN, 2023	The research was carried out to examine the artificial intelligence anxiety levels of nurses and their affecting factors.	a descriptive and cross-sectional design was used	Nurses	This study determined that AI anxiety was higher in nurses who had a lower education level, did not have knowledge about AI technologies, and thought that AI technologies would not have a positive effect on patient care.
O'Connor et al, 2024	Digital health technologies are designed, implemented, and evaluated to support clinical practice, enable	A bibliometric analysis.	Nurses and healthcare workers	Nurse leaders should support nurses in conducting more digital health research by providing dedicated time, funding, and professional development opportunities, particularly in under-

	patients to self-manage illness, and further public and global health.			researched clinical areas, technologies, and geographic regions to further evidence-based practice and patient care.
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Integrative Review Conclusion

Already, artificial intelligence (AI) is changing the nature of healthcare jobs, processes, and the relationship between nurses and their patients. This is the first integrated review that we are aware of that has mapped out the evidence for how artificial intelligence technologies are now impacting and will continue to impact the practice of caring professions like nursing. Healthcare providers are committed to integrating AI in a way that promotes ethical, safe, high-quality, and person-centered care for patients, their families, and themselves. This review provides valuable insights that will assist nurses in leadership roles across all levels and settings as they embrace AI in nursing.

Summary

This chapter provided an in-depth analysis of how technological developments, such as AI applications, have altered nursing administration and practice. According to the review, the most prevalent areas where AI is being used in the nursing industry include clinical practices, administration, policy, research, and education.

Appendix A

Search Terms

Nursing; Artificial intelligence; AI health technologies (AIHTs); Machine learning; Robotics; Patient-centered care; Review; Administration; Practice; Policy; Education; Research.

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