

Preparedness and Attitudes of Nursing Students toward the Integration of Artificial Intelligence in Nursing Education



Mohammad Bani Younis^{1,*} , Ahmad Ayed² , Hani Nawaf Alqudah³ , Murad Alkhalaileh³ , Atallah Hababbeh³, Mohammad H. Bani Khaled³  and Jawad Ahmad Abu-Shennar³

¹Faculty of Nursing, Al-Hussein Bin Talal University, Maan, Jordan

²Arab American University, Jenin, Palestine

³Faculty of Nursing, Jerash University, Jerash, Jordan

Abstract:

Introduction: With technological progress, it is anticipated that Artificial Intelligence (AI) will become an integral part of nursing education for both faculty and students. AI has the potential to assist across various aspects of nursing practice, including disease diagnosis, personalized treatment plans, and clinical advice through virtual assistants, workflow enhancements, and staff efficiency improvements. The primary aim of this study is to assess nursing students' preparedness and attitudes towards incorporating AI into their education. Additionally, the study seeks to explore perceived benefits, challenges, and training needs related to AI applications in nursing education.

Methods: A total of 122 undergraduate nursing students participated in this cross-sectional survey, with data collected through questionnaires completed directly in the classroom.

Results: The results showed that students held partially optimistic views regarding AI's potential to improve diagnostic and administrative efficiency (mean=3.75), but their sense of self-preparedness was relatively low (mean=3.36). Common concerns included the risk that AI might provide inaccurate or outdated information (n=32) and that AI could increase the likelihood of plagiarism, leading to unfair grading (n=27). Students with previous AI exposure, prior training, and those in their final year demonstrated notably more positive attitudes (*p*-value of group comparison > 0.05).

Discussion: The findings reveal a significant gap in current nursing education and underline the urgent need to introduce comprehensive, competency-based AI training that alleviates fears and equips future nurses to work safely and effectively within this emerging field.

Conclusion: Nursing students demonstrated positive attitudes toward the use of AI in nursing education despite limited self-perceived preparedness. Integrating AI-focused training into nursing curricula is essential to enhance students' competencies and address concerns related to accuracy, ethics, and academic integrity. Such efforts will better prepare future nurses for AI-supported healthcare environments.

Keywords: Nursing education, Artificial intelligence, Students' preparedness, Curriculum integration, Students' attitude, Digital transformation.

© 2026 The Author(s). Published by Bentham Open.

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International Public License (CC-BY 4.0), a copy of which is available at: <https://creativecommons.org/licenses/by/4.0/legalcode>. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

*Address correspondence to this author at the Faculty of Nursing, Al-Hussein Bin Talal University, Maan, Jordan;
Tel: 00962776195270; E-mail: mbaniyounis@yahoo.com

Cite as: Younis M, Ayed A, Alqudah H, Alkhalaileh M, Hababbeh A, Khaled M, Abu-Shennar J. Preparedness and Attitudes of Nursing Students toward the Integration of Artificial Intelligence in Nursing Education. Open Nurs J, 2026; 20: e18744346487793. <http://dx.doi.org/10.2174/0118744346487793260629120139>



Received: February 21, 2026

Revised: April 24, 2026

Accepted: May 04, 2026

Published: July 02, 2026



Send Orders for Reprints to
reprints@benthamscience.net

1. INTRODUCTION

The rapid development of Artificial Intelligence (AI) is exerting a profound impact on nursing education and care delivery. Educational capability needs to be progressively raised so that educators can effectively embed artificial intelligence into nursing education. These developments require faculty to build digital fluency, AI knowledge, and innovative pedagogies in designing and delivering technology-enhanced learning experiences. Furthermore, continuous professional development programs and institutional support are key to enabling educators to effectively use AI tools and adapt pedagogical methods accordingly while meeting the evolving learning needs of nursing students.

AI the driving force for reform in nursing education, training, and practice. AI use in nursing education spans across several learning domains. Second, it provides rapid access to evidence-based information and personalized learning environments [1], thereby advancing knowledge acquisition (knowing). Secondly, AI facilitates the learning of practical skills (know-how) via simulation-based training and virtual clinical scenarios [2]. Third, this promotes the development of competencies (performance in context) through providing students with complex cases that are relevant to a specific context and require integration of knowledge and skills [3]. Lastly, AI is essential in clinical decision-making enhancement, where students can use patient data to discern patterns and to make objective decisions in simulated or even real-world scenarios [1, 3].

To improve curricular content, insight is needed into students' preparedness to use AI applications aimed at nursing and nursing education, including their attitude towards the integration of AI in education and practice [4-10].

Previous international studies [1-3] have highlighted the effectiveness of AI in enhancing clinical reasoning and decision-making skills among nursing students. The findings of recent research suggested that the majority of nursing students have a positive attitude towards AI, knowing its expected role to enhance both learning and patients' condition [4, 6, 8, 11-15]. However, worries about becoming dependent on robots or "losing the human touch" in nursing care, as well as practical advantages and ethical issues, affect students' attitudes [16-18].

Many factors, such as technological skill, prior exposure to AI, self-efficacy, and educational background, affect students' preparation in using AI; the more they receive special training on AI and the higher their digital literacy skills, the better prepared the students are [6, 11, 19, 20]. Furthermore, poor access to technology and incompetence in AI, as well as fear for the potential use of AI in health care, prevent the successful implementation of AI [17]. However, attitudes are also molded by socio-demographic and psychological factors such as sex, academic year, and personality characteristics [8, 21].

Systematic reviews and meta-analyses underline the importance of including AI content, empirical learning, and ethical considerations in nursing education to form

positive attitudes towards and promote the fair and proficient use of AI in future practice [22, 23]. As AI progresses, conducting research and curriculum development is required for nursing students to be ready to face the challenges of AI implementation in practice settings. Assessing nursing students' perceptions about the use of AI is important to provide effective acceptance into clinical practice and education.

1.1. Research Aims

The present study primarily aims to explore student nurses' readiness and willingness to integrate AI into their nursing program. Alternatively, even to investigate the possible advantages, barriers, and training deficit of AI implementation in nursing education.

1.2. Research Questions

- [1] How much do nursing students feel that they are ready for AI integration in their education?
- [2] What is the perception of nursing students in relation to AI integration into their learning experience?
- [3] What are the students' perceived advantages and challenges of AI implementation in nursing education?
- [4] What supports or training do nurse students need for effective use of AI tools?

2. MATERIAL AND METHODS

2.1. Research Design

This study adopted a descriptive cross-sectional survey design to assess nursing students' preparedness and attitudes toward AI integration in their education. This design collects data from nursing students at one specific time, aiming to describe participants' characteristics, preparedness, and attitudes toward integrating AI in nursing education. It also gathers data about the perceived benefits and barriers of the use of AI in nursing education.

2.2. Participants and Setting

The population of this study comprises undergraduate nursing students from the bachelor's degree program at Jerash University. All study levels (1st to 4th year) are encouraged to get involved. A survey method was adopted to select the respondents by convenience sampling. Students were recruited for the survey by posting an invitation in their WhatsApp groups and in classrooms. A sample of 180 students from Jerash University was targeted for the study. The sample size was determined using the G Power statistical software program (version 3.1.9.4), and an ANOVA test was run with $\alpha=0.05$ and a power size of 0.8. A total of 400 nursing students were assessed for eligibility during the study period. Among the eligible students, 192 agreed to participate and completed the questionnaire, yielding a response rate of 48%. Questionnaires with substantial missing data or incomplete responses ($n = 76$) were excluded from the analysis. Consequently, data from [122] participants were included in the final statistical analysis.

2.3. Instrument

The primary outcomes of this study were nursing students' preparedness for integrating artificial intelligence (AI) into nursing education and their attitudes toward AI integration.

A three-section self-administered questionnaire developed by the research team was used for data gathering. The first section is about the demographic data of the participants. It consists of 7 items to collect data about age, gender, education level, previous training on AI, participants' use of AI, frequency of AI use, and AI tools used. The second section gathers data about students' preparedness to use AI in nursing education. It consists of 6 Likert scale items with responses ranging from strongly disagree (1) to strongly agree (5). The third section gathers data about students' attitudes toward integrating AI in nursing education. It consists of 9 Likert scale items with responses ranging from strongly disagree (1) to strongly agree (5). The fourth section gathers data on the benefits, barriers, and suggestions for integrating AI into nursing education through open-ended questions.

2.4. Data Collection

During data collection, the researchers distributed the questionnaire directly to students in the classroom. This approach typically began with the researchers providing a brief explanation of the study's purpose and instructions for completing the questionnaire, ensuring that students understood the confidentiality and voluntary nature of their participation. The questionnaires were then handed out to all students present, allowing them to complete the forms individually and in a controlled environment, which helps minimize external influences and ensures a higher response rate. The researchers remained available to clarify any questions or ambiguities regarding the items, thereby supporting accurate and reliable responses. Once completed, the questionnaires were collected immediately by the researchers, reducing the risk of loss or incomplete data and facilitating efficient data management for subsequent analysis. Data were collected between July and August 2025.

Several measures were implemented to minimize potential sources of bias. Selection bias was reduced by inviting all eligible nursing students within the target population to participate and by applying uniform inclusion criteria. To reduce information bias, data were collected using a standardized, structured questionnaire based on previously validated instruments and relevant literature. Prior to data collection, the questionnaire was pilot-tested to ensure clarity, comprehensibility, and content validity.

Response bias and social desirability bias were minimized by ensuring participant anonymity and confidentiality and by informing participants that their responses would be used solely for research purposes and would not affect their academic standing. Participation was entirely voluntary, and students could withdraw at any time without penalty.

2.5. Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS, version 25) program. Descriptive statistics in terms of the mean and standard deviation were used to describe the demographic data when they were continuous and normally distributed. The frequencies and percentages were used when the demographic data were categorical. Inferential statistics (Independent samples t-test, NOVA, and Correlation) were used to test the relationship between the demographic data and students' preparedness and attitude toward the integration of AI in nursing education. Qualitative responses (Section four) were analyzed thematically to identify common themes.

3. RESULTS

3.1. Characteristics of the Study Sample

The characteristics of the study sample may help to obtain more accurate data and play a crucial role in explaining the study results. Table 1 shows the demographic characteristics of the study sample. Regarding age, the results showed that the students' ages ranged from 18 to 38 years, with a mean age of 23.73 years. For gender, the results illustrated that 64 (52.5%) of the participants were female. For previous training on AI, the majority of the participants (n=90, 73.8%) did not receive training on the use of AI applications. The results showed that the vast majority of the students (n=110, 90.2%) use AI applications, and the "sometimes" response was the most frequent answer (n=42, 34.4%). However, ChatGPT was the most commonly used application by the participants (n=80, 65.6%). For the students' level of education, a large number of the participants were fourth-year students (n=76, 62.3%).

Table 1. Demographic information N= 122.

Factor	Category	Frequency	Percentage
Gender	Male	58	47.5
	Female	64	52.5
Previous training	Yes	32	26.2
	No	90	73.8
Using AI	Yes	110	90.2
	No	12	9.8
Frequency	Daily	34	27.9
	Weekly	26	21.3
	Some times	42	34.4
	Rarely	20	16.4
Application used	Seri	20	16.4
	Copilot	04	03.3
	Deepseek	14	11.5
	ChatGPT	80	65.6
	Others	04	03.3
Level	First year	06	04.9
	Second year	12	09.8
	Third year	28	23.0
	Fourth year	76	62.3
	Minimum	Maximum	Mean (SD)
Age	18	38	23.73 (3.97)

Abbreviations: N: Number, AI: Artificial intelligence, SD: Standard deviation.

3.2. Nurses' Preparedness toward AI Integration in Nursing Education

To evaluate nurses' preparedness toward AI usage in nursing education, six items were assessed on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The results are summarized in Table 2. The overall preparedness toward AI among nursing students was moderate, with a mean score of 3.36 (SD = 1.15). The highest-rated item was confidence in learning and using AI tools in nursing education (M = 3.60, SD = 1.03). Awareness of ethical and privacy concerns also scored relatively high (M = 3.47, SD = 1.16). The lowest-rated item was program preparation for AI in healthcare (M = 3.11, SD = 1.33). Students' knowledge of AI applications in clinical practice was also relatively low (M = 3.18, SD = 1.21). Access to AI-related resources (M = 3.34, SD = 1.19) was moderate.

3.3. Nurses' Attitudes toward AI Integration in Nursing Education

This section presents findings on nurses' attitudes toward the integration of Artificial Intelligence (AI) into nursing education. Nine items were evaluated on a 5-point

Likert scale (1 = strongly disagree to 5 = strongly agree). Results are presented in Table 3.

The overall attitudes toward AI were generally positive, with a mean score for all items of (3.75). The highest-rated items were: 1. AI helps students better understand complex topics (M = 3.98, SD = 0.95). 2. Using AI can improve the quality of students' academic work (M = 3.97, SD = 0.93). 3. AI can support students in organizing and structuring their assignments (M = 3.91, SD = 0.95). The lowest-rated item was excitement about using AI in nursing education (M = 3.46, SD = 1.06). Moderate agreement was found regarding AI improving nursing education quality (M = 3.64, SD = 1.10) and providing useful feedback to improve assignments (M = 3.70, SD = 0.97).

3.4. Difference in Preparedness or Attitudes based on Demographic Factors

This section explores whether demographic characteristics (age, gender, training, AI usage, frequency of use, applications used, and academic level) influenced nursing students' preparedness and attitudes toward AI integration. The results are presented in Table 4.

Table 2. Nurses' preparedness toward AI in nursing education.

-	Item	Minimum	Maximum	Mean	SD
1	I am familiar with the basic concepts of Artificial Intelligence (AI).	1.0	5.0	3.46	1.03
2	I feel confident in my ability to learn and use AI tools in nursing education.	1.0	5.0	3.60	1.03
3	My nursing program has adequately prepared me to understand AI in healthcare.	1.0	5.0	3.11	1.33
4	I know how AI can be applied in clinical nursing practice.	1.0	5.0	3.18	1.21
5	I have access to AI-related resources (e.g., workshops, modules, apps).	1.0	5.0	3.34	1.19
6	I am aware of ethical and privacy concerns related to AI in nursing.	1.0	5.0	3.47	1.16
	Overall preparedness			3.36	1.15

Abbreviation: SD: Standard deviation.

Table 3. Attitudes toward AI integration.

-	Item	Minimum	Maximum	Mean	SD
1	AI will improve the quality of nursing education.	1.0	5.0	3.64	1.10
2	I am excited about using AI in nursing education.	1.0	5.0	3.46	1.06
3	AI tools can assist students in completing their assignments more efficiently.	1.0	5.0	3.80	0.99
4	AI helps students better understand complex topics when working on assignments.	1.0	5.0	3.98	0.95
5	Using AI can improve the quality of students' academic work.	1.0	5.0	3.97	0.93
6	AI can support students in organizing and structuring their assignments.	1.0	5.0	3.91	0.95
7	I believe AI provides useful feedback that helps students improve their assignments.	1.0	5.0	3.70	0.97
8	I believe AI should be integrated into the nursing curriculum.	1.0	5.0	3.57	1.17
9	I believe AI can help reduce the gap between technology skilled and unskilled students.	1.0	5.0	3.73	1.07
	Overall attitudes			3.75	1.02

Abbreviation: SD: Standard deviation.

Table 4. Difference in preparedness and attitudes based on demographic factors.

Students' Preparedness					
Item	Category	Mean	SD	Test	P-value
Age		23.73	3.97	r= -0.035	0.700
Gender	Male	3.42	0.99	t= - 0.78	0.938
	Female	3.44	1.46		
Previous training	Yes	4.01	0.59	t= 3.14	0.002*
	No	3.22	1.37		
Using AI	Yes	3.54	1.21	t= 3.39	0.001*
	No	2.33	1.20		
Frequency	Daily	3.59	0.83	f= 1.57	0.199
	Weekly	3.64	2.01		
	Some times	3.40	0.87		
	Rarely	2.91	1.23		
Application used	Seri	3.36	0.942	f= 0.16	0.922
	Copilot	3.66	0.767		
	Deepseek	3.35	0.675		
	ChatGPT	3.43	0.884		
	Others				
Level	First year	2.89	1.34	f= 0.73	0.536
	Second year	3.27	1.16		
	Third year	3.29	1.07		
	Fourth year	3.54	1.33		
Students' attitudes					
Age				r= 1.08	0.235
Gender	Male	3.79	0.697	t= 0.538	0.592
	Female	3.72	0.749		
Previous training	Yes	4.22	0.626	t= 3.09	0.002*
	No	3.76	0.756		
Using AI	Yes	3.95	0.716	t= 3.20	0.002*
	No	3.25	0.790		
Frequency	Daily	3.97	0.722	f= 2.227	0.089
	Weekly	4.10	0.604		
	Some times	3.82	0.809		
	Rarely	3.57	0.772		
Application used	Seri	3.97	0.679	f= 1.004	0.394
	Copilot	4.50	0.577		
	Deepseek	3.95	0.500		
	ChatGPT	3.88	0.749		
Level	First year	3.35	1.142	f= 4.263	0.007*
	Second year	3.55	1.016		
	Third year	3.66	0.715		
	Fourth year	4.05	0.623		

Note: *: Significant result at α level < 0.05.

3.4.1. Students' Preparedness

The results indicating that the following factors did not influence students' preparedness for using AI in nursing education: Age ($r = -0.035$, $p = 0.700$), gender ($M = 3.42$ for males vs. 3.44 for females, $t = -0.78$, $p = 0.938$), frequency of AI use ($f = 1.57$, $p = 0.199$), though preparedness was highest among weekly users ($M = 3.64$), type of AI application used ($f = 0.16$, $p = 0.922$), and academic level ($f = 0.73$, $p = 0.536$), although fourth-year students reported slightly higher scores ($M = 3.54$).

On the other hand, the following factors showed significant influence on nursing preparedness for using AI in nursing education: Previous training in AI significantly improved preparedness ($M = 4.01$ vs. 3.22 , $t = 3.14$, $p = 0.002$), and using AI was also significant, with higher

preparedness among users ($M = 3.54$ vs. 2.33 , $t = 3.39$, $p = 0.001$).

3.4.2. Students' Attitudes

The results indicating that the following factors did not influence students' preparedness for using AI in nursing education: Age ($r = 1.08$, $p = 0.235$), gender ($m = 3.79$ for males and 3.72 for females, $t = 0.538$, $p = 0.592$), AI Application used ($f = 1.004$, $p = 0.394$), despite slightly higher scores among Copilot users ($m = 4.50$), and frequency of AI use ($f = 2.227$, $p = 0.089$), though attitudes were most positive among weekly users ($m = 4.10$).

On the other hand, the following factors were significantly associated with more positive attitudes: Previous training ($m = 4.22$ vs. 3.76 , $t = 3.09$, $p = 0.002$), using AI ($m = 3.95$ vs. 3.25 , $t = 3.20$, $p = 0.002$, and academic level ($f = 4.263$, $p = 0.007$).

Table 5. Perceived benefits, challenges, and training needs.

Question	Students' Answers	Frequencies
In your opinion, what are the benefits of using AI in nursing education?	Save time, effort, and get the answer quickly.	19
	Easy access to information.	17
	Improve research skills.	14
	Deep understanding of knowledge.	13
	Get high grades in assignments	11
What challenges or concerns do you have regarding AI integration?	Inappropriate training to use AI tools.	15
	Over-reliance on AI without checking the results.	08
	Depending on AI for assignments may reduce students' own skills of analytical skills.	05
	AI could encourage plagiarism leading to unfair grades.	27
	Unequal chances to access AI tools	18
	Students may depend too much on AI and not fully understand the content.	09
	AI might provide wrong and outdated information.	32
	Fear that student data used by AI systems	09
What support or training would you like to receive regarding AI?	Appropriate training on how to use AI tools	31
	Training on what the appropriate vs. inappropriate use of AI in assignments	26
	Training in evaluating whether AI information is accurate, current, and unbiased	19
	Practice sessions where students can apply AI	16
	Continuous updates since AI is always changing	10

3.5. Perceived Benefits, Challenges, and Training Needs of AI in Nursing Education

This section explores students' perceptions of the benefits, challenges, and training needs regarding Artificial Intelligence (AI) in nursing education. The findings are summarized in Table 5.

3.5.1. Perceived Benefits

Students identified saving time and effort ($n = 19$) and easy access to information ($n = 17$) as the most frequently mentioned benefits. Other benefits included improved research skills ($n = 14$), a deeper understanding of knowledge ($n = 13$), and better grades in assignments ($n = 11$).

3.5.2. Challenges and Concerns

The most frequently reported challenge was the possibility that AI might provide wrong or outdated information ($n = 32$). Other major concerns included plagiarism and unfair grading ($n = 27$) and unequal access to AI tools ($n = 18$). Students also raised issues such as inappropriate training ($n = 15$), data privacy risks ($n = 9$), over-reliance on AI ($n = 8$), and loss of analytical skills ($n = 5$).

3.5.3. Training and Support Needs

The most requested training and support by the participants was appropriate training on how to use AI tools ($n = 31$). Students also stressed the need for direction on ethical use in assignments ($n = 26$) and skills to evaluate AI-generated information ($n = 19$). Other suggestions included practical training in the application of AI tools ($n = 16$) and continuous updates ($n = 10$).

4. DISCUSSION

4.1. Demographic Characteristics

The demographics of the sample in this study are consistent with the AI use demographics at universities across the world. The majority of the participants were young adults, predominantly women, and aged 21 to 23. The pattern of people widely using AI applications without established conventions reflects research that found learners frequently use ChatGPT for their homework, even when they do not have institutional guidance to support them [24-26]. Alignment of ChatGPT as the leading AI tool is concordant with global surveys that have identified it as the most prominent and popular generative AI application amongst students for brainstorming ideas and assignments [24-27]. The fact that fourth-year students prevail in the sample could suggest higher academic pressure on them, or prior experience with digital means and machines might imply they are more likely to actively use AI for learning purposes, which agrees with previous literature. However, the limited exposure to formal AI training reflects a digital literacy gap and demands that intervention mechanisms be developed to promote the ethical use of AI technologies within higher education and effectively [25, 27, 28].

4.2. Nurses' Readiness for AI in Nursing Education

The findings indicate that nursing students show a moderate level of readiness to integrate AI into the education process ($M = 3.36$). The findings suggest that while nursing students are not entirely unprepared, there are gaps in preparing the nursing workforce to deal with AI in healthcare.

The item with the highest score (students' confidence in using and learning AI tools, $M = 3.60$) is a good indicator of their attitudes. This discovery shows digital mechanics who are primarily open to technological advances. This confidence is a sturdy foundation upon which to build more systematic curricula aimed at developing AI literacy. As Robert N. [29] has also observed, the uptake of AI will be influenced by both the technology and end-user readiness to interact with it. Schools must use this existing confidence to drive the usage of AI-based learning modules and tools.

Besides the low knowledge score, participants also reported a moderate-to-high awareness towards ethical and privacy issues ($M = 3.47$), while this attitude is in line with the caring nature of nursing as a profession. The impact of AI on patient data privacy and the dehumanization of care [28] should be highlighted to students. However, as knowledge alone is not enough, formal education on AI ethical frameworks is essential if current practice is to change in the future.

On the contrary, rated on the lowest end of the scale is perception about program preparedness for AI in health care ($M = 3.11$), signifying a deflection in what nursing education should be currently practicing. This finding is supported by contemporary literature showing that there is a delay between the rapid development of AI in clinical settings and integration into nursing curricula [30]. Students seem to believe that their programs are not training them appropriately for the technological transition. This lack, if it can be called that, is further supported by the low mean for the medical AI application ($M = 3.18$). If nursing students do not know how to work with AI-coding in diagnostic prediction methodologies or on patient surveillance, they cannot make sense of it for their learning process and develop the critical thinking capacity to understand recommendations based on artificial intelligence. The mean access to AI-related resources ($M = 3.34$) falls into an accessible range. Without exposure to software, simulation tools, or curated learning content, even the most self-assured students may become preoccupied with becoming proficient in their use. However, the results of this study highlight the need for AI infrastructure and resources to train theoretical experts into practical expertise.

4.3. Students' Attitude toward AI Integration

Overall, a positive attitude toward AI ($M = 3.75$) may indicate that nursing students recognize the value of using AI academically to better understand complex concepts and achieve academic success. This aligns with reports from other studies showing that nurses have positive attitudes toward AI as a beneficial tool for improving both clinical decision-making and education. However, the mean score of "excitement" is the lowest ($M = 3.46$), revealing a critical nuance that they are aware that AI is useful but may not be excited about it due to moral issues and fear of loss of humanization. This circumspect optimism means that acceptance is also provisional, or contingent. The discrepancy between the high utility

scores and lower excitement indicates that hands-on interactive AI training that is not only instructional, but confidence-building could be required. Furthermore, demographic correlates should be studied in the context of prior research demonstrating that previous exposure and frequency are significant predictors of both preparedness and attitudes. Therefore, education interventions suited to attenuate local demographic disparities should be required rather than a one-size-fits-all approach, in which we consider a workforce prepared and enthusiastic about AI to transform health care.

4.4. Difference in Preparedness or Attitudes based on Demographic Factors

Results of this study indicate that demographic variables such as age and gender are weak predictors of AI readiness compared to experience-related variables. Educational and private engagement with AI are the strongest predictors of AI literacy, underscoring that explicit learning and exposure play a fundamental role in shaping skills and attitudes. Additional consideration is given to the school year and its strong relationship with attitudes, suggesting a potential benefit of being exposed for a longer time in the clinic to more advanced aspects of this technology.

Pragmatic students recognize that AI can enhance efficiency and learning, and they do not concentrate on the nature of technology as much as the reliability or what all this means for academic integrity. Concern about misinformation and plagiarism rates reflects the immediate need to develop critical thinking as well as skill training. Notably, students appear to seek not only access to AI tools, which are already freely available, but also comprehensive training on their effective use, ethical implications, and the critical evaluation of AI-generated outputs. This clear ask for help surfaces a large void that schools of nursing must address if there is to be responsible and effective movement of AI into practice [31].

4.5. Implications for Nursing Education

Nursing programs need to take a proactive and multilevel approach. The researchers recommend that curricula be revised to include formal education on the basics of AI and its common use cases in health care, as well as basic data literacy. Second, the curriculum of the AI ethics case study needs to be distributed across the curriculum, grounding as much as possible ethical awareness in practice. Third, collaborations with medical facilities using AI could provide students with practical experience and access to actual resources. Last, but not least, faculty development is a key component to prepare educators to teach and mentor students in this emerging field [31].

4.6. Limitations of the Study

The researchers acknowledge the limitations of our study's reliance on self-reported data from a single institution, with potential for restricted generalizability.

Subsequent studies will also need to explore the precise types of AI resources students perceive as most helpful, and explore any association between being prepared for AI in relation to clinical reasoning skills. Furthermore, studies that follow students through their training to evaluate the impact of changing curricula on student preparedness over time are needed.

CONCLUSION

Nursing students generally demonstrated positive attitudes toward the integration of artificial intelligence in nursing education, although variations in preparedness were observed. Integrating AI-related content into nursing curricula and providing targeted training may enhance students' readiness to effectively utilize AI technologies in future educational and clinical practice settings.

AUTHORS' CONTRIBUTIONS

The authors confirm their contribution to the paper as follows: M.B.Y., J.A.S.: Study conception and design; A.H.: Validation; A.A.: Methodology; H.A, M.A., M.B.K.: Draft manuscript. All authors reviewed the results and approved the final version of the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the Scientific Research Committee at Jerash University, Jordan, with decision number (JU-N-25-4) dated 11 June 2025.

HUMAN AND ANIMAL RIGHTS

All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

All participants signed the consent form, and their verbal consents were also secured from all of them after explaining the study purpose.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

All the data and supporting material are available within the article.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

The authors would like to express their gratitude to the nursing students who participated in this study with great generosity and took the time to offer us insights into their

perceptions. They thank them for their valuable input in completing this study. The authors also thank the faculty members and academic staff for their assistance with data collection and administrative support during the study. Finally, the authors thank their institutions for supporting research at a scholarly level of innovation in artificial intelligence and digital transformation within nursing education.

REFERENCES

- [1] Topaz Maxim , Pruinelli Lisiane . Big data and nursing: Implications for the future. *Stud Health Technol Inform* 2017; 232: 165-71.
<http://dx.doi.org/10.3233/978-1-61499-738-2-165> PMID: 28106594
- [2] Plotzky C, Lindwedel U, Sorber M, *et al.* Virtual reality simulations in nurse education: A systematic mapping review. *Nurse Educ Today* 2021; 101: 104868.
<http://dx.doi.org/10.1016/j.nedt.2021.104868>
- [3] Buchanan C, Howitt ML, Wilson R, Booth RG, Risling T, Bamford M. Predicted influences of artificial intelligence on nursing education: Scoping review. *JMIR Nurs* 2021; 4(1): e23933.
<http://dx.doi.org/10.2196/23933> PMID: 34345794
- [4] Labrague LJ, Aguilar-Rosales R, Yboa BC, Sabio JB, De los Santos JAA. Student nurses' attitudes and intention to adopt artificial intelligence. *Nurse Educ Pract* 2023; 73: 103815.
<http://dx.doi.org/10.1016/j.nepr.2023.103815> PMID: 37922736
- [5] Lukić A, Kudelić N, Antićević V, Lazić-Mosler E, Glunčić V, Hren D, *et al.* First-year nursing students' attitudes toward artificial intelligence. *Nurse Educ Pract* 2023; 71: 103735.
<http://dx.doi.org/10.1016/j.nepr.2023.103735> PMID: 37541081
- [6] Yalcinkaya T, Ergin E, Yucel S. Exploring Nursing Students' Attitudes and Readiness for Artificial Intelligence: A Cross-Sectional Study. *Teach Learn Nurs* 2024; 19(4): e722-8.
<http://dx.doi.org/10.1016/j.teln.2024.07.008>
- [7] Ostick M, Mariani B, Lovecchio C, Moriarty H. Nursing student and faculty attitudes toward artificial intelligence. *Nurs Educ Perspect* 2025; 46(1): 10-5.
<http://dx.doi.org/10.1097/01.NEP.0000000000001372>
- [8] Salameh B, Qaddumi J, Hammad B, *et al.* Nursing students' attitudes toward artificial intelligence. *SAGE Open Nurs* 2025; 11: 23779608251343297.
<http://dx.doi.org/10.1177/23779608251343297> PMID: 40386173
- [9] Han S, Kang HS, Gimber P, Lim S. Nursing students' perceptions and use of generative artificial intelligence in nursing education. *Nurs Rep* 2025; 15(2): 68.
<http://dx.doi.org/10.3390/nursrep15020068> PMID: 39997804
- [10] Bozkurt RCSA, Aydoğan S, Ergezen FD, Dursun F. Artificial intelligence in healthcare education: A systematic review and sequential explanatory synthesis. *Int Nurs Rev* 2025; 72(1): 45-60.
<http://dx.doi.org/10.1111/inr.70018> PMID: 40243390
- [11] Sumengen AA, Subasi DO, Çakır GN. Nursing students' attitudes and literacy toward artificial intelligence: A cross-sectional study. *Teach Learn Nurs* 2025; 20(1): e250-7.
<http://dx.doi.org/10.1016/j.teln.2024.10.022>
- [12] Amiri H, Peiravi S, rezazadeh shojae S, *et al.* Medical, dental, and nursing students' attitudes and knowledge towards artificial intelligence: a systematic review and meta-analysis. *BMC Med Educ* 2024; 24(1): 412.
<http://dx.doi.org/10.1186/s12909-024-05406-1> PMID: 38622577
- [13] Khaled AEM, Elborai ASA. Knowledge and Attitude of Nursing Students Regarding Artificial Intelligence. *Egypt J Health Care* 2024; 15(3): 510-23.
<http://dx.doi.org/10.21608/ejhc.2024.377035>
- [14] Alsenany SA, AlMaraira OA, Mansour SES. Nursing students' perception and attitudes toward utilization of artificial intelligence in health care. *Edelweiss Appl Sci Tech* 2024; 8(6): 663-70.

- <http://dx.doi.org/10.55214/25768484.v8i6.2138>
- [15] Alenazi L. Artificial intelligence in nursing education. *World Family Med J* 2024; 22(5s): 125-34.
<http://dx.doi.org/10.5742/MEWFM.2024.95257818>
- [16] Kwak Y, Ahn JW, Seo YH. Influence of AI ethics awareness, attitude, anxiety, and self-efficacy on nursing students' behavioral intentions. *BMC Nurs* 2022; 21(1): 267.
<http://dx.doi.org/10.1186/s12912-022-01048-0> PMID: 36180902
- [17] Kong W, Ning Y, Ma T, *et al.* Experience of undergraduate nursing students participating in artificial intelligence + project task driven learning at different stages: a qualitative study. *BMC Nurs* 2024; 23(1): 314.
<http://dx.doi.org/10.1186/s12912-024-01982-1> PMID: 38720326
- [18] Tsiara A, Bakalis VI, Toska A, *et al.* The role of personality traits in nursing students' attitudes. *Cureus* 2025; 17(2): e78847.
<http://dx.doi.org/10.7759/cureus.78921> PMID: 40084307
- [19] Labrague LJ, Aguilar-Rosales R, Yboa BC, Sabio JB. Factors influencing student nurses' readiness to adopt artificial intelligence (AI) in their studies and their perceived barriers to accessing AI technology: A cross-sectional study. *Nurse Educ Today* 2023; 130: 105945.
<http://dx.doi.org/10.1016/j.nedt.2023.105945> PMID: 37625351
- [20] Jallad ST, Alsaqer K, Albadareen BI, Al-maghairah D. Artificial intelligence tools utilized in nursing education: Incidence and associated factors. *Nurse Educ Today* 2024; 142: 106355.
<http://dx.doi.org/10.1016/j.nedt.2024.106355> PMID: 39163690
- [21] Güllümkar Güler K, Şen Atasayar B. The relationship between nursing students' attitudes toward artificial intelligence and their creative personality traits. *Int Nurs Rev* 2025; 72(1): e70008.
<http://dx.doi.org/10.1111/inr.70008> PMID: 40070203
- [22] Attitude of nursing students towards artificial intelligence. *Int J of Sci Healthcare Res* 2022; 7(3): 272-7.
<http://dx.doi.org/10.52403/ijshr.20220447>
- [23] Taskiran N. Effect of artificial intelligence course in nursing on students' medical artificial intelligence readiness: A Comparative Quasi-Experimental Study. *Nurse Educ* 2023; 48(5): E147-52.
<http://dx.doi.org/10.1097/NNE.0000000000001446>
- [24] von Garrel J, Mayer J. Artificial Intelligence in studies—use of ChatGPT and AI-based tools among students in Germany. *Humanit Soc Sci Commun* 2023; 10(1): 799.
<http://dx.doi.org/10.1057/s41599-023-02304-7>
- [25] Črček N, Patekar J. Writing with AI: University students' use of ChatGPT. *J Lang Edu* 2023; 9(4): 128-38.
<http://dx.doi.org/10.17323/jle.2023.17379>
- [26] Almulla MA. Investigating influencing factors of learning satisfaction in AI ChatGPT for research: University students perspective. *Heliyon* 2024; 10(11): e32220.
<http://dx.doi.org/10.1016/j.heliyon.2024.e32220> PMID: 38933954
- [27] Folmega M, Fekete I, Koris R. Enhancing student engagement using artificial intelligence (AI) and chatbots like ChatGPT. *J Univ Teach Learn Pract* 2024; 21(2): 1-18.
<http://dx.doi.org/10.53761/caraaq92>
- [28] Booth RG, Strudwick G, McBride S, O'Connor S, Solano López AL. How the nursing profession should adapt for a digital future. *BMJ* 2021; 373: n1190.
<http://dx.doi.org/10.1136/bmj.n1190>
- [29] Robert N. How artificial intelligence is changing nursing. *Nurs Manage* 2019; 50(9): 30-9.
<http://dx.doi.org/10.1097/01.NUMA.0000578988.56622.21> PMID: 31425440
- [30] O'Connor S, Yan Y, Thilo FJS, Felzmann H, Dowding D, Lee JJ. Artificial intelligence in nursing and midwifery: A systematic review. *J Clin Nurs* 2023; 32(13-14): 2951-68.
<http://dx.doi.org/10.1111/jocn.16478> PMID: 35908207
- [31] Buchanan C, Howitt ML, Wilson R, Booth RG, Risling T, Bamford M. Predicted influences of artificial intelligence on the domains of nursing: A scoping review. *JMIR Nurs* 2020; 3(1): e23939.
<http://dx.doi.org/10.2196/23939> PMID: 34406963

DISCLAIMER: The above article has been published, as is, ahead-of-print, to provide early visibility but is not the final version. Major publication processes like copyediting, proofing, typesetting and further review are still to be done and may lead to changes in the final published version, if it is eventually published. All legal disclaimers that apply to the final published article also apply to this ahead-of-print version.