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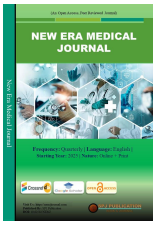

Original Article

Perception, Awareness, and Attitudes Toward Artificial Intelligence in Health Sciences: A Questionnaire-Based Cross-Sectional Study

[1]Santosh Kumar*, [2]Rohit Kumar

[1,2]Faculty of Medicine and Health Sciences, SGT University, Gurugram, India

***Corresponding author:**
Santosh Kumar, Faculty of Medicine and Health Sciences, DGT University, Gurugram, India

Email: santoshkrty9900@gmail.com

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ABSTRACT

Background: Artificial intelligence (AI) is rapidly transforming healthcare by supporting clinical decision-making, diagnostics, education, and health system management. Understanding how individuals in health sciences perceive, understand, and respond to AI is essential for its effective and ethical integration into healthcare practice and education.
Aim: To assess the perception, awareness, and attitudes toward artificial intelligence among individuals in health science disciplines.
Methods: A questionnaire-based cross-sectional study was conducted over six months among health science students, academic staff, and healthcare professionals. A structured, validated, self-administered questionnaire assessed demographic characteristics, awareness of AI concepts and applications, perceptions of benefits and risks, and attitudes toward AI adoption. Data from 1,010 participants were analyzed using descriptive and inferential statistics. Associations between demographic factors, awareness levels, and attitudes toward AI were evaluated, with statistical significance set at $p < 0.05$.
Results: Of the 1,010 participants, 360 (35.6%) were male and 650 (64.4%) were female. High awareness of AI was observed in 48.0% of respondents, while 34.0% demonstrated moderate awareness and 18.0% showed low awareness. Positive attitudes toward AI were reported by 62.0% of participants, whereas 25.0% expressed neutral attitudes and 13.0% reported negative attitudes. A statistically significant association was identified between higher awareness levels and positive attitudes toward AI ($p < 0.01$), indicating that greater exposure and understanding were linked to increased acceptance.
Conclusion: The study reveals a generally favourable perception of artificial intelligence among health science students and professionals, with awareness playing a key role in shaping attitudes. Despite positive trends, concerns related to ethics, data privacy, and professional roles persist. Integrating structured AI education and ethical training into health sciences curricula is crucial to support informed adoption and responsible use of AI in healthcare.

Keywords: Artificial intelligence, Health sciences, Awareness and perception Attitudes toward technology

INTRODUCTION

Artificial intelligence (AI) has emerged as a transformative force in health sciences, reshaping diagnostic processes, clinical decision-making, healthcare administration, and biomedical research. AI refers to computational systems capable of performing tasks that typically require human intelligence, including learning, reasoning, pattern recognition, and prediction. In healthcare, AI applications are increasingly used in medical imaging interpretation, disease risk prediction, clinical decision support, and personalized treatment planning, with the potential to enhance accuracy, efficiency, and patient outcomes. [1,2] However, the successful implementation of AI in healthcare settings depends not only on technological capability but also on the perceptions, awareness, and attitudes of healthcare stakeholders. Awareness of AI defined as an understanding of its basic principles, applications, and limitations, is a fundamental determinant of its acceptance in health sciences. Previous studies have demonstrated considerable variability in AI awareness among healthcare professionals and students. While many report general familiarity with AI concepts, detailed knowledge of clinical applications and operational principles remains limited. [3] Evidence suggests that higher levels of awareness are associated with more favourable attitudes toward AI adoption, whereas limited understanding often contributes to skepticism and resistance. [4] Perception of AI in healthcare reflects how individuals interpret its role, usefulness, and impact on professional practice. Among healthcare professionals, AI is often perceived as a supportive tool capable of improving diagnostic accuracy and reducing workload rather than as

replacement for human expertise. [5] Patients, on the other hand, tend to express cautious optimism, recognizing the benefits of AI while emphasizing the continued importance of human oversight in clinical decision-making. [6] Studies conducted in tertiary healthcare settings have reported that most patients are receptive to AI-assisted care, provided transparency, safety, and physician accountability are maintained. [7]

Attitudes toward AI encompass beliefs, emotional responses, and readiness to adopt AI-driven technologies. Research among health sciences students and early-career professionals generally indicates positive attitudes toward AI integration, particularly regarding its potential to enhance learning, diagnostic accuracy, and healthcare efficiency. [8] However, concerns persist regarding ethical challenges, data privacy, accountability, and the potential impact of AI on professional roles and employment. [9] Negative attitudes have been linked to inadequate training, lack of institutional support, and uncertainty about legal and ethical frameworks governing AI use in healthcare. Despite growing interest in AI adoption, existing literature reveals several gaps. Many studies focus on single stakeholder groups, such as medical students or clinicians, and often employ heterogeneous assessment tools, limiting comparability across studies. [10]. Furthermore, evidence from low- and middle-income countries remains scarce, despite these settings facing unique challenges related to infrastructure, training, and resource availability. Understanding how demographic factors, educational background, and prior exposure to AI influence perceptions and attitudes is critical for designing effective educational strategies and policy interventions.

Given the rapid expansion of AI applications in health sciences, there is a clear need for systematic, questionnaire-based cross-sectional studies to assess current levels of awareness, perceptions, and attitudes toward AI. Such studies can provide valuable insights to inform curriculum development, capacity-building initiatives, and institutional policies aimed at facilitating the responsible and effective integration of AI into healthcare systems. Therefore, the present study seeks to evaluate the perception, awareness, and attitudes toward artificial intelligence among individuals in the health sciences using a structured questionnaire-based approach.

AIM AND OBJECTIVE

Aim: The aim of this study is to assess the perception, awareness, and attitudes toward artificial intelligence among individuals in the health sciences.

Objectives

1. To evaluate the level of awareness and basic understanding of artificial intelligence and its applications in health sciences.
2. To assess perceptions regarding the role, benefits, and limitations of artificial intelligence in healthcare practice and education.
3. To examine attitudes toward the adoption and future integration of artificial intelligence in health science–related fields.
4. To analyze the association between demographic and educational factors and perceptions, awareness, and attitudes toward artificial intelligence.

MATERIALS AND METHODS

Study Design and Setting: A questionnaire-based cross-sectional study was conducted among participants affiliated with health science disciplines. The study was carried out over a defined study period of six months. The target population included students, academic staff, and healthcare professionals involved in medical, nursing, allied health, and public health sciences.

Study Population and Sampling: Participants were recruited using a convenience sampling technique. Inclusion criteria comprised individuals aged 18 years and above who were enrolled in or professionally associated with health science–related fields and who provided informed consent. Individuals with no background in health sciences or those unwilling to participate were excluded from the study. The minimum sample size was calculated using a standard cross-sectional formula based on an assumed prevalence of adequate AI awareness of 50%, a 95% confidence interval, and a margin of error of 5%. An additional allowance was included to account for incomplete responses.

Study Instrument: Data were collected using a structured, self-administered questionnaire developed after an extensive review of existing literature. The questionnaire consisted of four sections:

1. **Demographic information** (age, gender, academic/professional role, and field of study)
2. **Awareness of artificial intelligence**, including basic concepts and familiarity with AI applications in healthcare
3. **Perceptions of artificial intelligence**, focusing on perceived benefits, risks, and ethical considerations
4. **Attitudes toward artificial intelligence**, assessing willingness to adopt AI, perceived impact on professional roles, and future expectations

Responses were recorded using a five-point Likert scale ranging from “strongly disagree” to “strongly agree.”

Validity and Reliability: Content validity of the questionnaire was assessed by a panel of subject experts in health sciences and biomedical informatics. A pilot study was conducted on a subset of participants to evaluate clarity, relevance, and comprehensibility. Reliability analysis demonstrated acceptable internal consistency, with a Cronbach's alpha coefficient greater than 0.70 across the main domains.

Data Collection Procedure: The questionnaire was distributed electronically using a secure online platform. Participants were informed about the purpose of the study, voluntary participation, and confidentiality of responses. No personally identifiable information was collected.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics were used to summarize demographic variables and questionnaire responses. Inferential statistics, including chi-square tests and independent sample t-tests, were applied to examine associations between demographic variables and levels of awareness, perception, and attitude. A p-value of <0.05 was considered statistically significant.

RESULT

A total of 1,010 participants completed the questionnaire and were included in the final statistical analysis. The study population consisted of 360 males (35.6%) and 650 females (64.4%), indicating a higher representation of female respondents. Participants were drawn from diverse health science backgrounds, including medicine, nursing, allied health sciences, and public health, ensuring a comprehensive representation of perspectives on artificial intelligence (AI) in healthcare. The majority of participants were either undergraduate or postgraduate students, with a smaller proportion comprising faculty members and practicing health professionals. This demographic diversity allowed for comparative assessment of AI-related perceptions across varying levels of academic exposure and professional experience.

Table 1. Gender Distribution of Participants

Gender	Number (n)	Percentage (%)
Male	360	35.6
Female	650	64.4
Total	1,010	100

Awareness of Artificial Intelligence in Health Sciences

Assessment of AI awareness revealed varying levels of familiarity among participants. A high level of awareness was observed in 485 participants (48.0%), who demonstrated a clear understanding of AI concepts and their applications in diagnosis, medical imaging, clinical decision support, and healthcare management. A moderate level of awareness was reported by 343 participants (34.0%), reflecting partial knowledge or indirect exposure to AI technologies. In contrast, 182 participants (18.0%) exhibited low awareness, indicating limited understanding or lack of exposure to AI-related concepts. Statistical analysis demonstrated that participants with prior academic exposure to AI through coursework, workshops, online training programs, or conferences had significantly higher awareness scores compared to those without such exposure ($p < 0.05$).

Table 2. Awareness Levels Regarding Artificial Intelligence

Awareness Level	Number (n)	Percentage (%)
High	485	48.0
Moderate	343	34.0
Low	182	18.0
Total	1,010	100

Attitudes Toward Artificial Intelligence: Participants' attitudes toward artificial intelligence were assessed across multiple dimensions, including perceived usefulness, trust, ethical concerns, and future adoption in healthcare. Overall, 626 participants (62.0%) expressed a positive attitude toward AI, viewing it as a valuable tool capable of improving diagnostic accuracy, enhancing clinical efficiency, and supporting evidence-based decision-making.

A neutral attitude was observed in 253 participants (25.0%), reflecting uncertainty or cautious optimism regarding AI integration in healthcare settings. These respondents commonly cited the need for clearer regulatory frameworks and professional training before widespread implementation. Conversely, 131 participants (13.0%) demonstrated a negative attitude, primarily due to concerns related to data privacy, algorithmic bias, ethical accountability, and the potential impact of AI on employment within the healthcare sector.

Table 3. Attitudes Toward Artificial Intelligence

Attitude	Number (n)	Percentage (%)
Positive	626	62.0
Neutral	253	25.0
Negative	131	13.0
Total	1,010	100

Relationship Between Awareness and Attitude: Comparative analysis revealed a statistically significant association between awareness levels and attitudes toward AI ($p < 0.01$). Participants with high awareness

were more likely to exhibit positive attitudes, whereas those with low awareness demonstrated higher levels of neutrality or negativity. This finding suggests that increased exposure and understanding of AI technologies may play a critical role in fostering acceptance and positive perception among health science professionals.

DISCUSSION

The present questionnaire-based cross-sectional study examined the perception, awareness, and attitudes toward artificial intelligence (AI) among health sciences students and professionals. In alignment with the study aim, the findings provide important insights into current levels of knowledge, acceptance, and concerns related to AI integration within healthcare education and practice. Overall, the results demonstrate moderate to high awareness of AI and a predominantly positive attitude toward its application in health sciences, while also highlighting persistent gaps in understanding and areas of ethical concern. A key finding of this study is the relatively high level of awareness regarding AI among participants, with nearly half of respondents demonstrating substantial familiarity with AI concepts and healthcare applications. This reflects the growing exposure of health science learners and professionals to AI-driven technologies such as clinical decision support systems, medical imaging analysis, and predictive analytics. Increased visibility of AI in academic curricula, online platforms, and clinical environments may have contributed to this level of awareness. However, the presence of a considerable proportion of participants with moderate to low awareness suggests that AI education remains inconsistent and fragmented across health science disciplines.

The predominance of positive attitudes toward AI observed in this study is consistent with the increasing recognition of AI's potential to enhance diagnostic accuracy, optimize workflow efficiency, and support evidence-based clinical decision-making. Participants expressing favorable attitudes largely perceived AI as a supportive tool rather than a replacement for healthcare professionals. This perception aligns with the concept of AI as an adjunct to human expertise, reinforcing the role of clinicians in decision-making while leveraging computational strengths. Nevertheless, a notable subset of respondents reported neutral or negative attitudes, underscoring ongoing apprehension about ethical accountability, data privacy, and the reliability of algorithm-based systems.

Importantly, the study identified a significant association between awareness levels and attitudes toward AI. Participants with higher awareness were more likely to demonstrate positive attitudes, whereas lower awareness was associated with skepticism or uncertainty. This finding emphasizes the critical role of education and training in shaping perceptions of emerging technologies. Insufficient understanding of AI principles may contribute to misconceptions, fear of job displacement, or mistrust in automated systems. Conversely, informed exposure appears to promote acceptance and confidence in AI-enabled healthcare solutions. Gender distribution showed a higher participation of females; however, attitudes toward AI were not predominantly gender-dependent, suggesting that perception is more closely linked to educational exposure and professional experience rather than demographic characteristics alone. This reinforces the need for inclusive, interdisciplinary AI literacy programs targeting all health science domains.

The findings of this study have important implications for health sciences education and policy development. Integrating structured AI-related content into undergraduate and postgraduate curricula may enhance foundational knowledge and address ethical, legal, and practical considerations associated with AI use in healthcare. Additionally, professional development programs and workshops can help bridge the gap between theoretical understanding and real-world clinical applications. Despite its strengths, this study has limitations. The cross-sectional design restricts causal interpretation, and reliance on self-reported data may introduce response bias. Furthermore, the study population may not fully represent all healthcare professionals, particularly those in rural or resource-limited settings. Future longitudinal and multicenter studies are warranted to assess changes in perception over time and to evaluate the impact of targeted AI education interventions.

CONCLUSION

This questionnaire-based cross-sectional study demonstrates that artificial intelligence is increasingly recognized as a valuable and influential component of modern health sciences. The majority of participants exhibited moderate to high awareness of AI and expressed positive attitudes toward its application in healthcare, particularly in enhancing diagnostic accuracy, clinical efficiency, and decision-making support. These findings indicate a growing acceptance of AI as a complementary tool rather than a replacement for healthcare professionals. Importantly, the study highlights a clear association between awareness and attitude, suggesting that greater knowledge and exposure to AI are key determinants of acceptance and confidence. Despite the overall favorable perception, a subset of participants expressed uncertainty and concern regarding

ethical issues, data privacy, algorithmic transparency, and potential workforce implications. These concerns underscore the need for structured education and clear regulatory frameworks. Integrating artificial intelligence–related content into health sciences curricula, along with continuous professional training, may help bridge existing knowledge gaps and promote informed, responsible use of AI technologies. Addressing ethical and legal considerations alongside technical training is essential to foster trust and ensure patient-centered implementation. Overall, enhancing AI literacy among health science students and professionals will be critical to maximizing the benefits of artificial intelligence while minimizing potential risks within healthcare systems.

DECLARATIONS

Ethical Approval: The study was conducted in accordance with the ethical standards of the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Committee, prior to commencement of the study.

Informed Consent: Informed consent was obtained electronically from all participants before their inclusion in the study. Participants were informed about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any stage without any consequences.

Consent for Publication: Not applicable. The study does not contain any identifiable personal information or images of participants.

Availability of Data and Materials: The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Competing Interests: The authors declare that they have no competing interests.

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