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Perceptions of Artificial Intelligence in Radiology Education: A Survey-based Study

Aswathi P[1], Pavithra M[2], Ganga Prasanth[3], William Leo A[4], Jith U S[5]
[1,2]Assistant Professor, Medical Radiology & Imaging Technology, School of Allied Health Science, Centre for Food Science, REVA Research Centre, Bangalore, 560064, Karnataka, India.
[3]Medical Imaging Technology, Institute of Allied Health Science, Srinivas University, Mangalore, Karnataka, 575001, India.
[4]UG – Medical Radiology & Imaging Technology, Medical Radiology & Imaging Technology, School of Allied Health Science, Centre for Food Science, REVA Research Centre, Bangalore, 560064, Karnataka, India.
[5]Assistant Professor, Physiotherapy, School of Allied Health Science, Centre for Food Science, REVA Research Centre, Bangalore, 560064, Karnataka, India.
Emails: *aswathipuliyakkara@gmail.com[1], pavithramotukupali@gmail.com[2], gangaprasanth06@gmail.com[3], williamleo164@gmail.com[4], itsmejithsajeev@gmail.com[5]*

Abstract

Artificial Intelligence (AI) is rapidly transforming radiology practice and is expected to influence radiology education and professional competencies. However, the level of awareness, training and readiness among radiology students regarding AI integration remains uncertain. To assess the perceptions, familiarity, confidence and readiness of radiology students towards the incorporation of AI in radiology education. A cross-sectional survey-based study was conducted in December 2025 among 119 radiology students from various academic levels. A validated questionnaire comprising demographic details, current AI status, attitudes, concerns and training exposure was administered online. Descriptive statistics, including frequencies and percentages, were used to analyze categorical and ordinal Likert scale responses. The study population was predominantly undergraduate BSc radiology students, with females constituting 54.6% of participants. Most respondents reported moderate confidence (34.5%) and moderate familiarity (37.8%) with AI applications in radiology. A considerable proportion expressed slight to moderate concern (74.8%) about the impact of AI on future career prospects. Notably, 77.3% of students had not received formal training in AI, indicating a significant educational gap. Nearly half of the participants (48.8%) agreed that AI plays an important role in their radiology career, while 46.2% were uncertain about AI creating new career opportunities. Readiness to critically evaluate AI tools was mostly moderate (39.5%), with fewer participants demonstrating high preparedness. Radiology students exhibit moderate awareness and cautious optimism toward AI but lack formal training and high-level preparedness for clinical AI evaluation. Integrating structured AI education, practical training, and curriculum reform in radiology programs is essential to enhance competency, reduce uncertainty, and prepare students for AI-driven clinical practice.

Keywords: *Artificial Intelligence; Radiology Education; Students, Health Occupations; Diagnostic Imaging; Surveys and Questionnaires.*

1. Introduction

X-rays, CT scans, MRIs, ultrasounds, PET scans, and other medical imaging equipment and technologies are varied and continuously changing, with new developments appearing on a regular basis. Since radiology is a very practical field, thorough clinical experience is essential to improving students' ability to think logically and diagnose problems. (1) Artificial intelligence (AI) is becoming more and

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more significant in all areas of medicine, but especially in radiology. Its scope will change both the future paradigm of education and the manner that medicine is practiced. The ability to properly understand and apply AI will often determine how well health professionals work, which should result in the delivery of high-quality healthcare based on precision medicine, thorough diagnosis, and patient-specific prognosis. (2) Because of the evolution and interactions among the various systems that make up artificial intelligence, the notion has been continuously evolving. In the context of medical activity, artificial intelligence (AI) refers to the creation and application of algorithms and software techniques that can analyze medical data in order to learn from them, adapt, and improve their performance through this experience. This helps to improve patient safety and lessen the direct workload of professionals. (3) The concept of artificial intelligence has been constantly changing due to the interactions and evolution of the several systems that comprise it. The development and use of algorithms and software approaches that can evaluate medical data in order to learn from it, adapt, and enhance its performance is referred to as artificial intelligence (AI) in the context of medical activities. This reduces the direct workload of experts and enhances patient safety. (4) Artificial Intelligence (AI) is revolutionizing radiology by improving image interpretation and diagnostic accuracy. Radiology education must now integrate AI concepts to prepare students for evolving clinical practices. However, awareness and formal training on AI applications remain limited among radiology students. (5)

2. Method

2.1. Subjects

In December 2025, students studying radiology were asked to participate in an online survey. In order to include a realistic mix of people with diverse degrees of knowledge and exposure to AI in radiology, we selected several participant groups. This was done in order to improve our findings' validity and generalizability. The survey study's target population was determined to be 119 people. Every participant gave their consent. The Declaration of Helsinki was followed in the conduct of the study. All participants gave their informed consent. All identifiable information was removed from the data collection process [1-5].

2.2. Methods

The survey questionnaire was initially designed and validated by three radiology experts. The questionnaire was structured into several sections to capture different facets of the students' experience and perspectives on AI in radiology. The instrument was composed of single-choice, multiple-choice, Likert-type scale, and open-ended questions. Key sections included demographic details, Current AI status and Attitude and concerns. The survey was administered using an online platform, ensuring ease of access and participant anonymity. Data collection occurred during the period corresponding to the provided timestamps (December 2026). Participation was voluntary, and implied consent was assumed upon submission of the completed questionnaire Shown in Table 2

2.3. Statistical Analysis

- **Descriptive Statistics:** Frequencies and percentages were calculated for all categorical variables (e.g., gender, training stage, formal training, agreement scales) to describe the demographic characteristics of the sample and summarize overall responses
- **Scale Data:** Responses from the Likert-type scales for confidence and familiarity were treated as ordinal data, and their frequencies and percentages were reported.
- **Multi-Select Analysis:** For questions allowing multiple selections (e.g., "What aspects of AI would you like to learn more about?"), A count of each unique option was performed. The percentage for each option was calculated based on the total number of respondents for that specific question (i.e., the total number of non-null responses), allowing for the total percentage to exceed 100%.

3. Results and Discussion

3.1. Results

Demographic Statistics of patient

Among the study participants, 65 (54.6%) were females, while 54 (45.4%) were males. Thus, females constituted a slightly higher proportion of the study population compared to males. Out of the total 119 participants, the largest proportion were BSc 3rd-year

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students (48; 40.3%), followed by BSc 2nd-year students (39; 32.8%) and BSc 1st-year students (17; 14.3%). A smaller proportion of participants were from BSc 4th year (6; 5.0%), MSc (8; 6.7%), and Diploma courses (1; 0.8%). Overall, the study population was predominantly composed of undergraduate BSc students, particularly those in the second and third years of training [6-10].

Current AI status

Confidence in using AI tools in radiology. The distribution of participants according to their self-reported confidence in using AI tools in radiology, measured on a scale from 0 to 5. Among the 119 participants, the highest proportion reported a confidence score of 3 (41; 34.5%), followed by a score of 4 (35; 29.4%). Lower confidence levels were reported by 14 participants (11.8%) with a score of 2, 5 participants (4.2%) with a score of 1, and 9 participants (7.6%) with a score of 0. A score of 5, indicating the highest confidence, was reported by 15 participants (12.6%). Overall, the findings suggest that most participants had moderate to high confidence in using AI tools in radiology. Anxious or concerned AI potentially impacting future career in radiology levels of anxiety or concern regarding the potential impact of AI on their future career in radiology. Of the 119 participants, the largest proportion were slightly concerned (46; 38.7%), followed closely by those who were moderately concerned (43; 36.1%). A smaller proportion reported being very concerned (24; 20.2%), while only 6 participants (5.0%) were not at all concerned. Overall, the distribution indicates that the majority of participants expressed at least some degree of concern about the influence of AI on future career prospects in radiology. Familiarity with AI applications in radiology. Among the 119 participants, the highest proportion reported a familiarity score of 3 (45; 37.8%), indicating a moderate level of familiarity. This was followed by scores of 4 (25; 21.0%) and 2 (22; 18.5%). Lower familiarity was reported by 20 participants (16.8%) with a score of 1, while only 7 participants (5.9%) reported the highest familiarity score of 5. Overall, the findings suggest that most participants had low to moderate familiarity with AI applications in radiology. Attitude and concerns Shown in Table 1.

Table 1 Received Formal Training on AI in Radiology

Received formal training on AI in radiology	Frequency	Percentage
May be	16	13.4
No	92	77.3
Yes	11	9.2
Total	119	100.0

Among the 119 participants, the majority had not received any formal training (92; 77.3%). A small proportion reported that they may have received training (16; 13.4%), while only 11 participants (9.2%) confirmed that they had received formal training. Overall, the findings indicate a substantial gap in formal education and training on AI in radiology among the study population [11-15].

Table 2 AI Play an Important Role in Your Radiology Career

AI plays an important role in your radiology career	Frequency	Percentage
Strongly agree	24	20.2
Agree	34	28.6
Neutral	52	43.7
Disagree	5	4.2
Strongly disagree	4	3.4
Total	119	100.0

Out of the 119 participants, 34 (28.6%) agreed and 24 (20.2%) strongly agreed that AI plays an important role in their radiology career.

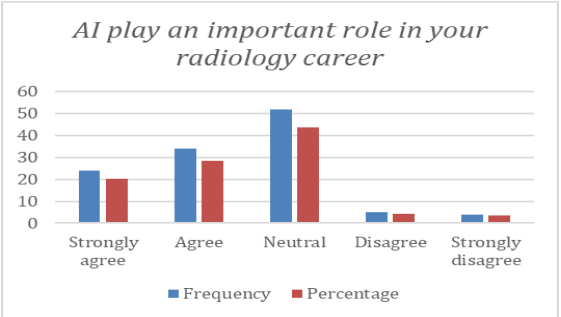

Figure 1 AI Play an Important Role in Your Radiology Career

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A substantial proportion of participants expressed a neutral opinion (52; 43.7%). In contrast, only a small percentage disagreed (5; 4.2%) or strongly disagreed (4; 3.4%) with the statement Shown in Table 3. Overall, while nearly half of the participants viewed AI as important in their radiology career, a considerable number remained neutral. (Figure 1).

Table 3 Do you think AI has the potential to create new career opportunities in radiology?

Do you think AI has the potential to create new career opportunities in radiology?	Frequency	Percentage
Maybe	55	46.2
No	23	19.3
Yes	41	34.5
Total	119	100.0

Among the 119 participants, nearly half responded "Maybe" (55; 46.2%), indicating uncertainty regarding the potential impact of AI on new career avenues. A substantial proportion agreed (Yes: 41; 34.5%) that AI could create new career opportunities, while 23 participants (19.3%) believed that AI would not contribute to new career opportunities Shown in Table 4. Overall, the findings suggest cautious optimism, with many participants remaining uncertain but a considerable proportion recognizing the potential of AI to generate new roles in radiology (Figure 2).

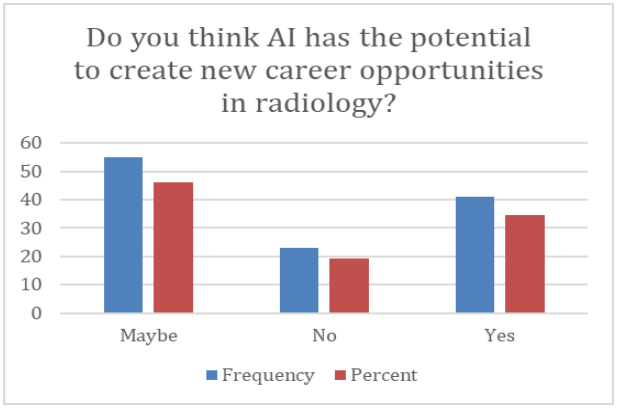

Figure 2 Do you think AI has the potential to create new career opportunities in radiology?

Table 4 Do you feel ready to critically evaluate AI technologies/tools for use in clinical practice?

Do you feel ready to critically evaluate AI technologies/tools for use in clinical practice?	Frequency	Percentage
1	10	8.4
2	25	21.0
3	47	39.5
4	26	21.8
5	11	9.2
Total	119	100.0

The table summarizes participants' self-reported readiness to critically evaluate AI technologies and tools for use in clinical practice, measured on a scale from 1 to 5. Among the 119 participants, the largest proportion reported a readiness score of 3 (47; 39.5%), indicating a moderate level of preparedness. This was followed by scores of 4 (26; 21.8%) and 2 (25; 21.0%) [16-21]. Lower readiness was reported by 10 participants (8.4%) with a score of 1, while 11 participants (9.2%) indicated the highest level of readiness with a score of 5. Overall, the results suggest that most participants felt moderately prepared, with fewer participants expressing high confidence in critically evaluating AI tools for clinical use. (Figure 3)

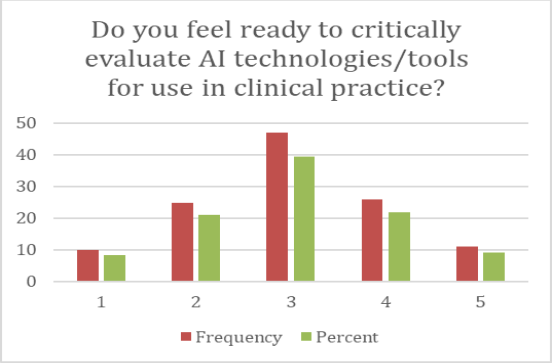

Figure 3 Do you feel ready to critically evaluate AI technologies/tools for use in clinical practice?

3.2. Discussion

With the greatest percentages scoring 3 (34.5%) and 4 (29.4%), the majority of the 119 participants

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expressed moderate confidence in adopting AI technologies in radiology, whereas fewer expressed very high (12.6%) or very low confidence levels. Only 5.0% of respondents were unconcerned, whereas the majority (38.7%) were somewhat concerned, 36.1% strongly concerned, and 20.2% very concerned about how AI might affect their future professions. The majority of participants reported low to moderate acquaintance with AI applications in radiology; the largest group scored 3 (37.8%), followed by 4 (21.0%) and 2 (18.5%), while only a small percentage reported the highest level of familiarity (5.9%). Our study revealed that students don't have a very high confidence levels to use AI in radiology and most of them are concerned about AI might affect their future professions. Cherry Sit et al. (2020) found that, the majority of students in the group—88%—believe that AI will be crucial to healthcare. (6) Gong B et al. (2019) found that medical students were more worried about radiologists being replaced rather than being replaced, which could result in lower workforce expectations. It's interesting to note that a different German study by Pinto dos Santos et al. (2019) revealed that the students in their cohort did not think AI would take the role of radiologists. (7,8) The majority of the 119 participants in our survey (92; 77.3%) had not received official AI training, while 16 (13.4%) were unsure and only 11 (9.2%) verified having instruction. This indicates a glaring lack of formal AI education in radiology. This knowledge gap is also supported through various studies that have concrete participant numbers to validate the issue. For instance, among the sample of 155 participants of the study on the knowledge of AI/ML among radiology residents, 84.5% reported that they had no formal education or training in the area of AI/ML by E. Emekli et al. (2024). (9) Similarly, only a small percentage of the sample of 209 participants of the study conducted by Ninad V. Salastekar et al. (2023) (10) reported that they had formal education or research experience in the area of AI/ML, which was less than 20. Among the sample of international radiographers, radiologists, and students, only 10.3% reported that they had received formal education in AI by G. Doherty et al., (2024) (136 participants from 25 countries) (11). Among medical students from the UK, only 45 of the 484 reported that they had received some teaching on AI, and none of this was through formal education by C. Sit et al. (2020). (6) Among the 119 participants in this survey, 48.8% agreed or strongly agreed that AI had a significant impact on their radiology careers, compared to 43.7% who were neutral and just 7.6% who disagreed. 46.2% of respondents stated "Maybe," 34.5% said "Yes," and 19.3% said "No" when asked if AI would open up new job prospects. This shows cautious optimism with a great deal of ambiguity over AI's impact on radiology roles in the future. M. Hardy et al. (2019) also refers to "expansion of radiographer responsibility into AI-supported image reporting and auditing," enhanced patient-facing care delivery, and advanced technological competency (12). N. Woznitza et al. (2020) refers to AI-supported image interpretation for radiographers to enable them to provide quick results for patient triage (13). C. Malamateniou et al., (2021) states that "clearer career pathways and role extension provision" still has to be achieved, which means that it still has to be implemented instead of automatically achieved. (14) Various research has pointed to the presence of opportunities in career development. M. Hardy et al. (2019) and Abdullah Alfuraydi et al. (2023) have pointed to the presence of opportunities in AI-supported image reporting and auditing roles (15,16) AI has the potential to create new career opportunities for radiographers by improving the process of diagnosis and increasing efficiency in the workplace, but this evidence is not provided.AI has the potential to create new career opportunities for radiographers by automating the process and requiring ethical consideration for the application of AI. James H et al. (2024). (17) 39.5% of the 119 participants scored 3, indicating a modest level of preparedness to critically assess AI products. Fewer people indicated strong readiness (5; 9.2%) or low readiness (1; 8.4%), with scores of 4 (21.8%) and 2 (21.0%) coming next. Few participants expressed high confidence in assessing AI for clinical use, despite the fact that most people felt moderately prepared overall,But there are restrictions. There is a mismatch of bias in AI and epidemiology that needs to be specifically addressed, note Cabello et al. (2025). and G. Kennedy et al. (2021) found that clinicians were moderately positive

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about AI adoption but had particular concern for the appropriateness of the clinical setting (18,19). Stephanie Tulk Jesso et al., (2022) found that 82% of the design studies consulted clinicians in the later stages of the design process (20). Santoro et al., (2023) emphasizes the importance of understanding that the vast majority of AI studies have been retrospective and have had limited external validation and few RCTs. (21)

Conclusion

To achieve the effective integration of AI in the teaching of radiology, practical and clinical application of AI should be the focus rather than theoretical concepts related to AI, and this would be achieved through the practical application of AI tools using representative clinical datasets. There is also the need to allocate sufficient resources to the teaching of AI, which would include the appropriate infrastructure and software to support the teaching of AI concepts. There is also the need to develop faculty through faculty development programs to overcome the lack of expertise in AI concepts and the need to allocate sufficient curriculum time to overcome the existing time constraints in the teaching of AI concepts in radiology teaching. The smaller sample size was a limitation of the study. This study can be carried out in a variety of study settings with a sizable sample size.

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