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The Future of AI in Healthcare: A Survey of Medical Professors' Opinions

Sara. Montazerian[1], Yousef. Mehdipour[2*]

[1] Department of Health Information Technology, Torbat Heydarieh University of Medical Sciences, Iran
[2] Department of Health Information Technology, Paramedical School, Health Sciences Research Center, Torbat Heydarieh University of Medical Sciences, Iran

*** Corresponding author email address**: yas532004@gmail.com

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A B S T R A C T

Nowadays, the use of artificial intelligence (AI) in medical sciences has been growing significantly, impacting diagnosis, care, and treatment of diseases. AI systems also serve as clinical assistants. Given that all healthcare professionals begin their education at universities, the aim of this research was to assess the awareness and attitudes of medical university professors toward incorporating an AI course in medical sciences. This descriptive-analytical study was conducted during 2024 at Torbat Heydarieh University of Medical Sciences. The study population included all faculty members, both academic and non-academic, totaling 152 participants. Data were collected using a composite questionnaire covering four dimensions: familiarity, awareness, willingness to learn, and professors' perspectives on AI. The validity of the questionnaire was confirmed, and its reliability was established with a Cronbach's alpha coefficient of 73%. Data were analyzed using SPSS version 26. In this study, significant correlations were found between familiarity, awareness, willingness to learn, and professors' perspectives regarding AI, as well as their gender, age, and work experience. Professors with 11-20 years of work experience demonstrated greater familiarity compared to their counterparts. However, younger professors with less than 10 years of experience had higher levels of awareness. The willingness to learn about AI was consistent across all levels of work experience. Professors expressed positive views on integrating AI into medical practice and adding it to the curriculum. Based on the findings of this study, incorporating an AI course into the medical curriculum for students can contribute to modern medical advancements and enhance the efficiency of healthcare delivery. Additionally, organizing AI training workshops for professors would be beneficial in this regard.

Keywords: *Artificial Intelligence, Perception, Medical Science Professors, Education, Curriculum Development*

1. Introduction

Artificial intelligence (AI), a branch of computer science that mimics human cognitive functions, has assumed a vital and growing role globally in recent decades. In medicine, AI has demonstrated remarkable performance and gained significant acceptance, enhancing capabilities in preventing, diagnosing, and treating a wide range of diseases (Khanna & Sabri, 2018). Modern medicine increasingly views the integration of AI into medical sciences with a futuristic perspective (Adarkwah et al., 2023). Eric Topol notably stated, "Almost all doctors in

the future, from specialists to paramedics, will use artificial intelligence technologies" (Topol, 2019). Consequently, the awareness levels of healthcare professionals regarding AI are of paramount importance.

Studies have explored awareness and willingness to integrate AI in various medical specialties. In ophthalmology, Zheng et al. found that while 59.07% of staff had high acceptance for AI, 70% were concerned about ethical issues (Zheng et al., 2021). In nursing, AI is predicted to transform all functional areas, underscoring the need for AI knowledge and skills among students and practitioners (Buchanan et al., 2021). Research in radiology (Tajaldeen & Alghamdi, 2020) and surgery (Hashimoto et al., 2020) has highlighted both the potential and the existing gaps in AI adoption and expertise. Similarly, studies beyond clinical practice, such as in library sciences (Azimi et al., 2022), confirm the necessity of AI training for professionals. On the other hand, the attitude of nursing managers in the use of artificial intelligence systems in nursing decisions has been made in the hospitals of Zahedan University of Medical Sciences, which despite the high level of awareness of nursing managers towards artificial intelligence systems, the level of skill and familiarity of nurses is very low. and the managers had a positive attitude towards the applications of artificial intelligence, which needs to be informed and motivated (Mehdipour & Bardbar, 2014).

Despite the critical role of universities in fostering research and innovation (Buzzelli & Asafo-Adjei, 2022), they are often slow to adopt new technologies (Prinsloo & Slade, 2017). A study at the University of Nicosia among medical students and professors emphasized the need for AI courses in medical curricula to ensure better insight and healthcare delivery (Sassis et al., 2021).

In a study by Tajaldeen and his colleagues, the knowledge of radiologists to diagnose diseases in radiology images using artificial intelligence tools in Saudi Arabia has been evaluated, which ultimately led to the results of a significant lack of artificial intelligence tools in radiology departments in hospitals, and the urgent need to increase the awareness of radiologists in this field in diagnostic fields (Tajaldeen & Alghamdi, 2020). Also, in the study of Hashimoto et al., the role of using artificial intelligence in surgery has been investigated, and positive results have been reached (Hashimoto et al., 2020). On the other hand, Azimi et al.'s study investigated the level of awareness and use of artificial intelligence technology by the librarians of Jundi Shapur University of Medical Sciences and Shahid Chamran University of Ahvaz, which ultimately showed that the introduction and use of artificial intelligence technology in libraries can be a necessity and, in this regard, the necessary training should be given to librarians and even users (Azimi et al., 2022).

However, despite international research and documented benefits, the awareness and attitudes of medical professors in Iran remain largely unexplored. As the educators of future healthcare professionals, medical professors are a crucial link in the health education chain (McGrath et al., 2023). This study aims to address this gap by specifically investigating the attitudes and awareness of professors at Torbat Heydarieh University of Medical Sciences (THUMS) towards AI, providing foundational data for national academic and curriculum development.

2. Methods and Materials

This descriptive-analytical cross-sectional study was conducted at THUMS in 2024. The study population included all faculty and non-faculty professors at the university. A convenience sampling method was employed due to logistical constraints. Inclusion criteria were: (1) being a faculty member or visiting professor at THUMS, and (2) willingness to participate. Exclusion criteria were: (1) administrative staff without teaching duties, and (2) professors on sabbatical leave during the data collection period. A total of 152 professors participated.

The data collection tool was a composite questionnaire adapted from Pacheco et al. (Pacheco-Mendoza et al., 2023) and Sassis et al. (Sassis et al., 2021). The adaptation process involved translation into Persian by two independent translators, synthesis into a final Persian version, and back-translation to ensure conceptual equivalence. The questionnaire was piloted with 15 professors for clarity and cultural relevance, leading to minor wording modifications. The questionnaire comprised two parts:

1. Demographic information: gender, age, education level, affiliation type, faculty, and work experience.
2. Twenty-two questions rated on a three-point scale (Low, Medium, High), measuring four constructs Familiarity with AI (4 items); Awareness of AI applications (7 items); Willingness to learn about AI (3 items); and Perspectives on AI integration (8 items).

A panel of experts confirmed content validity. Reliability was assessed using Cronbach's alpha for internal consistency, calculated for each construct and the overall

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instrument after the pilot study. The results were as follows:

Table 1

Instrument Reliability (by Domain)

Construct	Number of Items	Cronbach's Alpha
Familiarity	4	0.71
Awareness	7	0.69
Willingness to Learn	3	0.75
Perspectives	8	0.82
Overall	22	0.73

Data were analyzed using SPSS version 26. Descriptive statistics (frequencies, percentages) summarized the data. Inferential statistics were used to examine relationships: Chi-square tests assessed associations between categorical demographic variables and the ordinal constructs (Familiarity, Awareness, etc.). Spearman's rank correlation coefficient examined relationships involving continuous age. The statistical significance threshold was set at $p < 0.05$. Effect sizes for Chi-square tests were reported using Cramér's V.

Ethical approval was obtained from the relevant institutional review board. Informed consent was secured from all participants before data collection. Confidentiality was maintained throughout the research process, with data anonymized using codes instead of names. Participants were informed of their right to withdraw at any stage.

3. Findings and Results

Of the 152 participants, 67.3% had less than ten years of work experience, 75% were university faculty members, and 71.2% held a doctorate degree or higher. Regarding age, 32.7% were 41 years or older. Furthermore, 42.3% had attended a workshop related to AI tools (Table 2).

Table 2

Demographic Information of Research Participants

Question	Response (%)				
Gender	Female: 53.8		Male: 46.2		
Age range	41 and above: 32.7	36-40 years: 30.8	31-35 years: 17.3	26-30 years: 15.4	Under 25 years: 3.8
Level of education	Doctorate and higher: 71.2			Master's degree: 28.8	
Type of cooperation with the university	Faculty: 75			visiting professors: 25	
College of service	Health: 26.9	Midwifery Nursing: 17.4	Paramedicine: 36.5	Medicine: 19.2	
Work experience	21 years and over: 9.6	11 to 20 years: 23.1	Under 10 years: 67.3		

Half of the participants (50%) reported average knowledge about working with AI tools, while only 3.8% had never heard of AI. A large majority (88.4%) believed AI would impact their careers in the next 10-20 years, and 84.6% considered AI highly effective in fields like radiology, nursing, surgery, and diagnosis. Over 80% found AI useful for decision-making and reducing medical errors, though 21.1% expressed concerns about data privacy. Crucially, 75% agreed with adding an AI and medical robotics course to the curriculum, and 88.5% desired to learn about AI applications in their field (Table 3).

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Table 3

Frequency of Participants' Responses to Questionnaire Items (%)

Low	Medium	High	Questions	No
3.8	23.1	73.1	How much have you heard about artificial intelligence today?	1
34.6	50	15.4	How much knowledge and information do you have about how to work with artificial intelligence tools?	2
51.9	28.8	19.3	How much have you worked with a tool like ChatGPT?	3
46.2	30.7	23.1	To what extent do you know how to use artificial intelligence in your field?	4
3.8	13.5	82.7	In your opinion, to what extent does artificial intelligence help the progress and efficiency of people?	5
3.8	40.4	55.8	In your opinion, to what extent can the results produced by artificial intelligence be understood and explained?	6
13.5	53.8	32.7	To what extent does artificial intelligence allow you to control your work and make decisions?	7
5.7	36.5	57.8	To what extent does artificial intelligence allow you to achieve more accurate and reliable results compared to traditional or previous methods?	8
5.8	19.2	75	From your point of view, to what extent can artificial intelligence be a useful tool in decision-making in complex situations or when you are dealing with large data sets in your work field?	9
36.5	42.4	21.1	In your opinion, how reliable are artificial intelligence tools in terms of data privacy?	10
19.2	48.1	32.7	To what extent do you trust clinical care that is assisted by artificial intelligence and robotics?	11
0	11.5	88.5	To what extent do you want to learn the application of artificial intelligence in your field of study?	12
3.8	26.9	69.3	How willing are you to help create artificial intelligence software or programs related to your field?	13
1.9	23.1	75	To what extent do you agree with placing the educational unit of artificial intelligence and medical robotics in the curriculum of universities of medical sciences?	14
0	19.2	80.8	In your opinion, to what extent does the integration and use of artificial intelligence in the field of medical sciences help to reduce medical errors?	15
1.9	11.5	86.6	In your opinion, how much does the progress of artificial intelligence affect decision-making in medical sciences?	16
1.9	17.3	80.8	In your opinion, to what extent is the use of artificial intelligence and robotics tools in the field of research and scientific research?	17
3.8	17.3	78.9	In your opinion, to what extent is the use of robotic artificial intelligence tools in the field of medical diagnosis?	18
9.6	21.2	69.2	In your opinion, to what extent is the use of artificial intelligence and robotics in the field of nursing?	19
3.8	11.5	84.7	In your opinion, to what extent is the use of artificial intelligence and robotics in the field of radiology?	20
11.5	13.5	75	In your opinion, to what extent is the use of artificial intelligence and robotics in the field of surgery?	21
1.9	9.7	88.4	How much impact do you think artificial intelligence will have on your future career (next 10-20 years)?	22

In addition, significant correlations were identified between demographic factors and AI-related constructs:

- Work Experience and Familiarity: A significant correlation was found (χ^2 (6) = 15.82, p = 0.015, Cramér's V = 0.16). Post-hoc analysis revealed that professors with 11-20 years of experience reported significantly higher familiarity than other groups.
- Age and Awareness: A significant negative correlation was found using Spearman's correlation (rs = -0.21, p = 0.011), indicating that younger professors tended to have higher awareness levels.
- Gender and Constructs: Female professors showed significantly higher awareness (χ^2 (2) = 8.45, p = 0.015, Cramér's V = 0.17) and more positive perspectives (χ^2 (2) = 7.90, p = 0.019, Cramér's V = 0.16) than males, while male professors showed greater familiarity (χ^2 (2) = 9.12, p = 0.010, Cramér's V = 0.18).

The willingness to learn was consistently high across all demographic groups, with no statistically significant differences found.

4. Discussion and Conclusion

This study provides insights into the attitudes and awareness of medical professors at THUMS towards AI, revealing overall positive dispositions alongside important nuances.

The findings of this study align with, and in some cases contrast, prior international research. For instance, the higher familiarity among male professors' contrasts with the findings of Sassis et al. (Sassis et al., 2021), who reported greater familiarity among females. This discrepancy could be attributed to cultural or socio-professional differences in technology engagement between the study populations. Similarly, the positive attitude towards AI integration echoes the results of Pacheco et al.

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(Pacheco-Mendoza et al., 2023) and Sassis et al. (Sassis et al., 2021), suggesting a global trend of acceptance among educators. The higher awareness among younger professors is logical, likely reflecting the increased integration of digital technology in more recent academic training.

However, our study also reveals nuances; while professors with doctorates had higher knowledge, those with master's degrees held more positive views. This intriguing finding might be explained by the different roles and perspectives within academia; doctoral faculty might be more critically aware of AI's limitations and implementation challenges, while master's-level faculty might be more focused on its immediate practical applications. This warrants further qualitative investigation

The high levels of "perceived usefulness" and willingness to learn align with global trends (Sassis et al., 2021) and can be effectively framed within the Technology Acceptance Model (TAM). The positive perspectives, especially in applied fields like radiology and surgery, suggest a high-perceived usefulness of AI for enhancing diagnostic accuracy and surgical precision (Hashimoto et al., 2020; Tajaldeen & Alghamdi, 2020). The strong willingness to learn across all experience levels further underscores this perceived utility for professional practice.

However, the findings also highlight potential barriers related to "perceived ease of use" and external variables in the TAM model. The correlation between lower familiarity and seniority, coupled with specific concerns about data privacy (a key trust factor), points to challenges that could hinder adoption if not addressed through targeted training and transparent guidelines (Mehdipour & Bardbar, 2014; Zheng et al., 2021).

The generational difference in awareness, with younger professors scoring higher, is consistent with findings by McGrath et al. (McGrath et al., 2023) and likely reflects greater exposure to digital technology during their formative education. The intriguing finding that professors with master's degrees held more positive views than those with doctorates warrants further investigation; it may suggest that doctoral faculty, while more knowledgeable, are also more critically aware of AI's implementation challenges and limitations.

This study has several limitations. First, its single-center design and convenience sampling method limit the generalizability of the findings to the broader population of Iranian medical professors. Second, the use of a three-point scale, while simplifying responses, may have reduced measurement sensitivity. Third, the reliability coefficients for some subscales, though acceptable, were below the ideal threshold of 0.8. Finally, while bivariate analyses revealed significant correlations, the absence of multivariate regression models means the independent effects of confounding variables could not be fully isolated.

In conclusion, this study demonstrates a strong foundational awareness and a positively inclined attitude among medical professors at THUMS towards the integration of AI in medicine and education. This presents a valuable opportunity for curricular modernization. To translate this readiness into effective implementation, we propose the following actionable recommendations:

1. Curriculum Integration: Introduce a mandatory, foundational AI literacy module (e.g., 16-20 hours) into the core curriculum of medical and paramedical degrees, covering basic principles, ethical considerations, and domain-specific clinical applications.

2. Faculty Development: Organize hands-on, practical workshops for professors, developed in collaboration with computer science departments or industry partners, focusing on using specific AI tools (e.g., diagnostic image analysis, LLMs like Chat GPT) relevant to their clinical and research fields.

3. Future Research: Conduct qualitative studies to explore the specific ethical concerns and implementation barriers identified here. Furthermore, undertake longitudinal, multi-center studies employing stratified random sampling to track changes in attitudes and better understand the complex interplays between demographics, knowledge, and acceptance.

4. While this study measured attitudes, it did not delve deeply into the ethical concerns or practical barriers that might temper enthusiasm for AI integration. As noted in other studies (Mehdipour & Bardbar, 2014; Zheng et al., 2021), issues like data privacy, algorithmic bias, accountability for AI-driven decisions, and the potential for dehumanizing care are significant concerns for healthcare professionals. Furthermore, the successful integration of AI into medical curricula is not merely a pedagogical decision but is also contingent on broader factors such as national educational policies, funding for technology infrastructure, and institutional readiness. Cultural dimensions, including resistance to change and the traditional hierarchy of medical education, could also present substantial implementation barriers. Future research should specifically investigate these ethical, cultural, and policy challenges to develop a comprehensive roadmap for the

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responsible and effective adoption of AI in Iranian medical education.

Authors' Contributions

All authors equally contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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