

KNOWLEDGE AND ATTITUDE OF NURSES REGARDING THE USE OF ARTIFICIAL INTELLIGENCE IN NURSING EDUCATION

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Abstract

Background: The integration of Artificial Intelligence (AI) in nursing education has the potential to revolutionize traditional teaching methods by enhancing learning experiences, developing clinical decision-making skills, and improving patient outcomes.

Objectives: This study explores nurses' knowledge and attitudes toward AI in nursing education, focusing on its applications, benefits, and challenges.

Methodology: This descriptive cross-sectional study will be conducted over three months (Nov 2024–Mar 2025) at Shaikha Fatima Institute of Nursing and Shaikh Zaid Hospital, Lahore, with a sample of 150 BSN students and staff nurses selected through convenient sampling. Inclusion criteria cover actively working nurses and students who consent to participate, while those in administrative roles or on leave are excluded. Ethical approval and written consent will be obtained, ensuring confidentiality and anonymity. Data will be collected using a self-developed demographic form, a 7-item AI knowledge questionnaire (Swed et al., 2022), and a 20-item AI attitude scale (Schepman & Rodway, 2023). Analysis will be done using SPSS 25 with descriptive stats and Chi-square tests.

Results: The demographic data of the 150 participants revealed that most were aged 20–30 years (40.7%), female (74%), and from rural areas (58.7%). The majority were second- (39.3%) and third-year (32.7%) nursing students, with 44.7% reporting a moderate economic background. Regarding computer skills, 44.7% had basic skills, 30% had very good, and 25.3% had advanced skills. In terms of knowledge about Artificial Intelligence (AI), 64.7% had moderate knowledge and 35.3% had good knowledge, while attitudes toward AI were split with 51.3% expressing a positive attitude and 48.7% remaining neutral.

Conclusion: The majority of nurses demonstrated moderate knowledge and a positive or neutral attitude towards Artificial Intelligence.

INTRODUCTION

Artificial Intelligence (AI) is transforming various aspects of healthcare, including diagnostics, treatment planning, and patient care. Among these

advancements, nursing education stands out as a field where AI can play a pivotal role in enhancing training and developing essential competencies (De

Gagne, 2023). As healthcare systems grow more complex and medical knowledge expands rapidly, nurses increasingly assume critical decision-making roles in patient care. This shift necessitates innovative teaching approaches to equip nursing students and professionals with the skills required to navigate modern healthcare environments (Abuzaid et al., 2022). AI offers a promising solution by augmenting traditional educational methods and fostering competency-based learning (Buchanan et al., 2021).

AI in nursing education refers to the application of advanced algorithms, machine learning models, and intelligent systems to facilitate learning, assess competencies, and enhance decision-making skills (Božić, 2024). Technologies such as virtual simulations, intelligent tutoring systems, and predictive analytics create interactive, personalized learning experiences. These tools allow nursing students to engage in realistic clinical scenarios in a risk-free environment, receive real-time feedback, and follow adaptive learning pathways tailored to individual progress. Such dynamic approaches help bridge the longstanding gap between theoretical knowledge and practical skills in nursing education (Glauber et al., 2023).

A major advantage of AI-driven learning is its ability to customize educational experiences to individual student needs. Unlike traditional classroom instruction, which follows a standardized approach, AI-powered platforms analyze students' learning styles, strengths, and weaknesses to deliver personalized content and assessments (Harmon et al., 2021). For instance, AI-enabled virtual reality (VR) simulations replicate patient-care scenarios, enabling students to practice procedures, refine clinical decision-making skills, and manage emergencies without compromising patient safety (Jallad et al., 2024).

Beyond student training, AI also supports the continuous professional development of practicing nurses by offering access to the latest healthcare knowledge and skill-building resources. Intelligent systems can identify gaps in training programs, monitor student progress, and predict learning outcomes, helping educators refine curricula and enhance teaching strategies (Ronquillo et al., 2021). Moreover, AI-powered analytics contribute to

evidence-based improvements in nursing education by aligning training with emerging healthcare demands (De Gagne et al., 2024).

Despite its potential, integrating AI into nursing education presents challenges. Concerns surrounding data privacy, ethical implications of machine-based decision-making, and the risk of technology overshadowing the human aspects of nursing care must be addressed (Hwang et al., 2024). Additionally, the high costs of AI implementation and the need for faculty training pose significant barriers to widespread adoption. Nonetheless, the potential benefits—enhanced learning experiences, improved patient outcomes, and a more competent nursing workforce—outweigh these challenges, making AI a valuable tool in modern nursing education (Topaz et al., 2024). Therefore, this study aimed to examine the knowledge and attitudes of nurses regarding AI in nursing education.

Methodology

A descriptive cross-sectional study will be conducted at Shaikha Fatima Institute of Nursing and Shaikh Zaid Hospital, Lahore, over a period of three months (November 2024 to March 2025). The sample size of 150 participants was calculated. A convenient sampling technique will be employed to recruit student nurses enrolled in the BSN (four-year) program and staff nurses working in various departments, including medical, surgical, pediatric, and critical care units, who meet the inclusion criteria and provide informed consent. Nurses in managerial roles, those on leave, or unwilling to participate will be excluded. Ethical approval will be obtained, and confidentiality, anonymity, and voluntary participation will be ensured. Data will be collected using a self-structured instrument comprising three parts: (1) demographic questionnaire, (2) Nurses' AI Knowledge Questionnaire adapted from Swed et al. (2022), and (3) Artificial Intelligence Attitude Questionnaire adapted from Schepman and Rodway (2023). Participants will have one week to complete the questionnaire after consent is obtained. Data will be analyzed using SPSS version 25, with frequencies and percentages for categorical variables and Chi-square tests to determine associations between knowledge levels and demographic characteristics.

Results

Table 4.1: Demographic information of participants

Study Variable	Category	Frequency (F)	Percentage (%)
Age	20-30 Year	61	40.7
	31-40 Year	44	29.3
	41-50 Year	22	14.7
	> 50 Years	23	15.3
Gender	Male	39	26.0
	Female	111	74.0
Residence	Rural	88	58.7
	Urban	62	41.3
Level of Study	First Year	35	23.3
	Second Year	59	39.3
	Third Year	49	32.7
	Fourth year	7	4.7
Economic Status	Low	39	26.0
	Moderate	67	44.7
	High	44	29.3
Computer Skills	Basic	67	44.7
	Very good	45	30.0
	Advanced	38	25.3
	Basic	67	44.7

Table 4.1 presents the demographic characteristics of the study participants. Most respondents were aged 20–30 years (40.7%), predominantly female (74.0%), and from rural areas (58.7%). The majority were in their second (39.3%) or third (32.7%) year of study. In terms of economic status, most reported a moderate income (44.7%). Regarding computer skills, 44.7% had basic skills, 30.0% had very good skills, and 25.3% reported advanced skills.

Table 4. 2 Overall Knowledge of Nurses Regarding the Use of Artificial Intelligence

Knowledge Level	Frequency	Percentage
Moderate Knowledge	97	64.7
Good Knowledge	53	35.3
Total	150	100.0

Table 4.2 presents the overall knowledge level of nurses regarding the use of artificial intelligence (AI). Among the 150 participants, 97 nurses (64.7%) demonstrated moderate knowledge of AI, while 53 nurses (35.3%) exhibited good knowledge. This suggests that most nurses possess a moderate understanding of AI, with a smaller proportion having a more advanced understanding.

Table 4. 3 Overall attitude of nurses Regarding the Use of Artificial Intelligence

Attitude Level	Frequency	Percentage
Neutral Attitude	73	48.7
Positive Attitude	77	51.3
Total	150	100.0

This table presents the overall attitude of nurses towards the use of Artificial Intelligence (AI) in healthcare settings. Out of a total of 150 respondents, 77 nurses (51.3%) demonstrated a positive attitude toward the use of AI, indicating a general openness and acceptance of AI technologies in their practice. Meanwhile, 73 nurses (48.7%) exhibited a neutral attitude, suggesting uncertainty or lack of strong opinions regarding AI implementation.

Discussion

This chapter discusses the study findings on the knowledge and attitude of nursing students regarding the use of Artificial Intelligence (AI) in healthcare, analyzed in relation to their demographic characteristics. The results are interpreted and compared with relevant literature published between 2021 and 2025.

This study assessed the knowledge and attitudes of nursing students regarding artificial intelligence (AI) in healthcare. Findings revealed that 64.7% of participants possessed moderate knowledge, while 35.3% demonstrated good knowledge of AI. In terms of attitude, 51.3% exhibited a positive outlook towards AI integration in healthcare settings. Significant associations were identified between knowledge levels and factors such as age and academic year, as well as between attitudes and variables including age, residence, level of study, economic status, and computer proficiency.

The findings revealed that 64.7% of nurses had moderate knowledge, while 35.3% exhibited good knowledge about AI. This aligns with a study by Wang et al. (2024), who found that although nurses are increasingly aware of AI, their practical and conceptual understanding remains at a moderate level due to limited exposure and training in AI-integrated systems. Similarly, Zhang et al. (2022) reported that while most nursing students recognize AI's potential, their comprehension is mainly theoretical, suggesting a gap in formal education.

The age-wise analysis showed that younger nurses (20–30 years) had significantly better knowledge ($p = 0.001$). This finding is supported by Lee et al. (2023), who concluded that younger nurses, being more technologically inclined and digitally literate, are more receptive to emerging technologies like AI. The

significant association between year of study and knowledge ($p = 0.017$) also supports the findings of Kahraman et al. (2022), who reported that nursing students in higher academic years display enhanced understanding due to increased academic exposure and clinical practice.

On the other hand, no significant association was found between knowledge and gender ($p = 0.387$), residence ($p = 0.077$), economic status ($p = 0.585$), or computer skills ($p = 0.844$). This is somewhat contrary to Chaudhary and Amin (2023), who reported that access to urban facilities and higher socioeconomic status often correlates with increased AI knowledge. The lack of association in the present study might be due to uniform curricular content or equal access to learning resources across these demographic groups.

The majority (51.3%) of the participants exhibited a positive attitude toward the use of AI in healthcare, while 48.7% showed a neutral attitude. This result resonates with Kim & Park (2021), who found that despite moderate knowledge, nurses often have favorable attitudes toward AI, driven by its potential to enhance efficiency, accuracy, and patient safety.

Conclusion

The findings of the present study highlight that the majority of nursing students were young females from rural areas, predominantly in their second or third year of study, and belonging to a moderate socioeconomic background. Most participants possessed at least basic computer literacy. The assessment of knowledge regarding artificial intelligence (AI) revealed that a considerable proportion of respondents exhibited a moderate level of understanding, while a smaller subset demonstrated a good level of knowledge. Overall, participants expressed a generally positive attitude toward AI, although a notable percentage remained neutral.

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