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A Review of Postgraduate Theses on Artificial Intelligence in the Field of Nursing in Türkiye

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Abstract

Background: Artificial intelligence is becoming increasingly relevant in nursing, yet academic research in Türkiye remains limited. This study aims to systematically review postgraduate theses to identify current research trends and highlight future directions.

Aim: This study aimed to review postgraduate theses on the use of AI in the field of nursing in Türkiye.

Methods: This descriptive study involved a comprehensive review and analysis of relevant postgraduate theses. The theses were systematically screened between 10 May and 15 May 2025, with no restriction on publication year. Researchers used the National Thesis Center database of the Council of Higher Education (CoHE Thesis) to identify all postgraduate theses related to AI in the medical field. A total of 6,623 registered theses were accessed in the CoHE database, and seven were selected based on inclusion and exclusion criteria.

Results: The first identified thesis on AI in the field of nursing was conducted in 2022, with the remaining theses completed in 2023. Most of the theses (71.4%) were doctoral dissertations. The reviewed theses were predominantly qualitative studies (42.9%), with two employing quasi-experimental and experimental designs. The majority were affiliated with the Department of Nursing (42.9%).

Conclusion: It can be asserted that AI has emerged as a novel and significant concept in nursing practice in recent years; however, the number of studies on AI in the field of nursing is limited. Increasing the level of knowledge and the number of studies on AI in nursing could enhance the utilization of AI-supported applications and guide future researchers.

Keywords: Artificial intelligence, machine intelligence, nursing, theses

Introduction

Artificial intelligence (AI) is a technology that models thinking and brain principles by imitating human intelligence through computer systems and is utilized in several fields.[1] The basic principle of AI is that machines perform certain operations by utilizing prior knowledge, perceiving, communicating, and learning.[2] AI encompasses various domains such as deep learning, artificial neural networks, machine learning, image processing, and mixed reality.[3] It is applied across numerous disciplines, including psychology, mathematics, computer science, art, architecture, and linguistics.[4] AI also has a widespread range of applications in the healthcare sector.[5]

AI is utilized in medical practice for many purposes, such as making accurate clinical decisions, enabling early diagnosis and treatment, and interpreting and classifying diseases.[6] One of the first examples of AI use in the medical field occurred in 1976, when Dr. Gunn[7] diagnosed a patient's abdominal pain using computer analysis. A previous study reported that an AI algorithm developed for patient triage helped physicians establish appropriate diagnoses by achieving a high level of performance.[8] A study in radiology revealed that AI was successful in conducting cancer screenings and identifying suspicious lesions.[9] Another study showed that an AI algorithm could diagnose skin cancer and differentiate malignant lesions.[10]

Nursing is a profession that requires a wide range of knowledge and qualifications to improve the health of individuals and society. It continuously evolves by incorporating evidence-based science and technology[11] With increasing workloads and technological advancements, nurses are expected to use AI applications more intensively.[12] In addition to its medical applications, AI is also used in nursing practice for various purposes, such as preparing medications, creating treatment plans, implementing clinical decision support systems and early warning systems, applying advanced data analytics techniques, and enhancing comprehensive staff and student training programs.[13] A robot called Cody, developed under the leadership of the University of Georgia, brings convenience to nurses in clinical practice by helping patients dress, bathe, and undergo rehabilitation.[14] Another robot, Veebot, assists nurses in selecting vascular access during nursing procedures.[15] Moxi is a robot that delivers necessary materials to nurses during patient care, while Robear is used for transferring patients and reducing the physical workload of nurses.[16] Similarly, the Arna robot monitors patients' vital signs and reports deviations to nurses, allowing for early intervention.[16] In recent years, clinical decision support systems (CDSS) in nursing have been facilitating nurses' decision-making processes and enhancing the quality of care through advanced technologies. These systems guide nurses in critical areas such as drug interactions, telephone triage, patient assessments, and ventilator-associated pneumonia by enabling faster and more effective interventions. Additionally,

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applications designed to prevent hospital admissions have been developed, helping nurses base their clinical decisions on more solid foundations.[17,18] At Yale New Haven Hospital, an AI algorithm analyzes patients' electronic health records to assess clinical status and identify the need for early intervention. This approach supports the timely, effective, and patient-centered delivery of nursing care.[5] AI has also been effectively utilized in nursing education, particularly in enhancing training on clinical simulations and communication skills. By offering students realistic patient care experiences, it contributes to improving their educational process.[19,20]

In light of these promising developments, it is considered that the integration of AI technologies into nursing practice and education is still at an early stage and faces significant challenges. Although AI applications in nursing have the potential to enhance patient care and alleviate nurses' workload, the number of studies in this area remains limited, and the widespread adoption of these technologies encounters several barriers.[21,22] Primarily, the integration of AI and robotic technologies into the nursing profession is hindered by ethical debates and concerns regarding patient privacy, which raise significant obstacles to their use.[23] Furthermore, factors such as the lack of human interaction, the limited ability of AI to interpret patient needs comprehensively, and its restricted capacity to manage complex clinical situations contribute to resistance against AI adoption in nursing practice.[24] Additionally, the high cost of implementing AI-supported systems and inadequate technological infrastructure further impede their integration into healthcare services. In this context, addressing the ethical, technical, and economic challenges associated with AI in nursing and conducting further research in this field are crucial for broader adoption of AI.[25,26]

The integration of AI into healthcare, particularly nursing, has gained importance in recent years. AI has transformed clinical decision-making, improved patient outcomes, and enhanced nursing efficiency by reducing routine tasks and promoting patient-centered care. However, a comprehensive understanding of AI's role in nursing research and practice in Türkiye remains limited. There is a lack of systematic reviews or in-depth analyses of AI applications in the field of nursing in Türkiye. This gap makes it difficult for researchers and policymakers to assess current knowledge, identify trends, and pinpoint areas requiring further investigation.

Although the number of scientific studies on the use of AI in nursing has been gradually increasing, the number of theses on this subject in Türkiye is limited. This is a notable issue. AI-supported studies generally require advanced technology and strong data infrastructure. The lack of adequate technical equipment at universities and health institutions may be a barrier to conducting such studies. The 2019 workshop report by the Turkish Informatics Association further supports this view.[27] Since AI projects are often costly, access to such technologies may be restricted in thesis studies. AI research typically requires collaboration between computer engineering, data science, and health sciences. However, the lack of sufficient multidisciplinary cooperation between these fields in Türkiye may limit the scope of AI studies in nursing.[28] Moreover, the level of knowledge and awareness regarding the use of AI in nursing may not be sufficiently developed. Academicians and students may face difficulties in conducting related research due to the limited number of courses on AI and digital health technologies in nursing education curricula.[29]

This study aims to bridge this gap by systematically reviewing postgraduate theses on AI in the field of nursing in Türkiye. By analyzing these academic works, the review also aims to identify research trends, methodological approaches, areas of focus, and existing deficiencies. The findings of this study are expected to serve as a key reference for future research, guide nursing education and practice, and contribute to the body of evidence necessary for the effective integration of AI technologies into nursing.

The researchers sought to answer the following research questions based on the reviewed theses:

1. What are the subjects of postgraduate theses on AI in the field of nursing?
2. What are the objectives, study types, sample sizes, data collection tools, and research outcomes of the postgraduate theses on AI in the field of nursing?

Materials and Methods

Study Design

This descriptive study involved a comprehensive review and analysis of postgraduate theses, conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

Data Source and Search Strategy

The data source for this study was the National Thesis Center of the Council of Higher Education (CoHE Thesis Center) database of the Republic of Türkiye. The search was performed manually across all available theses, without any restriction on the year of publication, using the official online database (https://tez.yok.gov.tr/UlusalTezMerkezi/). The search process was conducted between 10–15 May 2025.

No restrictions were applied regarding thesis type (master's or doctoral) or university. Keywords used in the search were identified based on a preliminary literature review and selected from common Turkish expressions used in academic texts related to AI and associated technologies. The keywords included:

"yapay zeka (artificial intelligence),"
"yapay zekâ (artificial intelligence),"
"akıllı makineler (smart machines),"
"akıllı makine (smart machine),"
"akıllı makinalar (smart machines),"
"akıllı makina (smart machine),"
"makine öğrenmesi (machine learning),"
"makine öğrenme (machine learning),"
"makina öğrenmesi (machine learning),"
"makina öğrenme (machine learning),"
"makine öğrenimi (machine learning),"
"yapay sinir ağı (artificial neural network),"
"yapay sinir ağları (artificial neural networks),"
"örüntü tanıma (pattern recognition),"
"genetik algoritma (genetic algorithm),"
"genetik algoritmalar (genetic algorithms),"
"görüntü işleme (image processing),"
"bulanık mantık (fuzzy logic),"
"derin öğrenme (deep learning),"

and/or various combinations of these keywords. Boolean operators (AND/OR) were used to combine the terms (e.g., "yapay zeka AND hemşirelik") to ensure broader, more inclusive results.

Inclusion Criteria

- Conducted in the field of nursing,
- Written in English or Turkish,
- Full text available with authorized access (open access),
- No restrictions on the year of publication.

Exclusion Criteria

- Conducted by disciplines other than nursing,
- Duplicate (repeated) theses.

Selection Process

A total of 6,623 registered theses were reviewed during the screening process. In the first stage, an initial evaluation was conducted based on the titles and abstracts of the theses. In the second stage, full-text access was obtained to allow for a more detailed assessment. During the title and abstract screening, theses that were clearly unrelated to nursing or did not involve AI in a substantial way were excluded. In the full-text review stage, theses were carefully examined to determine whether AI methods or technologies were integrated into the research design or analysis. Theses that failed to meet this criterion were excluded.

Theses that did not meet the inclusion criteria and met any of the exclusion criteria were removed from the study. As a result of this multi-step screening process, seven theses that directly integrated AI into nursing practice or education and fulfilled all inclusion criteria were included in the final analysis. These theses were thoroughly examined and analyzed (Fig. 1).

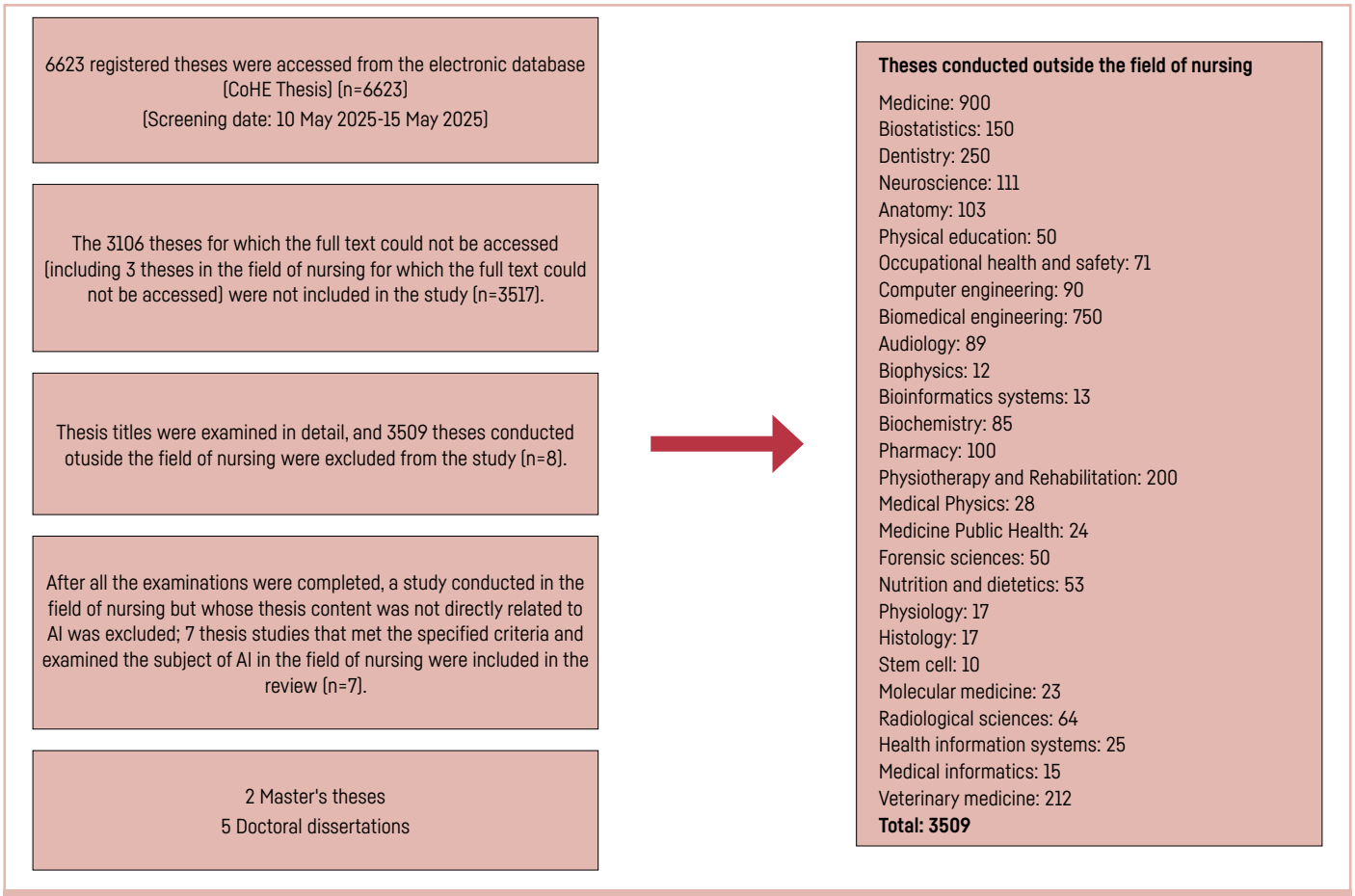

Figure 1. PRISMA flowchart of the analyzed theses.

CoHE:Council of higher education.

Data Collection and Analysis Process

The selected theses were systematically evaluated using content analysis. Key features such as the publication year, university, type of AI application (e.g., machine learning, deep learning, artificial neural networks), the medical field in which the study was conducted, and the outcomes were coded. A thematic analysis approach was then applied to classify findings and identify key patterns, areas of application, and emerging trends regarding the use of AI in nursing.

Results

In this study, seven postgraduate theses focusing on AI in the field of nursing were reviewed, and their distribution according to specific characteristics is presented (Table 1). The first thesis in this field was published in 2022, while the remaining studies were completed in 2023. Of the total theses, five (71.4%) were doctoral dissertations and two (28.6%) were master's theses. Among the master's theses, one thesis was retrospective and the other was qualitative, while the doctoral dissertations included qualitative (40%), retrospective (20%), quasi-experimental (20%), and experimental (20%) designs.

In terms of sample size, most of the studies involved fewer than 200 participants, with 42.9% of the theses including 200 participants or more. The study by Vicir[30] in 2023 had the largest sample (n=304),[31] while the smallest sample was found in the qualitative doctoral dissertation by Gündoğdu[32] in 2022, which included 19 participants.

Regarding departments, the theses were conducted across various nursing fields, including the Department of Nursing (42.9%), Department of Internal Medicine Nursing (14.3%), Department of Surgical Diseases Nursing (14.3%), Department of Nursing Management (14.3%), and Department of Fundamentals of Nursing (14.3%). The sample groups also varied: three theses included patients (42.9%), two included students (28.6%), one focused on nurses (14.3%), and one involved a mixed group of physicians, nurses, and patients (14.3%).

When examining subject characteristics (Table 2), the majority of the theses (57.1%) aimed to determine the success rate of AI algorithms in patient evaluation and nursing practice. The others focused on healthcare professionals' and patients' perceptions of AI and robot nurses (28.5%), and the effectiveness of AI-integrated advanced life support training (14.3%).

Table 3 presents methodological characteristics of the theses. According to the findings, the earliest thesis on AI in nursing was Gündoğdu's[32] doctoral dissertation in 2022 from the Department of Nursing, while the most recent was a doctoral dissertation by Polat[31] in 2023 in the Department of Internal Medicine Nursing. Overall, the results of these theses suggest that AI technologies are increasingly being integrated into nursing research and practice, with the potential to enhance care quality, support clinical decision-making, and improve educational outcomes.

Discussion

This study, which examined postgraduate theses on AI in the field of nursing, is discussed under three main headings:

1. Determination of the Success Rate of AI Algorithms in the Evaluation of Patients and Their Use in Nursing Practice

There are four postgraduate theses in the field of nursing that analyzed the success rate of AI algorithms in patient evaluation and their application in nursing practice. The study by Vicir[30] reported that the AI algorithm made 17 nursing diagnoses for

Table 1. Distribution of postgraduate theses according to selected characteristics

	Master's thesis		Doctoral dissertation		Total	
	n	%	n	%	n	%
Research type						
Qualitative	1	50	2	40	3	42.9
Retrospective	1	50	1	20	2	28.6
Quasi-experimental	0	0	1	20	1	14.3
Experimental	0	0	1	20	1	14.3
Total	2	100.0	5	100.0	7	100.0
Sample size						
n<50	0	0	2	40	2	28.6
50≤n≤100	0	0	1	20	1	14.3
100<n<200	0	0	1	20	1	14.3
200≤n	2	100.0	1	20	3	42.9
Total	2	100.0	5	100.0	7	100.0
Year of publication						
2022	0	0	2	40	2	28.6
2023	2	100.0	3	60	5	71.4
Total	2	100.0	5	100.0	7	100.0
Department						
Surgical diseases nursing	0	0	1	20	1	14.3
Internal medicine nursing	0	0	1	20	1	14.3
(General) nursing	1	50	2	40	3	42.9
Nursing management	0	0	1	20	1	14.3
Fundamentals of nursing	1	50	0	0	1	14.3
Total	2	100.0	5	100.0	7	100.0
Sample group						
Patients	1	50	2	40	3	42.9
Students	1	50	1	20	2	28.6
Nurses	0	0	1	20	1	14.3
Physicians, nurses, and patients	0	0	1	20	1	14.3
Total	2	100.0	5	100.0	7	100.0

Table 2. Distribution of theses on artificial intelligence (AI) according to subject focus

Subject focus	n	%
Evaluation of the success rate of AI algorithms in patient assessment and their use in nursing practice	4	57.1
Evaluation of healthcare professionals' and patients' opinions on the impact of AI and robot nurses in healthcare	2	28.5
Assessment of the effectiveness and sustainability of an advanced life support training model integrated with AI	1	14.3

gynecological cancer patients, with an accuracy rate of 98%, helping to relieve nurses' workload and ensure appropriate patient care. The experimental study by Polat[31] indicated that the AI-supported mobile virtual assistant used by diabetic patients reduced the rates of hospitalization, hypoglycemia, self-care errors, and overall healthcare costs within one year. This was achieved by enabling patients to easily access nutritional information for diabetes, take medications on time through blood glucose prediction, and receive reminders for annual check-ups. In the study by Gündoğdu,[32] it was concluded that the AI algorithm supported nurses by accurately classifying patients' pressure sores, thereby saving time and contributing to the delivery of appropriate care. In the study by Yiğit,[33] an AI-supported system was developed to evaluate the comfort behavior levels of newborns. The study aimed to assess the effectiveness of AI in identifying and interpreting behavioral indicators of comfort in neonatal care. Yiğit's study[33] indicated that AI-supported behavioral assessment systems in neonatal care were effective in reducing nurses' workload by supporting clinical decision-making. The results showed that the AI-supported evaluation method provided faster, more consistent, and more objective measurements compared to traditional observational methods. Moreover, it contributed to enhancing the quality of individualized care in neonatal intensive care units, supported nurses in clinical decision-making, and reduced subjectivity in behavioral assessments. The common finding across these three theses is that the use of AI algorithms in nursing had positive effects on patient care and evaluation. The studies revealed that AI algorithms improved patient treatment processes, reduced hospital admissions, increased survival rates, and were effective in preventing pressure ulcers.[34,35] In one study, it was determined that the AI algorithm used in evaluating diabetic wounds in 28 patients provided more accurate and reliable measurements compared to traditional evaluations performed by an expert wound care nurse.[36] Another study reported that LOVOT, an AI-supported social robot, was widely adopted by individuals with dementia, providing support in daily life by encouraging communication and social interaction. It was evaluated by healthcare professionals as an innovative tool in dementia care.[37] In another study, the usability of an AI-supported system in the postoperative follow-up of orthopedic patients was examined. It was found that the system facilitated patient monitoring, improved communication between patients and healthcare

Table 3. Distribution of postgraduate theses included in the study by objective, study type, sample group, and outcomes

Author/ year/ USA	Objective	Type of study	Sample size	Data collection tools used	Outcome
Gümüş, 2023 Department of Nursing Management	To determine the views of healthcare professionals and patients on the use of artificial intelligence (AI) and robot nurses in the field of healthcare. Doctoral Dissertation	Qualitative	A total of 45 participants, including 13 physicians, 17 nurses, and 15 patients.	• Semi-structured In-Depth Individual Interview Form for Healthcare Professionals • Semi-structured In-Depth Individual Interview Form for Patients	Interviews with healthcare professionals and patients revealed that participants were only beginning to become familiar with AI and robotic technologies and had limited knowledge of them. Most participants favored the use of robots in supportive roles but opposed their placement in managerial positions. They believed that such technologies could help reduce workloads, save time, and enhance healthcare delivery. However, concerns were raised about data privacy and the inability of robots to replicate human emotions in healthcare interactions.
Çelikbürk Doruker,[49] 2023 Department of Surgical Diseases Nursing	To assess the effects of an advanced life support training model integrated with AI on the acquisition of knowledge and skills, and to evaluate the retention of these gains over time. Doctoral Dissertation	Quasi-experimental design The control group received training using a low-tech simulation and intubation model with a standard scenario. The AI group received skills training on the same models, but with individualized scenarios generated through a supervised machine learning technique. This technique created tailored scenarios by identifying the specific steps in which student nurses in the AI group were deficient in advanced cardiac life support skills and needed improvement. The knowledge and skill scores of both groups were assessed before the training, immediately after, and again at three and six months post-training.	The sample group consisted of 80 fourth-year nursing students, including 40 in the control group and 40 in the AI group.	• Descriptive Information Form • Advanced Cardiac Life Support Information Form • Advanced Cardiac Life Support Skills Checklist	Results of the study showed that the student nurses in both the control and AI groups had inadequate levels of knowledge and skill before the Advanced Cardiac Life Support (ACLS) training. After the training, both groups showed higher knowledge and skill scores for ACLS. The AI group had a higher mean knowledge score than the control group immediately after the training. The training provided with low-tech simulation models, accompanied by individualized scenarios and the supervised machine learning technique, was found to be more effective than the standard scenario training. The AI group achieved higher mean skill scores than the control group, sustained even six months after the training. It was concluded that AI-supported educational models can potentially enhance students' knowledge and skill acquisition.
Cankara,[40] 2023 Fundamentals of Nursing Department	To examine nursing students' views on robot nurses and artificial intelligence applications Master's Thesis	Qualitative	The sample consisted of 206 third- and fourth-year nursing students	• Personal Information Form • Opinion Form on Robot Nurses and Artificial Intelligence Applications	The majority of students viewed robot nurses positively as supportive tools in health services. However, they noted that robots may be insufficient in terms of human contact, empathy, and emotional interaction. Although artificial intelligence applications are considered to have the potential to improve the quality of nursing care, various concerns were expressed regarding adherence to ethical principles and the protection of professional roles.
Yiğit,[33] 2023 Department of Nursing	To evaluate newborns' comfort levels using artificial intelligence techniques Doctoral Dissertation	Retrospective	A total of 52 newborns were monitored in the neonatal intensive care unit	• Image processing techniques (using deep learning-based AI algorithms) • Neonatal Comfort Behavior Form • Nurse Evaluation Forms	It was determined that AI techniques provided a high level of accuracy in assessing the comfort levels of newborns by analyzing their facial expressions, body movements, and vocal responses. A significant and strong correlation was found between the results obtained from AI algorithms and the clinical evaluations conducted by nurses. The findings indicated that AI-supported systems can serve as valuable tools to support nurses' decision-making processes in neonatal care.

Table 3. Cont.

Author/ year/ USA	Objective	Type of study	Sample size	Data collection tools used	Outcome
Vicir,[30] 2023 Department of Nursing	To make accurate and appropriate nursing diagnoses using AI algorithms in gynecological cancer patients Master's Thesis	Retrospective	The sample consisted of 304 patients diagnosed with gynecological cancer	• AI algorithm called Weka • Multilayer Perceptron and the J48 database	The algorithm developed using artificial neural networks made 17 nursing diagnoses for gynecological cancer patients based on the North American Nursing Diagnosis Association (NANDA) nursing diagnoses, achieving an accuracy rate of 98%. The study demonstrated that AI algorithms are an effective tool for nurses to make nursing diagnoses using machine learning and artificial neural networks.
Polat,[31] 2023 Department of Internal Medicine Nursing	To examine the effect of a mobile virtual assistant developed with an AI algorithm on hospitalization rate, cost, self-care, and hypoglycemia in individuals with diabetes Doctoral Dissertation	Randomized, controlled experimental study A randomized controlled trial was conducted. The control group received standard diabetes care and training (including foot care, insulin administration, and medical nutrition therapy). The experimental group received the same training along with instruction on how to use an "AI-supported Android Assistant" mobile application on their phones. This application predicts the user's blood glucose levels at 5, 10, and 15-minute intervals using an AI-based prediction algorithm. The hypoglycemia scale, self-care scale, and data from the cost table of the intervention group were recorded at the first, sixth, and twelfth months.	A total of 120 patients diagnosed with diabetes: 60 in the experimental group and 60 in the control group	• Individual Information Form • Diabetes Self-Care Scale • Hypoglycemic Confidence Scale • Opinion Form on the Mobile Application • Cost Table of Interventions for Diabetes and Its Complications	The AI-supported mobile virtual assistant application had a more positive effect on hospitalization rates, hypoglycemia, self-care, and cost-effectiveness in the experimental group compared to the control group, which received standard diabetes education.
Gündoğdu,[32] 2022 Department of Nursing	To develop an intelligent classification system for the assessment of pressure sores and to evaluate this system with nurses. Doctoral Dissertation	Qualitative	19 volunteer nurses were interviewed	• Individual Descriptive Characteristics Form • Attitude Towards Technology Scale • Semi-structured Interview Form • Zoom and WhatsApp (online interview platforms)	The AI algorithm developed to classify pressure sores correctly staged the sores. Nurses who used the system reported that the application was simple and comprehensible. They stated it supported them during care, saved time, and helped guide their decision-making.

professionals, and positively contributed to the follow-up process.[38] Additionally, one study reported that the AI algorithm used during nursing care in the postoperative period improved the efficiency and quality of care by 6.9%.[39] The findings of the reviewed postgraduate theses concerning AI applications closely align with those in both national and international literature. Given that the results of similar studies in the literature are consistent with each other, AI algorithms can be effectively used in nursing practice and can provide significant benefits in patient care.

2. Determination of the Views of Healthcare Professionals and Patients on the Effect of AI and Robot Nurses on Health Services

Two postgraduate theses addressed the opinions of healthcare professionals and patients regarding AI and robot use in the field of nursing. The study by Gümüş revealed that participants were only beginning to recognize AI technologies and robot nurses and had limited knowledge about them. In that study, participants did not support the idea of robots in managerial roles but preferred their use in auxiliary positions. They believed that these technologies could reduce workload, save time, and improve healthcare practices.[32] The thesis by Cankara,[40] conducted in the Department of Fundamentals of Nursing, examined nursing students' views on robot nurses and AI applications. Cankara's study[40] emphasized students' generally positive attitudes toward technology and highlighted the need for ethical education, suggesting that AI integration should be supported by educational initiatives in the future. The findings showed that, while students were aware of the growing importance of technology in healthcare, they emphasized the need for education and ethical guidelines, along with a positive attitude toward the integration of AI and robotic systems into nursing practice. Overall, the study investigating the views of healthcare professionals and patients on the integration of AI and robot nurses into healthcare services revealed that, while participants positively evaluated the potential of these technologies to enhance service quality, they also emphasized that factors such as ease of use, hygiene, and the effectiveness of human-robot interaction are critical for successful implementation.[41] A systematic review reported that AI has transformed nurses' roles by automating routine tasks, thus enabling them to focus more on clinical decision-making and patient-oriented care. As a result, the quality of patient care improved, and nurses' job satisfaction increased.[42] In another study, it was found that nurses accepted service robots at a moderate level, while patients showed lower acceptance. The main factors affecting acceptance included robots' capacity for interaction and emotional responsiveness, reliability in care, job security, ease of use, and the role of robots in healthcare. These findings emphasize the importance of education and confidence-building measures for both healthcare professionals and patients in the integration of AI and robot nurses into healthcare services.[43] A study conducted in Canada reported that while 52% of participants had knowledge about AI, most had positive views about its use in healthcare and expressed interest in using AI in their careers.[44] The findings regarding knowledge levels and attitudes toward AI from the reviewed thesis are consistent with both national and international literature. The studies reported that a significant majority of participants were knowledgeable about AI and believed its application in healthcare would help reduce nurses' workload. Participants also expressed positive opinions about the potential benefits of robots in the nursing profession. Additionally, healthcare professionals stated that AI applications could accelerate healthcare processes and showed a desire to incorporate such technologies into their careers.[45–48] Most studies indicated that participants believed AI would improve nursing practice and reduce workload. Based on these findings, the more widespread and effective use of AI and robots in nursing practice may contribute to the more efficient and higher-quality delivery of nursing care and services.

3. Studies Evaluating the Use and Effect of AI-supported Educational Models in Nursing and Healthcare

There is only one postgraduate thesis that evaluated AI-supported training in the field of nursing. The study by Çeliktürk Doruker[49] reported that training provided to students using low-tech simulation models, accompanied by individualized scenarios and the supervised machine learning technique, was more effective and produced more lasting results than standard training provided without the use of AI. The study focused specifically on advanced life support training integrated with AI. Additional studies indicated that AI-supported simulation training had a significant positive effect on participants' learning outcomes. For example, a study conducted in Canada reported that AI-supported simulation training provided to nurses increased their knowledge levels, and the effect lasted for up to three months. It was found that the use of AI in simulation not only enhanced nurses' knowledge immediately after training but also ensured retention of that knowledge for up to three months, demonstrating both the effectiveness and durability of AI-supported educational methods.[50–52] Another study revealed that AI-supported case analysis improved students' case management performance. Moreover, it was found to be as effective as traditional instructor-led case analysis in terms of satisfaction, focus, and interest in the case.[53] Another study investigated the effect of an immersive virtual reality (IVR) application on improving nursing students' indwelling urinary catheter placement skills. It demonstrated that students practiced using both IVR and traditional methods, and that the use of IVR increased learning satisfaction and positively supported skill acquisition.[54] In a separate study, a mobile chatbot-supported educational method was implemented to enhance the learning achievement and self-efficacy of nursing students. The experimental results revealed that students who received education through the chatbot experienced significant and substantial improvements in both academic achievement and self-confidence compared to those who received traditional instruction.[55] The findings of the AI-supported training in the reviewed postgraduate thesis are consistent with those of other studies in the literature. The results indicate that AI-supported simulation training in nursing is an effective learning method. For example, studies involving virtual reality and AI in nursing education have reported similar improvements in clinical decision-making and procedural skills. Such training methods yield more effective and longer-lasting outcomes compared to traditional standard training. Studies that examined attitudes toward AI also found that the majority of participants believe AI applications should be integrated into nursing education. These studies emphasized the importance of incorporating AI into nursing curricula and highlighted its potential for enhancing student learning experiences.[44,46] Therefore, it is considered that the more widespread use of AI-supported simulations in nursing education and their integration into nursing curricula may be an important step toward increasing students' knowledge and improving their practical skills.

Limitations

The limitation of this study is that it only examines postgraduate theses conducted in Türkiye.

Conclusion

This review highlights the emerging, yet still underexplored, role of artificial intelligence in postgraduate nursing research in Türkiye. Despite the limited number of studies, the existing theses demonstrate a growing academic interest in the integration of AI into nursing practice and education. The findings emphasize the need for broader and more methodologically diverse research, particularly in experimental and training-based studies. Expanding research efforts in this area could help improve patient care, advance nursing education, and address current gaps in the literature.

According to the results of reviewed theses:

- AI should be integrated into nursing education, used to facilitate nursing practice, and applied in disease management.
- Ethical issues such as data privacy and the inability of AI to feel human emotions should not be overlooked.
- Regular training and awareness-raising activities should be organized to address these concerns.
- It is recommended that AI-supported simulation training be incorporated into nursing curricula to enhance students' knowledge and practical skills.

AI-supported educational studies and clinical evaluations are expected to contribute to care quality and guide future applications in both educational and clinical nursing settings. Further studies on AI should be added to the literature.

Ethics Committee Approval: Ethics committee approval was not required.

Informed Consent: Informed consent was obtained from all participants.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Use of AI for Writing Assistance: During the preparation of this work, the authors did not use AI-supported technologies (such as large language models [LLMs], chatbots, or image creators).

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References

1. Featherstone JD. The science and practice of caries prevention. J Am Dent Assoc. 2000;131(7):887–899. [CrossRef]
2. Uysal F, Güven M, Paç M. Yapay zekânın dünü, bugünü ve geleceği. Turkiye Klinikleri J Radiol. 2020;13(1):6–10. [Article in Turkish]
3. Karaata E. Usage of artificial intelligence in today's graphic design. Online J Art Des. 2018;6(4):183–198.
4. Rezk SMM. The role of artificial intelligence in graphic design. J Art Des Music. 2023;2(1):1. [CrossRef]
5. Robert N. How artificial intelligence is changing nursing. Nurs Manage. 2019;50(9):30–39. [CrossRef]
6. Reddy S, Fox J, Purohit MP. Artificial intelligence-enabled healthcare delivery. J R Soc Med. 2019;112(1):22–28. [CrossRef]
7. Gunn AA. The diagnosis of acute abdominal pain with computer analysis. J R Coll Surg Edinb. 1976;21(3):170–172.
8. Baker A, Perov Y, Middleton K, et al. A Comparison of artificial intelligence and human doctors for the purpose of triage and diagnosis. Front Artif Intell. 2020;3:543405. [CrossRef]
9. Zhou LQ, Wang JY, Yu SY, et al. Artificial intelligence in medical imaging of the liver. World J Gastroenterol. 2019;25(6):672–682. [CrossRef]
10. Mar VJ, Soyer HP. Artificial intelligence for melanoma diagnosis: How can we deliver on the promise? Ann Oncol. 2018;29(8):1625–1628. [CrossRef]
11. American Nurses Association. Nursing informatics: Scope and standards of practice. 2nd ed. Silver Spring (MD): American Nurses Association; 2015.
12. Clancy TR. Artificial intelligence and nursing: The future is now. J Nurs Adm. 2020;50(3):125–127. [CrossRef]
13. Ronquillo CE, Peltonen LM, Pruinelli L, et al. Artificial intelligence in nursing: Priorities and opportunities from an international invitational think-tank of the Nursing and Artificial Intelligence Leadership Collaborative. J Adv Nurs. 2021;77(9):3707–3717. [CrossRef]
14. Lo AC, Guarino PD, Richards LG, et al. Robot-assisted therapy for long-term upper-limb impairment after stroke. N Engl J Med. 2010;362(19):1772–1783. Erratum in: N Engl J Med. 2011;365(18):1749. [CrossRef]
15. Pepito JA, Locsin R. Can nurses remain relevant in a technologically advanced future? Int J Nurs Sci. 2018;6(1):106–110. [CrossRef]
16. Kyrarini M, Lygerakis F, Rajavenkatanarayanan A, et al. A survey of robots in healthcare. Technologies. 2021;9(1):8. [CrossRef]
17. Akalin B, Veranyurt Ü. Sağlık bilimlerinde yapay zekâ tabanlı klinik karar destek sistemleri. Gevher Nesibe J Med Health Sci. 2022;7(18):64–73. [Article in Turkish] [CrossRef]
18. Çiriş Yıldız C, Başıbüyük M, Yıldırım D. Klinik karar destek sistemlerinin hemşirelikte kullanımı. J Inonu Univ Health Serv Voc Sch. 2020;8(2):483–495. [Article in Turkish] [CrossRef]
19. Harmon J, Pitt V, Summons P, Inder KJ. Use of artificial intelligence and virtual reality within clinical simulation for nursing pain education: A scoping review. Nurse Educ Today. 2021;97:104700. [CrossRef]
20. Shorey S, Ang E, Yap J, Ng ED, Lau ST, Chui CK. A virtual counseling application using artificial intelligence for communication skills training in nursing education: Development study. J Med Internet Res. 2019;21(10):e14658. Erratum in: J Med Internet Res. 2019;21(11):e17064. [CrossRef]
21. Kandemir F, Azizoglu F, Terzi B. Use of artificial intelligence and robotic technologies in nursing. J Intensive Care Nurs. 2023;27(2):118–127.
22. Barış Eren N. Hemşirelik bakımında yapay zeka. In: Bakım kalitesini iyileştirmede inovasyon. Ankara: Akademisyen Kitabevi; 2021. [In Turkish]
23. Çoban N, Eryiğit T, Dülcek S, Beydağ D, Ortabağ T. Hemşirelik mesleğinde yapay zekâ ve robot teknolojilerinin yeri. Fenerbahçe Univ Sağlık Bilim Derg. 2022;2(1):378–385. [Article in Turkish]
24. Bulut B, Hüseyinoğlu S. Ebelik eğitiminde yapay zekâ ve öğrenci başarısına etkisi. In: Ebelik ve kadın sağlığı üzerine güncel araştırmalar. 2024. p. 19–42. [In Turkish] [CrossRef]
25. Özdemir L, Bilgin A. Sağlıkta yapay zekânın kullanımı ve etik sorunlar. Sağlık Hemşirelik Yönetimi Derg. 2021;8(3):439–445. [Article in Turkish] [CrossRef]
26. Par S. Yapay zekânın sağlık alanında kullanımı ve hukuki statüsü. Int Anatolia Acad Online J Soc Sci J. 2024;10(2):179–196. [Article in Turkish]
27. Türkiye Bilişim Derneği. Yapay Zeka Stratejisi Çalıştayı Sonuç Raporu. Accessed June 7, 2025. https://www.tbd.org.tr/yapay-zeka-stratejisi-calistayi-sonuc-raporu/
28. Kalaycı F, Şengör K, Görücü R. Türkiye'de hemşirelik lisansüstü tez çalışmalarının bibliyometrik incelenmesi: Yapay zekâ kavramı örneği. Sağlık Bilimleri Klin Araştır Derg. 2024;3(3):204–212. [Article in Turkish]
29. Aslan F, Subaşı A. Hemşirelik eğitimi ve hemşirelik süreci perspektifinden yapay zekâ teknolojilerine farklı bir bakış. Sağlık Bilimleri Univ Hemşirelik Derg. 2022;4(3):153–158. [Article in Turkish] [CrossRef]
30. Vicir M. Jinekolojik kanser hastalarında NANDA hemşirelik tanılarının makine öğrenmesi ve veri madenciliği yöntemi ile geliştirilmesi [Master's thesis]. Denizli: Pamukkale Üniversitesi; 2023. [In Turkish]
31. Polat G. Diyabetli bireylere yönelik geliştirilen yapay zekâ tabanlı mobil sanal asistanın maliyet etkinliği, hastaneye yatırılma oranı, özbakım ve hipoglisemi üzerine etkisi [Doctoral dissertation]. İzmir: İzmir Kâtip Çelebi Üniversitesi; 2023. [In Turkish]
32. Gündoğdu H. Akıllı basınç yarası sınıflandırma sisteminin geliştirilmesi ve sistemi kullanan hemşirelerin deneyimlerinin incelenmesi [Doctoral dissertation]. Sakarya: Sakarya Üniversitesi Sağlık Bilimleri Enstitüsü; 2022. [In Turkish]
33. Yiğit D. Yapay zeka teknikleri ile yenidoğanların konfor davranış düzeylerinin değerlendirilmesi [Doctoral dissertation]. Eskişehir: Eskişehir Osmangazi Üniversitesi; 2022. [In Turkish]
34. Hong L, Cheng X, Zheng D. Application of artificial intelligence in emergency nursing of patients with chronic obstructive pulmonary disease. Contrast Media Mol Imaging. 2021;2021:6423398. [CrossRef]
35. Liu Q, Yang L, Peng Q. Artificial intelligence technology-based medical information processing and emergency first aid nursing management. Comput Math Methods Med. 2022;2022:8677118. Retraction in: Comput Math Methods Med. 2023;2023:9868521. [CrossRef]
36. Chan KS, Chan YM, Tan AHM, et al. Clinical validation of an artificial intelligence-enabled wound imaging mobile application in diabetic foot ulcers. Int Wound J. 2022;19(1):114–124. [CrossRef]
37. Dinesen B, Hansen HK, Grønborg GB, et al. Use of a social robot (LOVOT) for persons with dementia: Exploratory study. JMIR Rehabil Assist Technol. 2022;9(3):e36505. [CrossRef]
38. Bian Y, Xiang Y, Tong B, Feng B, Weng X. Artificial intelligence-assisted system in postoperative follow-up of orthopedic patients: Exploratory quantitative and qualitative study. J Med Internet Res. 2020;22(5):e16896. [CrossRef]
39. Duan N, Lin G. Effect of intelligent medical data technology in postoperative nursing care. Biomed Res Int. 2022;2022:9681769. Retraction in: Biomed Res Int. 2023;2023:9763701. [CrossRef]
40. Cankara S. Hemşirelik öğrencilerinin robot hemşireler ve yapay zeka uygulamalarına yönelik görüşlerinin incelenmesi [Master's thesis]. İzmir: Ege Üniversitesi; 2023.
41. Jang SM, Hong YJ, Lee K, Kim S, Chiến BV, Kim J. Assessment of user needs for telemedicine robots in a developing nation hospital setting. Telemed J E Health. 2021;27(6):670–678. [CrossRef]
42. Al Khatib I, Ndiaye M. Examining the role of AI in changing the role of nurses in patient care: Systematic review. JMIR Nurs. 2025;8:e63335. [CrossRef]
43. El-Gazar HE, Abdelhafez S, Ali AM, Shawer M, Alharbi TAF, Zoromba MA. Are nurses and patients willing to work with service robots in healthcare? A mixed-methods study. BMC Nurs. 2024;23(1):718. [CrossRef]
44. Teng M, Singla R, Yau O, et al. Health care students' perspectives on artificial intelligence: Countrywide survey in Canada. JMIR Med Educ. 2022;8(1):e33390. [CrossRef]
45. Akyüz HÖ, Alkan S, Yücebaş SC. Sağlık hizmetleri meslek yüksek okulu öğrencilerinin yapay zeka hakkında bilgi düzeylerinin incelenmesi. Med Res Rep. 2021;4(3):28–35. [Article in Turkish]
46. Hoşgör DG, Güngördü H, Hoşgör H. Sağlık profesyonellerinin yapay zekâya ilişkin görüşleri: Metaforik bir araştırma. Al Farabi Ulus Sos Bilim Derg. 2023;8(1):71–87. [Article in Turkish]
47. Yılmaz Y, Yılmaz DU, Yıldırım D, Korhan EA, Kaya DÖ. Yapay zeka ve sağlıkta yapay zekanın kullanımına yönelik sağlık bilimleri fakültesi öğrencilerinin görüşleri. Süleyman Demirel Univ Sağlık Bilim Derg. 2021;12(3):297–308. [Article in Turkish] [CrossRef]
48. Ergin E, Karaarslan D, Şahan S, Bingöl Ü. Can artificial intelligence and robotic nurses replace operating room nurses? The quasi-experimental research. J Robot Surg. 2023;17(4):1847–1855. [CrossRef]
49. Çeliktürk Doruker N. Yapay zekâ entegrasyonlu ileri kardiyak yaşam desteği eğitim modelinin etkinliğinin değerlendirilmesi [Doctoral dissertation]. İzmir: Ege Üniversitesi; 2023. [In Turkish]
50. Coşkun G, Karagözoğlu Ş. Yüksek gerçeklikli simülasyon yönteminin hemşirelik öğrencilerinin anjinalı hastanın hemşirelik bakımına yönelik bilgi ve klinik karar verme düzeyine etkisi. Hacettepe Univ Hemşirelik Fak Derg. 2023;10(2):135–144. [Article in Turkish] [CrossRef]
51. Koivisto JM, Buure T, Engblom J, Rosqvist K, Haavisto E. Association between game metrics in a simulation game and nursing students' surgical nursing knowledge - A quasi-experimental study. BMC Nurs. 2024;23(1):16. [CrossRef]
52. Crowe S, Ewart L, Derman S. The impact of simulation based education on nursing confidence, knowledge and patient outcomes on general medicine units. Nurse Educ Pract. 2018;29:70–75. [CrossRef]
53. Akutay S, Yüceler Kaçmaz H, Kahraman H. The effect of artificial intelligence supported case analysis on nursing students' case management performance and satisfaction: A randomized controlled trial. Nurse Educ Pract. 2024;80:104142. [CrossRef]
54. Chang CL. Effect of immersive virtual reality on post-baccalaureate nursing students' in-dwelling urinary catheter skill and learning satisfaction. Healthcare (Basel). 2022;10(8):1473. [CrossRef]
55. Chang CY, Hwang GJ, Gau ML. Promoting students' learning achievement and self-efficacy: A mobile chatbot approach for nursing training. Br J Educ Technol. 2022;53(1):171–188. [CrossRef]