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Nurse academics' experiences and perceptions of artificial intelligence in education, research, clinical practice and nursing management: a qualitative descriptive study

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Abstract

Background

Nurse academics educate future nurses and nurse managers and often hold managerial roles, yet existing research has examined artificial intelligence (AI) in education, research, clinical practice and nursing management separately and mostly through surveys. This study aimed to explore nurse academics' experiences, perceptions and expectations regarding AI across academic work, nursing education, clinical practice and nursing management.

Methods

A qualitative descriptive study was conducted with 17 nurse academics in Türkiye selected by criterion sampling. Data were collected through semi-structured interviews and analysed in MAXQDA using Braun and Clarke's thematic analysis. Coded segments were descriptively quantitized and code saturation was assessed. The study is reported according to the COREQ checklist.

Results

Nine themes and 47 codes (405 coded segments) were identified. Participants positioned AI as an assistant rather than a replacement for the nurse. AI was used most intensively in academic work, whereas clinical experience remained limited. In nursing management, use for duty rostering, in-service training planning and documentation stood out, and AI-generated rosters were reported to strengthen perceived fairness among nurses. Reliability, ethical and security concerns formed the most extensive theme, and verifying AI outputs against sources was the most frequently coded strategy. Although almost all participants used AI, 14 did not feel ready or competent and requested structured training. Participants emphasised that the final decision must remain with the nurse; most showed opportunity-oriented but conditional adoption.

Conclusions

Nurse academics adopt AI as a supportive tool under human oversight. Perceived lack of competence and concerns about the reliability of information are the main barriers to adoption. Nursing schools and healthcare organisations should provide structured AI literacy training, develop guidelines on output verification and data protection, and transparently pilot AI-assisted rostering in which the final decision remains with the nurse manager.

Background

Artificial intelligence (AI) is no longer a distant vision in healthcare; it has begun to permeate everyday processes such as monitoring, documentation, decision-making and planning. Nurses, who constitute the largest professional group in the health workforce, are among those most directly affected by this transformation. The World Health Organization (WHO) lists digital health and technology among its priority policy areas and stresses that nurses must be prepared and supported to use digital technologies competently [1]. The International Council of Nurses (ICN) likewise defines digital competence as an urgent need and states that nurses should have a voice at every stage of AI, from development to implementation [2]. However, much of the evidence on AI in nursing still relies on technologies in the development and testing phases, and their impact in real practice settings remains insufficiently understood [3]. This situation reinforces calls for nurses to be not merely users of AI but actors who shape it [4].

Nursing management is one of the areas in which AI has found concrete application. A scoping review on the organisation of nursing care grouped AI tools into monitoring and prediction, decision support and communication technologies, reporting that these tools increase operational efficiency and reduce workload, although their effect on the organisation of care remains unclear [5]. Systematic reviews examining the impact of AI-based technologies on nursing management also show growing interest in this field [6]. Shift scheduling is one of the most debated examples: in a qualitative study in Switzerland, nurses stated that current schedules were neither fair nor transparent and that AI could improve equity by consistently applying predefined criteria, while insisting that the final decision should remain with humans [7]. In a Turkish study of 326 nurse managers, most participants believed that AI and robot nurses would benefit the profession and reduce workload, and 86.2% did not believe that robots would replace nurses [8]. A more recent qualitative study showed that infrastructure deficiencies, data security concerns and organisational resistance hinder integration, and that success depends on organisational readiness and on empowering managers in AI leadership [9].

With the public release of ChatGPT in late 2022, the focus of the debate shifted rapidly to higher education. Generative AI tools offer new possibilities for preparing course materials, searching the literature and academic writing, but they also raise serious questions about academic integrity, plagiarism and students' critical thinking skills [10]. Studies with nurse educators reflect this duality. In South Korea, approximately 39% of 120 nurse educators had never used generative AI, and those who found it useful used it only to a moderate extent [11]. In a mixed-methods study in Saudi Arabia, educators expressed more pronounced ethical concerns than students about plagiarism, dependence on the tool and reliability [12]. In a study of 311 nurse educators, mostly from Jordan, legal liability and the lack of regulatory standards emerged as the main risks, and cost reduction and improved research outputs as the main benefits [13]. Qualitative studies with students likewise view AI as a supportive tool but emphasise that it cannot replace empathy, therapeutic communication and person-centred care [14, 15].

Nurse academics occupy a distinctive position in this debate. As a group that educates future nurses and nurse managers, produces knowledge, maintains links with clinical practice and often assumes

institutional management roles, they will largely determine the values with which AI enters the profession. Nevertheless, a recent scoping review of 15 studies on nursing academics' perspectives draws attention to an "adoption paradox": academics anticipate that AI will transform nursing education, yet their own use is largely limited to productivity and research writing, with knowledge gaps and weak institutional policies among the main barriers [16]. Most existing studies rely on cross-sectional surveys and treat education, research, clinical practice and management separately, whereas academics' engagement with AI constantly moves across these domains. In Türkiye, research has focused mainly on students and nurse managers [8, 9, 14], and qualitative evidence examining nurse academics' experiences in depth across all four domains remains limited.

Aim and research questions

The aim of this study was to explore nurse academics' experiences, perceptions and expectations regarding AI in academic work, nursing education, clinical practice and nursing management. The study sought to answer the following questions:

- How do nurse academics make sense of AI?
- How do they experience AI in academic, educational, clinical and managerial processes?
- To what extent do they feel ready and competent to use AI?
- What are their expectations regarding the effects of AI on the future of the nursing profession?

Methods

Study design

A qualitative descriptive design was used to describe nurse academics' experiences, perceptions and expectations from their own perspectives and within their contexts. This design aims to provide a comprehensive description of a phenomenon in the everyday language of participants without high-level interpretive abstraction and is widely used in nursing research [17, 18]; recent studies examining nurse educators' and students' views on AI have also used descriptive qualitative designs and semi-structured interviews [15, 19]. The study is reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) [20]; the completed checklist is provided in Additional file 1.

Research team and reflexivity

The interviews were conducted by a female researcher holding a PhD in nursing, working as an assistant professor, with five years of clinical experience and experience in conducting numerous qualitative studies. The interviewer had no professional or personal relationship or contact with the participants before the study. Considering that the researchers' own use of AI and their views on the role of AI in

nursing could influence data collection and interpretation, reflexive notes were kept throughout the process and discussed with the research team during analysis.

Setting and participants

Participants were 17 academics teaching in the nursing department of a state university in eastern Türkiye. They were selected by criterion sampling, a purposive sampling method that enables access to information-rich individuals with respect to the research question [21]. The inclusion criteria were: (a) having taught in the nursing department of a higher education institution, (b) having used AI tools at least at a basic level, and (c) voluntarily agreeing to participate. Nineteen academics who met the criteria were invited face-to-face after the aim of the study was explained; two declined to participate. Participants were coded P01–P17.

Because the study focus was narrow and participants had specific experience with the topic, sample size was guided by the concept of information power [22], and saturation was assessed at the code level based on the approach proposed by Guest et al. [23]. In interview order, the first interview generated 38.3% of the code system, 97.9% of the codes had been identified by the seventh interview, and the last new code emerged in the tenth interview. Because confirming saturation requires consecutive interviews yielding no new codes [24], data collection continued; no new codes emerged in the subsequent seven interviews (P11–P17). Although these interviews did not expand the code system, they provided 42% of all coded segments (f = 170) and deepened existing codes with different contexts and experiences, consistent with evidence that meaning saturation requires more interviews than code saturation [25]. To test whether this result depended on interview order, the interviews were randomly reordered 500 times; on average, 90% of the codes were reached by the eighth interview and 95% by the tenth, and in 95% of the orderings at least 90% of the code system was obtained by the eleventh interview at the latest.

Data collection instruments

Data were collected using a Personal Information Form and a Semi-Structured Interview Form. The Personal Information Form included questions on gender, age, academic title, years of work in academia, clinical experience, area of specialisation and previous AI-related training. The interview form was developed by the researchers based on the relevant literature [15, 19] and finalised after obtaining the opinions of five experts on clarity and scope. The form explored participants' (i) meanings attributed to digital technologies and AI and their process of becoming acquainted with AI, (ii) experiences with AI in academic, clinical and managerial processes, (iii) use of AI in nursing education, (iv) perceptions of readiness and competence in AI use, and (v) views on the effects of AI on the future of the nursing profession. The interview questions are provided in Additional file 2.

Data collection procedure

Data were collected in September 2026 through face-to-face individual interviews held in participants' own offices. Interviews took place at times convenient for participants, with only the interviewer and the participant present. With participants' permission, interviews were audio-recorded and transcribed verbatim by the researchers. Interviews lasted between 10 and 20 minutes.We collected data from 17 participants: in written form from 6 of them, and in the form of audio recordings from the other 11.Interviews were conducted in Turkish; the quotations presented in this article were translated into English by the authors.

Data analysis

Data were analysed in MAXQDA 26.4 following Braun and Clarke's thematic analysis approach [26, 27]. The analysis comprised six phases: (1) familiarisation with the data through repeated reading, (2) generating initial codes, (3) collating codes into potential themes, (4) reviewing themes against the entire data set, (5) defining and naming themes, and (6) producing the report. Coding was conducted inductively based on participants' statements; statements containing more than one meaning were assigned to more than one code. The analysis yielded 405 coded segments under 9 themes and 47 codes.

To support interpretation, coded segments were descriptively quantitized [28]. Coded segments exported from MAXQDA were processed in Python (pandas, matplotlib) to calculate, for each code, the number of coded segments (f) and the number of participants expressing the code (n); co-occurrence values were determined from codes assigned to the same statement of the same participant, and the saturation analysis described above was performed. To compare participants' overall orientations, codes were classified by the researchers, according to their content, into four attitude categories: opportunity and benefit; concern, risk and inadequacy; condition and boundary (human oversight); and contextual/descriptive. These indicators were not intended for statistical inference and were used only to show the extent to which findings were shared among participants [29].

Rigour and trustworthiness

Trustworthiness was ensured using Lincoln and Guba's criteria [30]. For credibility, coding was performed independently by two researchers, disagreements were resolved by consensus, and findings were shared with some participants for confirmation. For transferability, the study context and process were described in detail and findings were supported with direct quotations. For dependability and confirmability, an audit trail was created by recording analytical decisions in the MAXQDA project file, and the coded segments and the Python script used to generate the quantitative indicators were retained to ensure reproducibility of the analyses [31]. The match between each quotation and its corresponding code was verified against the coded segment records.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki [32]. Ethical approval was obtained from the Iğdır University Non-Interventional Clinical Research Ethics Committee (decision no. 27/11, dated 06.05.2026). Participants were informed about the purpose of the study and the use of audio recording; their informed consent was obtained [recorded both in writing and verbally]. Participation was voluntary, participants could withdraw from the study at any time, identities were kept confidential, and each participant was assigned a code (P01–P17).

Results

A total of 17 academics participated; 58.82% were female and 41.18% male (Table 1). The mean age was 37.41 ± 4.20 years (range 29–45), mean years in academia was 7.35 ± 3.69 (range 2–15) and mean clinical experience was 6.82 ± 2.63 years (range 2–13). Regarding academic title, 64.71% were lecturers or research assistants, 29.41% assistant professors and 5.88% associate professors. The most represented specialties were medical nursing (17.65%) and surgical nursing (17.65%), followed by nursing management, paediatric nursing, obstetrics and women's health nursing, and psychiatric and mental health nursing (11.76% each). Overall, 41.18% of participants had previously received AI training, whereas 58.82% had not.

Table 1
Descriptive characteristics of participants (N = 17)

Characteristic	Category	n	%
Gender	Female	10	58.82
	Male	7	41.18
Age (years)	Mean ± SD (min–max)	37.41 ± 4.20 (29–45)	
Academic title	Professor	0	0.00
	Associate professor	1	5.88
	Assistant professor	5	29.41
	Lecturer / research assistant	11	64.71
Years in academia	Mean ± SD (min–max)	7.35 ± 3.69 (2–15)	
Clinical experience (years)	Mean ± SD (min–max)	6.82 ± 2.63 (2–13)	
Area of specialisation	Medical nursing	3	17.65
	Surgical nursing	3	17.65
	Nursing management	2	11.76
	Paediatric nursing	2	11.76
	Obstetrics and women's health nursing	2	11.76
	Psychiatric and mental health nursing	2	11.76
	Public health nursing	1	5.88
	Fundamentals of nursing	1	5.88
	Physiology	1	5.88
Previous AI training	Yes	7	41.18
	No	10	58.82

AI artificial intelligence, SD standard deviation

The analysis identified 9 themes and 47 codes. Themes, codes, numbers of coded segments (f) and numbers of participants expressing each code (n) are presented in Table 2. The themes with the most coded segments were "Reliability, ethical and security concerns" (f = 57) and "Encountering and making sense of AI" (f = 56); the latter was present in all 17 participants. At the code level, 14 of the 47 codes were expressed by at least half of the participants. The code with the highest participant prevalence was

"Not feeling ready or competent to use AI" (f = 18; n = 14), and the most frequently coded code was "Need to verify AI-generated information against sources" (f = 21; n = 10).

Table 2
Themes, codes and participant prevalence

Theme / code	f	n	%
T1. Encountering and making sense of AI	**56**	**17**	**100.0**
Defining AI as a tool that speeds up work and makes life easier	10	9	52.9
Becoming acquainted with AI through the spread of generative tools such as ChatGPT	5	5	29.4
Positioning AI as an assistant, advisor or supportive tool	15	10	58.8
Approaching AI with anxiety, fear or opposition	6	3	17.6
Becoming acquainted with AI through social media and peers	4	4	23.5
Viewing digital technologies and AI as an inevitable reality of the era	11	8	47.1
Becoming acquainted with AI during academic work and doctoral studies	5	5	29.4
T2. AI experiences in clinical practice	**28**	**15**	**88.2**
No experience of AI in clinical nursing practice	10	10	58.8
Using AI support for nursing diagnoses and care planning	8	7	41.2
AI providing speed and alternative perspectives in clinical decision-making	4	4	23.5
Double-checking drug dose calculations with AI	3	2	11.8
AI-assisted and digital monitoring devices facilitating care	3	2	11.8
T3. Reliability, ethical and security concerns	**57**	**13**	**76.5**
AI providing incorrect, incomplete or fabricated information	12	9	52.9
Need to verify AI-generated information against sources	21	10	58.8
Considering AI use unethical	2	1	5.9
AI blunting thinking, memorisation, research and originality skills	9	6	35.3
Data security concerns about sharing patient and personal data	7	3	17.6
Concern that AI may be misused by malicious actors and threaten humanity	4	2	11.8
Information-overloaded outputs causing a sense of exhaustion	2	1	5.9
T4. Use of AI in academic work	**47**	**15**	**88.2**

f number of coded segments, n number of participants expressing the theme or code, % proportion of N = 17 participants. Because a statement could be assigned to more than one code, the sum of code f values equals the theme total, but n values cannot be summed.

Theme / code	f	n	%
T1. Encountering and making sense of AI	**56**	**17**	**100.0**
AI facilitating, accelerating and saving time in academic work	13	12	70.6
Using AI for literature searching, accessing sources and data processing	17	13	76.5
Using AI for language editing, translation and sentence correction in academic texts	17	9	52.9
T5. Use of AI in nursing management	**32**	**13**	**76.5**
No direct experience of AI in nursing management	5	5	29.4
Using AI to prepare duty rosters and work schedules	10	9	52.9
Reducing administrative burden in paperwork, petitions, quality and documentation	5	4	23.5
AI-generated rosters increasing fairness and reducing conflicts among nurses	3	2	11.8
Rapidly planning student rotation lists with AI	3	3	17.6
Using AI to plan in-service training and prepare content	6	4	23.5
T6. Readiness and competence in AI use	**51**	**16**	**94.1**
Not feeling ready or competent to use AI	18	14	82.4
Feeling more ready through experience gained with use	6	5	29.4
Struggling to keep up with rapidly updated tools	4	3	17.6
Importance of writing effective prompts	12	7	41.2
Using AI based on hearsay without formal training	4	3	17.6
Developing AI competence through courses, classes and self-study	7	2	11.8
T7. AI in nursing education	**35**	**13**	**76.5**
Using AI to prepare lecture presentations, exam questions and teaching materials	15	10	58.8
Warning and guiding students on AI use	6	5	29.4
Students having AI complete their care plans and assignments	6	5	29.4
Students using AI to understand topics, research and translate	4	4	23.5

f number of coded segments, n number of participants expressing the theme or code, % proportion of N = 17 participants. Because a statement could be assigned to more than one code, the sum of code f values equals the theme total, but n values cannot be summed.

Theme / code	f	n	%
T1. Encountering and making sense of AI	**56**	**17**	**100.0**
Safe learning environment through AI-assisted simulation and case scenarios	4	3	17.6
T8. Expectations and recommendations for the future of the profession	**51**	**15**	**88.2**
Expectation that AI will reduce nurses' workload and routine administrative tasks	9	7	41.2
Recommendation to provide AI training to academics and nurses	13	8	47.1
Expectation of improved patient safety and quality of care through decision support systems	10	8	47.1
Need for controlled, balanced and appropriate use of AI	17	9	52.9
Insufficient AI knowledge among nurses in practice	2	2	11.8
T9. The human essence of nursing and the limits of AI	**48**	**15**	**88.2**
Belief that AI cannot replace the nurse	13	10	58.8
Final decision remaining with the nurse, with AI as a decision-support tool	18	8	47.1
Care being grounded in compassion, touch, communication and a holistic approach	17	11	64.7
Total	**405**	**17**	**100.0**

f number of coded segments, n number of participants expressing the theme or code, % proportion of N = 17 participants. Because a statement could be assigned to more than one code, the sum of code f values equals the theme total, but n values cannot be summed.

Theme 1: Encountering and making sense of AI

In this theme, present in all participants' accounts, AI was defined not as an agent that takes over work but as an assistant that needs to be directed. The most frequently coded code was "Positioning AI as an assistant, advisor or supportive tool" (f = 15; n = 10); participants described AI as an assistant, an advisor or a "mental work partner":

"For me, it actually became an assistant, a mental work partner. I can say I came across it during this tough process in academia, especially while struggling to make sense of that enormous pile of data in the literature." (P13)

Participants also tended to view "digital technologies and AI as an inevitable reality of the era" (f = 11; n = 8), likening this transformation to the spread of the internet:

"I think, just as the internet once entered our lives and made accessing information easier, that was a great revolution. I can say we are actually living through another great revolution right now." (P10)

Acquaintance with AI mostly occurred through the spread of generative tools such as ChatGPT (f = 5; n = 5), doctoral and academic work (f = 5; n = 5), and social media and peers (f = 4; n = 4). For a small number of participants, the first contact took the form of "Approaching AI with anxiety, fear or opposition" (f = 6; n = 3), an attitude associated with adapting to technology later in life:

"Because these are things we learned later, we weren't born into them. And since we started using them later, I'm afraid of it, and that's why, frankly, I don't use it very actively." (P09)

Theme 2: AI experiences in clinical practice

That the most frequently coded code in this theme was "No experience of AI in clinical nursing practice" (f = 10; n = 10) indicates that clinical AI experience remained limited; many participants stated that AI had not yet been integrated into care processes when they worked in clinical settings:

"Although I previously worked as a clinical nurse in the paediatric intensive care unit of a university hospital, I did not personally experience a practice in which AI was integrated into patient care processes." (P17)

Existing clinical experiences were largely based on observations of students and colleagues and clustered under the codes "Using AI support for nursing diagnoses and care planning" (f = 8; n = 7), "AI providing speed and alternative perspectives in clinical decision-making" (f = 4; n = 4), "Double-checking drug dose calculations with AI" (f = 3; n = 2) and "AI-assisted and digital monitoring devices facilitating care" (f = 3; n = 2). A dose-calculation example described by one participant illustrates the contribution of verification with AI to patient safety:

"One of my students was doing a drug dose calculation. But she wanted to double-check it, and when she asked AI, she unfortunately saw that her calculation was wrong. Of course, these are near misses, so in terms of patient safety it turned out to be a life-saving situation." (P10)

Theme 3: Reliability, ethical and security concerns

This theme, which contained the most coded segments, was shaped around concerns about the reliability of AI-generated information. Participants raised the risk of "AI providing incorrect, incomplete or fabricated information" (f = 12; n = 9) and, as the main safeguard against it, emphasised the most frequently coded code in the study, "Need to verify AI-generated information against sources" (f = 21; n = 10):

"However, I don't accept the information it provides as correct straight away. (...) Because I have experienced that AI can produce persuasive but incorrect information." (P14)

Co-occurrence analysis showed that the relationship between these two codes was among the strongest in the study (7 shared segments, 7 participants); participants mostly justified the risk of incorrect

information with the need for verification within the same statement. The theme also included concerns that AI blunts thinking, memorisation, research and originality skills (f = 9; n = 6), data security concerns about sharing patient and personal data (f = 7; n = 3) and concerns about misuse by malicious actors (f = 4; n = 2). One participant stated that they considered the use of AI unethical in principle (f = 2; n = 1):

"I see some colleagues using it, but in the end it is something that kills our research instinct. That's why I don't find it very right, but colleagues use it." (P02)

These concerns were not homogeneous across participants: the theme did not appear at all in the accounts of four participants (P06, P08, P12, P13), whereas 13 of P02's coded segments fell within this theme.

Theme 4: Use of AI in academic work

Academic work was the area in which AI had entered professional life most intensively; all three codes in this theme were expressed by more than half of the participants: "Using AI for literature searching, accessing sources and data processing" (f = 17; n = 13), "AI facilitating, accelerating and saving time in academic work" (f = 13; n = 12) and "Using AI for language editing, translation and sentence correction in academic texts" (f = 17; n = 9).

"For example, when writing an article, I can use it to generate title alternatives, to make a paragraph clearer, to check the language of an English text, or to see where I could start researching a topic." (P14)

The literature searching and language editing codes were frequently coded together (7 shared segments) and formed a triad with the time-saving code, indicating that these uses are parts of an integrated academic workflow. Participants described time saving as delegating routine tasks so that more time could be devoted to intellectual work:

"It especially makes paperwork, file work, preparing or revising presentations, documentary tasks that take a long time easier (...) these chores, these data-sorting tasks that take hours, it pulls together in seconds..." (P13)

Theme 5: Use of AI in nursing management

In nursing management, AI stood out mainly in tasks requiring multivariable planning: "Using AI to prepare duty rosters and work schedules" (f = 10; n = 9), "Using AI to plan in-service training and prepare content" (f = 6; n = 4), "Reducing administrative burden in paperwork, petitions, quality and documentation" (f = 5; n = 4) and "Rapidly planning student rotation lists with AI" (f = 3; n = 3).

"As someone who has prepared duty rosters myself, I know that I literally didn't get up from the roster for a whole day, so I know it's a hard job, but from the feedback we now get from the field, I can see that AI is used very easily for these tasks." (P05)

A notable finding concerned experiences that AI-generated rosters strengthened perceived fairness among nurses (f = 3; n = 2):

"When we talked about it, the nurses there said they felt more at ease in terms of fairness. So, in a way, the problem was solved at its root." (P10)

However, five participants fell under the code "No direct experience of AI in nursing management" (f = 5; n = 5) and based their views in this area on observation and anticipation.

Theme 6: Readiness and competence in AI use

Although almost all participants used AI, the code with the highest participant prevalence in the study, "Not feeling ready or competent to use AI" (f = 18; n = 14), stood out in this theme. Participants mostly attributed this perception to the lack of systematic training:

"I definitely still don't feel ready or competent to use AI applications. Because I haven't taken any course or training on this subject, on AI applications." (P12)

In the code map, this code was linked with "Struggling to keep up with rapidly updated tools" (f = 4; n = 3) and "Using AI based on hearsay without formal training" (f = 4; n = 3), indicating that perceived inadequacy was explained by the rapid change of tools and informal learning. Participants also emphasised the "Importance of writing effective prompts" (f = 12; n = 7); those who had developed their competence through courses, classes and self-study (f = 7; n = 2) and those who gained experience through use (f = 6; n = 5) felt more ready:

"When I cannot formulate the question I put to AI clearly and correctly enough, the answer I get does not always meet my expectations. Therefore, I think it is important not only to use the application but also to know how to instruct it." (P17)

Theme 7: AI in nursing education

AI in nursing education was evaluated as both an opportunity and a risk. From the educator's perspective, the most frequently mentioned use was "Using AI to prepare lecture presentations, exam questions and teaching materials" (f = 15; n = 10):

"I consulted an AI about this topic for a short while, and it prepared a very nice, very clear (...) very effective presentation, with instructions of course. Then I realised that this presentation was much more effective than my old presentations." (P06)

While students using AI to understand topics, research and translate (f = 4; n = 4) and AI-assisted simulation and case scenarios offering a safe learning environment (f = 4; n = 3) were seen as opportunities, "Students having AI complete their care plans and assignments" (f = 6; n = 5) was defined as a major risk to the development of clinical reasoning:

"However, leaving a student's work entirely to AI can be a problem for education. Because in nursing it is not just about accessing information; clinical thinking, decision-making and problem-solving skills need to develop." (P14)

Participants' response to this risk was "Warning and guiding students on AI use" (f = 6; n = 5); this guidance focused on teaching correct and ethical use rather than restriction. The strong co-occurrence between Theme 3 and Theme 7 (6 shared segments) shows that reliability concerns were expressed particularly in the context of students' AI use.

Theme 8: Expectations and recommendations for the future of the profession

Participants' expectations for the future were generally positive but conditional. The most frequently coded code was "Need for controlled, balanced and appropriate use of AI" (f = 17; n = 9):

"I think it is not right for nurse academics either to stay completely away from AI or to accept every piece of information it gives without question. A more balanced approach is needed." (P14)

The main expectations were "Expectation of improved patient safety and quality of care through decision support systems" (f = 10; n = 8) and "Expectation that AI will reduce nurses' workload and routine administrative tasks" (f = 9; n = 7). Participants also put forward the "Recommendation to provide AI training to academics and nurses" (f = 13; n = 8), justifying it with the observation that nurses in practice have insufficient AI knowledge (f = 2; n = 2). The strong co-occurrence between Theme 6 and Theme 8 (6 shared segments) shows that participants derived their training recommendations directly from their own perceived inadequacy:

"Yes, right now there is a serious lack of knowledge about how the AI that everyone has in their hands is actually used (...) orientation training could be provided both for academics and for those who use AI." (P01)

Theme 9: The human essence of nursing and the limits of AI

In this theme, the densest theme with a mean of 16.0 coded segments per code, participants clearly drew the boundary of AI in nursing. The most frequently coded code was "Final decision remaining with the nurse, with AI as a decision-support tool" (f = 18; n = 8):

"But here I think the final decision must definitely rest with the nurse manager. Because some things in the work environment, such as staff characteristics, leave, level of experience, are not just data." (P14)

Participants justified this boundary with "Care being grounded in compassion, touch, communication and a holistic approach" (f = 17; n = 11) and expressed the "Belief that AI cannot replace the nurse" (f = 13; n = 10):

"Unfortunately, AI still cannot provide that communication part. At this point, I think we still very much need humans, human experiences and human emotions." (P07)

The relationship between these two codes was among the strongest co-occurrences in the study (7 shared segments, 7 participants); participants based their belief in the irreplaceability of the nurse directly on the compassionate, communicative and holistic nature of care.

Relationships between codes and participants' attitude patterns

Figure 1 shows the relationships between codes coded together within the same statement; line thickness reflects co-occurrence frequency. Four clusters emerged: (1) a competence cluster comprising perceived inadequacy, rapid change of tools, informal learning and the training recommendation; (2) an academic use cluster comprising literature searching, language editing and time saving; (3) a reliability cluster comprising incorrect information and the need for verification; and (4) a professional boundary chain extending from defining AI as a facilitating tool and assistant to the final decision remaining with the nurse, the human essence of care and the belief in irreplaceability. This chain summarises how participants, while adopting AI, bounded it by human oversight and the human essence of care.

Of the coded segments, 40.7% were opportunity and benefit, 22.7% condition and boundary, 18.8% concern, risk and inadequacy, and 17.8% contextual codes (Fig. 2). Opportunity and benefit codes predominated in most participants (e.g. 61% for P08, 58% for P01 and 57% for P10). In contrast, 70% of P02's coded segments fell in the concern category, making this participant the only one with a principled critical stance towards AI. The concurrently high opportunity (47%) and concern (41%) codes of P07 indicated an ambivalent attitude, whereas the high proportion of condition and boundary codes in P09, P03, P15 and P14 (32–41%) indicated an attitude of adopting AI within a framework of verification and the nurse's decision-making responsibility. Overall, nurse academics did not display a uniform approach; most showed opportunity-oriented but conditional adoption.

Discussion

Nurse academics positioned AI as a supportive but bounded assistant; AI was used intensively in academic work, emergingly in education and management, and to a limited extent in clinical practice.

An assistant under human oversight

Participants consistently positioned AI as an assistant and linked this to the principle that the final decision remains with the nurse. Nurse managers and students also view AI as a tool that supports, rather than replaces, professional judgement and the human connection [8, 14, 15]. The professional boundary chain shows that acceptance and limitation are parts of the same reasoning: participants adopted AI because they believed its role could be bounded. This is consistent with international calls for nurses to shape AI and for human oversight to be preserved in AI-assisted care [2, 4, 33]. From the

perspective of the technology acceptance model, perceived usefulness (time saving) and ease of access to the literature drove use [34], whereas acceptance was conditioned by trust and professional values.

Uneven use across domains: the adoption paradox

Academic work was the most intensive area of use, whereas clinical experience remained limited and largely indirect. This pattern reflects the "adoption paradox" in which academics anticipate that AI will transform nursing but their own use is concentrated on productivity and writing [16]. Similarly productivity-focused use of limited depth has been reported among nurse educators in South Korea and Jordan [11, 13]. This gap matters because academics are preparing students for clinical settings in which AI will become increasingly prevalent [3]. Academics without clinical AI experience may find it difficult to teach the critical appraisal of AI-assisted decisions.

AI in nursing management: efficiency, fairness and the limits of data

In management, AI was used mainly in rostering, training planning and documentation; this finding is consistent with reviews showing that AI tools in nursing management primarily support planning and operational efficiency [5, 6]. The perception that AI-generated rosters increase fairness is notable. Duty rosters are a common source of perceived injustice among nurses, and the consistent application of transparent criteria can strengthen procedural justice [35]. Gerlach et al. [7] also found that nurses expected AI to make scheduling fairer and more transparent, provided that the final decision remained with humans. Participants' statement that staff characteristics, leave and experience level "are not just data" (P14) points to the same boundary. However, this finding is based on a small number of participants and partly on observation; barriers such as infrastructure deficiencies, data security and organisational resistance [9] suggest that the realisation of these benefits depends on organisational readiness.

Reliability, verification and the risk of deskilling

Reliability concerns formed the most extensive theme, and verification was the most frequently coded strategy. The tendency of generative AI to produce plausible but fabricated content, including non-existent references, is well documented [36, 37]. Participants' habit of verifying outputs against sources is therefore a protective practice, and the dose-calculation example shows that AI itself can serve as a verification tool that prevents near misses. However, verification depends on the user's own knowledge; when users over-trust automated outputs, automation bias and complacency may occur [38]. Concerns that AI may blunt thinking and originality and that students may delegate their care plans to AI overlap with educators' concerns about dependence and academic integrity [10, 12]. These findings indicate that AI literacy should encompass not only tool use but also the critical appraisal of outputs. The uneven distribution of concerns among participants suggests that institutions should expect differentiated attitudes rather than uniform resistance or enthusiasm.

Perceived inadequacy despite widespread use

Although almost all participants used AI, 14 of the 17 did not feel ready or competent. This coexistence of use without perceived competence reflects, as seen in the competence cluster, learning through informal channels and the rapid change of tools. Similar knowledge gaps and weak institutional policies have been identified as the main barriers to AI adoption among nursing academics [11, 16]. AI literacy is defined as a set of competencies that enables individuals to critically evaluate AI, communicate and collaborate with it and use it effectively [39]; participants' emphasis on prompt writing and verification corresponds to these competencies. That participants derived their training recommendations directly from their own perceived inadequacy indicates that they are ready for the structured professional development that the WHO [1] and the ICN [2] regard as a priority for the nursing workforce.

Implications for practice and nursing management

- Nursing schools and healthcare organisations should provide structured and continuous AI literacy training for academics, nurse managers and clinical nurses, covering effective prompt writing, critical appraisal and verification of outputs, data protection and ethical use.
- Nurse managers should develop institutional guidelines that define acceptable areas of AI use, require verification of AI-generated information against reliable sources and prohibit entering identifiable patient or staff data into unapproved tools.
- AI-assisted rostering should be piloted with transparent, jointly defined criteria and evaluated for fairness, with the final decision remaining with the nurse manager.
- AI can be used to reduce the administrative burden of in-service training planning and documentation, freeing time for clinical leadership and direct care.
- Nursing curricula should integrate AI literacy and clinical reasoning so that students learn to use AI as a tool that supports rather than replaces care, and clear policies should be established on the use of AI in assignments and care plans.
- To preserve professional values such as compassion, communication and holistic care, academics and nurse managers should be involved in the selection, implementation and evaluation of AI tools.

Strengths and limitations

The strengths of the study include the joint examination of academic, educational, clinical and managerial domains; a transparent code saturation assessment tested with 500 random orderings; independent coding by two researchers; descriptive quantitizing showing the extent to which findings were shared among participants; and reporting based on COREQ.

The study also has limitations. Because the sample consisted of 17 nurse academics in Türkiye, the transferability of findings to other countries and academic cultures is limited. Because at least basic AI experience was required, academics who had never used AI or who strongly opposed it may have been excluded. Some participants answering the questions in writing or by voice recording rather than in a live interview may have limited in-depth probing. Clinical and managerial views were partly based on

observation rather than direct experience. Finally, coding frequencies and attitude categories reflect the visibility of codes in the data rather than their importance and do not permit statistical inference.

Conclusions

Nurse academics adopted AI as a supportive assistant under human oversight. AI is used intensively in academic work, emergingly in education and management, and to a limited extent in clinical practice. AI-assisted rostering was perceived to increase fairness; however, participants insisted that the final decision must remain with the nurse and that care must be grounded in compassion, touch and communication. Concerns about the reliability of information and widespread perceived inadequacy despite frequent use are the main barriers to adoption. Structured AI literacy training, institutional guidelines on verification and data protection, and transparent, human-led implementation in nursing management are recommended. Future research should include academics who use AI to a limited extent or not at all, compare different countries and academic cultures, and examine the effects of AI-assisted rostering and training interventions on fairness, workload and competence.

Abbreviations

AI
Artificial intelligence
COREQ
Consolidated Criteria for Reporting Qualitative Research
ICN
International Council of Nurses
WHO
World Health Organization

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from Ethical approval was obtained from the Iğdır University Non-Interventional Clinical Research Ethics Committee .decision no. 27/11, dated 06.05.2026)./ recorded and verbal informed consent to participate was obtained from all participants.

Consent for publication

Not applicable.

Availability of data and materials

To protect participants' confidentiality, interview transcripts are not publicly available. Anonymised data and the analysis script are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

EB: conceptualization, methodology, investigation, data curation, formal analysis, writing – original draft. FK: supervision, validation, writing – review and editing, project administration. All authors read and approved the final manuscript.

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Clinical trial number

Not applicable.

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Figures

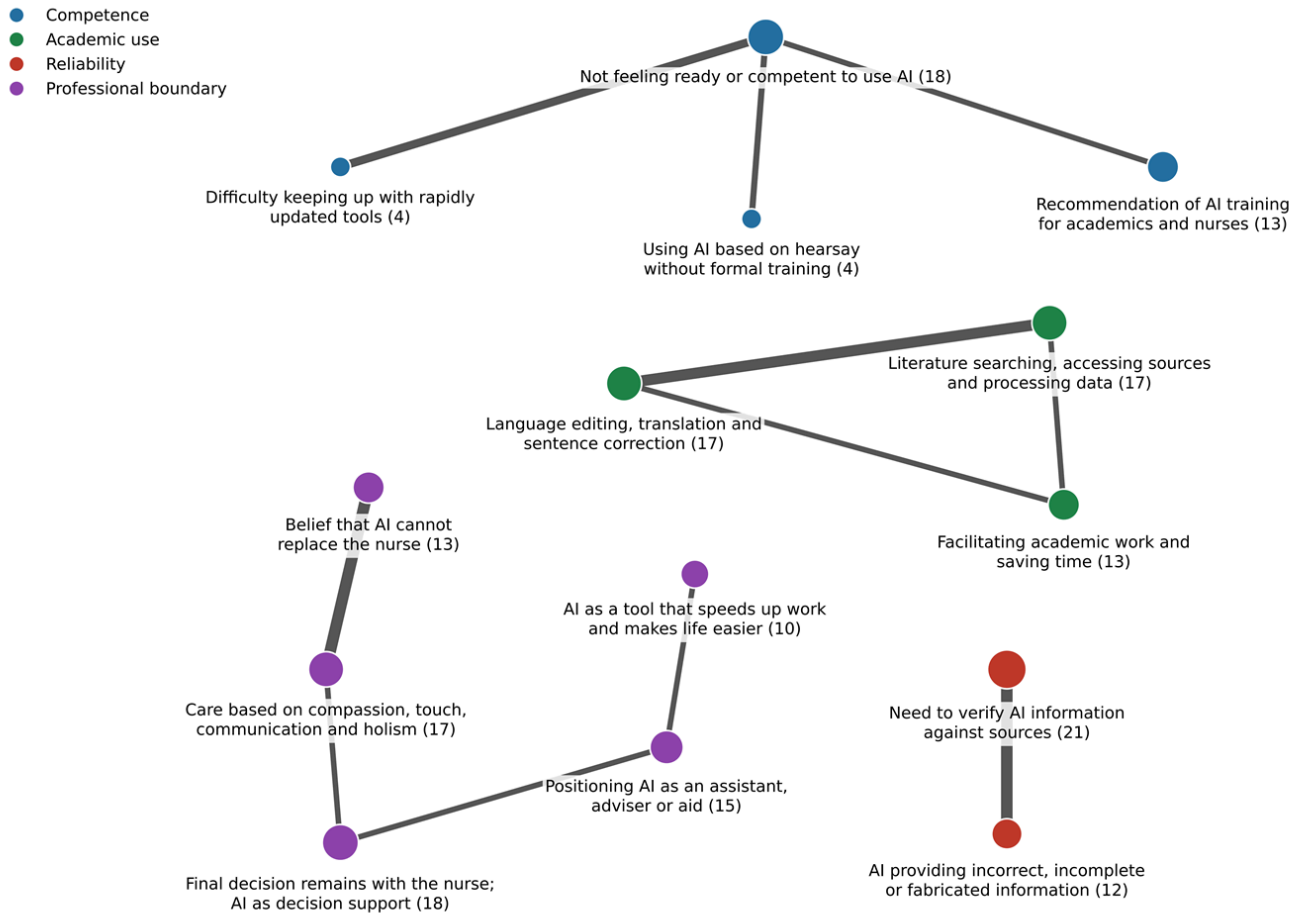


Figure 1

Code map showing relationships between codes

Node size indicates code frequency (f, in parentheses); line thickness indicates the frequency with which codes were coded together within the same statement.

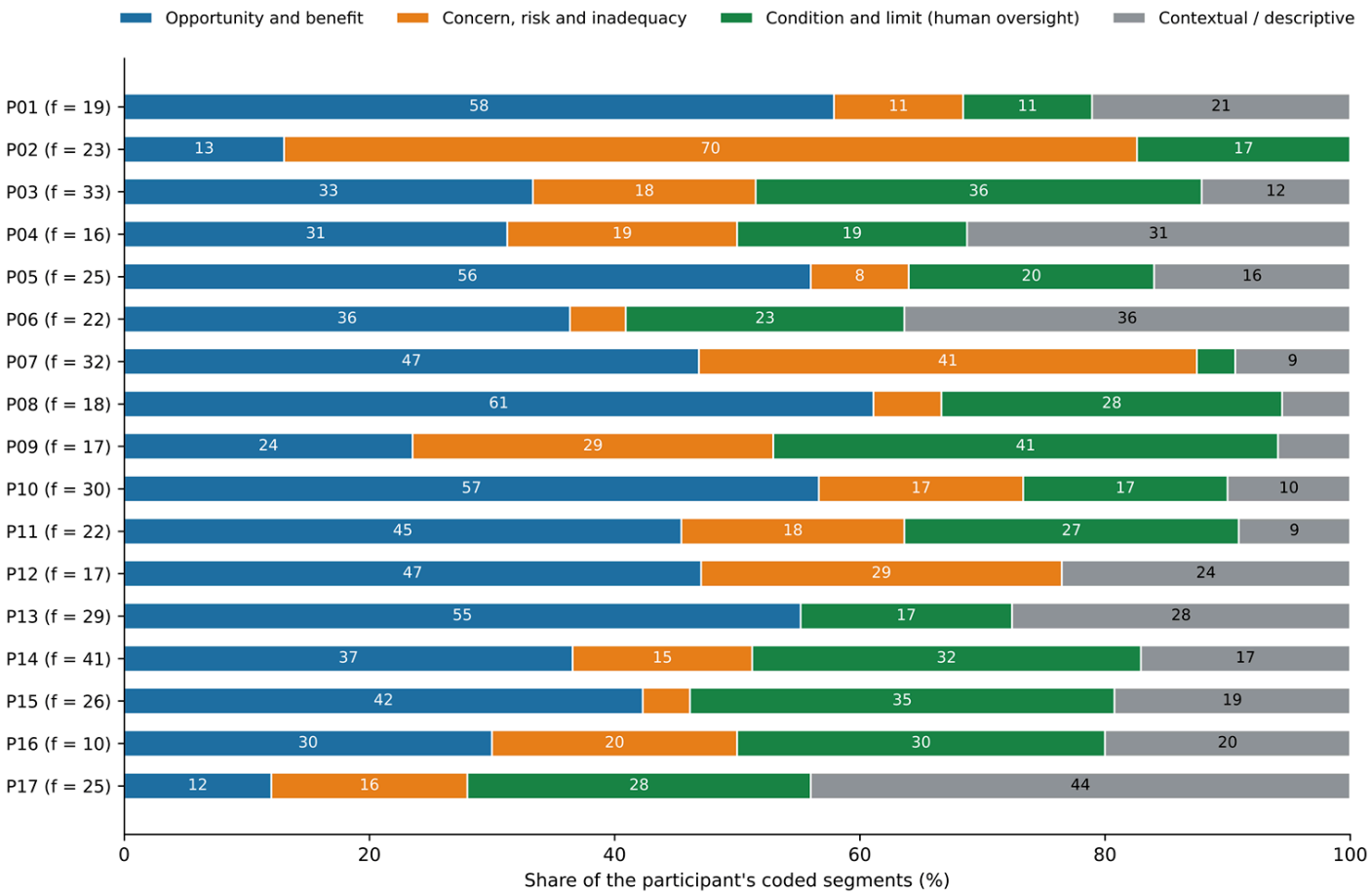


Figure 2

Distribution of participants' coded segments by attitude category (%)

Each bar shows the share of a participant's coded segments falling into the four attitude categories; f = total number of coded segments for the participant. Values below 9% are not labelled.