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Nurses' perceptions of artificial intelligence use in clinical practice: a qualitative study

Postrzeganie przez pielęgniarki wykorzystania sztucznej inteligencji w praktyce klinicznej: badanie jakościowe

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A – Development of the concept and methodology of the study/Opracowanie koncepcji i metodologii badań; B – Query - a review and analysis of the literature/Kwerenda – przegląd i analiza literatury przedmiotu; C – Submission of the application to the appropriate Bioethics Committee/Złożenie wniosku do właściwej Komisji Biotycznej; D – Collection of research material/Gromadzenie materiału badawczego; E – Analysis of the research material/Analiza materiału badawczego; F – Preparation of draft version of manuscript/Przygotowanie roboczej wersji artykułu; G – Critical analysis of manuscript draft version/Analiza krytyczna roboczej wersji artykułu; H – Statistical analysis of the research material/Analiza statystyczna materiału badawczego; I – Interpretation of the performed statistical analysis/Interpretacja dokonanej analizy statystycznej; K – Technical preparation of manuscript in accordance with the journal regulations/Opracowanie techniczne artykułu zgodne z regulaminem czasopisma; L – Supervision of the research and preparation of the manuscript/Nadzór nad przebiegiem badań i przygotowaniem artykułu

STRESZCZENIE

POSTRZEGANIE PRZEZ PIELĘGNIARKI WYKORZYSTANIA SZTUCZNEJ INTELIGENCJI W PRAKTYCE KLINICZNEJ: BADANIE JAKOŚCIOWE

Cel pracy. Wykorzystanie sztucznej inteligencji (AI) budzi szereg wątpliwości dotyczących jej wpływu na pielęgniarstwo i ogólnie na opiekę zdrowotną. Do tej pory nie poświęcano zbyt wiele uwagi opiniom praktykujących pielęgniarek na temat wykorzystania tej technologii, co pozostawia lukę badawczą w tej dziedzinie. Niniejsze badanie miało na celu zbadanie aktualnych opinii pielęgniarek na temat wykorzystania AI w ich zawodzie oraz przeanalizowanie związanych z tym korzyści i kwestii etycznych związanych z tą innowacją technologiczną.

Materiał i metody. Zastosowano jakościowy, eksploracyjny projekt badawczy. Piętnaście słoweńskich pielęgniarek przedłożyło swoje pisemne refleksje i wzięło udział w dwóch grupach fokusowych poświęconych temu tematowi.

Wyniki. Zidentyfikowano trzy następujące tematy: ograniczenia sztucznej inteligencji (kategorie: empatia i komunikacja oraz rozumowanie kliniczne), potencjalne korzyści płynące ze sztucznej inteligencji (kategorie: wydajność pracy i poprawa pielęgniarstwa jako dyscypliny) oraz kwestie społeczne i zarządcze (kategorie: akceptacja sztucznej inteligencji oraz wdrażanie i wykorzystanie).

Wnioski. Zidentyfikowane tematy i kategorie kierują procesem wdrażania innowacji AI w pielęgniarstwie i odzwierciedlają jego specyfikę. Ponadto podkreślają one potrzebę zmiany paradygmatu w pielęgniarstwie, której można się spodziewać wraz z wykorzystaniem tej technologii w klinicznej praktyce pielęgniarskiej.

Słowa kluczowe: pielęgniarstwo, grupy fokusowe, sztuczna inteligencja, postrzeganie

ABSTRACT

NURSES' PERCEPTIONS OF ARTIFICIAL INTELLIGENCE USE IN CLINICAL PRACTICE: A QUALITATIVE STUDY

Aim. The use of artificial intelligence (AI) raises several uncertainties about its impact on nursing and health care in general. To date, not much attention has been paid to the views of practicing nurses on the use of this technology, leaving a research gap in this area. The aim of the study was to explore nurses' current perceptions of the use of AI in their profession and examine the associated benefits and ethical considerations of this technological innovation.

Material and methods. A qualitative, exploratory design was used. Fifteen Slovenian nurses submitted their written reflections and participated in two focus groups on this topic.

Results. The following three themes were identified: AI limitations (categories: Empathy and Communication, and Clinical Reasoning), potential benefits of AI (categories: Work Efficiency and Improving Nursing as a Discipline), and social & managerial concerns (categories: Acceptance of AI and Implementation and Use).

Conclusions. The identified themes and categories direct the process of adopting the innovation of AI in nursing and reflect its specificity. Furthermore, they highlight the need for a paradigm shift in nursing that can be expected with the use of this technology in clinical nursing practice.

Key words: nursing, focus groups, artificial intelligence, perception

INTRODUCTION

In the ever-evolving landscape of health care, technological advances continue to shape the way patient care is delivered. Among these innovations, artificial intelligence (AI) has emerged as a powerful tool that has the potential to revolutionise the field of nursing [1]. The integration of AI into healthcare systems has generated a wave of opportunities, from improving diagnostic accuracy to streamlining administrative tasks [2]. As the demand for high-quality and efficient patient care increases, there is a growing trend among nurses to utilise AI-driven solutions to address these challenges [3]. This article explores nurses' perceptions towards the current applicability of AI in the nursing profession and its potential impact on the profession in the future. As AI evolves from a novel to a fundamental component of nursing practice, understanding its impact is of paramount importance for healthcare providers as well as patients.

AI refers to computer-based systems that include both hardware and software and can perform physical tasks as well as cognitive functions. These systems have the potential to overcome various challenges, solve problems and make decisions autonomously, without explicit instruction from human operators [4]. AI is not a single technology but a set of technologies serving different functions depending on the task [5]. AI is becoming increasingly common in global clinical environments, with global expenditures on AI-related advancements expected to surpass $36 billion by 2025 [5]. Given its potential to improve operational processes and provide insights to support clinical judgment, AI is expected to significantly affect the nursing profession.

While nursing has been at the forefront of technological advances for over a decade, the introduction of AI has had an unprecedented impact on patient care. Examples include automated robots for dispensing medication, companion robots for people with disabilities, and complex AI systems that enable machines to make important decisions in terms of health management and care coordination, such as assessment of the likelihood of a patient developing pressure ulcers or prediction and prevention of falls [6-9]. Japan, is an example of a country where approximately 30% of the population is over 65 years of age, nurses rely on AI-driven robots within long-term care facilities and hospitals. These robots help patients with their daily activities and foster social engagement [10].

The introduction of AI in nursing has raised concerns and sparked public debate. Many fear AI will undermine human interaction and ethics of care, while others worry it could even replace caregivers [11,12]. In nursing, providing compassionate and individual-centered and family--centred care is a core aspect of both theory and practice, expressed in various nursing frameworks [13,14]. This approach shifts the focus of nurses' practicefrom merely completing tasks to holistically engaging with the patient and responding to individual needs [15]. It also promotes well-being and supports the building of important therapeutic relationships for effective care. As AI trends may alter this nurse-patient dynamics [12], it is crucial for nurses to actively advocate for the meaningful use of AI in health care that will help improve the quality of patient care and treatment.

For example, Seibert et al. [3] point out that a large proportion of nurses' working hours are often spent documenting care processes, and that this accounts for approximately one-third of their workload. This highlights the first opportunity to develop AI solutions that will enhance care processes to consistently and efficiently support nurses in their daily tasks and allow them to focus their efforts on the essential aspects of patient care. However, a necessary step towards reaping the wider benefits of AI--based technologies in nursing is to identify areas in which they add real value to the field [5].

Several well-established theoretical models explain the adoption of innovations in healthcare. For example, the Technology Acceptance Model (TAM) [16,17], which identifies the key factors that influence the acceptance of new technologies and therefore predicts user behaviour for different technologies and different user groups. Originally, the model of TAM consisted of four key constructs: perceived usefulness, ease of use, attitude towards use, and intention to use. To overcome the limitations of the TAM, Venkatesh and Davis [18] developed the extension of TAM, i.e. TAM2, which provides a more sophisticated framework that accounts for the complexity of technology acceptance in different contexts by providing a more comprehensive understanding of the factors that influence technology acceptance. In particular, subjective norm was included in TAM2. Another relevant theory is Rogers' Diffusion of Innovations (DOI) [19], which provides a sound theoretical background detailing the decision-making process for an innovation and specifying the perceived attributes of technology acceptance (e.g., relative advantage, compatibility, complexity, trialability, and observability). The Unified Theory of Acceptance and Use of Technology (UTAUT) [20] extends the TAM by integrating constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions, while taking into account the moderating effects of variables such as age, gender, and experience. Together, these frameworks provide a comprehensive understanding of the individual and organisational factors that influence the adoption of new technologies, including artificial intelligence, in nursing clinical practice. However, before applying these theoretical models int should be noted that AI is not just a technical innovation. As emphasised by Johnson & Verdicchio [21], AI should be understood as a complex, interrelated sociotechnical system, whose consequences extend far beyond those of traditional technical innovations.

With the rising prominence of AI in clinical settings, nurses in all roles and domains need to reflect on the impact of these technologies. This includes both their influence on the nurse–patient dynamic and on the broader landscape of the nursing profession. In this context, it is of paramount importance for nurses to gain a comprehensive understanding of these new technologies. This understanding will play a pivotal role in shaping the trajectory of the nursing profession and defining aspects of patient care that can be effectively and safely performed

by AI systems. Buchanan et al. [1] stress that while nurses' clinical and research skills are indispensable for co-designing AI technologies relevant to nursing, there is a lack of clarity about the extent to which nurses currently participate in the research and co-design of these technologies. In the ongoing debates and uncertainties about how AI might impact nursing and health care in general, we find that limited attention has been paid to the opinions of practicing nurses. The aim of the study was therefore to explore nurses' current perceptions on the use of AI in their profession and examine the benefits and ethical considerations associated with this technological innovation.

MATERIALS AND METHODS

Study Design

A qualitative, exploratory design was used, based on the analysis of participants' reflections and the transcripts of two focus groups. The use of both methods represents a triangulation method aimed at reducing bias in data collection. Inductive content analysis [22] was adopted as there is insufficient knowledge about nurses' perceptions of the use of AI in clinical practice. Both researchers have backgrounds in nursing and nursing informatics. Given the lack of consensus in the literature regarding the use of AI in nursing, they made a conscious effort to maintain a neutral stance throughout the entire research process.

Participants

A convenience sample of 15 nursing professionals working in clinical practice was recruited for the study. The sample consisted of nurses from all levels of health care who had completed their training at our institution, predominantly female, which is typical for the nursing profession. The demographic data of the participants are shown in Tab. 1.

Tab. 1. Participant demographics (n = 15)

Parameter		Value
		M (SD)
Age		34.5 (8.7)
Years of experience in nursing		11.3 (9.6)
		n (%)
Level of the healthcare system	Primary	5 (33.3%)
	Secondary	6 (40.0%)
	Tertiary	4 (26.7)%
Gender	Female	13 (86.7%)
	Male	2 (13.3%)

Data collection

Data collection was conducted prior to the start of the training on 29 May 2023. Only the participants and the two researchers were present during data collection. At the beginning, the two researchers introduced themselves to the participants and explained the aim and details of the study as well as ethical considerations relevant to the participants. This was followed by a brief presentation of the definition of AI and some examples from clinical practice. The objective of this presentation was to clarify the AI-related terminology used in the data collection procedure to avoid any misunderstandings. Special care was taken to make this presentation clear and concise and to avoid sentences that could potentially distort participants' responses.

Initially, participants wrote down their reflections regarding the use of AI in nursing practice. In this phase of the study, they were given 20 minutes to respond to the questions posed, whereby a minimum of 100 words per response was required. Participants uploaded their responses to the server.

After submitting their reflections, participants were randomly assigned to two focus groups. Each researcher conducted one focus group and recorded participants' responses. Both researchers have considerable experience in qualitative analysis and conducting focus groups and were trained as part of their doctoral studies. The duration of both focus groups was approximately 30 min. The findings of each focus group were documented in focus group notes, which were then reviewed and confirmed by the participants.

Instruments

Tab. 2 shows the instruments used in each phase of the study. In the Reflection phase, participants responded to two general questions about the use of AI in nursing. while four more detailed questions about AI were used to guide the focus group discussion. The questions were designed with reference to similar studies in health care [23-25]. In order to ensure clarity, the instruments were piloted with two participants who were not included in the final sample.

Tab. 2. Instruments used in each phase of the study

Phase	Questions
Reflections	1. Provide your opinion on the use of AI in nursing; 2. In your opinion, what are the positive or negative aspects of its use?
Focus group	1. What is your opinion on the use of AI in patient-centred care? [Additional question: What positive or negative aspects do you perceive in this context?] 2. What is your opinion on the use of AI in patient interaction? [Additional question: How do you comment on this from the perspective of emotional interaction?] 3. Comment on the use of AI in health care from an ethical and moral perspective. [Additional question: Can you provide any examples? 4. In which field of nursing do you find AI as useful [management, policy, administration, clinical practice, research]?

Data analysis

The coding process was performed by both researchers independently to increase the validity of results. Initially, naïve reading of all reflections and focus groups notes was performed, followed by open coding, categorisation and abstraction. The data were analysed using the Atlas. ti 9 software. Two focus groups notes and 15 written participants' reflections were uploaded into the software into

a single hermeneutic unit and analysed, with both data sources given equal weight in the analysis. After the consolidation of codes, categories, and category groups by both researchers, the coding process was repeated and any inconsistencies identified were discussed and adequately addressed. Saturation was reached after analysing ten reflections and one focus group note. Further analysis of the remaining transcripts and additional focus group notes revealed no new codes.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki. It was approved by the Commission of the University of Primorska for Ethics in Human Subjects Research (Approval No./ 4264-19-6/23). Participation in the study was voluntary and participants had the right to withdraw from the study at any time without consequences. Participants provided informed consent by completing a consent form. None of the participants refused to participate in the study. The study received no other financial support. To ensure the confidentiality and privacy of our participants, each quote from the first phase of the study was labelled with a unique code assigned to the participant (labelled Px, where x stands for a specific participant), gender, and age group. The conclusions from the focus group notes are labelled as Focus Group 1 or 2 and are not attributed to a specific participant. Although participants did not provide direct feedback on the findings, we plan to share the published article with them by email.

RESULTS

The qualitative analysis revealed three themes related to nurses' perceptions of the use of AI in their profession: 1) AI Limitations, 2) Potential Benefits of AI, and 3) Social & Managerial Concerns. Table 3 shows the identified themes, categories and their grounding in the participants' reflections and focus group notes, shown separately for participants' reflections and focus groups.

Tab. 3. Identified themes and categories with their reasoning, shown separately for participants' reflections and focus groups' reflection

Group	Category	Grounding (n)		
		Reflections	Focus groups	Total
(1) AI limitations	Empathy and communication	13	8	21
	Clinical reasoning	29	4	33
(2) Potential benefits of future technology	Work efficiency	18	11	29
	Improving nursing as a discipline	8	12	20
(3) Social & managerial concerns	Acceptance of AI	9	9	18
	Implementation and use	12	18	30

AI Limitations

The *AI Limitations* theme includes two categories, *Empathy and Communication*, mentioned in 21 quotes, and *Clinical Reasoning* mentioned in 33 quotes. The *Empathy and Communication* category contains participants' concerns about compassionate care, focusing mainly on patient–nurse interactions:

"*I`m concerned that a future overreliance on AI in health care can lead to the elimination of the warmth of human touch, which is so vital for compassionate patient care.*" [P1, female, 27]

"*The nurse develops a unique connection with the patient, one that is built on trust, respect, and friendship – a bond that a machine could never replicate.*" [P9, female, 49]

"*The machine does not see the patient's behaviour and non-verbal communication… when a person is most vulnerable, they need to feel close to another person. A machine cannot pour them a cup of tea.*" [P9, female, 49]

Furthermore, the Clinical Reasoning category contains participants' concerns about the validity and reliability of AI results, as well as the danger of overreliance on AI in nursing practice:

"*People would take advantage of AI and, thus no longer use their common sense.*" [P3, female, 44]

"*The introduction of AI might lead to new types of errors or threats.*" [Focus Group 2]

Potential benefits of AI

This theme consists of two categories: *Work Efficiency*, identified in 29 quotes, and *Improving Nursing as a Discipline*, identified in 20 quotes. The *Work Efficiency* category comprises nurses' positive opinions on the possibility of using AI to assist them with administrative tasks:

"*Definitely suitable for finding information that would require too much time to find on your own.*" [P3, female, 44]

"*I think we can do many positive things with it [AI], especially in terms of reducing paperwork.*" [P10, female, 41]

Moreover, this category also includes nurses' expectations related to saving time, for example:

"*The use of AI could save time spent on record-management tasks and thus enable us to focus more efficiently on our work with patients.*" [Focus Group 2]

The *Improving Nursing as a Discipline* category highlights nurses' expectations for AI to relieve them of dangerous, routine and/or repetitive tasks:

"*AI can make the workplace safer as dangerous tasks can be performed by robots, and it can open up new employment opportunities as related fields grow and change.*" [P2, female, 28]

In addition, the *Improving Nursing as a Discipline* category contains quotes expressing nurses' expectations related to optimisation and/or standardisation of workflows and terminology:

"*AI can provide a solution by accelerating essential processes and possibly reducing human errors in care planning.*" [P14, male, 25]

In this category, participants noted the possibilities of AI support in research, for example:

„*In addition to supporting nursing documentation or managing the administrative part of patient care, I think the use of AI is also useful in research. These new systems facilitate data collection and analysis.*" [Focus Group 1]

Social & managerial concerns

This theme consisted of the following categories: *Acceptance of AI*, identified in 18 quotes, and *Implementation and Use* (30 quotes).

The *Acceptance of AI* category included age-specific issues related to the adoption of AI:

"*Younger generations would be quick to embrace the use of AI in clinical practice, but the older generations [of nurses] would not… The younger ones would probably be able to accept the use of AI in clinical care.*" [Focus Group 2]"

Moreover, this category shows the importance, which participants ascribe to training and acquiring AI-related knowledge:

"*The use of AI is inevitable, but it is up to us to learn how to use it to our advantage and make it work for us.*" [P11, female, 41]

The *Implementation and Use* category includes participants' concerns regarding information security in the use of AI:

"*The protection of personal data and the threat of cyber security breaches into databases raise concerns.*" [Focus Group B]

In addition, this category also includes participants' concerns regarding the implementation of AI in healthcare:

"*However, it is important to maintain a professional and sober attitude when using AI [in clinical practice].*" [P8, female, 24]

DISCUSSION

The results of the qualitative analysis provided interesting insights into nurses' perceptions of the current use of AI in their professional environment. The identified themes and categories are analysed from two perspectives: the process of innovation adoption and the paradigm shift in nursing. These two perspectives, which are presented in the continuation, provide an insight into nurses' perceptions of the use of AI in their profession.

The first perspective, relevant to understanding nurses' perceptions of the current use of AI in nursing, is to understand the specificity of AI adoption as an innovation in nursing clinical practice. Our analysis identified several elements relevant to the process of innovation adoption that reflect the specificity of AI adoption in nursing clinical practice. According to Rogers [19], the process of innovation adoption consists of five stages: Knowledge/Awareness, Persuasion, Decision, Implementation, and Adoption. The identified categories are particularly relevant to the Persuasion and Implementation phases. The theme *Potential Benefits of AI* (Tab. 3) plays a decisive role in the Persuasion phase. In line with other relevant theories on the adoption of innovations, this theme can be attributed to the following factors that influence the decision to adopt an innovation: *relative advantage* in DOI [19], *perceived usefulness* in the Technology Acceptance Model [26], and *performance expectancy* in the Unified Theory of Acceptance and Use of Technology [20]. Petitgand et al. [27] and Sandhu et al. [28] conducted a study on the use of AI in emergency care by physicians and nurses. Both noted the importance of the usefulness of AI for its adoption in clinical practice. Coffetti et al. [29] has also found that perceived usefulness represents an important individual determinant for ICT innovation adoption. The acceptance of an innovation, which was also identified in our analysis as the *Acceptance of AI* category (Table 3), represents an important milestone in the innovation decision process [19]. In a study focusing on Iranian physicians and nurses, Hamedani et al. [30] investigate the importance of AI acceptance for the adoption of medical AI-related technologies. In their qualitative study on the use of AI-based chatbots in a simulated emergency situation by final-year nursing students, Rodriguez-Arrastia et al. [31] also emphasise the acceptance of this innovation as a prerequisite for the feasibility of its implementation. Our participants emphasised the importance of age as a key factor for the acceptance of AI. This was to be expected, as Coffetti et al. [29] also find that age is an important factor in the adoption of an ICT innovation. However, in their study on the use of AI in healthcare, Hamedani et al. [30] found no statistically significant correlation between age and the adoption of AI.

Our participants emphasised the importance of training and knowledge acquisition for the acceptance of AI. This is consistent with Rony et al. [32] who stress the importance of AI education and training in nursing to advance the understanding of AI limitations and potential biases and to recognise the importance of human supervision in the use of AI. Similarly, in a qualitative study involving mental health professionals, including nurses, Zhang et al. [33] identified the problem of insufficient AI training opportunities for mental health professionals and therefore recommend the development of relevant and sustainable training programmes to support the adoption of AI in this field.

The theme Social & Managerial Concerns reflects wider organisational challenges rather than personal reluctance. The findings pointed to age-related disparities that underscore the importance of promoting digital readiness and providing customised training approaches [29,32]. Additionally, participants' focus on responsible AI deployment emphasizes the critical role of leadership and governance structures [34]. Thus, the effective integration of AI in healthcare relies not only on technical improvements but also on fostering a supportive organisational culture, strong managerial backing, and ongoing education to ensure that AI-enabled practices remain consistent with the core values of professional nursing [35].

The final, desired step in the innovation adoption process is its implementation and use, which was also identified as a relevant category in our study (Tab. 3). This category includes information security concerns [36] related to the use of AI and the implementation of AI in health care [37]. In a qualitative study conducted with

experts from the fields of nursing and robotics, Stinder et al. [38] highlight the importance of data protection, as AI in health care typically requires the collection of large amounts of sensitive patient data. Similarly, in an excellent review paper, Hlávka [36] underscore the risks posed by AI in terms of data protection (e.g., re-identification of patients by AI, data integrity and bias, accidental disclosure, etc.), some of which were also mentioned by the participants in our study.

Our qualitative analysis revealed an important category of *AI Limitations* relevant to the innovation adoption process, namely *Empathy and Communication* (Table 3), which highlights the importance of prevailing norms and values in nursing care. Participants expressed concerns that inappropriate use of AI in nursing practice might negatively impact communication with patients and compromise empathic compassionate care. As noted by Stokes & Palmer [11] the division of tasks or skills between AI and humans within professions of care must aid the preservation of caring, caring touch, and presence as the core concern. This was one of the main limitations of AI noted by the participants in our study. However, a literature review by Buchanan et al. [1] identifies several positive aspects of AI that can promote and enhance emphatic and compassionate in care (e.g., nurses can spend more time getting to know their patients' preferences, appropriately respond to their needs, and build stronger therapeutic relationships so as to better understand their patients). In the present study, such a positive connotation was only expressed by one participant. Defining the positive and negative impacts of AI use on compassionate care is therefore crucial and should be considered when implementing AI in clinical practice. As noted by Buchanan [1], nurses need to proactively define ways in which person-centred and compassionate care can be maintained in the age of AI.

The second perspective is the importance of understanding how the use of AI is changing the way care is provided and managed. In the literature, we find several elements related to this paradigm shift in nursing: better work efficiency [38,39], workflow optimisation [1,31,34,40], data-driven decision making [32,41], predictive and preventive nursing care [32,41], personalisation of nursing plans [32,34,42], collaborative care models [43,44], ethical and legal considerations [35,45], improvement of nursing research [46], etc.

Participants in this study only recognised some of these elements, in particular better work efficiency (Potential Benefits of AI, Table 3), optimisation and standardisation of workflows and terminology, and improvement of nursing research (codes within the *Improving Nursing as a Discipline* category in relation to nurses' expectations, theme: *Potential Benefits of AI*, Table 3). This limited perception of the paradigm shift is a clear indication that the participants in our study had a limited understanding of the benefits of AI for health care. It also led to a biased view of data-driven decision making, which was perceived as a limitation due to the risk of over-reliance on AI and the validity and reliability of AI results (codes within the *Clinical Reasoning* category, theme: *AI Limitation*).

However, when viewed more broadly, the theme „*Improving Nursing as a Discipline*" suggests that the programme offers more than mere assistance with routine tasks. The participants' emphasis on relieving nurses from repetitive or hazardous work suggests a shift towards greater autonomy, research engagement, and evidence-based care. This standpoint is consistent with the assertions put forth by Robert [5] and Ronquillo et al. [35], who contend that the integration of AI has the potential to enhance nursing practices through the implementation of standardisation, data-driven methodologies, and the augmentation of research contributions. In this sense, AI is not only a tool for efficiency but also a catalyst for reinforcing nursing's disciplinary identity within interprofessional teams.

Our participants expressed high expectations for the use of AI in clinical practice, especially in terms of relieving them from manual, repetitive, and even dangerous tasks (e.g., administration, routine collection of demographic and health data, assistance in scheduling patient appointments) so that they might have more time for patient care [47] and other activities. We believe that nurses relieved of such tasks and given the opportunity to consciously engage in this paradigm shift will appreciate the transformative impact of AI to improve nursing practice [32]. In this context, both adequate formal education and lifelong learning are crucial [32] to realise the multidimensionality of this paradigm shift. According to Robert [5], AI will have a significant impact on the experience, knowledge and skills required for nurses to become information integrators, health coaches and providers of human care, who will be supported rather than replaced by AI technologies. The introduction of AI in nursing thus represents a paradigm shift, a momentous precedent for how a particular innovation can shape the systemic level as well as the individual, organisational level by also influencing the nursing discipline as such.

Although the study participants recognised several potential benefits of AI, not a single quote – either in the participants' reflections or in the focus group notes –was attributed to key positive aspects of AI in nursing identified in the literature: improvement of patient monitoring and support through predictive analytics [32], personalised care [48], collaborative care models and interprofessional support [49], and AI to support compliance or improve patient safety [50]. This suggests that participants were clearly unfamiliar with, or had not yet had the opportunity to explore, the broader possibilities that AI can offer. This aligns with the findings of Taie and Ali [51], who reported that a lack of knowledge about AI limits understanding of the full range of possibilities of this technology. Accordingly, they recommended that appropriate training programmes be made available to nurses to support the meaningful implementation of AI in nursing clinical practice.

Before generalising the findings of this study, it is important to acknowledge its limitations. Firstly, our findings are based on the reflections of 15 participants and two sets of focus groups notes. Although saturation was reached after analysing ten reflections and one set of focus group notes, we cannot be certain whether additional

potential themes might emerge with a larger number of participants. Secondly, as a cross-sectional study, this study reflects the views of participants at a particular point in time. The development and actual implementation of AI in clinical practice, news about AI in the mass media, lifelong learning in the field, etc., may all influence the perception of AI. Therefore, the audience should be aware of the changing nature of these perceptions. Thirdly, the participants in this study were recruited using convenience sampling from a single institution, which could limit the generalisability of the results. Future studies should therefore consider broader, multi-institutional sampling methods to increase external validity. Finally, while the researchers made a conscious effort to maintain a neutral stance throughout the research process, their professional backgrounds in nursing and informatics may have introduced a potential risk of bias, which should be recognised as a limitation. Nevertheless, scientific rigour was applied, and data collection and analysis was conducted objectively and systematically to minimise this risk.

CONCLUSIONS

The results of the study present relevant themes and categories that shape the process of AI adoption in nursing and highlight the specificities of this innovation. Managers and other relevant stakeholders should consider these findings in order to appropriately and thoughtfully introduce this innovation into clinical practice.

Furthermore, the present study emphasises the need for a paradigm shift in clinical nursing practice to embrace this technology. As the use of AI in nursing and health care in general is inevitable, nurses should be prepared to acquire the necessary knowledge and skills and proactively participate in this transformation. In this way, they will be able to play an active role in the effective and ethical implementation of AI in clinical nursing practice, ultimately improving patient care and advancing the nursing profession.

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REFERENCES

1. Buchanan C, Howitt ML, Wilson R, et al. Predicted Influences of Artificial Intelligence on Nursing Education: Scoping Review. JMIR Nurs. 2021;4:e23933. https://doi.org/10.2196/23933
2. Jiang F, Jiang Y, Zhi H, et al. Artificial intelligence in healthcare: past, present and future. Stroke Vasc. Neurol. 2017;2:23-243. https://doi.org/10.1136/svn-2017-000101
3. Seibert K, Domhoff D, Bruch D, et al. Application scenarios for artificial intelligence in nursing care: rapid review. J. Med. Internet Res. 2021;23:e26522. https://doi.org/10.2196/26522
4. Esmaeilzadeh P. Use of AI-based tools for healthcare purposes: a survey study from consumers' perspectives. BMC Med. Inform. Decis. Mak. 2020;20:170. https://doi.org/10.1186/s12911-020-01191-1
5. Robert N. How artificial intelligence is changing nursing. Nurs. Manag. (Harrow). 2019;50:30-39. https://doi.org/10.1097/01.NUMA.0000578988.56622.21
6. Benke K, Benke G. Artificial Intelligence and big data in public health. Int. J. Environ. Res. Public Health. 2018;15:2796. https://doi.org/10.3390/ijerph15122796
7. Cramer Em, Seneviratne Mg, Sharifi H, et al. Predicting the incidence of pressure ulcers in the intensive care unit using machine learning. EGEMS Wash DC. 2019;7:49. https://doi.org/10.5334/egems.307
8. Marschollek M, Wolf Kh, Gietzelt M, et al. Assessing elderly persons' fall risk using spectral analysis on accelerometric data--a clinical evaluation study. Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. IEEE Eng. Med. Biol. Soc. Annu. Int. Conf. 2008. https://doi.org/10.1109/IEMBS.2008.4650008
9. Pepito JA, Locsin R. Can nurses remain relevant in a technologically advanced future? Int. J. Nurs. Sci. 2019;6:106-110. https://doi.org/10.1016/j.ijnss.2018.09.013
10. Maalouf N, Sidaoui A, Elhajj IH, et al. Robotics in nursing: a scoping review. J. Nurs. Scholarsh Off Publ. Sigma Theta Tau. Int. Honor. Soc. Nurs. 2018;50:590-600. https://doi.org/10.1111/jnu.12424
11. Stokes F, Palmer A. Artificial Intelligence and robotics in nursing: ethics of caring as a guide to dividing tasks between AI and humans. Nurs. Philos. Int. J. Healthc. Prof. 2020;21. https://doi.org/10.1111/nup.12306
12. von Gerich H, Moen H, Block LJ, et al. Artificial Intelligence -based technologies in nursing: A scoping literature review of the evidence. Int. J. Nurs. Stud. 2022;127:104153. https://doi.org/10.1016/j.ijnurstu.2021.104153
13. Curtis K. Compassion is an essential component of good nursing care and can be conveyed through the smallest actions. Evid. Based Nurs. 2015;18:95. https://doi.org/10.1136/eb-2014-102025
14. Sharp S, McAllister M, Broadbent M. The vital blend of clinical competence and compassion: How patients experience person-centred care. Contemp. Nurse. 2016;52. https://doi.org/10.1080/10376178.2015.1020981
15. Perez-Bret E, Altisent R, Rocafort J. Definition of compassion in healthcare: a systematic literature review. Int. J. Palliat. Nurs. 2016;22. https://doi.org/10.12968/ijpn.2016.22.12.599
16. Davis FD, Bagozzi RP, Warshaw PR. User acceptance of computer technology: a comparison of two theoretical models. Manag. Sci. 1989;35:982-1003. https://doi.org/10.1287/mnsc.35.8.982
17. Venkatesh V, Davis FD. A Model of the antecedents of perceived ease of use: development and test. Decis. Sci. 1996;27:451-481. https://doi.org/10.1111/j.1540-5915.1996.tb01822.x
18. Venkatesh V, Davis FD. A Theoretical extension of the technology acceptance model: four longitudinal field studies. Manag. Sci. 2000;46:186-204. https://doi.org/10.1287/mnsc.46.2.186.11926
19. Rogers EM. Diffusion of innovations. 5th ed. New York: Free Press; 2003.
20. Venkatesh V, Morris MG, Davis GB, et al. User acceptance of information technology: toward a unified view. MIS Q. 2003;27:425-478. https://doi.org/10.2307/30036540
21. Johnson DG, Verdicchio M. The sociotechnical entanglement of AI and values. AI Soc 2025;40:67-76. https://doi.org/10.1007/s00146-023-01852-5
22. Elo S, Kyngäs H. The qualitative content analysis process. J. Adv. Nurs. 2008;62:107-115. https://doi.org/10.1111/j.1365-2648.2007.04569.x
23. Blease C, Bernstein MH, Gaab J, et al. Computerization and the future of primary care: A survey of general practitioners in the UK. PLOS ONE. 2018;13:e0207418. https://doi.org/10.1371/journal.pone.0207418
24. Blease C, Kaptchuk TJ, Bernstein MH, et al. Artificial Intelligence and the future of primary care: exploratory qualitative study of uk general practitioners' views. J. Med. Internet Res. 2019;21:e12802. https://doi.org/10.2196/12802
25. Abuzaid MM, Elshami W, Fadden SM. Integration of artificial intelligence into nursing practice. Health Technol. 2022;12:1109-1115. https://doi.org/10.1007/s12553-022-00697-0
26. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. 1989;13:319-340. https://doi.org/10.2307/249008
27. Petitgand C, Motulsky A, Denis J-L, et al. Investigating the barriers to physician adoption of an artificial intelligence- based decision support system in emergency care: an interpretative qualitative study. Digit. Pers. Health Med. IOS Press; 2020, p. 1001-1005. https://doi.org/10.3233/SHTI200312
28. Sandhu S, Lin AL, Brajer N, et al. Integrating a machine learning system into clinical workflows: qualitative study. J. Med. Internet Res. 2020;22:e22421. https://doi.org/10.2196/22421
29. Coffetti E, Paans W, Roodbol PF, et al. Individual and team factors influencing the adoption of information and communication technology by nurses: a systematic review. CIN Comput. Inform. Nurs. 2023;41:205-214. https://doi.org/10.1097/CIN.0000000000000931
30. Hamedani Z, Moradi M, Kalroozi F, et al. Evaluation of acceptance, attitude, and knowledge towards artificial intelligence and its application from the point of view of physicians and nurses: A provincial survey study in Iran: A cross-sectional descriptive-analytical study. Health Sci. Rep. 2023;6:e1543. https://doi.org/10.1002/hsr2.1543

31. Rodriguez-Arrastia M, Martinez-Ortigosa A, Ruiz-Gonzalez C, et al. Experiences and perceptions of final-year nursing students of using a chatbot in a simulated emergency situation: A qualitative study. J. Nurs. Manag 2022;30:3874-3884. https://doi.org/10.1111/jonm.13630
32. Rony MKK, Parvin MstR, Ferdousi S. Advancing nursing practice with artificial intelligence: Enhancing preparedness for the future. Nurs. Open. 2024;11:nop2.2070. https://doi.org/10.1002/nop2.2070
33. Zhang M, Scandiffio J, Younus S, et al. The adoption of AI in mental health care–perspectives from mental health professionals: qualitative descriptive study. JMIR Form. Res. 2023;7:e47847. https://doi.org/10.2196/47847
34. Laukka E, Hammarén M, Kanste O. Nurse leaders' and digital service developers' perceptions of the future role of artificial intelligence in specialized medical care: An interview study. J. Nurs. Manag. 2022;30:3838-3846. https://doi.org/10.1111/jonm.13769
35. Ronquillo CE, Peltonen L, 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;77:3707-3717. https://doi.org/10.1111/jan.14855
36. Hlávka JP. Security, privacy, and information-sharing aspects of healthcare artificial intelligence. Artif. Intell. Healthc., Elsevier; 2020, p. 235-270. https://doi.org/10.1016/B978-0-12-818438-7.00010-1
37. Ahmed MI, Spooner B, Isherwood J, et al. A systematic review of the barriers to the implementation of artificial intelligence in healthcare. Cureus. 2023. https://doi.org/10.7759/cureus.46454
38. Stinder AK, Frische A-M, Schilberg D. How can robotics be integrated into the field of care and acceptance by the population for the use of artificial intelligence be strengthened? In: Karwowski W, Ahram T, Nazir S, ed. Adv. Hum. Factors Train. Educ. Learn. Sci., vol. 963, Cham: Springer International Publishing; 2020, p. 85-94. https://doi.org/10.1007/978-3-030-20135-7_8
39. Senthilkumar T, Arumugam T, Pandurangan H, et al. Adoption of artificial intelligence in health care: A nursing perspective. Salud. Cienc. Tecnol. 2023;3:510. https://doi.org/10.56294/saludcyt2023510
40. Martinez-Ortigosa A, Martinez-Granados A, Gil-Hernández E, et al. Applications of Artificial intelligence in nursing care: A systematic review. J. Nurs. Manag. 2023;2023:1-12. https://doi.org/10.1155/2023/3219127
41. Raymond L, Castonguay A, Doyon O, et al. Nurse practitioners' involvement and experience with AI-based health technologies: A systematic review. Appl. Nurs. Res. 2022;66:151604. https://doi.org/10.1016/j.apnr.2022.151604
42. Gannod GC, Abbott KM, Van Haitsma K, et al. A machine learning recommender system to tailor preference assessments to enhance person-centered care among nursing home residents. The Gerontologist. 2019;59:167-176. https://doi.org/10.1093/geront/gny056
43. Moser EC, Narayan G. Improving breast cancer care coordination and symptom management by using AI driven predictive toolkits. The Breast. 2020;50:25-29. https://doi.org/10.1016/j.breast.2019.12.006
44. Sahoo SK, Choudhury BB. Challenges and opportunities for enhanced patient care with mobile robots in healthcare. J. Mechatron. Artif. Intell. Eng. 2023;4:83-103. https://doi.org/10.21595/jmai.2023.23410
45. McGreevey JD, Hanson CW, Koppel R. Clinical, legal, and ethical aspects of artificial intelligence–assisted conversational agents in health care. JAMA. 2020;324:552. https://doi.org/10.1001/jama.2020.2724
46. Lee D, Yoon SN. Application of artificial intelligence-based technologies in the healthcare industry: opportunities and challenges. Int. J. Environ. Res. Public Health. 2021;18:271. https://doi.org/10.3390/ijerph18010271
47. Buchanan C, Howitt ML, Wilson R, et al. Predicted influences of artificial intelligence on the domains of nursing: scoping review. JMIR Nurs. 2020;3:e23939. https://doi.org/10.2196/23939
48. Chen M, Decary M. Artificial intelligence in healthcare: An essential guide for health leaders. Healthc. Manage. Forum. 2020;33:10-18. https://doi.org/10.1177/0840470419873123
49. Al-Ruwaili MD, Al-Anzi AA-H, Al-Gaisi FFG, et al. The Role of technology in enhancing collaboration between nurses and healthcare assistants in improving healthcare delivery and promoting sustainability in health systems. J. Int. Crisis. Risk. Commun. Res. 2024;7:905-911. https://doi.org/10.63278/jicrcr.vi.2064
50. Khirfan R, Kotb H, Atiyeh H. Utilizing artificial intelligence to improve patient safety: innovations, obstacles, and future paths. Res. J. Pharm. Technol. 2024:4630-4636. https://doi.org/10.52711/0974-360X.2024.00714
51. Taie ES, Ali FN. Artificial intelligence in nursing practice: challenges and barriers. Helwan. Int. J. Nurs. Res. Pract. 2024;3:217-230. https://doi.org/10.21608/hijnrp.2024.292923.1169.

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