

Understanding Medical Professionals' Views on Integrating Artificial Intelligence (AI) in Medical Information Retrieval and Healthcare Information Systems

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Abstract

This study evaluates the views and expectations of postgraduate medical trainees of the Postgraduate Institute of Medicine (PGIM) regarding the use of AI-based systems for medical information retrieval and Healthcare Information Systems. The study was conducted from January to May 2023 with 106 trainees participating in a library user education programme, and the study achieved a 62.26% response rate (66 respondents). Data were collected through a Google Form questionnaire and analysed using Excel and SPSS version 23. The finding reveals different perspectives among medical professionals on the use of AI in medical information retrieval. Most respondents (63.34) were enrolled in the MD programme. Medical literature reviews (24.24%) and treatment guidelines, diagnosis, and management of diseases (18.18%) were most frequently searched information types. Important factors for evaluating AI tools were accuracy (90%), user-friendliness (80%), and speed (70%). Integration of AI in administrative and operational tasks was seen as significant (41.46%). Satisfaction with AI-generated search accuracy was moderate, with 40.91% "Somewhat satisfied" and 18.18% "Very satisfied." The need for training to use AI tools effectively was widely recognised, with 56.06% indicating some level of expertise required and 24.24% supporting extensive training. Overall, the study highlighted the importance of accurate, efficient, and user-friendly AI solutions along with sufficient training to enhance medical practice and support evidence-based decision-making.

Keywords: Artificial intelligence, Medical information retrieval, Healthcare professionals, Patient safety, Professional development

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Introduction

The integration of Artificial Intelligence technology is fundamentally becoming the driving force in the field of healthcare and offers a revolutionary transformation of several medical practice details (Topol, 2019). Through the prevailing research in medical information and the strong influence of available AI, one can realise a wide range of changes in these areas. The capability of obtaining and interpreting large volumes of medical knowledge has the potential to reform clinical decision-making, patient care, and medical surveys with speed and consistency (Esteva et.al., 2017; Raikomar et.al.,2018). As the volume and complexity of health data increases, AI is becoming an essential component of the medicine industry. AI has various forms that have been developed and are already in use. AI technology being developed for healthcare includes precision medicine, clinical decision support, radiological image analysis, and chatbots (Davenport,2019; Krishnan,2023; Intechopen,2023; Javaid, 2022). The AI technology could be used to support medical decisions by providing clinicians with real-time assistance and insights (Alowais, 2023). Though AI technologies present numerous advantages, there will always be threats and concerns along the way. Some of the major ethical challenges that the technology presents include data privacy and bias (Siala, 2022).

With an impressive expansion rate, AI algorithms in healthcare systems are offering possibilities to improve the way these systems are operated as well as providing unforeseen views into treatment variability, care procedures, diagnostics, and patient outcomes. A vast amount of research is devoted to the technical aspects of AI in healthcare, however, there is a severe dearth of information about the views of medical professionals on the integration of AI, which raises the question of how to integrate AI in healthcare. The main focus of the existing research so far has been on AI's technical capabilities, the

possibility of computerised precision in diagnosis and its role in the automation of the operational process while data gathering and processing.

The study explores how medical professionals interact with AI in healthcare. It highlights the importance of their acceptance and involvement with AI technology. Their input is essential for solving issues and ethical problems related to AI. This research aims to identify medical professionals' views on using AI for medical information retrieval to develop healthcare practices. This study will support policymakers, healthcare organisations, and AI developers in focusing on these challenges and ultimately enhance healthcare by facilitating the integration of AI into medical systems.

Statement of the Problem

The research problem focuses on how medical professionals view and utilise AI for medical information retrieval and healthcare systems. This study examines their attitudes, advantages and disadvantages, skills and training, as well as their level of interest in AI systems. By investigating these views, the research aims to understand the role of AI in healthcare and how it is integrated into the healthcare system.

Objectives of the Study

The study aims to analyse how medical professionals utilise and have confidence in the integration of AI in medical information retrieval. The study has the following objectives:

- To study the level of confidence among medical professionals in using AI tools for searching medical information.
- To reveal which types of medical information are most effectively searched using AI-based tools.

- To find and analyse the factors considered by medical professionals when evaluating the effectiveness of AI-based tools for medical information searching.
- To explore the significant advantages and integration categories of using AI-based tools in medical information searching and overall medical practice.
- To explore the knowledge, skills, and training necessary by healthcare professionals to effectively use AI technologies in medical research, education, and training.

Review of Literature

The formation of AI and healthcare will announce a revolutionary period, through the utilisation of AI in medical search information which is of great potential (Choy et al., 2018). Historically, medical professionals have faced a challenging obstacle that of getting and processing, timely and accurate processing of an ever-increasing of medical knowledge, which is exponentially growing. The AI has the capability of not only simplifying the research process but also providing data-based insights through machine learning and natural language processing. This is why the future of business analytics appears to be increasingly dependent on AI (Holzinger et al., 2017). The medical professionals' attitudes and perceptions about AI in medical information searching are understudied in this research. The important issues addressed in the research include acceptance, trust, perceived benefits, concerns, proficiency, training needs, alignment with medical priorities, and the healthcare system's readiness to meet the changing AI landscape. By highlighting these complexities, this paper contributes to the discussion of AI integration in healthcare to meet the greatest need to integrate AI into the general practice of evidence-based medicine.

For AI to become a visible solution in healthcare, medical practitioners must first accept and be willing to use it to (Obermeyer et al., 2016). Their specialised knowledge and views of these experts can be highly useful in the formation of AI medical records, which involve medical information. Studies conducted in Ghana about radiographers' views on the usage of AI in medical imaging (Botwe et.al., 2021). While the majority had a positive attitude towards AI integration, radiologists expressed concerns about AI related errors and job security. Similarly, Lennartz et al. (2021) evaluated patients' perceptions of the employment of AI in various elements of the medical process. According to the study, medical experts in the specialities most affected by AI support its introduction and see it as a tool to supplement their jobs.

Grunhut et al. (2021) emphasised the importance of including AI in medical education courses to educate future physicians about AI's transformational influence on healthcare. Pedro et al. (2023) examined Portuguese medical professionals' views on AI's influence, benefits, and disadvantages of artificial intelligence in healthcare. The findings assist in facilitating the professional integration of AI in medical practice in Portugal, which aids in the integration of AI in healthcare. Martinho et al. (2021) investigated the ethical difficulties of the use of AI technology in healthcare, as well as medical physicians' perspectives on these topics. In 2020, Amann, J. et al. carried out a systematic analysis of the function of explainability in medical AI and an ethical evaluation of the distinctions between AI-based clinical decision support and normal diagnostic instruments. Health professionals may apply AI technology to enhance patient care and community health, as mentioned by Lomis et al. (2021). Zheng et al. (2021) analysed Chinese medical personnel's opinions towards artificial intelligence in ophthalmology. The study found that some

medical personnel felt AI may replace physicians, emphasising the need to address issues and ethical problems in the integration of AI into medicine. Some research has explored the use of AI in healthcare, including diagnostic tools (Esteva et al., 2017) and predictive analytics (Rajkomar et al., 2018). Overall, the research found that medical professionals, especially radiographers, have generally positive opinions about using artificial intelligence in medical imaging.

This study aims to examine how medical professionals use AI to find medical information and healthcare information systems. Understanding their perspectives will be able to guide the development of AI solutions that meet the needs and expectations of medical professionals. Additionally, the perception of medical professionals' attitudes and perspectives towards AI integration facilitates the acceptance of these technologies, potentially enhancing healthcare services and patient outcomes.

Methodology

The questionnaire was created using the web platform Google Form, and the data was analysed using Excel and SPSS version 23. The sample of the study is the PGIM postgraduate medical trainees who participated in the library user education programme from January to May 2023. A total of 106 postgraduate medical trainees participated in the study, with 66 of them actively responding to the Google Form, resulting in a rate of 62.26%.

Results and Discussion

The research findings revealed that there are different viewpoints among medical professionals about the usage of AI in medical information retrieval and healthcare information systems.

Table 1 shows the enrolled statistical information, categorised by postgraduate trainees based on their selected courses of study. According to Table 1, the course has 66 registered postgraduate medical trainees.

Table 1: Enrolled in the Programme of the PGIM

Course	No of Respondents	Percentage
Certificate	2	3.03
Diploma	3	4.54
Masters	19	28.79
MD	42	63.64
Total	66	100

Table 1 and Table 2 data show how many PG trainees enrolled in various courses and employed in different positions. The highest number of respondents are enrolled in the MD programme (63.64%), followed by those in the Masters programme (28.79%), Diplomas (4.54%), and Certificates (3.03%). In terms of professional roles, the highest number are Registrars (39.39%), then Medical Officers (34.85%), Senior Registrars (13.64%), Pre-Registrars (9.09%), and finally, Dental Surgeons (3.03%).

Table 2: Professional Designations

Professional Designation	No. of Respondents	Percentage
Medical Officers	23	34.85
Pre- Registrar	6	9.09
Registrar	26	39.39
Senior Registrar	9	13.64
Dental Surgeon	2	3.03
Total	66	100

Table 3 shows the medical information that medical professionals search for in their education and clinical practice. This information is frequently sought by medical trainees to assist them in making decisions.

Table 3: Types of medical information

Medical information frequently sought by doctors	Frequency	Percentage
Medical literature reviews	16	24.24
Treatment guidelines, Diagnosis and management of diseases	12	18.18
Treatment guidelines, Diagnosis and management of diseases, Medical literature reviews	11	16.67
Treatment guidelines, Drug information, Diagnosis and management of diseases	7	10.61
Treatment guidelines, Drug information, Diagnosis and management of diseases, Medical literature reviews	8	12.12
Treatment guidelines, Drug information, Diagnosis and management of diseases, Medical literature reviews, Case studies, narratives, discovery of viruses, infection control, biosafety, vaccines	4	6.06
Treatment guidelines, Drug information, Diagnosis and management of diseases, Medical literature reviews, Health Information System related content	3	4.55
Treatment guidelines, Drug information, Diagnosis and management of diseases, Medical literature reviews, Journal articles	2	3.03
Treatment guidelines, Drug information, Medical literature reviews	3	4.55
Total	66	100

Medical professionals frequently seek specific types of medical information as shown in table 3. Sixty-six PG trainees were surveyed regarding their information needs. The highest interest is in medical literature reviews, with 24.24% of PG trainees actively searching for the most recent research and publications. Those focused on treatment guidelines, diagnosis, and illness management are close behind, with 18.18% of the followers showing a significant interest in clinical practice and patient care procedures. 16.67%, includes treatment recommendations, diagnosis, illness management, and medical literature studies, demonstrating a complete approach to medical knowledge achievement. According to this, medical professionals often seek information about medical literature reviews, treatment guidelines, and

diagnosis and management of diseases, for the majority of their information needs. It shows their commitment to following evidence-based practices and staying up to date on healthcare developments.

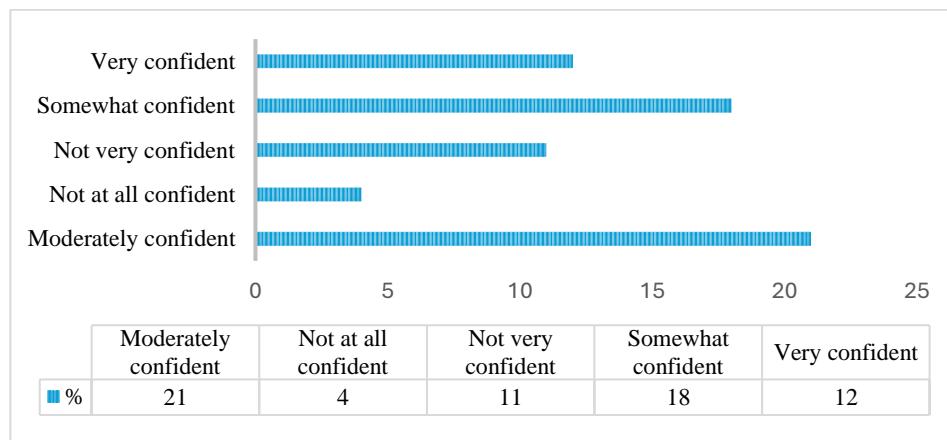


Figure 1: Confident to use AI-based tools for medical information searching

Figure 1 presents the data on user confidence in utilising AI-based tools for medical information seeking. Four percent, which includes individuals who are 'Not at all confident' and 11% 'Not very confident', appear to have concerns or doubts about their ability to effectively utilise AI-based technologies for medical information searches. Respondents show diverse levels of confidence, with 'Moderately confident' (21%), 'Somewhat confident' (18%), and 'Very confident' (12%) indicating a significant level of comfort and certainty in their ability to use AI technologies for medical information searches. The confidence in using AI-based tools for searching medical information varies among healthcare professionals, with a significant percentage displaying moderate confidence.

In Figure 2, PG trainees were asked to express their views regarding the types of medical information that they believe are most suitable for AI-based

searching. The results revealed that a significant majority of respondents found several categories of medical information highly suitable for AI assistance.

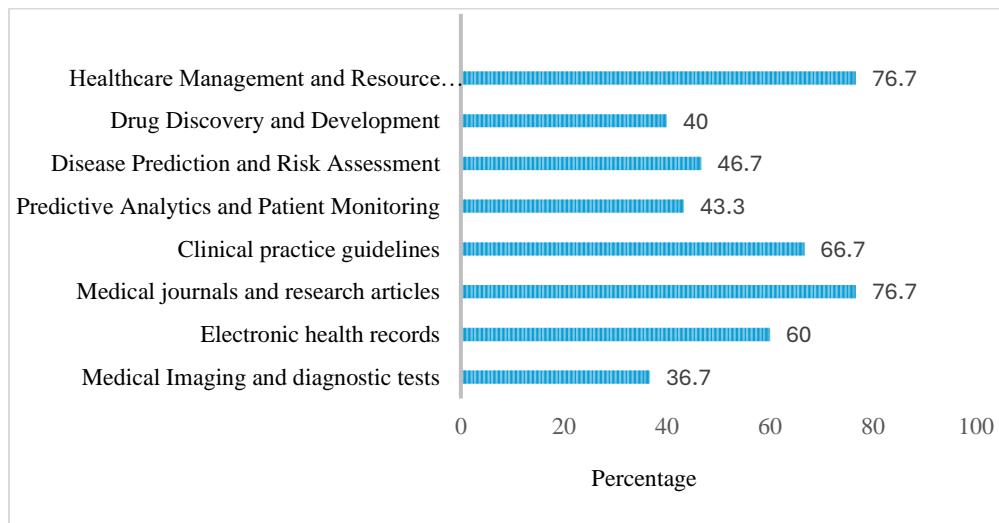


Figure 2: Types of medical information are best suited for AI-based searching

Specifically, 76.7% of PG trainees believed that medical journals and research articles are well suited for AI-based searching, while the same percentage considered electronic health records to be suitable for AI utilisation. Clinical practice guidelines and healthcare management/resource optimisation received substantial support, with 66.7% and 76.7% of respondents, respectively, indicating their suitability for AI assistance. Predictive analytics and patient monitoring, along with disease prediction and risk assessment, generated considerable interest, with 43.3% and 46.7% of respondents recognising their potential for AI-driven improvements. Drug discovery and development, slightly lower in percentage at 40%, represented a significant proportion of respondents who saw potential in this area. According to these findings, medical professionals agree that AI can be used for searching and making decisions regarding medical information.

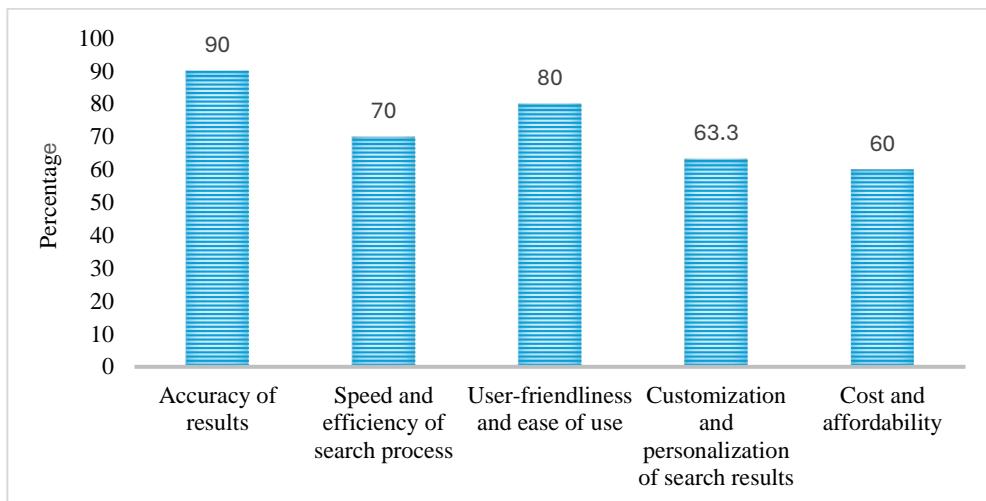


Figure 3: Considering factors when evaluating the effectiveness of AI-based tools for medical information searching

The role of AI-based resources for medical information search is multi-faceted, and evaluating their performance is crucial. The most important is the accuracy of outcomes, which holds the highest at 90%. Providing correct and trustworthy data in the medical field is essential, as decisions often rely on the quality of information. The speed and efficiency of the search process, at 70%, are particularly significant since quick access to essential medical information can directly influence patient care and decision-making. User-friendliness and ease of use at 80%, emphasise the necessity for a simple and accessible interface to support effective utilisation. Customisation and personalisation of search results, at 63.3%, increase relevance and usability. As a result of these findings, there is a growing demand for accurate, user-friendly, and efficient medical information retrieval tools, as well as customisation and cost-effectiveness.

Figure 4 indicates the primary benefit of medical information retrieval. The data reveals that “Time savings” stands out prominently, with 19.51% of

respondents considering it a “Very high” advantage and an additional 9.06% rating it as “High”.

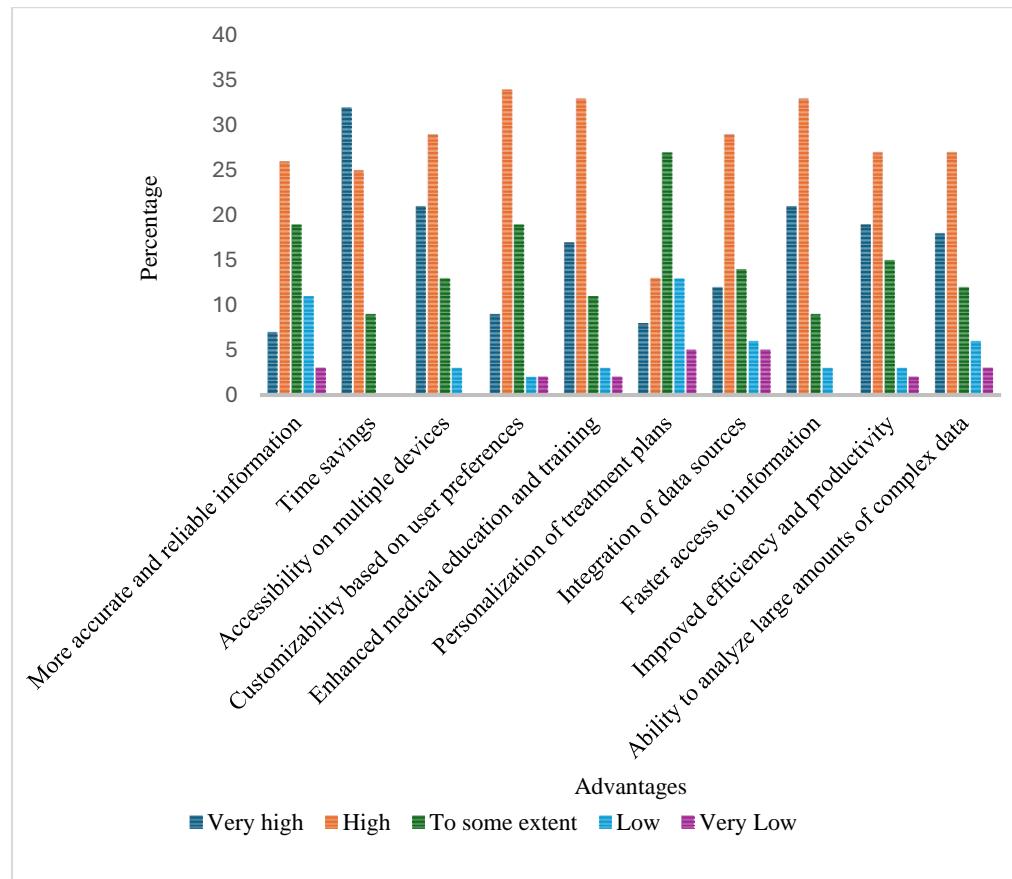


Figure 4: The most significant advantage of using AI-based tools for medical information searching

This emphasis on time efficiency highlights the critical role of AI in updating information retrieval and enabling healthcare professionals to access essential data quickly, ultimately leading to more efficient patient care and decision-making. Additionally, “More accurate and reliable information”, with 4.27% rating it as “Very high” and 9.42% as “High” focuses on AI’s potential to enhance the quality and reliability of medical information. These findings reflect a clear need for AI-powered solutions that improve efficiency, accuracy, and user-friendliness in medical information retrieval.

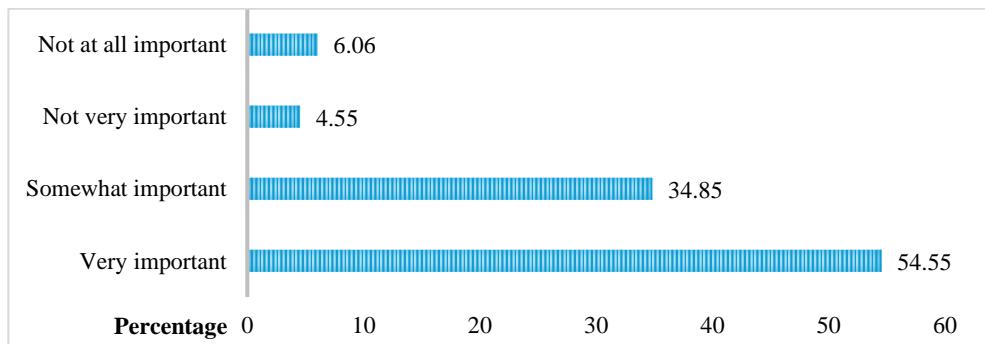


Figure 5: Medical professionals to stay up to date with the latest AI-based technologies

The data from Figure 5 shows a strong consensus among respondents regarding the importance of medical professionals staying up to date with the latest AI-based technologies in healthcare. A significant majority, 54.55%, consider it “Very important”, highlighting the recognition of AI’s transformative potential in revolutionising healthcare practices. An additional 34.85% view it as “Somewhat important”. Only a small percentage, 4.55%, regard it as “Not very important”, and an equally minimum of 6.06% find it “Not at all important”. Overall, the data highlights a substantial level of awareness and recognition among medical professionals regarding the importance of keeping informed about AI-based developments in the healthcare sector.

According to the survey results Figure 6, there is a strong agreement on the necessity of AI-based technologies that can discover and recommend appropriate clinical guidelines and best practices in the healthcare industry. A majority, 48.48%, view it as “Very important”, suggesting a great appreciation for the critical role that AI may play in supporting evidence-based decision-making and adherence to established therapeutic standards. Furthermore, 34.85% consider it “Somewhat important”, demonstrating that even those who do not consider it the top priority recognise its importance.

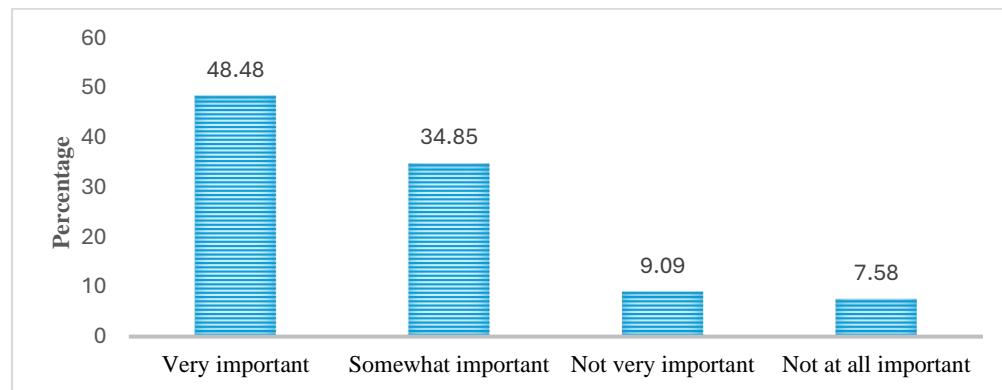


Figure 6: AI-based tools to be able to identify and suggest relevant clinical guidelines and best practices

Only 9.09% think it's "not very important", and 7.58% think it's "not at all important". These findings reflect the healthcare community's consensus on the critical role AI may play in improving healthcare quality and safety. Overall, the data shows that respondents agree that AI technologies are important for making it easier to find and promote pertinent clinical guidelines and best practices in healthcare.

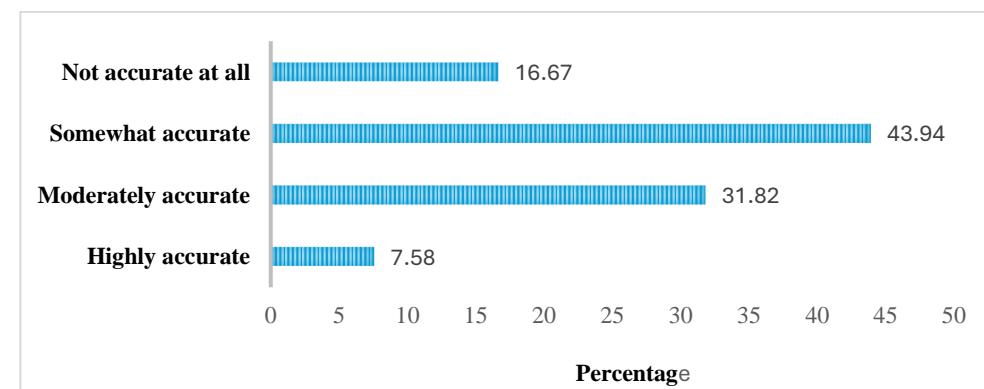


Figure 7: Accurate the diagnostic or treatment recommendations provided by AI-based tools

Figure 7 shows that the responses of healthcare professionals, patients and medical experts vary from an extremely high confidence to a low confidence

level about the accuracy and prevention that the implementation of AI-based systems in healthcare can offer. The majority (43.94%) assess these recommendations as “Somewhat accurate”, indicating that AI technologies can be relied upon to some extent but may not always be. Furthermore, 31.82% of respondents assess the recommendations as “Moderately accurate”, demonstrating moderate confidence in AI’s ability to diagnose and cure health problems. However, 16.67%, express doubt and rate the advice as “Not accurate at all”. Only 7.58% of respondents think AI-based technologies offer “Highly accurate” suggestions. Table 7 emphasises the role of AI in healthcare and the need for continuous improvement and validation to ensure that recommendations based on AI are consistently accurate.

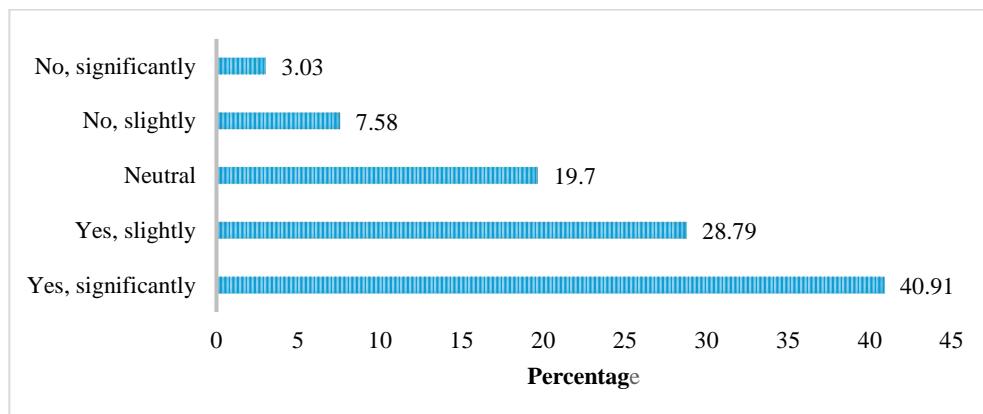


Figure 8: AI-based tools help reduce medical errors and improve patient safety

Figure 8 data of the research identifies the fact that AI-based technologies can lead to better safety of patients and fewer medical errors thus contributing to the progress of the healthcare industry. Of the individuals who approve of AI’s ability to provide solutions to these areas 40.91% believe it can maintain this level of effect. Furthermore, 28.79% said they have some confidence in AI’s potential by responding “Yes, slightly”. While there is 19.70% of respondents

continue to hold a “Neutral” position, indicating a need for more information and confirmation before concluding. Only 3.03% of respondents believe that AI will “No, significantly” improve patient safety and reduce medical mistakes, while, 7.58%, have a doubtful perspective and say that it can “No, slightly” help. Overall, the majority of respondents are confident about the potential of AI-based solutions to improve patient safety and reduce medical errors, with fewer expressing uncertainty or neutrality about the topic.

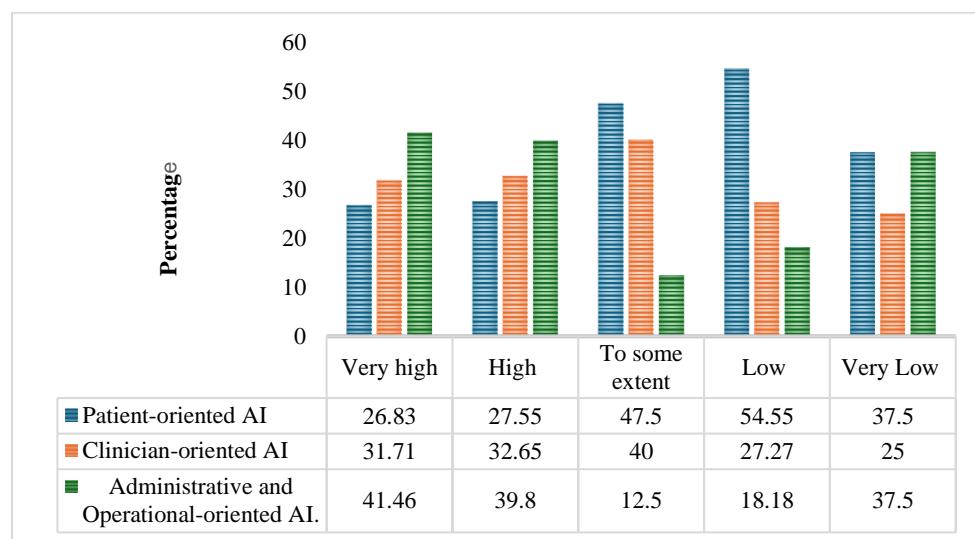


Figure 9: Most significant integration category of using AI-based tools

According to Figure 9, respondents consider integrating AI-based solutions in the “Administrative and Operational-oriented AI” area to be the most important. A significant 41.46% of participants regard it as “Very high” importance, with an additional 39.8% ranking it as “High”. This indicates that there is broad consensus on the potential of AI to improve administrative and operational elements of healthcare, such as resource allocation and workflow management. “Clinician-oriented AI” also receives much attention, with 31.71% rating it as “Very high” and 32.65% rating it as “High”, underscoring the relevance of AI in supporting healthcare practitioners with clinical

decision-making. Meanwhile, “Patient-oriented AI” has a more mixed reaction, with 47.5% saying it is “to some extent” important. The data shows that the respondents think that the administrative and operational-oriented AI is the most relevant group of AI systems, and the clinician-oriented AI is the significant part right after it, while the patient-oriented AI is considered a lower, though, the first two categories.

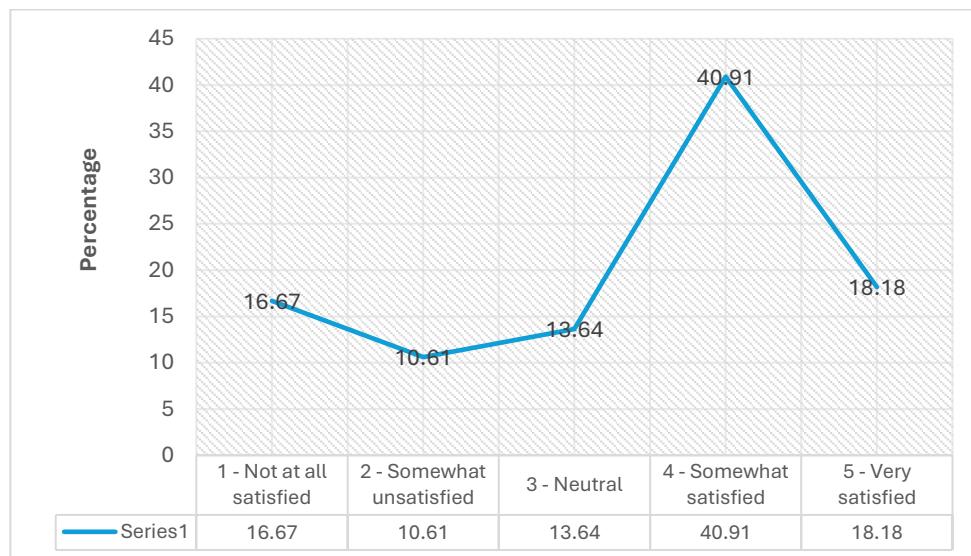


Figure 10: Satisfied with the accuracy of search results generated by AI-based tools

The survey’s findings Figure 10 show a range of opinions on the accuracy of search results produced by AI-based technologies. At 40.91%, express a favourable opinion and say they are “Somewhat satisfied” with the accuracy. Furthermore, 18.18% of respondents say they are “Very satisfied”, suggesting greater satisfaction. But a significant of respondents, with 16.67% saying they are “Not at all satisfied” and 10.61% saying they are “Somewhat unsatisfied”. 13.64% of participants declared themselves “Neutral”, indicating they would need more time or better AI-based search accuracy before concluding. These findings highlight the need for continued AI tool validation and development

as they demonstrate the conflicting perspectives about the accuracy of AI-generated search results.

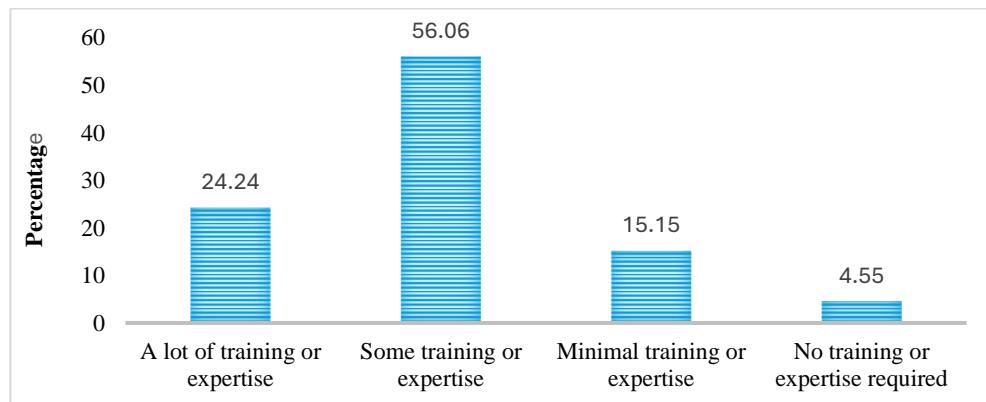


Figure 11: Training or expertise is required to effectively use AI-based tools for medical education, training and research

The results represent Figure 11, a wide range of perspectives on the amount of training or experience necessary to effectively employ AI-based technologies for medical education, training, and research. A significant number of respondents, 56.06% of participants believe that there should be some training or expertise to fully utilise the potential of AI technologies. These percentages specify that the AIs are effective to a certain extent only when the person who is using them understands them. Furthermore, 24.24% believe "a lot of training or expertise" is necessary, indicating an understanding of the difficulties and potential that "minimal training or expertise" is adequate, reflecting a more positive assessment of user-friendly AI products. According to 4.55% of respondents, "no training or expertise is required," suggesting a lack of expertise. The data shows that some level of training or knowledge is required to use AI-based solutions in the medical profession.

Conclusion

This study examined the perceptions and expectations of PGIM postgraduate medical professionals regarding the integration of AI-based systems for medical information retrieval and healthcare information systems. The findings showed that there are a variety of attitudes among medical professionals about the role of AI and its skills for positive changes in the field of medicine. Healthcare professionals' confidence level in utilising AI-based tools for medical searches varies, and they consider accuracy and user-friendliness to enhance their information-seeking behaviour. In addition, integrating AI into healthcare information retrieval extends advantages such as easier access to medical information and enhanced decision-making abilities.

The findings of the research reveal that AI offers significant benefits for healthcare information retrieval. As a result of using AI technology, medical professionals can access up-to-date information more easily, enhance their decision-making practices, and reduce the risk of medical errors. These technologies increase patients' safety by providing medical professionals with necessary information and assisting them to make more accurate and responsible decisions. Regarding the development of healthcare professionals and their ability to effectively use AI tools in medical education and training, research, and other areas, this has given some important features regarding the trends in healthcare practices and technologies. Research findings show that the impact of AI on healthcare will depend on the skills of healthcare professionals to adapt to the new era. Overall, as AI technology advances into a more prominent role in healthcare, it will enhance patient satisfaction and improve outcomes significantly.

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