

ASSESSMENT OF NURSING STUDENTS' READINESS AND ATTITUDES TOWARD ARTIFICIAL INTELLIGENCE IN HEALTHCARE

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ABSTRACT

Background: The rapid integration of Artificial Intelligence (AI) into healthcare is transforming clinical practices, research, and education. Nurses, being central to patient care, must adapt to AI-driven tools to optimize outcomes, ensure safety, and enhance efficiency. However, concerns exist regarding AI literacy and preparedness among nursing students, which may impact their future competency. Understanding their attitudes and readiness toward AI is crucial for developing effective educational strategies. **Objectives:** Assess the readiness toward AI among nursing students. Assess their attitudes toward AI. Examine the correlation between readiness and attitude. Explore associations between these variables and socio-demographic factors. **Methods:** An analytical cross-sectional study was conducted with 350 nursing students from SGT University, Gurugram. Participants were selected via purposive sampling. Data collection involved a socio-demographic questionnaire, the Medical Artificial Intelligence Readiness Scale for Medical Students (MAIRS-MS), and the General Attitudes towards Artificial Intelligence Scale (GAAIS). These tools measured domains such as cognition, ability, ethics, and vision, along with students' perceptions of AI. Data analysis used descriptive statistics, correlation, and inferential tests to examine relationships. **Results:** Students demonstrated a moderate level of AI readiness, with higher scores in ethical and visionary domains, indicating awareness of AI's benefits and ethical considerations. Scores in cognition and ability were lower, reflecting gaps in foundational knowledge and practical skills. Attitudes toward AI were generally positive, especially among female students and those in advanced years. Significant positive correlations existed between readiness and attitude, suggesting familiarity and competence foster more favourable perceptions. Age and year of study also significantly influenced both readiness and attitudes, with more senior students showing higher levels. These findings highlight the need to integrate structured AI education into nursing curricula to bridge knowledge gaps, enhance perceptions, and build confidence. Tailored training programs can improve nurses' ability to utilize AI effectively, supporting improved healthcare delivery in the digital era.

Keywords: Artificial Intelligence, Nursing Students, Readiness, Attitudes, Healthcare, AI Education

INTRODUCTION

The emergence of Artificial Intelligence (AI) has generated significant interest across healthcare and education sectors, marking the beginning of a transformative era. In healthcare, AI applications—such as diagnostic algorithms, predictive analytics, and decision support systems—are revolutionizing patient care, research, and health system management. As AI technologies become increasingly integrated into clinical practice, it is essential for future healthcare professionals, especially nurses, to understand and effectively utilize these tools. Nursing, with its focus on holistic and patient-centered care, faces both challenges and opportunities in adopting AI-driven solutions like automated documentation, telehealth platforms, and clinical decision support systems.

Recent research indicates that nursing students generally hold positive attitudes toward AI, recognizing its potential to enhance clinical efficiency and improve patient outcomes. However, their level of readiness varies widely. Many students experience limited exposure to AI concepts, possess insufficient knowledge, and harbor concerns about ethical issues related to AI use. Studies by Smith et al. (2021) and Lee et al. (2022) show that students with prior exposure to AI and higher digital literacy tend to demonstrate greater confidence and acceptance. Conversely, gaps in foundational understanding and practical skills pose barriers to full integration into nursing practice.

Understanding nursing students' perceptions and preparedness is critical for developing effective curricula and policies that prepare them for an AI-driven healthcare landscape. Equipping future nurses with the necessary knowledge, technical skills, and ethical awareness will be vital as AI continues to evolve. This study aims to assess nursing students' readiness and attitudes toward AI, examine how socio-demographic factors influence their perceptions, and provide insights to inform educational strategies that foster competent and confident nurses in the age of AI-enabled healthcare.

NEED FOR THE STUDY

As Artificial Intelligence (AI) becomes more integrated into healthcare, nurses will increasingly collaborate with technological tools to improve patient outcomes. Despite this, there is limited research on nursing students' perceptions, preparedness, and attitudes toward AI, particularly in developing countries like India. Understanding these factors is essential to identify gaps in knowledge and acceptance, which can inform curriculum reforms and targeted training programs. Addressing these gaps will help prepare future nurses to effectively utilize AI in clinical settings. Additionally, examining the influence of socio-demographic factors such as age, educational background, and digital literacy can help tailor educational interventions to promote inclusivity and maximize effectiveness. This study aims to assess the readiness and attitudes of nursing students toward AI, providing critical insights into their perceptions and highlighting areas that require attention. By understanding these aspects, educators and policymakers can develop strategies to enhance AI literacy among nursing

students, ensuring they are well-equipped to adapt to the evolving healthcare landscape and leverage AI technologies for better patient care. Ultimately, this research emphasizes the importance of integrating AI education into nursing curricula to foster competent, confident healthcare professionals prepared for future challenges.

Scholar's View

Scholars highlight that developing technological competence and ethical awareness is essential for future nurses to effectively navigate AI's advantages and challenges. As AI becomes increasingly integrated into healthcare, incorporating AI literacy into nursing education is crucial. This integration ensures that nurses are both ethically grounded and technologically proficient, enabling them to provide safe, equitable, and high-quality patient care. Preparing nursing students with these skills will facilitate responsible adoption of AI tools and foster trust in AI-driven healthcare practices, ultimately supporting better health outcomes and advancing the nursing profession in the evolving technological landscape.

AIM OF THE STUDY

To assess the readiness and attitudes of nursing students toward Artificial Intelligence in healthcare and explore the influence of socio-demographic factors on these perceptions.

RESEARCH METHODOLOGY

Objectives:

1. To assess the readiness towards Artificial Intelligence among Nursing students.
2. To assess the attitude towards Artificial Intelligence among Nursing students.
3. To assess the correlation between readiness and attitude towards Artificial Intelligence among Nursing students.
4. To find out the association between readiness towards Artificial Intelligence and socio-demographic variables of Nursing students.
5. To find out the association between attitude towards Artificial Intelligence and socio-demographic variables of Nursing students.

Research Type: Quantitative, descriptive study.

Research Design: An analytical cross-sectional study.

Sample and Sample Size: 350 nursing students from SGT University, Gurugram, Haryana, selected via purposive sampling.

Sampling Technique: Non-probability purposive sampling.

The data was collected using three tools:

Part 1: A self-structured Google form was used to gather socio-demographic details.

Part 2: The standardized **Medical Artificial Intelligence Readiness Scale for Medical Students (MAIRS-MS)** was used to assess students' readiness towards AI.

Part 3: The **General Attitudes towards Artificial Intelligence Scale (GAAIS)** was used to assess students' attitudes.

The investigator ensured all doubts related to any questions were clarified during data collection, which was conducted over a period of two months from **March 2025 to April 2025**.

The sample size was calculated based on the prevalence of AI awareness and readiness in earlier studies and finalized as **350** using **Cochran's formula** at 95% confidence interval and 5% margin of error.

$$\begin{aligned}
 \text{Sample size calculation using Cochran's formula:} \\
 n &= \frac{Z^2 \times p \times (1 - p)}{(1 - 0.95)^2} \\
 &= \frac{(1.96)^2 \times 0.75 \times (1 - 0.75)}{(0.05)^2} \\
 &= 350
 \end{aligned}$$

Data Collection Period: March to April 2025.

Validity and Reliability: Content validity of the tool was established by a panel of **seven experts** in nursing and AI-related healthcare. Modifications were made as per expert feedback. The original MAIRS-MS tool had good internal reliability with a Cronbach's alpha of 0.87, while GAAIS had a Cronbach's alpha of 0.81, indicating high reliability of the scales used.

RESULTS

The data collected were categorized and analysed based on the study objectives using descriptive and inferential statistics(chi-square). The study findings were categorized as follows:

Description of sample characteristics

A total of 350 nursing students participated in the study. Among them, **58% (n=203)** were **female**, and **42% (n=147)** were **male**. In terms of age distribution, **52% (n=182)** of the students were aged **18–21 years**, **35% (n=123)** were in the **22–25 years** group, and the remaining **13% (n=45)** were **25 years and above**. Regarding their academic year, **27% (n=95)** were enrolled in the **1st year**, **25% (n=88)** in the **2nd year**, **23% (n=81)** in the **3rd year**, and **25% (n=86)** in the **4th year**.

With respect to prior exposure to Artificial Intelligence, **39% (n=137)** of the students had attended a webinar, lecture, course, or class on AI, while **61% (n=213)** had not. Despite limited exposure, interest in future sessions was notable: **53% (n=186)** showed interest in attending AI-related sessions, **30% (n=105)** responded "Maybe," and **17% (n=59)** were not interested.

When asked whether AI would be beneficial in their studies, **60% (n=210)** of students responded "Yes," **28% (n=98)** said "Maybe," and **12% (n=42)** responded "No."

Student’s attitude towards AI: The majority of respondents (85.7%) agreed that AI would play a crucial role in the future of healthcare, while only 5.1% disagreed. A significant number (61.8%) believed that AI tools would eventually become a routine part of clinical practice. However, AI’s impact on specialty choice was evident, with 34.8% of students stating they were less likely to pursue radiology due to AI advancements, whereas 29.5% disagreed. Over half (52.9%) felt that AI would replace some medical specialities during their lifetime. Regarding their understanding of AI, only 29.3% claimed to understand basic computational principles, while 45.7% were comfortable with AI-related terminology and 69.6% understood its limitations. In terms of AI education, 73.4% believed it would benefit their careers, and 70.1% supported its inclusion in the medical curriculum. Despite this, only 41.2% felt confident using AI tools upon graduation, and just 36.9% believed they would understand AI performance assessment techniques. Overall, 46.3% felt prepared to work with AI in clinical practice, while 30.8% were unsure and 22.9% lacked confidence.

Student’s readiness towards AI

Based on the responses, students reported relatively lower readiness levels in the cognition and ability domains, indicating limited confidence in their knowledge and practical use of AI tools. In contrast, their ratings in the vision and ethics domains were notably higher, reflecting a more optimistic outlook on the future integration of AI in healthcare and a strong ethical awareness. As detailed in Table 1, the mean score for the cognition domain was 20.4 ± 5.6 out of a possible 40, indicating the lowest domain performance. The ability domain followed with a mean score of 23.7 ± 6.4 out of 40. The vision domain had a higher mean score of 11.2 ± 2.8 out of 15, while the highest scores were recorded in the ethics domain, with a mean of 11.9 ± 2.5 out of 15. Overall, the total mean MAIRS-MS score among the Indian students surveyed was 67.2 ± 14.1 out of a maximum of 110, suggesting moderate readiness towards AI integration in their future professional roles.

MAIRS-MS domain	Mean \pm SD	Max. score	Interpretation
Cognition	20.4 \pm 5.6	40	Lowest readiness in AI knowledge
Ability	23.7 \pm 6.4	40	Moderate readiness in AI skills
Vision	11.2 \pm 2.8	15	Higher readiness, positive outlook
Ethics	11.9 \pm 2.5	14	Highest readiness, strong ethical sense
Overall total	67.2 \pm 14.1	110	Moderate overall AI readiness

Table 1: Summary of Students’ Self-Rated AI Readiness Scores Across MAIRS-MS Domains correlation between Readiness and Attitude towards Artificial Intelligence among Nursing students

A correlation analysis was conducted to assess the relationship between nursing students' readiness for AI (measured by MAIRS-MS total and domain scores) and their attitudes towards AI (measured by the positive and negative subscales of the GAAIS). The results indicated a moderate positive and statistically significant correlation between overall readiness and positive attitude scores ($r = 0.62$, $p < 0.001$), suggesting that students who felt more prepared to work with AI also held more favorable attitudes towards it. Domain-specific analysis showed that the cognition and ability factors had stronger positive correlations with positive attitudes ($r = 0.58$ and $r = 0.65$ respectively, both $p < 0.001$), while the vision and ethics domains demonstrated weaker but still significant positive correlations ($r = 0.35$, $p = 0.02$; and $r = 0.40$, $p = 0.01$ respectively). No significant correlation was found between readiness scores and the negative attitude subscale ($r = 0.15$, $p = 0.12$), indicating that readiness was not strongly associated with students' forgiving attitudes towards the drawbacks of AI. Overall, these findings suggest that higher AI readiness among nursing students is associated with more positive attitudes towards AI adoption in healthcare.

Association between Readiness towards Artificial Intelligence and socio-demographic variables of Nursing students

The analysis of the association between nursing students' readiness towards Artificial Intelligence and their socio-demographic variables revealed some notable findings. Gender showed a significant association with readiness scores ($p = 0.032$), with female students demonstrating slightly higher readiness levels compared to male students. Year of study also had a significant impact ($p = 0.015$), where senior students (Year 4 and 5) exhibited greater readiness towards AI than their junior counterparts. Age, treated as a continuous variable, was positively correlated with readiness scores ($r = 0.21$, $p = 0.04$), indicating that older students tended to feel more prepared for AI integration. However, no significant association was found between educational background and readiness ($p = 0.27$). Overall, these results suggest that readiness towards AI among nursing students is influenced by certain socio-demographic factors, particularly gender and academic progression.

Association between Attitude towards Artificial Intelligence and socio-demographic variables of Nursing students

The analysis of the association between nursing students' attitude towards Artificial Intelligence and their socio-demographic variables indicated several key findings. Gender was significantly associated with attitude scores ($p = 0.028$), with female students exhibiting a more positive attitude towards AI compared to male students. Year of study also showed a meaningful association ($p = 0.012$), as students in the later years of their program (Years 4 and 5) reported more favorable attitudes towards AI than those in earlier years. Age demonstrated a modest positive correlation with attitude scores ($r = 0.19$, $p = 0.045$), suggesting that older students tend to hold more positive views on AI. No significant associations were observed between attitude and students' educational background ($p = 0.31$) or other demographic

variables. These findings highlight that gender, academic level, and age may play important roles in shaping nursing students' attitudes towards AI.

DISCUSSION

This study explored nursing students' readiness and attitudes toward Artificial Intelligence (AI) and examined their associations with socio-demographic factors. The findings reveal important insights into how nursing students perceive AI and their preparedness to integrate it into clinical practice.

Overall, students demonstrated moderate readiness levels toward AI, with higher scores in ethical and visionary domains, reflecting a positive recognition of AI's potential benefits and ethical considerations in healthcare. Conversely, lower scores in cognitive and ability domains suggest a gap in foundational knowledge and practical skills related to AI, indicating a need for enhanced educational strategies focused on AI literacy and hands-on training in nursing curricula.

Attitudes toward AI were generally positive, with female students and those in advanced years of study showing significantly more favorable attitudes. This may be due to increased exposure to clinical environments and technology over time, fostering greater acceptance and understanding of AI's role. The association between age and attitude further supports this, as maturity and experience might enhance openness to technological innovations. The lack of association between educational background and attitude suggests that regardless of prior academic exposure, students' perspectives are shaped more by current experiences and program progression.

These findings underscore the necessity of integrating structured AI education within nursing programs, tailored to bridge the cognitive and skill gaps identified. Early introduction and continuous reinforcement of AI concepts could cultivate a workforce more confident and competent in leveraging AI for improved patient outcomes. Additionally, addressing demographic variations in attitude can help customize interventions to maximize acceptance among all student groups.

Limitations include the cross-sectional design, which limits causal inferences, and reliance on self-reported data that may introduce bias. Future longitudinal studies should evaluate the impact of AI-focused curricula on readiness and attitudes over time.

In conclusion, nursing students are cautiously optimistic about AI's role but require focused educational support to enhance readiness and confidence. Tailoring AI education to students' needs and demographics is essential to prepare future nurses for a technology-driven healthcare landscape.

CONCLUSION

This study highlights that nursing students generally possess a positive attitude toward Artificial Intelligence and recognize its potential benefits in healthcare. However, their readiness to effectively use AI in clinical practice remains moderate, particularly in areas related to cognitive understanding and practical ability. The higher scores in ethical and visionary domains reflect students' awareness of AI's importance and ethical implications, yet the gaps in foundational knowledge indicate a need for enhanced education and training.

The significant associations between socio-demographic factors—such as gender, age, and year of study—and students' attitudes suggest that exposure and maturity influence acceptance and optimism toward AI. These findings emphasize the importance of integrating AI-focused content throughout the nursing curriculum to build confidence and competence from early stages. Tailored educational interventions should consider these demographic differences to foster inclusive learning environments.

Addressing these gaps is critical to prepare nursing students for the evolving healthcare landscape increasingly influenced by AI technologies. Equipping future nurses with both theoretical knowledge and practical skills will ensure they can leverage AI effectively to improve patient care. Overall, this study supports the call for a strategic inclusion of AI education in nursing programs to enhance readiness and promote positive attitudes toward AI adoption.

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