Original Article
DOI: https://doi.org/10.70749/ijbr.v4i1.2827

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://ijbr.com.pk
ISSN: 2960-2793/ 2960-2807

Readiness for AI-Enabled Healthcare Systems: Insights from Healthcare Professionals

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ARTICLE INFO

Keywords: Artificial Intelligence, AI-Enabled Healthcare Systems, Healthcare Professionals, Readiness Assessment, Attitudes toward AI, Clinical Decision Support, Digital Health, Healthcare Technology Adoption, Ethical Challenges, Medical Education.

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Declaration
Authors' Contribution
All authors equally contributed to the study and approved the final manuscript

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History
Received: 22-10-2025 Revised: 06-01-2026
Accepted: 12-01-2026 Published: 30-01-2026

ABSTRACT

Background: Artificial intelligence is a gradually advancing field that is being integrated into healthcare to help with clinical decision-making, improve patient safety, and operational efficiency. Even though AI-supported healthcare systems are becoming more popular, it is important to note that successful adoption of the technology depends significantly on the readiness of healthcare professionals who should apply these technologies in the clinics. To create a sustainable, efficient, and effective AI implementation into a healthcare environment, their awareness, attitudes, readiness, and perceived challenges need to be evaluated. **Objective:** This study was aimed at assessing the awareness, attitudes, preparedness and perceived challenges and future expectation of the healthcare professionals with regard to AI-enabled healthcare systems. **Methods:** The survey was a quantitative cross-sectional survey design. The sample population used in this research was 350 health care workers who were represented through medical doctors, nurses, pharmacists, allied health professionals, health care administrators. The data was collected with the help of a structured self-administered questionnaire comprising of demographic variables, knowledge regarding AI in healthcare, beliefs about AI-enabled systems, willingness to use AI, perceived barriers to implementation, and future expectations. Descriptive statistical analysis was carried out with frequencies and percentages and results were given in tables and figures. **Results:** The findings revealed a great awareness of the topic of artificial intelligence in healthcare, and the majority of the respondents were familiar with the concept of AI and clinical use. The reactions towards the healthcare systems that were AI-enabled were largely favorable, particularly regarding the improvement in the quality of the diagnoses and patient safety. Majority of the interviewees indicated that they would not hesitate to implement AI systems and accept the technological development. Organizational readiness, however, was described as moderate, and a smaller number of respondents indicated that their organizations were technologically ready to integrate AI. The key challenges that were identified were issues with data privacy, expensive implementation, ethical considerations, and insufficiency of technical expertise. Nevertheless, despite the difficulties, the respondents showed an optimistic attitude to the future of AI and gave strong support to the adoption of AI in medical education and the creation of clear regulations. **Conclusion:** It is concluded that healthcare providers have positive attitudes and intentions towards AI-enabled healthcare systems, yet effective application must be supported by better organizational preparedness, specific training opportunities, and strong ethical and regulatory actions. The presence of these factors is important to address in order to achieve the responsible and successful introduction of artificial intelligence to a healthcare practice.

INTRODUCTION

The swift development of artificial intelligence started to transform healthcare systems all over the world, affecting the manner of medical services delivery, management, and assessment. AI-based health care systems have a broad scope that covers machine learning algorithms, predictive analytics, natural language processing, and automated decision support systems [1]. Such technologies are gradually finding their way into clinical practice to help with the diagnosis, treatment planning, monitoring of patients and administration management [2]. With the mounting demands on healthcare systems due to the escalating number of patients, insufficiency of resources, and the complexity of healthcare provision, AI is

frequently brought up as an effective solution that can enhance the efficiency, accuracy, and the general quality of healthcare delivery [3].

Although there is an increasing trend in interest and investment in AI-based healthcare solutions, the success of the implementation is largely reliant on whether healthcare professionals are ready to engage with such systems in their day-to-day practice [4]. The healthcare professionals are the key to the implementation and successful use of AI technologies, and they are the main users who interpret the AI-generated outputs and translate them to clinical decision-making [5]. Their awareness, attitudes, abilities and readiness to interact with AI systems have a direct impact on whether these technologies will improve patient care or not be used at all [6]. Unless adequate readiness is undertaken by healthcare professionals, AI-enabled systems may be viewed as disruptive, unreliable, and non-congruent with clinical realities [7].

The readiness of AI-based healthcare systems is not limited to the technological presence. It possesses a number of dimensions, including knowledge about the concepts of AI, trust in the utilization of digital tools, acceptance of AI-mediated decision-making, and trust in the ethical and regulatory measures that govern these technologies [8]. Infrastructure, training, and institutional support gaps connected with the use of AI also exist in most healthcare settings, particularly in developing and transitional systems [9]. Such uncertainties could lead to resistance, doubt, or skepticism among healthcare professionals, although the value of AI is often perceived [10].

The other factor that should be considered is the ethical and legal concerns about AI in healthcare [11]. The problems of Data privacy, patient confidentiality, biasing of algorithms, accountability, and transparency continue to be the points of concern in the professional attitudes toward AI technologies. Coordination Health workers are generally cautious about using systems that are black boxes where the decision-making process is not fully understood [12]. This caution is amplified by the fear that AI may compromise professional autonomy or redistribute responsibility in a vague or legally ambiguous way. These issues should be addressed to establish trust and willingness among healthcare professionals [13].

Another significant way of creating AI adoption preparedness is training and education. Most medical employees did not receive much formal training on artificial intelligence during their academic or professional training [14]. They may then be unprepared to evaluate AI tools critically or be ready to implement them to clinical workflow, without reservations. Planned training, lifelong learning, and the incorporation of AI-related content in medical and other related health fields into the curriculum are starting to be viewed as the necessary steps toward filling this knowledge gap [15]. Even systems that are technologically advanced cannot deliver the desired effects unless they are well trained.

Moreover the organizational readiness is another key factor that has an impact on individual readiness. Healthcare facilities that encourage innovation, offer technical assistance, and engage clinicians in the development and adoption of AI systems are also likely to generate more favorable attitudes to adoption [16]. On the other hand, the work environments, which are marked by low levels of resources, excessive workloads, and low-quality communication, could support resistance to change [17]. It is thus important to know how organizational variables interplay with personal perceptions to come up with effective AI implementation strategies [18].

Since artificial intelligence has transformative potential and given the role of healthcare professionals in adopting AI-enabled healthcare, it is becoming essential to determine how ready healthcare professionals are to adopt AI-enabled healthcare systems. The analysis of the level of awareness and attitudes, perceived challenges and acceptance among the healthcare professionals would be useful to the policy makers, healthcare and technology administrators. The knowledge can be applied in making certain interventions, training programs, and policy frameworks to aid in ensuring AI adoption in healthcare is responsible and effective. This study will contribute to this expanding body of knowledge by examining the question of readiness to AI-powered healthcare systems through the lens of healthcare professionals, and finding the opportunities and challenges that emerges within the environment of the implementation of AI into clinical practice.

LITERATURE REVIEW

Artificial Intelligence in Healthcare

One of the revolutionary elements of the modern healthcare system is the artificial intelligence, and the instruments that are able to process a tremendous quantity of information and perform it quicker and more accurately than a human. Applications of AI in healthcare include: disease prediction, medical imaging analysis, personalized treatment planning, robotic surgery, and automated administration [19]. The aim of such applications is to enhance clinical accuracy, clinical errors and to optimize the use of healthcare resources [20]. As the number of data-driven healthcare systems grows, AI technologies take their place as the source of evidence-based and precision medicine.

Benefits of AI-Enabled Healthcare Systems

The possible advantages of AI in enhancing healthcare results have been emphasized in numerous studies [21]. Diagnostic systems based on AI have been shown to be very accurate in identifying diseases like cancers, cardiovascular diseases, and neurological diseases. Moreover, AI applications can help forecast the further development of diseases and determine high-risk patients and provide earlier interventions [22]. To continue with the operational aspect, AI systems help in promoting efficiency by simplifying documentation procedures, scheduling, and billing so that healthcare professionals can dedicate additional time to direct work with patients [23]. Such perceived advantages have led to increased interest in the adoption of AI in the healthcare industry.

Healthcare Professionals' Attitudes Toward AI

The fact that attitudes of healthcare professionals towards AI are decisive in terms of adoption and implementation

[24]. Good attitudes are even accompanied by the attitude towards better efficiency, less work load, and better clinical decision-making. Nevertheless, not all attitudes are positive, and skepticism still stands pervasive in most of the settings. Certain medical practitioners urge that AI can simplify complicated clinical decisions or that it cannot take into account situational and patient-specific factors [25]. The belief in AI systems is also closely connected to transparency, reliability, and how professionals perceive that their expertise is being supplemented instead of substituted.

Readiness and Acceptance of AI Technologies

Readiness to healthcare systems that are AI-enabled has cognitive, technical, and psychological aspects. Cognitive readiness is the knowledge of the concepts and applications of AI, whereas the technical readiness is the capacity to use AI-based tools efficiently [26]. Psychological readiness will be openness towards change, trust in technology, and the desire to use the AI-escalated insights. It has been indicated that increasing degrees of readiness are linked to preexisting experience in interactive health technologies and favorable organizational cultures [27]. The adoption of AI can be facilitated by the perception of AI as an assistant by the healthcare professionals, as opposed to a threat to professional autonomy.

Barriers to AI Adoption in Healthcare

Though it can be effective, there are a number of obstacles to AI implementation in healthcare. Among the most commonly mentioned issues are data privacy and data security concerns especially in settings that are weakly regulated [28]. The issue of accountability, informed consent, and algorithmic bias also create ethical issues that make adoption more difficult. Healthcare organizations are also hit by financial constraints such as the high implementation and maintenance expenses [29]. Also, technical skills and undertraining are the reasons of resistance and low confidence among healthcare professionals.

Role of Training and Healthcare Education

Training and education have been mentioned consistently as the key elements of enhancing the preparation to adopt AI [30]. Healthcare providers with systematic education on the issue of digital health and AI-related concerns are more likely to show greater confidence and acceptance levels. The programs of continuous professional development in the field of AI literacy can be used to clear up the confusing technologies and encourage the responsible usage [31]. The integration of AI training at both undergraduate and postgraduate levels of health education is being increasingly seen as a long-term intervention to equip future professionals with technological-driven healthcare settings.

Organizational and Policy Considerations

In the medical field, AI preparedness is largely influenced by the policy frameworks and organizational support. Companies, which involve medical personnel in decision-making processes related to AI implementation, will have a successful adoption [32]. Clear policies, codes of conduct and regulatory measures are helpful in the solution of the problem that is related to accountability and patient safety [33]. Policymakers play an important role in setting standards to ensure safe, ethical, and effective use of artificial intelligence in healthcare systems [34]. In order to make AI integration sustainable, technological innovation and professional practice and regulatory oversight should be aligned.

Objectives of the Study

1. To assess the level of awareness and knowledge of artificial intelligence among healthcare professionals.
2. To examine healthcare professionals' attitudes toward AI-enabled healthcare systems.
3. To evaluate the readiness and acceptance of healthcare professionals for adopting AI technologies in healthcare practice.
4. To identify perceived challenges and barriers associated with the implementation of AI in healthcare.
5. To explore healthcare professionals' perspectives on the future integration of AI in healthcare systems.

METHODOLOGY

Study Design

The research paper was conducted in a quantitative, cross-sectional survey to determine the preparedness of medical workers to AI-based healthcare systems. A cross-sectional study was regarded as a suitable method because it will enable the researcher to gather information about a wide sample of respondents at one time that will give a summary of knowledge, attitudes, preparedness, perceived obstacles, and the future outlook concerning artificial intelligence in healthcare practice.

Study Population and Sampling

The population sample included healthcare professionals working in clinical and administrative positions such as medical doctors, nurses, pharmacists, allied health professionals and healthcare administrators. The convenience sampling method was applied as it was the easiest approach to use and time-constrained. This approach allowed including respondents of different professional backgrounds and levels of experience that would guarantee diversity in opinions regarding the use of AI in the healthcare environment. The sample size of 350 healthcare professionals was deemed to be sufficient to yield meaningful results and achieve statistical representation.

Data Collection Instrument

A self-administered, structured questionnaire that was designed in this research was used to collect the data. The questionnaire was prepared based on the analysis of the related literature on artificial intelligence in healthcare and readiness assessment. It consisted of five main sections: demographic characteristics, awareness of AI in healthcare, attitudes toward AI-enabled healthcare systems, readiness for AI adoption, perceived challenges, and future outlook regarding AI integration. A three-point Likert scale with Agree, Neutral, and Disagree was taken as the measuring tool of most items to make them easier to respond to and be interpreted.

Data Collection Procedure

The questionnaire was sent electronically and in a hardcopy to the medical practitioners in hospitals, clinics and healthcare organization. The respondents were made aware of the study purpose and assured that their feedback would only be utilized in academic and research purposes. The respondents were free to participate in the process, and they had enough time to fill in the questionnaire. Questionnaires completed were gathered and checked against completeness before data was entered.

Data Analysis

The obtained data has been coded and entered into statistical software to be analyzed. A summary of the data was conducted in terms of the descriptive statistics, including the frequencies and the percentages of respondents to demographic variables and respondents to the questionnaires. The results were displayed in tables and figures to make it easier and understandable. The purpose of the analysis was to identify the trends related to awareness, attitudes, readiness, perceived challenges, and future expectations of AI-enabled healthcare systems.

Ethical Considerations

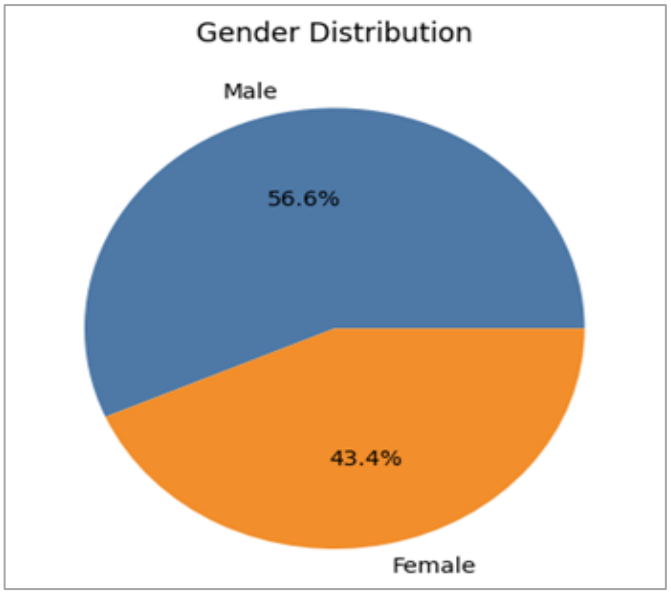
Ethical principles have been observed in the study. The respondents were not coerced to participate in the study and no data was gathered without the consent of the respondents. The anonymity and confidentiality of the respondents were also taken care of since personal identifiers were not included in the questionnaire. The respondents were told that they had the right to drop out of the study at any point without any repercussions. The study was conducted in accordance with ethical standards for research involving human participants.

Findings of the Study

Findings of the study refer to the most important results or outcomes of the analysis of the collected data. They provide a summary of what the research found out, presenting patterns, relationships, trends, or important facts concerning the research purposes.

Figure 1

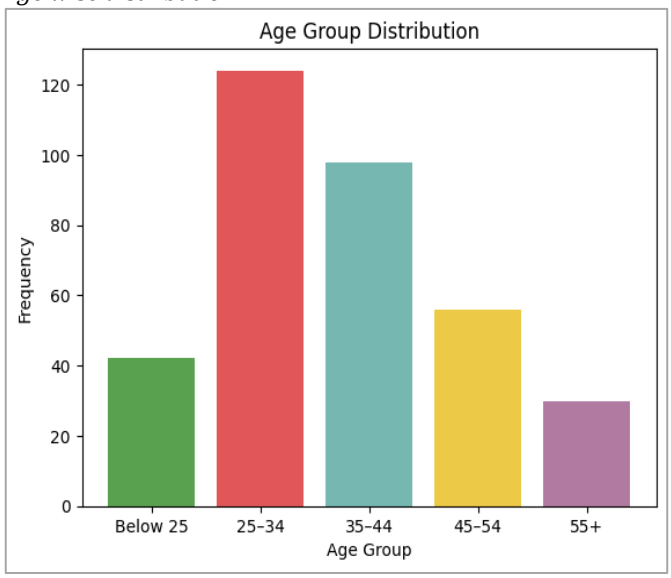
Gender distribution



The statistics show that the sample is predominantly male, with 198 male respondents (56.6%) in comparison to 152 female respondents (43.4%). This distribution indicates a rather equal distribution of gender, although a higher percentage of the participants in the study is male.

Figure 2

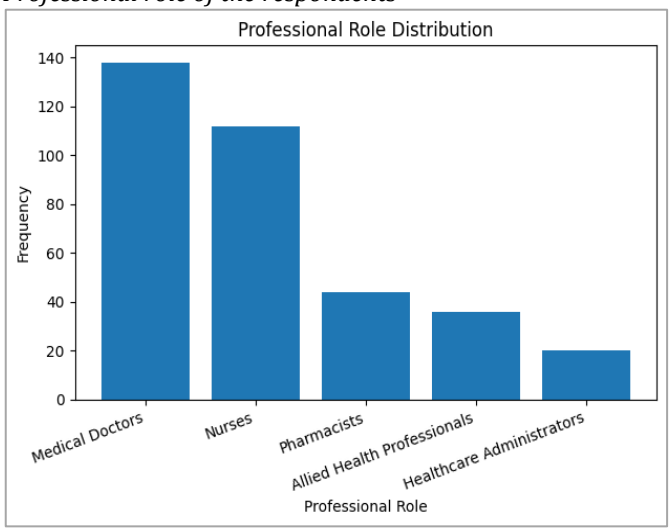
Age wise distribution



The age distribution indicates that most of the respondents are at the age group of 25-34 (35.4%) years, then there are those of age between 35 and 44 (28.0%) years. The highest percentage of participants is 16.0% between 45-54 years and 12.0% under 25 years. Respondents with the age 55 years and above (8.6%) are the least represented meaning that the sample consists of mostly young and middle aged respondents.

Figure 3

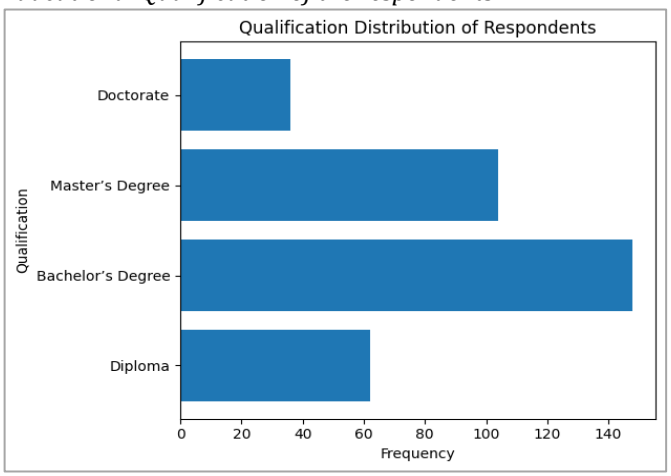
Professional role of the respondents



The findings show that the larger proportion of respondents is represented by medical doctors (39.4%), then by nurses (32.0%). Pharmacists take 12.6% with allied health professionals having 10.3% of the sample. The smallest proportion (5.7) is made up of healthcare administrators which implies that the study is mainly an expression of clinical healthcare staffs as opposed to administrative staffs.

Figure 4

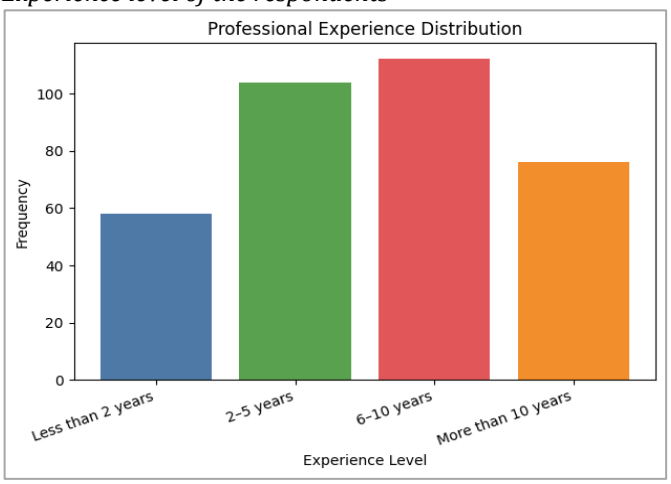
Educational Qualification of the respondents



The results indicate that most of the respondents have a Bachelor (42.3%) degree and then there are those with a Master degree (29.7%). The highest percentage (17.7%), is comprised of the diploma holders, with the smallest percentage (10.3%), being respondents with a Doctorate. In general, the sample represents a highly educated community, and a significant number of respondents have higher education.

Figure 5

Experience level of the respondents



The findings indicate that the majority of the respondents are professional people with 6-10 years of experience (32.0%), then there are people with 2-5 years of experience (29.7%). Those who have had over 10 years experience make up 21.7%, and those who have had less than 2 years experience make up 16.6%. This distribution shows that the sample is mainly mid-career professionals who have a lot of practical work experience.

Table 1

Awareness of AI in Healthcare

Statement	Agree (%)	Neutral (%)	Disagree (%)
Familiar with AI in healthcare	68.3	18.9	12.8
Aware of AI clinical applications	64.6	21.1	14.3
Organization provides AI-related information	41.7	29.4	28.9

Table 1 data show that awareness of AI in healthcare is high among the respondents, with 68.3% familiar with AI in healthcare, and 64.6% aware of its clinical uses; this is an overall positive perception of AI knowledge. Nonetheless, 41.7% of participants mentioned that their organization offers AI-related information, and 28.9% declined, indicating a discrepancy between institutional support and formal AI education in healthcare organizations.

Table 2

Attitudes Toward AI-Enabled Healthcare Systems

Statement	Agree (%)	Neutral (%)	Disagree (%)
AI improves diagnostic accuracy	72.0	16.0	12.0
AI enhances patient safety	69.4	18.6	12.0
AI reduces workload	61.1	22.0	16.9
Confidence in working with AI	54.3	26.9	18.8

Table 2 results suggest that the overall attitude towards AI-enabled healthcare systems is positive. Most of the respondents are confident that AI can positively impact diagnostic accuracy (72.0%) and patient safety (69.4%), and while 61.1% respondents are sure that AI decreases the workload, a significant number is neutral (22.0%) or even opposed to AI (16.9%). Regarding personal confidence in the work with AI, slightly more than a half (54.3%) confirm it, which implies that healthcare professionals are moderately prepared to implement AI in practice and can be further trained and encouraged.

Table 3

Readiness for AI Adoption

Readiness Indicator	Agree (%)	Neutral (%)	Disagree (%)
Willing to use AI systems	66.9	19.1	14.0
Prepared to adapt to AI	58.6	24.6	16.8
Workplace technologically ready	47.4	28.9	23.7
Training increases acceptance	74.3	15.1	10.6

The Table 3 results indicate that the readiness to adopt AI among healthcare professionals is moderate to high. Most of them are open to AI systems (66.9%) and they are ready to embrace AI (58.6%). Nonetheless, workplace readiness is only seen as ready in 47.4%, which means that organizational readiness might not be as willing to embrace as an individual. It is worth noting that 74.3% like that training boosts AI acceptance, and the issue of education and capacity-building is vital in enabling the successful integration of AI.

Table 4

Perceived Challenges in AI Implementation

Challenge	Agree (%)	Neutral (%)	Disagree (%)
Data privacy concerns	71.7	17.4	10.9
Lack of technical skills	66.3	20.0	13.7
Ethical concerns	63.1	22.6	14.3
High implementation cost	69.1	18.0	12.9

Table 4 provides insights into the major issues that healthcare professionals see in AI implementation. The top issue is data privacy (71.7%), and then high implementation costs (69.1%). The shortage of technical proficiency (66.3) and ethical issues (63.1) is also a problematic barricade. These results show that, although medical professionals are aware of the potential of AI, there are practical, technical, ethical, and financial barriers that could seem on the road to successful implementation, which requires the effective policies, training, and sources.

Table 5
Future Outlook on AI in Healthcare

Statement	Agree (%)	Neutral (%)	Disagree (%)
AI should be part of medical education	78.0	13.1	8.9
Clear AI regulations are necessary	82.6	11.4	6.0
Support long-term AI integration	70.9	18.0	11.1

Results of Table 5 indicate that the perspective of the future of AI in healthcare is very positive. The majority of the respondents are sure that AI should be included in medical education (78.0%), and there should be explicit rules regarding AI (82.6%), which indicates that the respondents are aware of the importance of knowledge and control. Moreover, they have 70.9% who support the integration of AI in the long term, which means that most people are interested in using AI in healthcare, provided it is regulated and supported by education and policies.

DISCUSSION

The findings of this study provide an interesting perspective on the preparedness of medical specialists on AI-based healthcare systems, and the aggregate positive attitude to artificial intelligence alongside a strong structural and competency-related concern. The demographic background indicates that most of the respondents were yound middle-career professionals with strong educational statuses and working experiences that means that there is a possible flexible workforce to the technological change [15]. This is an important age group, and prior experience with using digital tools, as well as professional maturity, are typically driving factors that contribute to receptivity to innovation [21, 32].

The results show that there is a high level of awareness regarding the role of artificial intelligence in healthcare because the majority of respondents claimed to be aware of the concepts of AI and clinical implementation. This is in accordance with the increased development of AI technologies in diagnostics, patient monitoring and clinical decision support [7]. However, the comparatively low proportion of participants who refer to their organizations as the sources of AI-related information demonstrate the absence of connections between individual awareness and organizational support. Such a gap suggests that, despite informal exposure of healthcare professionals to AI, the development of formal organizational efforts to improve AI literacy is underdeveloped [18].

There is also the optimistically cautious perception of AI-driven healthcare systems in terms of attitudinal results. Most of the respondents believed that AI can provide more accurate diagnosis and patient safety and this shows that they have confidence in this capability of AI to help in clinical decision making [6]. The perceptions of workload-reduction were positive but weaker with apparent uncertainty on whether AI implementation is indeed lowering the professional load or simply redistributing tasks [11]. Another fact is that trust in working with AI was moderate, this is why such positive attitudes do not guarantee the actual preparation.

The indicators of readiness demonstrate that medical workers have a positive intention to utilize AI systems and adapt to technology [2]. Nevertheless, the reduced percentage of the respondents considered their workplaces as being prepared to use technology, which emphasizes the issue of organizational preparedness as a significant restricting factor [30, 33]. This kind of a personal readiness to AI and institutional readiness underscores the importance of infrastructure, executive commitment, resource deployment in successful introduction of AI. The consensus that education is not alone in supporting AI acceptance is overwhelming and suggests education as one of the primary facilitators of readiness.

The perceived challenges, as can be seen in the research, are consistent with the larger problems in implementations of AI literature [7]. Data privacy was the most significant problem and demonstrated greater sensitivity to data security and confidentiality of patients [18]. The cost of implementation was also high, the ethical considerations and lack of technical competence were high barriers and it means that readiness is not merely an attitude, but also a practical, ethical and financial consideration [34]. These obstacles indicate that the adoption of AI will continue to be disjointed unless clear policies, technical safeguards, and skill development programs are established.

Finally, the conclusions about the future perspectives show that the probability of the introduction of AI into medical education and the development of specific regulation frameworks is high. This is reflective of the recognition that the process of AI sustainability implementation needs to be preemptively trained professionally and well-governed. Overall, it can be seen in the discussion that, despite the positive attitudes and intentions of healthcare professionals concerning AI-enabled healthcare systems, readiness must be transformed into reality through organizational support, certain training, and general regulatory and ethical frameworks.

CONCLUSION AND RECOMMENDATIONS

This study identified the readiness of the medical workforce to AI-driven healthcare infrastructure and discovered a fairly positive approach towards the introduction of artificial intelligence into the practice of medicine. It is disclosed that healthcare providers possess a moderate level of knowledge and familiarity with AI applications, namely in the area of diagnosing and patient safety and decision support. The general favorable attitudes towards AI mean that the resistance on an individual level is not the biggest factor that prevents its adoption. Rather, preparedness seems to be a result of a mix of self-confidence, organizational readiness and systemic support systems. The demographic of the respondents, who are mostly young to mid-career professionals with high education and work experience rates, only serves to underpin the probability of successful AI implementation, provided there were the right ground rules elaborated.

Despite this positive orientation, the study reveals the existence of a number of critical challenges that can have negative implications on the successful adoption of AI-based healthcare systems. The organizational

preparedness became a major problem since less respondents believed that their workplaces were technologically ready to allow the use of AI. This gap between individual readiness and organizational capability suggests that the healthcare institutions may be being undermined by workforce expectations. In addition, the integration of AI in healthcare facilities can be characterized by the complexity of such a solution by the existence of severe problems related to the privacy of the data used, ethical aspects, costs of implementation, and insufficient technical skills. These concerns indicate that preparedness is multidimensional and not grounded on attitudes alone but involves infrastructure, governance, skills development, and financial planning.

Based on these results, it can be proposed that some recommendations can be made to ensure successful implementation of AI in healthcare. First of all, medical institutions should prioritize establishing a sound technological foundation, and it should have available reliable digital infrastructure that will be capable of supporting AI applications. Two, standardized training programs will be introduced in the context of promoting the literacy of AI and practical skills among medical workers. The continuous professional development programs focused on AI tools, data interpretation, and ethical usage would be able to improve the confidence and acceptance significantly. Third, there is high support to integrate the AI-related information in the undergraduate and postgraduate curricula of medical and allied health programs to prepare future professionals with technology-based healthcare environments.

Besides, it is to be expected that there are transparent regulatory frameworks and ethical considerations that would address the problem of data privacy, accountability, and transparency of an algorithm. Policy makers and healthcare administrators ought to work together to ensure that AI systems are implemented in a manner that is responsible and addresses the clinical standards and patient safety requirements. Finally, the involvement of healthcare professionals in the planning and implementation of AI projects can promote trust, usability, and resistance to change.

In conclusion, it is evident that the problem of AI-based healthcare systems can be widely welcomed by healthcare professionals but the successful implementation of the new system will require collaboration between individual, organizational, and policy effortss. Through targeted training, institutional support, and proper governance, the healthcare systems can utilize the possibilities of artificial intelligence to their utmost potential in order to achieve improved quality of care, efficiency, and patient outcomes.

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