

# Understanding and Use of Artificial Intelligence Among Doctors in a University Hospital in Morocco

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**Abstract.** Introduction: Research and development in artificial intelligence (AI) has increased dramatically over the past decade, with all areas of life being affected and particularly the medical field. It is with this in mind that this study focused on the perceptions of AI by physicians at the University Hospital of Casablanca in Morocco. Methods: a cross-sectional study conducted among physicians at the University Hospital of Casablanca in April 2023. A questionnaire was distributed electronically by sending it to the participants' email addresses. Results: We received 103 responses to our questionnaire from physicians. The median age of the participants was 27 years with a range of 23-44 years. Concerning the seniority in clinical practice; about 59% had an experience ranging from 1 to 5 years, 58% agreed that the use of medical artificial intelligence technologies will complete clinical tasks quickly, and 51% of these respondents agreed that these applications increase clinical performance. Prevalence of physicians using AI in daily life was 48% with a CI [38-57] %. The concerns perceived by the responding physicians regarding the use of artificial intelligence in the medical field were in 63% of the cases reported about the reduction of human contact with patients. Conclusion: In our study doctors have good knowledge in terms of artificial intelligence and they are open to develop their medical competences in relation with this artificial intelligence.

**Keywords.** Artificial intelligence, physicians, understanding

## 1. Introduction

Artificial intelligence (AI) is described as the science of algorithms that give machines the capability to perform human-like operations and cognitive tasks for which they were not necessarily programmed, such as problem resolution, object and word recognition, and decision making.[1]

AI technologies with the ability to automate many tasks typically performed by physicians in clinical learning are being developed. So far, these developments are limited principally to research applications, but it is only a question of time before commercial adoption leads to their widespread use in daily clinical practice. [2] AI has

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been taken up in a diverse range of clinical medicine applications [3–8]; however, use of AI technologies in public health is still relatively slow.

Ideally, physicians should have sufficient knowledge about medical AI and accept the use of medical AI. This will support them to utilize the technology and contribute to the advancement of medical AI for patient care. The present study focused on the perceptions of AI by physicians at the University Hospital of Casablanca in Morocco, with a particular focus on their intention to learn and use medical AI.

2. Methods

This is a cross-sectional study conducted among physicians at the University Hospital of Casablanca in April 2023. A questionnaire was distributed electronically by sending it to the participants' email addresses. Informed consent was confirmed when the online survey was started, and convenience sampling was used.

The questionnaire included socio-demographic questions, questions about the understanding of artificial intelligence, its use in everyday practice and the concerns of practitioners regarding the adoption of artificial intelligence in their daily medical practice. The descriptive analysis was done with the Jamovi software, associations were calculated using the chi-square test, and the alpha risk was set at 5%.

3. Results

We received 103 responses to our questionnaire from physicians. The internal reliability of the survey questions was high (Cronbach's alpha 0.82). The median age of the participants was 27 years with a range of 23-44 years. There was a 75% female predominance, for status 75% of respondents were residents and 15% were interns. Concerning the seniority in clinical practice; 59% had an experience ranging from 1 to 5 years while 32% did not exceed one year.

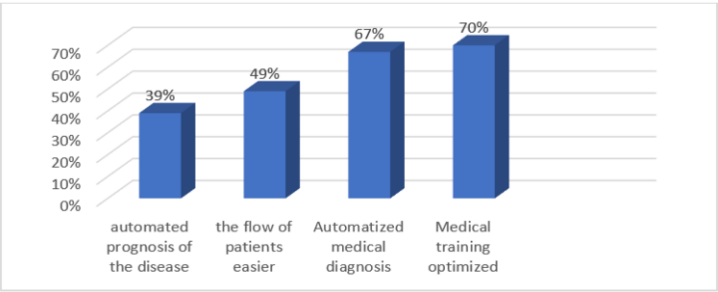
3.1. Perception of artificial intelligence by university hospital physicians

Among the responding physicians 48% confirm that they have a basic knowledge of artificial intelligence technologies, 56% of these physician's report knowing the applications of artificial intelligence in the medical field. (Table 1)

Table 1. Understanding of the basic principles of AI.

	No N (%)	I don't know. N (%)	Yes N (%)
I have a basic understanding of artificial intelligence technologies?	22(21.4)	30(30.0)	50(48.6)
AI has many applications in medicine. I know these applications?	30(29.1)	15(14.6)	58(56.3)

Among the perceived applications of artificial intelligence in medicine, 70% of respondents reported the optimization of medical training, 67% the automation of medical diagnosis. (Figure 1)



**Figure 1.** Perceived potential applications of AI in medicine

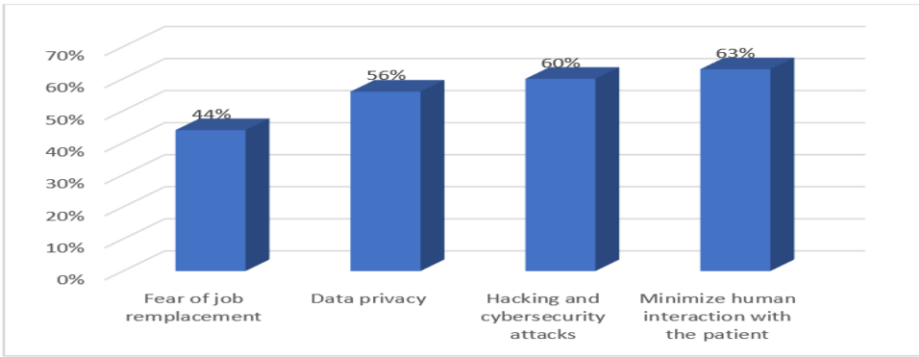
3.2. Attitudes toward artificial intelligence among physicians

Prevalence of physicians using AI in daily life was 48% with a CI [38-57] %. Among physicians 58% agreed that the use of medical artificial intelligence technologies will complete clinical tasks quickly, and 51% of these respondents agreed that these applications increase clinical performance. Most respondents (60%) were convinced that they can learn the basic concepts of medical AI, on the other hand 46% of the physicians did not understand how the AI assistant in the online guidance system handles human-machine interaction, and 65% of the practitioners agreed to pay more attention to the novelties concerning the application of AI in the medical practice. (Table 2)

**Table 2.** Attitudes toward artificial intelligence among physicians

	Disagree. N (%)	Neutral N (%)	Agree N (%)
Using AI medical technology allows clinical tasks to be completed more quickly	20(20)	23(22)	60 (58)
Using medical AI technology improves clinical performance	21(21)	29(28)	53(51)
I am confident that I can learn the basic concepts taught in medical AI courses	23(23)	18(17)	62(60)
I know how computers process medical imaging to produce visual recognition and analysis.	40(38)	28(28)	35(34)
I will pay attention to emerging applications of AI used in medical practice	17(17)	19(18)	67(65)
I understand how the AI assistant in the online patient guidance system handles human-machine interaction.	48(46)	28(27)	27(27)

The concerns perceived by the responding physicians regarding the use of artificial intelligence in the medical field were in 63% of the cases reported about the reduction of human contact with patients, followed by the fear of hacking attacks damaging the confidentiality of patients' medical data in 60% of the participants. (Figure 2)



**Figure 2.** Concerns over artificial intelligence

**4. Discussion**

The objective of this study is to examine the perceptions and attitudes of medical practitioners towards artificial intelligence (AI) technologies. In our investigation, 48% of the participants confirmed possessing a fundamental understanding of AI technologies. Among these respondents, 56% reported being acquainted with the various applications of AI within the medical domain. This level of familiarity aligns with a similar study conducted among medical and dental students, where 56.5% indicated a moderate to substantial grasp of AI's current applications in medicine and dentistry. [9]

Approximately 58% of the participants concurred that incorporating medical AI technologies could expedite clinical tasks. Likewise, 51% of these individuals agreed that these AI applications contribute to enhanced clinical performance. These findings mirror a separate study among medical students in London, where a majority of participants acknowledged AI's potential to reduce workload time (62%) and advance research and audit training (68%). [2]

Within our survey, 60% of respondents expressed confidence in their ability to grasp the fundamental concepts of medical AI. However, this figure remains relatively lower compared to a study involving radiology residents in Saudi Arabia, where 76% indicated the necessity of acquiring foundational knowledge of AI applications in medicine. [10]

Among the concerns raised by physicians, 63% of residents indicated unease regarding reduced human interaction with patients following AI integration into medical practices. A comparable sentiment was noted in a Canadian study, where non-radiology residents expressed discouragement over diminished patient contact. [11] Another noteworthy concern is the apprehension of being supplanted by AI applications, which was voiced by 44% of physicians. This apprehension significantly exceeded the levels found in a study involving radiologists and residents in Europe, where such fear did not exceed 13%. [12]

## 5. Conclusion

In our study doctors have good knowledge in terms of artificial intelligence and they are open to develop their medical competences in relation with this artificial intelligence, having nevertheless fears that can be overcome by performing in medical tools and applications based on artificial intelligence.

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