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THE IMPACT OF AI ON HEALTHCARE DIAGNOSIS

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Abstract
Artificial intelligence (AI) became a fundamental component of the modern healthcare system, and it is altering the process of diagnosing patients in numerous ways. There is a rapid development of machine learning (ML) and deep learning (DL) technologies that enables automated systems to analyze clinical, imaging and physiological data with greater accuracy in comparison to humans. In this paper, the recent literature about the impact of AI on the diagnostic decision in the field of healthcare is described, both in terms of imaging and data driven diagnostic application. We will review the evidence on AI to enhance the diagnostic accuracy, efficiency and consistency of AI in the following medical domains: radiology, oncology, ophthalmology, hepatology, and critical care medicine, through a review of the most recently published systematic reviews and original studies. Moreover, we will comment on multimodal and personalized diagnostic strategies, explainable AI, and creating deployment models like edge AI. Although a lot has been accomplished, a lot remains of the work to be done in areas of data quality, bias, interpretability, regulatory oversight, and linkage to real world practice. Thus, we can conclude that despite the high potential of AI in assisting diagnostic decision-making, it must undergo a high-quality validation process, be ethically implemented, and well-integrated with human clinicians to ensure the long-term effect on patient care.

1. INTRODUCTION

Artificial Intelligence is changing how we diagnose and treat patients in the health care field. AI is a way for Healthcare Providers to make diagnosing and treating a patient easier and faster. AI helps health care providers to make better decisions, etc. There have been many studies conducted to analyse the use of AI in hospitals and clinic settings, and they have shown that AI can improve the quality of care health care providers provide to their patients. In the past year, there have also been a number of studies published in many different medical specialties, including radiology, ophthalmology, and oncology that illustrate how well AI technology works to diagnose a person compared to traditional methods of diagnosing a patient's issue. In many cases, researchers have found that AI technology has improved the accuracy and efficiency of diagnosing medical problems compared to traditional methods, and, in some instances, by using AI technology, some doctors may be able to diagnose patients' medical problems better than they could without using AI technology. [1] [2] [3].

The advancements in Artificial Intelligence as it relates to imaging are growing rapidly. For example, AI and imaging are becoming increasingly advantageous for physicians' ability to

view images of the body. Using neural networks, AI enables physicians to diagnose and better understand potential issues such as tumors and to evaluate the severity of specific cancers. Research has demonstrated that AI is proficient in analyzing images, as demonstrated by several studies, including those by [21, 38]; additionally, AI enhances the quality of diagnosing diseases through improved accuracy in diagnosing complex medical conditions, as shown in the studies mentioned in [4, 5]. AI has numerous uses including creating diagnostic markers, which improve accuracy and assist the physician in determining the presenting issues in the case of complex cases by allowing the physician to review multiple considerations simultaneously.

Artificial Intelligence can be designed for more than just imaging; AI can create additional capabilities for improving decision-support systems and predicting patient outcomes prior to real time. Machine Learning is an active area of research and study within the medical imaging community. Evidence has shown that Machine Learning algorithms outperform highly trained clinicians in diagnosing certain diseases. The Eye, Breast and Lung disease examples provide an indication of just 3 disease areas where AI outperformed Radiologists [7] [8]. Overall, AI has proven to be a useful tool when it comes to addressing the many challenges presented by these types of diseases. Therefore, there is a need for standardization of data collection and evaluation methods in order to create trust in the AI systems being utilized in a variety of Healthcare Delivery Systems environments. Machine Learning will require validation in each of these environments before it can be successfully incorporated into the overall Healthcare Delivery Model.

AI technology has recently become an integral part of clinical practice, which has led to discussions surrounding the long-term effects of these technologies on healthcare systems, healthcare providers, and the patients they serve. While the technical capabilities of AI are well established and understood, the research demonstrates that institutional preparedness for the introduction of new technology, engagement with stakeholders, and on-going monitoring of how the AI technology is used will play an essential role in ensuring that safe and ethical AI technologies are deployed in healthcare [10], [11].

In general, the potential of AI technology in healthcare diagnostics continues to be significant; however, significant issues remain with regard to data accessibility, equity, as well as creation of standardized evaluation frameworks that measure fairness, robustness, and cost-effectiveness [12], [13].

2. LITERATURE REVIEW

The use of Artificial Intelligence (AI) in healthcare is undergoing a revolution, specifically in diagnosis related to specialty areas such as radiology, ophthalmology and personalized medicine. What has been created by AI, when used in conjunction with a healthcare system, has improved the quality, speed of delivery and care of patients as it applies to diagnostic methods. Deep Learning (DL) and other AI-based technology has had a remarkable and positive impact on a broad array of complex medical data and in the early detection of the various forms of cancer through their use in various forms of imaging technology, as well as providing rapid answers and an increase in diagnostic accuracy across all specialties. [1]

The first area in which Artificial Intelligence Applications have had a major positive impact, is in the early diagnosis and triage of diseases. AI systems can detect potential health-related problems before these problems develop into noticeable symptoms and allow for the early detection of health-related problems and for earlier implementation of effective interventions that improve the overall health of patients. Research has demonstrated that when AI models are integrated into Electronic Health Records (EHR) and other types of data, they help healthcare providers predict the development of diseases such as diabetes and sepsis, which helps to facilitate an early diagnosis and, therefore, better treatment options [2], [5]. In addition, AI tools have improved the ability of health care providers to more accurately screen for specific conditions, such as diabetic retinopathy and hepatic steatosis, providing diagnostic capabilities comparable to that of experienced professional

health care professionals [4], [7].

Artificial intelligence (AI) has dramatically changed how we diagnose images for use within medicine or other industries where the interpretation of complex information is critical, particularly for radiology and oncology. In this regard, most of the current AI models available (primarily deep-learning and transfer-learning) have been integrated into existing medical imaging techniques to greatly increase detection, create better staging techniques, and develop more accurate prognostic tools. One area of AI's contribution to diagnostic imaging is the application of AI models for decision support purposes to help Radiologists enhance their diagnostic efficiency while at the same reducing the potential for human error. Another valuable contribution of AI to the field is the use of explainable AI (XAI) software to enhance the level of trust and transparency associated with using AI within the medical imaging process; thus, leading to the success of AI and radiology's collaboration within a clinician's practice [11].

Personalized medicine has also been studied broadly using AI. With the combination of clinical, genomic, and lifestyle data, AI systems can provide custom risk analysis and treatment regimens to patients, improving the accuracy of treatment. Such systems have potential to enhance patient based care, especially the chronic disease and cancer treatment [18], [19]. On the same note, AI has demonstrated the possibility of forecasting maternal mortality by enhancing the maternal healthcare diagnostic processes, showing that AI can be of key importance in enhancing the results in under-served areas with limited access to medical providers [10].

The use of AI in healthcare has the potential to provide major benefits, but the use of AI in healthcare systems is faced with several challenges, including issues related to the quality of the data being used to train AI models, issues with obtaining regulatory approval for AI products, and the need for training for clinicians using these products. One of the major challenges is ensuring that the AI models being used to support critical diagnostic tasks have been properly validated through testing against real-world clinical data so that they can be relied upon to provide accurate clinical decision support to health professionals. There is also a growing interest in developing regulatory frameworks for the use of AI in healthcare systems to ensure the ethical and safe use of AI products and technologies in the healthcare system [8], [9]. In addition, there is continuing research into how AI may help to reduce healthcare disparities by providing more affordable diagnostic options to rural or otherwise underserved population [10].

Artificial intelligence is taking sustainable steps towards enhancing the quality of diagnoses and efficiency in different fields of medicine. The applications of AI in the medical field include the imaging and detecting diseases in the early stages, as well as customizing health care and nurturing motherhood, making it a massive and the expanding field. Nonetheless, the issues concerning the quality of data, its validation, and authorization by the authorities cannot be disregarded in order to utilize its potential to its maximum in enhancing healthcare outcomes globally [12], [13]. The comparison of existing literature has been given in Table 1.

Table I. The Comparison of Existing Literature

Ref. #	Authors & Year	Journal	Diagnostic Focus / Domain	AI Methods / Data	Main Diagnostic Impact (Summary)
1	Chong et al., 2025	Future Science OA	Multi-domain (cancer, dental, brain)	AI for diagnosis & planning	Reviews AI's role in detection, data management, and precision treatment.
2	Joseph et al., 2025	Journal of Medical Artificial Intelligence or similar	Healthcare broadly	AI applications overview	Discusses early diagnosis, triage, and preventive analytics using AI across the health system.
3	Alqurashi et al., 2025	The Open Public Health Journal	Hospitals in Saudi Arabia	AI applications	Reports improved diagnostic accuracy and speed in facilities adopting AI tools.
4	Alshammari et al., 2025	(Ophthalmology/DR journal)	Diabetic retinopathy	DL/AI screening	Finds high diagnostic accuracy of AI for DR, emphasizing external validation needs.
5	Tocu et al., 2025	Diagnostics	Sepsis	ML/DL on EHR & vitals	Reviews AI Tools to Identify Early Sepsis and Predict Outcomes
6	Lawrence et al., 2025	eClinicalMedicine / similar	Radiology + AI assistance	AI-assisted reading	The different ways AI affect radiologist performance show that humans and AI interact.
7	Nivethitha et al., 2025	Scientific Reports	Hepatic steatosis	CNN on ultrasound	AI ultrasound systems reach the same level of accuracy for identifying fatty liver as radiologists do.
8	Hirosawa et al., 2025	Medical diagnostics journal	Diagnostic Medications	Narrative AI review	Regulatory alignment, evaluation frameworks, and pathway integration are all key features of AI-enabled devices.
9	Ullah et al., 2025	Journal of Medical Artificial Intelligence	Health structures	AI roles & applications	AI to traditional diagnostic and operational methods. Established governance structures and ongoing training were highlighted in this analysis.
10	Ngepah et al.,	Globalization and Health	Maternity health	AI in maternal care	Reduced number of mothers dying as a result

	2025				of being able to access AI-enabled diagnostic tools.
11	Houssein et al., 2025	Cluster Computing	Explainable AI images	XAI methods	The XAI for medical images.
12	Xu et al., 2025	Artificial Intelligence Review	Infection prediction	Edge DL for diagnostics	The surveys control organized DL in health diagnostics.
13	Aamir et al., 2024	Annals of Medicine and Surgery	Multi disease analysis	ML/DL on images & EHR	Shows AI rushes diagnostic chains early detection and risk.
14	Rahman et al., 2024	AIMS Public Health / related	Tissue image transfer	ML/DL predictive systems	The AI for chronic sickness early prediction, ICU monitoring.
15	Zeb et al., 2024	Int. J. of Multidisciplinary Sciences and Arts	Medical systems	AI across care continuum	Positions AI early detection to medical help and treatment optimization.
16	Khalifa & Albadawy, 2024	Computer Methods and Programs in Biomedicine Update	Diagnostic imaging	DL on radiography, CT, MRI, US	Increased image interpretation accuracy and efficiency by using DL methods; very important for the future of using this tech.
17	Sriraman et al., 2024	Journal of Multidisciplinary Healthcare	Cancer disease images	Real-time DL	Evaluate the differences between real-time and other traditional or old DL in diagnosing cancer through images and guiding surgeons during operations.
18	Chianumba et al., 2023	Journal of Frontiers in Multidisciplinary Research	Modified treatment	ML integrating clinical, genomic, lifestyle	The results of this research will allow for personalized prediction of risk and the development of individualized treatment plans.
19	Ghaffar Nia et al., 2023	Discover Artificial Intelligence	Infection analysis & early prediction	ML/DL on imaging & analytics	AI has been shown to outperform both traditional statics and any many specialist clinicians when interpreting data.
20	Atasever	Clinical Imaging	ML in Healthcare	Deep TL	A comprehensive review

	et al., 2023			survey	of transfer learning in relation to the medical imaging industry, and the overall diagnostic implications stemming from such methods.
21	Najjar et al., 2023	Diagnostics	Radiology	AI in medical imaging	AI's integration into radiology practices is reviewed, covering the areas of targeted detection, triage, and report preparation.
22	Li et al., 2023	Frontiers in Public Health	Medical image analysis	DL algorithms	Describes what the DL architectures are, as well as their effectiveness at performing various types of imaging tasks.
23	Mall et al., 2023	Healthcare Analytics	Medical image processing	Deep neural networks	The review of DNN architectures highlights the increased use of hybridization or combination of models, along with use of attention mechanisms.
24	Jiang et al., 2023	Cancers	Oncology	DL for cancer diagnosis	Emphasizes the use of multi-modal DL methods for identifying cancer and categorizing between types of cancer at an earlier stage than would otherwise be possible.
25	Suganyadevi et al., 2022	Int. J. Multimedia Information Retrieval	Medical image analysis	DL survey	Different areas of DT/DL applications are highlighted, such as those in: Neurosciences, Retinae, And more.
26	Pandey et al., 2022	J. King Saud Univ. – Computer & Info Sciences	Imaging + NLP	DL survey	The Reviews DL of multimodal diagnostics in imaging.
27	Kim et al., 2022	BMC Medical Imaging	Medical image classification	Transfer learning review	Classification tasks surveys focusing on the characteristics and the performance of datasets.
28	Yu et al., 2022	Neurocomputing	Medical images	TL survey	The reviews method of medical image analysis, paying attention to the

					precision and efficiency.
29	Bajwa et al., 2021	Future Healthcare Journal	Medicine systems	General AI/ML	Position AI as disruptive, & enhance clinicians in radiology, pathology, etc.
30	Lee et al., 2021	IJERPH	Healthcare industry	AI adoption in hospitals	The studies of practical use of AI emphasize strategic and cultural aspects.
31	Ratawa et al., 2021	IRJET	Cancer disease	AI algorithms	Survey AI medical diagnostics architectures; points to issues with data quality & explainability.
32	Aggarwal et al., 2021	npj Digital Medicine	Medical images	DL – systematic review & meta-analysis	Reports DL frequently out/outperforms clinicians, but reports inconsistent quality of studies and reporting.
33	Wang et al., 2021	Mobile Networks and Applications	Medical image analysis	DL survey	Reviews DL Medical imaging Reviews in medical imaging, addressing the types of network and deployment challenges.
34	Zhou et al., 2021	Proceedings of the IEEE	Medical imaging	DL (CNNs, transformers)	Comprehensive review of models, case studies, and future promises in imaging diagnostics.
35	Kora et al., 2021	Biocybernetics and Biomedical Engineering	Medical image analysis	Transfer learning review	Summarizes TL techniques and shows benefits in limited-data diagnostic tasks.
36	Kaur et al., 2020	IEEE Access	Chronic disease diagnostics	Fuzzy logic, ML, DL	Shows AI diagnostic systems integrating heterogeneous data achieve higher accuracy than rule-based systems.
37	Ting et al., 2019	British Journal of Ophthalmology	Ophthalmology	DL on retinal images	Demonstrates AI systems comparable to specialists for diabetic retinopathy and other eye diseases.
38	Hosny et al., 2018	Nature Reviews Cancer	Radiology/oncology	AI & radiomics	Describes AI's role in tumor detection, staging, and radiomics-based prognostics..

39	Bakator et al., 2018	Multimodal Technologies and Interaction	General medical diagnosis		DL/ANNs	Early review documenting DL gains in diverse diagnostic tasks versus classical ML.
40	Shen et al., 2017	Annual Review of Biomedical Engineering	Medical image analysis		Deep learning	Early yet initial review on DL for medical image-based diagnosis.

3. METHODOLOGY

This paper discusses the use of Artificial Intelligence (AI) in healthcare diagnostics, in particular, how AI can be used to improve the accuracy, efficiency, and treatment planning of the diagnostic process. The review methodology included systematic literature search and selection procedure that would help identify the studies involved in the research which explore the effect of AI in the field of diagnostics in healthcare. The databases used in the search strategy were PubMed, IEEE Xplore and Scopus, preferably peer reviewed journals and conference papers published between 2017 and 2025. Inclusion criteria of the selected papers were as follows: the studies were required to be focused on AI applications in the diagnostic fields, including radiology, ophthalmology, personalized medicine, and clinical decision support; they also needed to assess the performance of AI in the medical imaging field, early disease detection, and risk prediction; and they had to be dedicated to the potential of AI in enhancing the diagnostic results and assisting clinicians making decisions [1], [2].

To begin with, 70 papers were discovered during the search process, and the scope was wide and included AI technologies in healthcare. Following the relevancy, quality, and applicability tests with the objective of the research after reading the abstracts and full texts, 40 studies were selected to be included in the final selection. The following criteria were used to conduct the exclusion process: papers that were not devoted to AI applications in diagnostics, those that failed to specify the methodology or even present empirical data, and that were peer-reviewed and published in credible journals. Also, the outdated papers that were not relevant to the topic of this study were filtered out [3], [4].

Regarding several variables, such as AI-based approach applied (deep learning, machine learning, and transfer learning), diagnostic areas involved, data sources (e.g., medical imaging, EHR, ultrasound, and others), and results obtained. The synthesis was conducted to find out trends, gaps, and major findings associated with the current state of AI in healthcare diagnostics. The articles selected for the final review were divided according to the fields of interest on these topics; namely, artificial intelligence (AI) for medical imaging, AI for early disease identification or detection, AI for customised or tailored health care, and the role of AI in managing and monitoring long-term chronic condition, [5], [6].

A qualitative synthesis was done to assess the weaknesses and strengths of AI methods that were reported in the articles. The problems found in the course of the analysis were also related to the question of data quality, model validation, compliance with regulations, and ethics associated with the introduction of AI technologies in healthcare. The results were matched to draw similarities and distinctions among the researches with the emphasis on the diagnostic specificity and clinical benefit of AI tools [7], [8].

The approach is systematic reviews, which is transient, strong, and reproducible in terms of study. The review will not only deliver a general overview of the current situation with AI applications in healthcare diagnostics but also add its part to the current discussion of how AI can be used to enhance diagnostic processes and clinical decision making [9].

4. AI EVOLUTION OF HEALTHCARE DIAGNOSIS

Decision-support systems for medical diagnostics were historically based upon graphics databases (static, rigid) and relied heavily on expert-curated data sources (manual, pre-designed features). With the development of machine learning, newly created predictive analytical models were developed that enable decision making using the full spectrum of clinical data and to create predictive analytical models from actual data using pattern discovery processes. As indicated by [36], this represents a movement from symbolic reasoning to pattern discovery and from probabilistic and statistical methods to machine learning-based analytical models and predictive machine learning-based predictive models.

The rapid advancement of deep learning also played a large role in accelerating this transformation. Deep Network architectures that now use Deep Learning, including the use of convolutional networks (CNN), can achieve extremely high levels of accuracy when applied to image based classifiers, given that they automatically learn multiple feature representations (i.e., hierarchically). The transition from traditional classification techniques to Deep Learning enabled the ability to automatically detect, segment, and classify Clinical Imaging from various Imaging Modalities (CT, MRI, Ultrasound, X-ray) [38], [40].

In their published summary articles following this transformation [23], [25], [34] established many new types of Deep Learning Architectures such as "U-Net", "attention mechanisms", and "hybrid CNN-Transformer" that have further enhanced Deep Learning robustness and accuracy on more complicated diagnostic tasks, and continue to underscore the position of AI as a prominent analytical engine within today's healthcare systems.

5. DIAGNOSTIC ACCURACY AND PERFORMANCE OF AI SYSTEMS

The assessment of AI's diagnostic capabilities in relation to human performers is a key area of research in the academic literature on AI. The authors [32] produced a wide ranging systematic review and meta-analysis that shows that deep learning models are often equivalent or superior in terms of ability to perform the types of medical imaging tasks that are most often performed by physicians. The authors do express concern about some aspects of this body of work, including limitations related to study design and the potential for publication bias. In [19] reached similar conclusions regarding the limitations presented by using CT scans for diagnostic purposes, while also arguing that, on average, AI-based analysis methods will outperform traditional statistical methods for a number of application areas.

The studies conducted by many researchers indicate that the largest advantages of using AI occur in areas where most CT scans are generated. [21] describe how AI has enhanced detection, triage and reporting processes for radiology; [16] illustrate the efficiency improvements in diagnostic imaging, as a result of the rapid interpretation of images. According to [21] the major advantages of these results relate not only to accuracy, but also to improved consistency and less observer variation.

While many of the studies described here demonstrate an enhanced ability to obtain accurate diagnoses or interpretations due to the inclusion of AI as a support system, [6] found that not all physician-user experiences were positively affected because of the inclusion of AI in their workflows. The results of their study illustrate that the performance of physicians using AI to assist them is influenced by a variety of factors, including provider experience, complexity of the task, and design of the user interface(s). That is, instead of focusing solely on the performance of the algorithms, one must also focus on the design of the human AI interaction systems.

6. DOMAIN SPECIFIC APPLICATIONS OF AI IN DIAGNOSIS

6.1 RADIOLOGY AND MEDICAL IMAGING

Artificial intelligence (AI) is an existing area of disease diagnosis by means of imaging. The example of the utilization of deep learning algorithms along with radiomics to detect tumors,

lesions, and other abnormalities in any medical imaging is presented in literature reviews of [38], [34]. Clinicians can get the quantitative imaging biomarkers by employing trained AI algorithms to use in making the stage and prognosis of patients. In the field of medical imaging, it is in the case of sparse data that transfer learning has come in useful especially in enhancing performance in diagnostic procedures. Literature reviews carried out by [20], [35], [28] show that fine tuning a pretrained model to a medical dataset significantly increases its accuracy. Transfer learning has been effectively applied in low-resource and populations with rare diseases.

6.2 OPHTHALMOLOGY

Some of the earliest users of AI-based diagnostic tools have been Eye Physicians and Surgeons, where it has been reported that the ability of Deep Learning systems to diagnose Diabetic Retinopathy, Glaucoma, and Age Related Macular Degeneration is equal to that of expert Eye Physicians [37]. Following this, [4] also support the findings of a high level of diagnostic accuracy of AI for Diabetic Retinopathy Screening; however, they recommend the validation of results from AI on a varying population from the population used in the AI model, to reduce bias.

6.3 CANCER TREATMENT

AI is now an integral part of diagnosing and managing cancer (Oncology). Deep Learning models have been shown to assist in the early diagnosis of cancer, classification of tumors, and providing guidance during surgery in near real time [17], [24]. When imaging, genomic, and clinical data are all used together, their combined performance is greater than that of single modality methods (or models).

6.4 HEPATOLOGY AND ULTRASOUND BASED DIAGNOSIS

The article by [7] presents the evidence demonstrating that the study of ultrasound B-mode images by the Artificial Intelligence (AI) offers the same level of accuracy as trained radiologists do in the process of identifying hepatic steatosis. These applications can bring out the potential of AI to democratize access to diagnostic services in regions with low access to magnetic resonance imaging (MRI) or biopsy.

6.5 CRITICAL CARE AND SEPSIS DETECTION

The developed models of predictive artificial intelligence have proven to have high possibilities of early detection of sepsis and clinical deterioration. In [5] a review process the physiological signals and electronic health records using machine learning algorithms to assist in the detection of sepsis before conventional clinical detection. The same review by [14] talks about how AI is used to monitor patients at the intensive care unit (ICU) and predict the risk of chronic diseases.

7. MULTIMODAL AND PERSONALIZED DIAGNOSTIC APPROACHES

Recent developments in the field have highlighted that AI systems are increasingly focusing on using multiple types of information, including Images, Clinical, Genomics and Text to provide a more comprehensive understanding of the patient's condition and better diagnose. [24], [26] identified that integrating these forms of data into an AI model results in a more complete representation, which will provide you with a more reliable diagnosis and [18] added that multimodal learning allows for personalised medicine by making predictions based on an individual's patient profile. A second essential development has been the emergence of Edge AI [12] found that Light weight models on portable devices enable real-time diagnostic capabilities for use in remote/underserved areas. By taking this approach, we increase accessibility while also reducing reliance on centralized infrastructure.

8. EXPLAINABILITY, BIAS, AND ETHICAL CHALLENGES

Although AI diagnostics have benefited from technological advancements, a number of barriers to their deployment safely exist. One of these barriers is explainability, which makes clinicians hesitant to use AI-generated outputs until they are able to understand and trust the results produced

by AI. [11] highlight the emergence of explainable AI techniques including saliency maps, attention mechanisms, and more, however, currently many of the emerging techniques lack sufficient clinical validation.

Bias and data imbalance also pose a risk to AI diagnostic deployment. According to [22] and [33], AI diagnostic models trained on datasets that do not reflect a population's demographics tend to perform poorly for some specific demographic groups. Furthermore, these demographic biases can contribute to the existing health inequality between certain demographics if not addressed in advance. Therefore, regulation and governance will play a major role in AI adoption. [8], [9] note the importance of having uniform evaluation frameworks, post deployment monitoring capabilities, and compliance with clinical workflows to help improve AI's overall acceptance by clinicians.

9. SYSTEM LEVEL AND SOCIETAL IMPLICATIONS

The effectiveness of AI as a diagnostic tool is not only a technical aspect; it also depends on the willingness of the organization to introduce this new technology into the current processes and the presence of the policies that will facilitate the introduction of AI. According to [30] an appropriate alignment of technology, training of workforce, and the strategy of the institution is required to successfully implement AI in an organization. According to [3] healthcare organizations that utilized AI had much better efficiency in their diagnostic processes when they had adequate training and infrastructure to use it. The chances of eliminating healthcare disparities through the public health perspective are also available with the help of AI. In [10] suggested that AI based diagnostic tools would be helpful in removing the disparities associated with maternal mortality in developing nations in case the issues associated with access, affordability, and governance were considered. The implications presented in these findings are as follows: AI is an intervention due to its socio-technical nature, but not a mere technical instrument.

10. DISCUSSION

The reviewed literature shows that the implications of AI on healthcare diagnosis are becoming larger and larger. There is robust evidence of how AI systems can enhance the accuracy of the diagnosed healthcare in the medical field, including imaging, clinical prediction, and multi modal analysis. Nevertheless, the literature also states that the shortcomings of this technology are also to be considered. It is the overwhelming majority of research studies which make use of retrospective data with no external validation and very few of the research studies examine actual clinical outcomes in a real-life situation. Moreover, considering that there are no even populations and settings where AI improves the diagnosis process equally, the outcomes of AI diagnostics should be treated with caution.

The other theme that is similar in most of the literature reviews is that AI diagnostics is not supposed to substitute clinicians. The output of AI is still open to human interpretation, and the capability to interpret AI output, deal with uncertainty related to AI output, and guarantee the ethical application of AI in practice is important. The proposed direction of future research is prospective studies, criteria of standard evaluation, explainability of AI output, and fairness-conscious model development in AI.

11. CONCLUSION

Artificial Intelligence (AI) has proved to be an effective source of change in the field of diagnostic medicine which has brought about enormous improvements in accuracy, time, and volume of various medical fields. Recent research has indicated that AI is applicable in radiology, cancer therapy, eye care, liver care, intensive care and design of patient-specific and multi-modal tests. Nevertheless, the maximum potential of AI implementation demands that these concerns are handled regarding the data quality, bias, interpretability, regulatory compliance, and clinical integration. In order to maximize the value of AI, the field of future research must focus on extensive validation, ethical utilization of AI implementation, and user-focused design. With a

proper implementation, AI technologies can be used in a new, next-generation approach to diagnostic medicine.

12. FUTURE WORK

The future research in AI-assisted healthcare diagnosis must be aimed at the further improvement of the multimodal data integration, the creation of real time and edge based AI applications, which can be used in point of care practice, and the refinement of predictive algorithms to handle chronic diseases. There should be an attempt to develop explainable and personalized AI systems that are not biased against different patient groups. Also, it is important to address the biases, establish regulatory measures, and promote AI adoption among clinicians. To validate AI systems, extensive clinical trials on a large scale will be required to conclude how these systems will affect the clinical outcomes in the long run and how they can be integrated with human expertise, which will in the end make them effective and ethically applicable to healthcare.

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