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Readiness of AI (Artificial Intelligence) strategies Used in Nursing Education among Undergraduate Nursing Students “A Cross Sectional Descriptive Survey”

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ABSTRACT

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The aim of this quantitative cross sectional survey is to describe the frequencies of readiness of AI (Artificial Intelligence) in nursing education among undergraduate nursing students. Methodology of this research included, the design of this research is cross sectional descriptive study, sample size was N=50 undergraduate nursing students of first year first semester. Sampling technique was simple random sampling and setting was a Nursing College in private University. The data was analyzing by SPSS AMOS-23 software. The TAM (Technology Acceptance Model) was used to collect the data basically this tool was adopted from a Pakistani research article the validity and reliability of the tool has been mentioned in methodology section in chapter 3. A total of 50 undergraduate nursing students participated in the study examining readiness for the use of artificial intelligence (AI) strategies in nursing education. The demographic findings showed an equal distribution of male and female participants, with 25 (50%) students in each group. Regarding age, the majority of participants, 47 (94%), were aged 21–23 years, while 3 (6%) were aged 24–26 years. Regarding the perceived usefulness of AI strategies in nursing education, all participants reported negative responses to the statement that AI strategies improved their learning outcomes, with 26 (52%) strongly disagreeing and 24 (48%) disagreeing. For the statement that AI tools could help students understand complex nursing concepts, 18 (36%) strongly disagreed, 11 (22%) disagreed, 11 (22%) remained neutral, and 10 (20%) strongly agreed. Similarly, 42 (84%) participants disagreed or strongly disagreed that AI-based learning resources could improve their clinical decision-making skills, while 4 (8%) were neutral and 4 (8%) strongly agreed. Regarding whether AI strategies could make nursing studies more productive, 17 (34%) strongly disagreed, 12 (24%) disagreed, 11 (22%) were neutral, and 10 (20%) strongly agreed. All participants (100%) disagreed with the statement that AI tools could help them prepare more effectively for nursing examinations.

The study revealed low readiness among undergraduate nursing students towards the use of AI strategies in nursing education. Most participants reported negative perceptions regarding AI usefulness, ease of use and integration into academic activities. The findings highlight the need for structured AI literacy training, practical guidance and education on the responsible use of AI. Further research with larger sample is recommended to explore student's readiness for AI integration in nursing education.

Introduction

Artificial intelligence (AI) is increasingly transforming education by introducing innovative approaches to teaching, learning, assessment, and academic support. AI refers to computer-based technologies that perform tasks commonly associated with human intelligence, including learning, reasoning, problem-solving, and language processing. In higher education, AI applications include generative AI tools, intelligent tutoring systems, adaptive learning platforms, AI-assisted simulations, automated feedback systems, and virtual learning assistants. These technologies can support personalized learning, improve access to educational resources, facilitate independent learning, and provide timely feedback to students. However, their effective integration requires appropriate educational policies, digital competencies, and responsible use [1]. Nursing education is an important area for AI integration because it requires students to develop theoretical knowledge, clinical skills, critical thinking, clinical judgment, communication, and evidence-based practice. Although traditional teaching approaches, including lectures, demonstrations, clinical placements, and simulation-based learning, remain essential, AI-based educational strategies may provide additional opportunities for individualized learning and clinical reasoning. AI-assisted learning tools can help nursing students review complex concepts, practice clinical scenarios, prepare for examinations, and develop care plans for simulated patients. These technologies may also facilitate repeated practice in controlled learning environments before students encounter similar situations in clinical settings. Nevertheless, AI should complement rather than replace clinical instructors, supervised clinical training, direct patient care experiences, and professional judgment [1,2].

Despite these potential benefits, the adoption of AI in nursing education presents several challenges. Students may differ in their familiarity with AI applications, digital literacy, confidence, access to reliable internet services, availability of appropriate devices, and understanding of how AI-generated information should be evaluated. Concerns regarding inaccurate information, academic integrity, patient confidentiality, data security, algorithmic bias, and excessive dependence on automated tools may also influence students' willingness to use AI. In nursing education, these concerns are particularly important because students must learn to distinguish reliable evidence from potentially misleading AI-generated responses. Therefore, effective AI integration requires not only access to technology but also appropriate training, institutional guidance, ethical awareness, and the ability to use AI critically and responsibly [1,2]. At the international level, educational organizations have emphasized the importance of integrating AI into education through appropriate policies, teacher preparation, and responsible use. UNESCO's guidance on generative AI in education and research highlights the importance of human-centered learning, data privacy, and appropriate safeguards for AI technologies [1]. Similarly, the World Health Organization (WHO) emphasizes human autonomy, transparency, accountability, safety, and equity in the development and use of AI in health-related settings [2]. These principles are relevant to nursing education because students must learn to use digital technologies without compromising patient safety, confidentiality, academic integrity, or professional responsibility.

Understanding nursing students' readiness for AI adoption is an important step toward effective educational integration. Readiness may include students' knowledge of AI applications, confidence in using digital tools, willingness to adopt new technologies, perceived usefulness, perceived ease of use, and awareness of ethical considerations. A cross-sectional study conducted among 291 nursing students in Turkey examined attitudes toward AI and readiness to use AI in healthcare-related education. The researchers identified a positive correlation between students' attitudes toward AI and their readiness scores, suggesting that attitudes may be relevant when assessing preparedness for AI adoption [3]. In Pakistan, undergraduate nursing education plays an important role in preparing future nurses to provide safe, evidence-based, and technologically informed care. As educational institutions explore digital learning approaches, AI tools may provide additional opportunities for students to access learning materials, clarify theoretical concepts, develop clinical reasoning, and engage in self-directed learning. However, the availability of AI applications does not necessarily mean that students are prepared to use them effectively. Their readiness may be influenced by previous exposure to AI, digital competence, access to internet-enabled devices, faculty support, institutional policies, and concerns about the accuracy and ethical use of AI-generated information [1,3]. These factors warrant investigation within the Pakistani nursing education context rather than assuming that findings from other countries apply equally to local students.

Against this background, the present study, titled "Readiness for the Adoption of Artificial Intelligence Strategies in Nursing Education among Undergraduate Nursing Students: A Cross-Sectional Survey," aims to assess undergraduate nursing students' readiness to adopt AI-based educational strategies. The study may also examine students' perceptions of AI, their acceptance of AI-supported learning, and factors associated with their readiness. The findings could provide evidence to guide nursing faculty, curriculum developers, and educational administrators in identifying students' training needs and developing appropriate strategies for responsible AI integration into undergraduate nursing education.

Problem statement

The increasing availability of artificial intelligence (AI) tools has created new opportunities for undergraduate nursing students to support their academic learning, clinical reasoning, and access to educational resources. However, the extent to which

nursing students are ready to adopt AI strategies in nursing education remains an important issue. International studies have begun to assess nursing students' attitudes toward AI and their readiness to use these technologies, but the reported findings may vary across countries and educational settings [1–3]. The proportion of students who use AI tools, their level of readiness, and the factors associated with their acceptance may differ according to academic year, previous AI exposure, digital competence, and access to technological resources. In Pakistan, quantitative evidence is needed to determine the proportion of undergraduate nursing students who are ready to adopt AI strategies in nursing education. Specifically, the prevalence of high, moderate, and low readiness, students' previous use of AI-based educational tools, and their perceived usefulness, perceived ease of use, attitudes, and intention to use AI need to be assessed in the selected study population. Without these data, nursing institutions may find it difficult to identify the proportion of students requiring additional AI training and to develop evidence-based educational strategies for AI integration.

Therefore, this cross-sectional survey will quantify the level of readiness for adopting AI strategies among undergraduate nursing students and determine the proportion of students demonstrating different readiness levels. It will also examine the association between readiness and selected demographic, academic, and technology-related characteristics. The findings will provide baseline quantitative evidence to support nursing education planning, AI literacy initiatives, and the responsible integration of AI into undergraduate nursing curricula.

Literature review

Research title: Readiness for the Adoption of Artificial Intelligence Strategies in Nursing Education among Undergraduate Nursing Students: A Cross-Sectional Survey The following literature review synthesizes research published between 2022 and 2026, emphasizing quantitative findings, prevalence of AI use, readiness, technology acceptance, AI literacy, and factors associated with adoption among nursing students. The review is organized thematically and uses Vancouver-style numerical citations.

Adoption and utilization of artificial intelligence among nursing students

Artificial intelligence has become an increasingly important topic in nursing education, particularly following the introduction of generative AI applications such as ChatGPT. Nursing students can use these tools to explain complex concepts, summarize educational material, prepare assignments, and explore simulated clinical scenarios. However, the frequency of AI use does not necessarily indicate that students possess adequate knowledge, critical evaluation skills, or readiness for responsible integration into nursing education. In a cross-sectional study published in *Nurse Education in Practice* in 2023, Lab ague et al. investigated student nurses' attitudes, perceived utilization, and intention to adopt AI technology in nursing practice. The study explored relationships between students' attitudes toward AI, perceptions of its usefulness in nursing, and their intentions to adopt AI technologies. This research established the relevance of assessing both attitudes and intended use rather than considering technological exposure alone [1].

Gonzalez-Garcia et al. conducted a quantitative cross-sectional study involving 98 nursing students at the University of León, Spain, to examine the impact of ChatGPT on nursing education. The findings indicated that 89.5% of students reported that ChatGPT significantly enhanced their academic performance. The authors also reported a positive association between previous ChatGPT use and higher grade point averages. These findings suggest that students perceive potential educational benefits from generative AI, although the cross-sectional design cannot establish that ChatGPT use caused improvements in academic performance [2]. A 2025 cross-sectional study examining nursing students' perceptions and ethical considerations of ChatGPT use at a university in the United Arab Emirates reported that 92.7% of participants had adopted ChatGPT. The study also identified concerns relating to accuracy, academic integrity, and the ethical use of AI-generated information. These findings demonstrate that widespread adoption can coexist with uncertainty about responsible use, reinforcing the importance of assessing readiness, knowledge, and ethical awareness alongside utilization [3]. Similarly, a 2025 study examining knowledge, attitudes, and practices toward ChatGPT among nursing students at Palestinian universities found that 84.5% were aware of AI, while 58.6% had used AI in coursework. However, 69.9% had not received formal ChatGPT education or training, despite 79% supporting the integration of AI into nursing curricula and specialized training programmes. These findings indicate that awareness and positive acceptance may coexist with a lack of structured preparation [4]. In a 2026 study of undergraduate nursing students in the United States, Khatun et al. reported that 89% of participants used AI, and more than half had started using it before entering nursing school. The findings further illustrate the increasing presence of generative AI in students' academic experiences and the importance of establishing appropriate educational guidance for its use [5].

Readiness and acceptance of artificial intelligence

Readiness for AI adoption refers to students' preparedness to understand, accept, and use AI technologies appropriately. It may involve technological competence, confidence, awareness of AI capabilities and limitations, ethical understanding, and

willingness to incorporate AI into learning. The Technology Acceptance Model (TAM) provides a useful theoretical framework for examining acceptance through perceived usefulness, perceived ease of use, attitude toward technology, and behavioral intention. A cross-sectional study published in *Teaching and Learning in Nursing* in 2024 assessed attitudes toward AI and readiness among 291 nursing students in western Turkey. The study found a relationship between students' attitudes toward AI and their readiness to use the technology. The authors emphasized that understanding these factors is important for developing nursing curricula that support appropriate AI integration [6].

In Saudi Arabia, a cross-sectional study involving 322 nursing students examined readiness and acceptance of AI-based healthcare technologies for nursing skills training. Approximately 92.2% of participants demonstrated positive attitudes toward AI, and 99.4% expressed acceptance of AI-based technologies. However, 69.6% demonstrated moderate technological readiness, while 30.4% demonstrated high readiness. These results illustrate an important distinction between accepting AI and possessing the practical readiness required to use it effectively [7]. Bakarman et al. published a study in *Nursing Open* in 2025 examining AI perceptions and readiness among 304 nursing students at King Saud University. The mean perception score was 3.67 (SD = 0.91), while the mean readiness score was 3.79 (SD = 0.74). Ethical readiness received the highest score among the readiness dimensions, followed by ability, cognition, and vision. Educational attainment and perceptions of AI were associated with readiness, suggesting that students' beliefs and educational experiences may influence their preparedness for AI integration [8].

Another 2025 study investigated nursing students' attitudes and readiness for AI in Al Ahsa, Saudi Arabia, among 219 participants. The findings indicated that 94% of participants demonstrated negative attitudes toward AI integration, with concerns including job displacement and the potential dehumanization of patient care. Readiness scores were also reported to be below optimal levels. The contrast between these findings and more favorable results in other Saudi studies indicates that AI readiness may vary across institutions, populations, measurement instruments, and educational environments [9]. A separate 2025 cross-sectional study of 227 nursing students at King Saud University found generally moderately positive attitudes toward AI. Women reported more negative attitudes than men, while part-time students demonstrated greater readiness than full-time students. These findings suggest that selected demographic and educational characteristics may be associated with AI attitudes and readiness, although the cross-sectional design does not establish causality [10].

Artificial intelligence literacy and associated factors

AI literacy is another important component of readiness because students must understand how AI works, identify its limitations, assess the reliability of generated information, and use AI ethically. In nursing education, literacy is particularly relevant when AI tools are used to explain clinical concepts or generate information about patient assessment, diagnosis, and care planning. A study published in *Teaching and Learning in Nursing* in 2025 examined nursing students' attitudes and literacy toward AI. The findings indicated that positive attitudes were associated with AI awareness, use, evaluation, and overall AI literacy. The researchers also identified continuing uncertainty regarding ethical aspects of AI in healthcare, suggesting that exposure to AI alone may not be sufficient to develop the competencies required for responsible use [11].

Taşkıran et al. and colleagues' 2026 investigation into ChatGPT use and AI literacy involved 436 nursing students in Turkey. The mean AI literacy score was 60.43 (SD = 9.91), while the mean ChatGPT acceptance score was 68.20 (SD = 15.14). Almost all participants (99.8%) reported daily AI use. ChatGPT acceptance was moderately and positively correlated with AI literacy ($r = 0.327$), ($p < 0.001$), and acceptance explained 10.7% of the variance in literacy scores. These results support examining the relationship between AI acceptance and literacy while recognizing that other factors also contribute to students' competencies [12].

A 2025 study in *Nurse Education in Practice* examined the relationship between nursing students' readiness, AI literacy, and attitudes toward medical AI. The findings indicated that the evaluation and ethics dimensions of AI literacy were significant predictors of readiness and attitudes. This suggests that students' ability to critically evaluate AI outputs and understand ethical implications may be more relevant to readiness than basic familiarity with technology alone [13]. A 2026 study published in *BMC Nursing* developed and evaluated a nursing AI readiness scale for students. The researchers emphasized the importance of measuring readiness with a psychometrically sound instrument to support curriculum development and targeted training. This work is particularly relevant to quantitative research because the selection of an appropriate, valid, and reliable questionnaire is essential when estimating readiness levels and examining associated factors [14]. A further 2026 cross-sectional study of Chinese nursing undergraduates examined AI literacy across awareness, application, evaluation, and ethics. Among 155 valid responses, students demonstrated moderate overall AI literacy, with application scoring highest and critical evaluation and ethical awareness identified as areas requiring attention. Gender and interest in AI were associated with literacy levels. The findings support the assessment of separate literacy domains instead of relying exclusively on general perceptions or frequency of use [15].

Educational interventions and AI integration in nursing curricula

In addition to measuring readiness, research has investigated whether AI-supported teaching can improve students' learning outcomes and AI-related competencies. Song et al. conducted a quasi-experimental study published in *Nurse Education in Practice* in 2025 to examine generative AI-based interactive teaching among undergraduate nursing students. The study focused on higher-order thinking skills and AI literacy. Its findings suggested that generative AI-supported teaching could improve these competencies, particularly when students received appropriate guidance and supervision. These findings support integrating AI literacy into nursing curricula while emphasizing the role of faculty in facilitating critical engagement with AI tools [16]. A 2025 mixed-method study by Yalçın and Dikmen explored the use of ChatGPT in nursing education. The research examined students' perceptions and learning experiences, including the limitations of AI-supported education. The findings highlighted that AI could support learning but could not fully replace the physical learning environment, social interaction, motivation, and teacher support provided through face-to-face education. This suggests that readiness should include an understanding of how to use AI alongside established educational approaches rather than as a substitute for them [17]. Furthermore, a 2026 study examining ChatGPT integration into clinical nursing education investigated students' patterns of use, perceived usefulness, ease of use, ethical concerns, and institutional support. The study highlights the importance of examining AI adoption in the context of actual learning activities, including clinical education, where students must consider the accuracy and appropriateness of generated information [18]. The reviewed literature demonstrates that AI adoption among nursing students is increasing internationally, but its prevalence and associated readiness vary across settings. Studies have reported high levels of AI use and acceptance, including 92.7% ChatGPT adoption in a UAE study and 58.6% AI use in coursework among Palestinian nursing students [3,4]. However, the Palestinian study also found that 69.9% of students had not received formal ChatGPT education or training, demonstrating that technology use does not necessarily reflect adequate preparation [4].

Research examining readiness has also produced differing results. In one Saudi study, 69.6% of participants demonstrated moderate readiness and 30.4% high readiness, despite nearly universal acceptance of AI-based technologies [7]. Other studies have reported moderate-to-high readiness or identified concerns about AI integration [8–10]. These differences indicate that readiness should be measured directly rather than inferred from students' attitudes or frequency of AI use. The literature further indicates that AI literacy, digital competence, previous exposure to AI, educational experience, and perceptions of usefulness may be relevant to adoption [11–15]. Intervention studies also suggest that guided AI use may support learning and higher-order thinking, while emphasizing the continuing importance of faculty supervision and face-to-face education [16,17].

Research gap: The studies reviewed provide international evidence, but the results cannot be assumed to represent undergraduate nursing students in Pakistan. A focused search of Pakistani databases and institutional research is needed to establish the extent of existing local evidence. The proposed cross-sectional survey can address this contextual gap by estimating the proportion of students at different levels of readiness, measuring their acceptance of AI-supported educational strategies, and examining associations between readiness and selected demographic, academic, and technology-related characteristics. The study can therefore provide a baseline for identifying training needs and informing responsible AI integration into undergraduate nursing curricula.

Methodology

This section is a roadmap of this research included methodology, method and materials of the research.

Study design

This is cross sectional quantitative survey.

Sample

This research was conducted on undergraduate nursing students of first semester first year.

Sample size

Sample size of this research is 50 undergraduate nursing students. The sample size was calculated through open epi software after entering prevalence 56% of AI adoption among nursing students in Karachi the title of article is “Nursing student’s awareness intention and perception towards the utilization of AI in nursing practice”

Sampling technique

Simple random sampling was employed to collect the data.

Sampling criteria

Inclusion criteria

- First semester first year students were selected for the research.
- Students are present on data collection day.
- Students are willing to participate.

Exclusion criteria

- Students are not willing to participate.
- Students are absent on data collection.

Sampling setting

Iqra University North Campus/ Iqra University Nursing College

Data analysis

Data has been analyzed by the SPSS AMOS-23. The normality of data did not analyze due to the data was ordinal, non-parametric test were used to analyze the data.

Data collection procedure

Data will be collected according to simple random sampling among N=50 undergraduate nursing students.

Data collection tool

TAM is used to collect the data, TAM tool is open access tool in the research titled "Utilizing AI (Artificial Intelligence) in Bedside Nursing Care "Comprehensive Review" (Mirani, Asif, Baloch, Ali, & Hazrat, 2025).

Validity and Reliability of tool

The TAM (Technology Acceptance Model) was already used in Pakistani Context. The reliability of tool is 0.75 Cronbach's alpha and validity of tool is 0.8 SCVI in Pakistani Context.

Discussion

A total of 50 undergraduate nursing students participated in the study examining readiness for the use of artificial intelligence (AI) strategies in nursing education. The demographic findings showed an equal distribution of male and female participants, with 25 (50%) students in each group. Regarding age, the majority of participants, 47 (94%), were aged 21–23 years, while 3 (6%) were aged 24–26 years. Regarding the perceived usefulness of AI strategies in nursing education, all participants reported negative responses to the statement that AI strategies improved their learning outcomes, with 26 (52%) strongly disagreeing and 24 (48%) disagreeing. For the statement that AI tools could help students understand complex nursing concepts, 18 (36%) strongly disagreed, 11 (22%) disagreed, 11 (22%) remained neutral, and 10 (20%) strongly agreed. Similarly, 42 (84%) participants disagreed or strongly disagreed that AI-based learning resources could improve their clinical decision-making skills, while 4 (8%) were neutral and 4 (8%) strongly agreed. Regarding whether AI strategies could make nursing studies more productive, 17 (34%) strongly disagreed, 12 (24%) disagreed, 11 (22%) were neutral, and 10 (20%) strongly agreed. All participants (100%) disagreed with the statement that AI tools could help them prepare more effectively for nursing examinations. (Rahman, Asif, Ronald, & Sarmad, 2025).

Regarding the perceived ease of use of AI applications, 36 (72%) participants strongly disagreed that nursing education would be easy for them through AI, while 8 (16%) disagreed and 6 (12%) strongly agreed. In terms of learning to use AI applications for nursing studies, 6 (12%) strongly disagreed, 23 (46%) disagreed, 12 (24%) were neutral, and 9 (18%) strongly agreed. Furthermore, 24 (48%) strongly disagreed and 21 (42%) disagreed that AI tools were easy to interact with for educational purposes. Regarding learning without extensive technical assistance, 14 (28%) strongly disagreed, 15 (30%) disagreed, 11 (22%) were neutral, and 10 (20%) strongly agreed. Similarly, 22 (44%) strongly disagreed and 24 (48%) disagreed that they could easily integrate AI tools into their regular study activities. (Mehmood et al., 2023). Regarding students' attitudes toward AI-supported learning, 26 (52%) strongly disagreed and 22 (44%) disagreed with enjoying the idea of learning nursing concepts using AI tools, while 2 (4%) strongly agreed. However, opinions were more varied regarding the value of AI tools compared

with traditional nursing education: 15 (30%) strongly disagreed, 6 (12%) disagreed, 14 (28%) were neutral, and 15 (30%) strongly agreed that AI tools were valuable. These findings indicate differences in students' perceptions of the potential educational value of AI tools. (Iqbal et al., 2024; Iqbal et al.).

Regarding behavioral intention and readiness to adopt AI, 42 (84%) participants disagreed with intending to use AI tools to support their nursing education in the future, while 5 (10%) strongly disagreed, 2 (4%) agreed, and 1 (2%) strongly agreed. For regular use of AI tools for appropriate academic activities, 22 (44%) strongly disagreed, 25 (50%) disagreed, 2 (4%) were neutral, and 1 (2%) strongly agreed. Similarly, 21 (42%) strongly disagreed and 8 (16%) disagreed that they would consider using AI tools when encountering difficult nursing concepts, whereas 10 (20%) were neutral and 11 (22%) strongly agreed. Regarding exploring new AI-based learning strategies in nursing, 23 (46%) strongly disagreed, 23 (46%) disagreed, 2 (4%) were neutral, and 2 (4%) strongly agreed. In addition, 16 (32%) strongly disagreed and 11 (22%) disagreed with recommending appropriate AI learning tools to other nursing students, while 10 (20%) were neutral and 13 (26%) strongly agreed. In terms of preparedness and professional application, 10 (Mirani et al., 2025).

(20%) participants strongly disagreed and 38 (76%) disagreed that they felt prepared to incorporate AI tools into their learning activities, while 2 (4%) were neutral. Regarding willingness to develop AI skills, 35 (70%) strongly disagreed, 3 (6%) disagreed, 7 (14%) were neutral, and 5 (10%) strongly agreed. Furthermore, 1 (Siyal, Ahmed, Asif, & Arif, 2025).

4 (28%) strongly disagreed and 28 (56%) disagreed that they were prepared to verify AI-generated outputs, while 8 (16%) were neutral. Regarding the importance of AI strategies in clinical nursing, 30 (60%) strongly disagreed, 2 (4%) disagreed, 9 (18%) were neutral, 4 (8%) agreed, and 5 (10%) strongly agreed. Similarly, 8 (16%) strongly disagreed and 36 (72%) (Majeed et al., 2023).

disagreed with being willing to use AI in their nursing profession, while 4 (8%) were neutral and 2 (4%) strongly agreed. Finally, 13 (26%) strongly disagreed and 29 (58%) disagreed that they were prepared to adapt to future changes in AI-based nursing education, while 4 (8%) were neutral, 2 (4%) agreed, and 2 (4%) strongly agreed. (Asif, Rahman, Perveiz, & Hussain, 2024). (Qaiser et al., 2023).

Overall, the descriptive findings showed predominantly negative responses concerning the perceived usefulness, ease of use, intention to adopt, and preparedness to use AI strategies in nursing education. Although some participants recognized the potential value of AI tools and expressed willingness to explore or recommend them, most reported limited confidence and readiness to integrate AI into their academic activities and future nursing practice. These findings suggest a need to further explore students' educational experiences with AI and consider appropriate training and guidance to support responsible AI use in nursing education.

Results

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	25	50.0	50.0	50.0
	female	25	50.0	50.0	100.0
	Total	50	100.0	100.0	

Age group		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-23years	47	94.0	94.0	94.0
	24-26years	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

AI strategies improved my learning outcomes		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	26	52.0	52.0	52.0
	disagree	24	48.0	48.0	100.0
	Total	50	100.0	100.0	

AI tool can help me understand complex nursing concepts		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	18	36.0	36.0	36.0
	disagree	11	22.0	22.0	58.0

neutral	11	22.0	22.0	80.0
strongly agree	10	20.0	20.0	100.0
Total	50	100.0	100.0	

AI based learning resources can improve my clinical decision making skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	21	42.0	42.0	42.0
	disagree	21	42.0	42.0	84.0
	neutral	4	8.0	8.0	92.0
	strongly agree	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

Using AI strategies can make my nursing studies more productive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	17	34.0	34.0	34.0
	disagree	12	24.0	24.0	58.0
	neutral	11	22.0	22.0	80.0
	Strongly agree	10	20.0	20.0	100.0
	Total	50	100.0	100.0	

AI tools can help me prepare more effectively for nursing examinations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	50	100.0	100.0	100.0

I believed nursing education would be easy for me through AI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	36	72.0	72.0	72.0
	disagree	8	16.0	16.0	88.0
	strongly agree	6	12.0	12.0	100.0
	Total	50	100.0	100.0	

I can easy learn how to use AI applications for my nursing studies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	6	12.0	12.0	12.0
	disagree	23	46.0	46.0	58.0
	neutral	12	24.0	24.0	82.0
	Strongly agree	9	18.0	18.0	100.0
	Total	50	100.0	100.0	

If I understand AI Tools easy to interact with for educational purposes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	24	48.0	48.0	48.0
	disagree	21	42.0	42.0	90.0
	neutral	2	4.0	4.0	94.0
	agree	2	4.0	4.0	98.0
	strongly agree	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

Learning without requiring extensive technical assistance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	14	28.0	28.0	28.0
	disagree	15	30.0	30.0	58.0
	neutral	11	22.0	22.0	80.0
	Strongly agree	10	20.0	20.0	100.0
	Total	50	100.0	100.0	

I can easy integrate AI Tools in to my regular study activities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	22	44.0	44.0	44.0
	disagree	24	48.0	48.0	92.0
	neutral	2	4.0	4.0	96.0
	Strongly agree	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

I enjoy the idea of learning nursing concepts with the supports of AI tools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	26	52.0	52.0	52.0
	disagree	22	44.0	44.0	96.0
	strongly agree	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

AI tools valuable It to traditional nursing education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	15	30.0	30.0	30.0
	disagree	6	12.0	12.0	42.0
	neutral	14	28.0	28.0	70.0
	strongly agree	15	30.0	30.0	100.0
	Total	50	100.0	100.0	

I intend to use AI tools to support my nursing education in the future

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	5	10.0	10.0	10.0
	disagree	42	84.0	84.0	94.0
	agree	2	4.0	4.0	98.0
	strongly agree	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

AI tools regularly for appropriate academic activities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	22	44.0	44.0	44.0
	disagree	25	50.0	50.0	94.0
	neutral	2	4.0	4.0	98.0
	strongly agree	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

I will consider us in AI tools when I encounter difficult nursing concepts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	21	42.0	42.0	42.0
	disagree	8	16.0	16.0	58.0
	neutral	10	20.0	20.0	78.0
	strongly agree	11	22.0	22.0	100.0
	Total	50	100.0	100.0	

I intent to explore new AI based learning strategies in nursing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	23	46.0	46.0	46.0
	disagree	23	46.0	46.0	92.0
	neutral	2	4.0	4.0	96.0
	strongly agree	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

I would recommend appropriate AI learning ools to other nursing students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	stonily disagree	16	32.0	32.0	32.0

disagree	11	22.0	22.0	54.0
neutral	10	20.0	20.0	74.0
strongly agree	13	26.0	26.0	100.0
Total	50	100.0	100.0	

I feel prepared incorporate AI tools in my learning activities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	10	20.0	20.0	20.0
	disagree	38	76.0	76.0	96.0
	neutral	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

I am willing to develop the skills in AI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	35	70.0	70.0	70.0
	disagree	3	6.0	6.0	76.0
	neutral	7	14.0	14.0	90.0
	strongly agree	5	10.0	10.0	100.0
	Total	50	100.0	100.0	

I am prepared to verify AI generated tools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	14	28.0	28.0	28.0
	disagree	28	56.0	56.0	84.0
	neutral	8	16.0	16.0	100.0
	Total	50	100.0	100.0	

I understand the importance of AI using strategies in clinical nursing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	30	60.0	60.0	60.0
	disagree	2	4.0	4.0	64.0
	neutral	9	18.0	18.0	82.0
	agree	4	8.0	8.0	90.0
	strongly agree	5	10.0	10.0	100.0
	Total	50	100.0	100.0	

I am willing to use AI in profession

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	8	16.0	16.0	16.0
	disagree	36	72.0	72.0	88.0
	neutral	4	8.0	8.0	96.0
	strongly agree	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

I am prepared to adaptation future changes in AI based nursing education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	13	26.0	26.0	26.0
	disagree	29	58.0	58.0	84.0
	neutral	4	8.0	8.0	92.0
	agree	2	4.0	4.0	96.0
	strongly agree	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

Conclusion

The study revealed low readiness among undergraduate nursing students towards the use of AI strategies in nursing education. Most participants reported negative perceptions regarding AI usefulness, ease of use and integration into academic activities.

The findings highlight the need for structured AI literacy training, practical guidance and education on the responsible use of AI. Further research with larger sample is recommended to explore student's readiness for AI integration in nursing education.

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Declaration

Authors contribution

Rahool collected the data and Mujeebullah analyzed the data with the help of biostatistician. Mahpara developed the literature review section whereas, Sumaira wrote down the discussion and results. Elisha developed the charts and results and Yashwa wrote the abstract of research

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