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Evaluating the Impact of Artificial Intelligence on Medical Diagnosis and Physiotherapy Treatment: A Systematic Review

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ABSTRACT

Background: Artificial Intelligence (AI) can assist healthcare professionals with various aspects of patient care and healthcare systems. This systematic review aims to assess the role of AI in healthcare today, emphasizing how it may impact medical diagnosis and physiotherapy treatment.

Methods: The electronic databases searched included PubMed, Scopus, Embase, and Web of Science. A thorough search of relevant literature published in peer-reviewed journals is part of the review, focusing on research examining AI's application in clinical trials, medical imaging, drug development, physiotherapy, and disease management. The search initially identified 255 studies. After screening, 30 studies met the inclusion criteria.

Results: This review provides evidence that AI systems can help with these aspects of medical diagnosis and therapy, especially in medical imaging, where they can precisely detect anomalies and lesions in images. However, the review also highlights the possible drawbacks and restrictions of using AI in healthcare. These include the risk that AI algorithms may exacerbate pre-existing health disparities and the necessity of ensuring that AI is implemented fairly, safely, and effectively for every patient.

Conclusion: AI systems can assist with disease management, medication development, medical imaging, clinical trials, medical diagnosis, and physiotherapy. The assessment finds that caution must be exercised in their application to ensure that potential advantages are maximized while possible dangers and drawbacks are minimized.

Keywords: Artificial Intelligence (AI), Medical Diagnosis, Medical Treatment, Medical Imaging, Physiotherapy, Drug Discovery, Clinical Trials, Disease Management.

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INTRODUCTION

Artificial Intelligence (AI) is a rapidly evolving field of computer science that aims to create machines capable of performing tasks that typically require human Intelligence. The subject of AI is expanding quickly and has the potential to change how we diagnose and treat medical conditions completely. Before adopting AI tools in clinical practice, we must meticulously verify their clinical efficacy and utility [1]. Large volumes of medical data may be analyzed by AI algorithms, which can then produce insights to help with diagnostic and treatment choices [2]. The healthcare system has extensively employed AI to enhance medical detection accuracy and reduce burden. It can speed up the decision-making process associated with traditional methods of detection. Economic impact assessment is becoming increasingly important in the age of value-based healthcare and the healthcare industry's enormous economic contribution. For example, in 2022, health expenditure in the United States increased by 4.1% to $4.5 trillion, which equates to $13,493 per capita. Pre-pandemic rates (4.1% in 2019) are comparable to this growth rate. Accordingly, recent studies have examined the financial effect of digital health apps [3,4].

In a 2014 study, over a decade later, researchers assessed systematic reviews and meta-analyses relating to electronic health (eHealth) interventions for somatic diseases. Out of 31 reviews, seven concluded that digital health is cost-effective or practical, while 13 pointed to promising evidence; the other 11 indicated inconsistent or limited proof. They also emphasized the need for significant improvements in creating and assessing plans for integrating efficient or affordable eHealth initiatives into routine practice [5-7]. In a different 2018 systematic review research, many databases with articles from 2010 to 2016 were examined with the economic assessments of eHealth technology. From eleven qualifying studies, the authors found that most utilized statistical modeling and randomized control trials to demonstrate the intervention's effectiveness and cost-effectiveness.

On the other hand, not enough information was given on the viability of implementing these modeling tools. As a result, the report highlights the lack of solid data and the need for more research to assess potential long-term cost advantages [1, 8-11]. This systematic review aims to evaluate the current status of AI in healthcare, focusing on how it impacts medical diagnosis and treatment from the physiotherapy perspective. The review, which examines studies looking into the application of AI in clinical trials, medical imaging, medication development, and illness treatment, includes a thorough search of important literature published in peer-reviewed journals.

METHODS

A literature search was conducted on PubMed, Scopus, Embase, and Web of Science to thoroughly investigate AI publications about physiotherapy, medical diagnosis, medical treatment, and more. The papers' titles or abstracts must contain at least one of the search terms for the AI and medical sections. The literature was thoroughly examined, as detailed in the subsequent sections. The summary of searched words includes medical terms (Artificial Intelligence, Medical Diagnosis, Physiotherapy, Low Back Pain, Spine Surgery, Medical Treatment, Medical Imaging, Drug Discovery, Clinical Trials, and Disease Management) and AI terms (Artificial Intelligence, Deep Learning, Machine Learning, Classification, Neural Network, and Decision Tree).

Searched Approaches

A literature search was conducted using the PubMed database and relevant search keywords. The review followed the Preferred Reporting Items for Systematic Reviews criteria. The following databases were used for a thorough search: Web of Science (Clarivate), Embase (Elsevier), Cochrane Library (Wiley), and PubMed (Medline). Figure 1 shows the phrases and the number of articles searched are "artificial intelligence" (6), "medical diagnosis" (1), "medical treatment" (1), "medical imaging" (7), "drug discovery" (5), "clinical trials" (3), "disease management" (2) as well as "physiotherapy" (5). Only research written in English and released between 2013 and 2024 was included in the search [2,8,12-16].

For the whole section, the search terms "Artificial Intelligence" and "Medical Imaging, Diagnosis, and Treatment" are not exhaustive since other possible search terms for the database queries may include "Decision Trees," "Support Vector Machines," or "Deep Neural Networks." However, the most popular search phrases for AI in healthcare have been employed since medical impact-based strategy decisions are typically taken at the strategic management and medical levels without a particular technology background. Furthermore, it is pretty likely that articles discussing topics like artificial Intelligence, at least in the abstract, will also discuss topics like deep neural networks. Ultimately, a Google Trends comparison of the most popular search phrases worldwide for AI in healthcare over the previous 12 months was chosen. The most often used terms are Artificial Intelligence and Medical Imaging, Diagnosis, and Treatment [13-15, 17, 18].

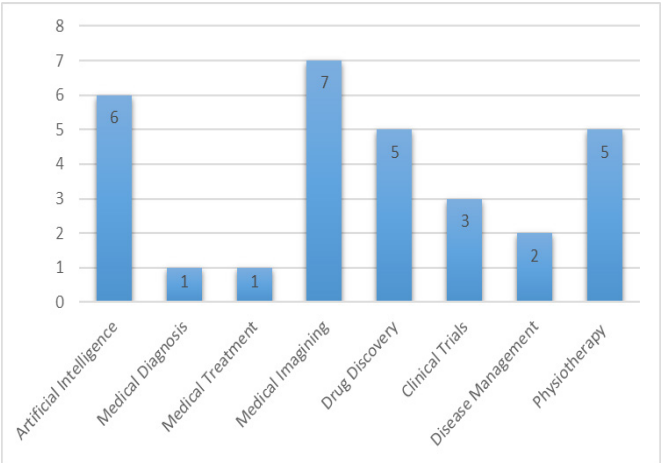

Figure 1: Number of Searched Phrases

Inclusion Criteria

The titles, abstracts, and full texts of the papers found using PubMed and several other searches have been examined. Publications in English published in a journal and released no more than ten years ago were included in the study that followed. A thorough description of AI functionality, an assessment of the efficiency and outcomes of Medical Imaging, Diagnosis, and Treatment, and quantitative outcomes of the AI functionality in at least one healthcare system were the content sectors included in the publications if they addressed at least one. Moreover, the papers included are limited to specific medical results, such as reviews or meta-analyses comparing AI solutions [1-5,19].

Exclusion Criteria

The following were the exclusion criteria for an article: the title had to do with anything unrelated to Artificial Intelligence (AI) in healthcare; the abstract or title had to describe an AI application in healthcare; or the full text, abstract, or title had to go into detail about the quantitative results of using AI in healthcare in any healthcare system. Unlike prior study review methodologies, the technique addressed the third exclusion criterion. It focused on comparing different medical analysis methodologies instead of solely assessing health or process-related outcomes without measurable effects from a national or global healthcare perspective, even though this severely reduced the number of medically successful research studies included [11,13,14,22].

The assessment process had two stages, following the previously outlined process of discovering prospective papers for inclusion via the PubMed search. First, the inclusion and exclusion criteria were checked for compliance in all titles, abstracts, and texts. Second, a quality criteria catalog was used to evaluate articles that met the inclusion requirements.

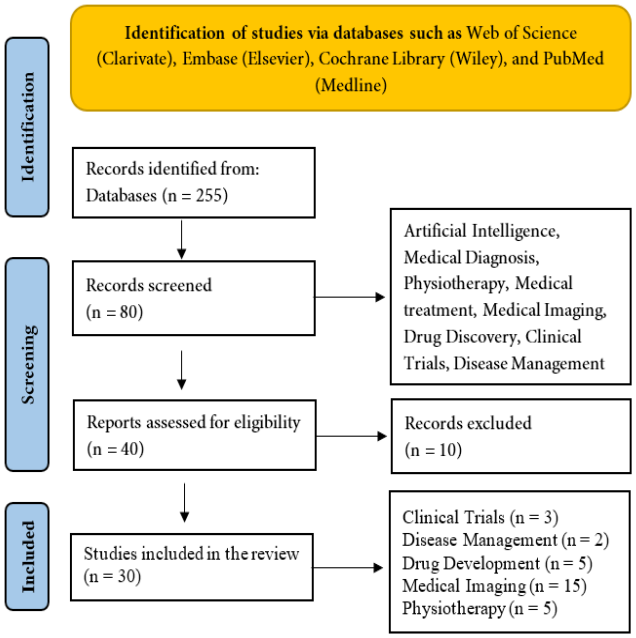

Figure 2: PRISMA Flow Diagram of Current Systematic Review

RESULTS

Quality Criteria Evaluation

The medical effect assessments have been evaluated using quality standards, with 1 representing cursory coverage, two substantial coverage, and three full explanations. As previously mentioned, these articles have been evaluated regarding the quality criteria for medical impact evaluation.

Quality Assessment Results

The search identified 255 studies, of which 30 met the inclusion criteria outlined in the PRISMA flow diagram (Figure 2). The review's papers examined the application of AI in clinical trials (n = 3), disease management (n = 2), drug development (n = 5), AI in medical diagnosis, treatment, and medical imaging (n = 15), and Physiotherapy (n=5). The research in the medical imaging area examined the use of AI algorithms for detecting and tracking a variety of illnesses, such as brain tumors, lung cancer, and breast cancer. The research under the drug discovery area examined the use of AI algorithms to identify novel drug candidates based on their prospective effectiveness and safety profiles. In physiotherapy, incorporating AI can greatly influence key areas like diagnosis, treatment, and patient management. Let's consider low back pain and spine surgery as examples to understand the potential benefits and challenges of artificial Intelligence in physiotherapy. The studies focused on how AI algorithms are utilized for patient recruitment and stratification in the clinical trials category. The application of AI algorithms in predicting and preventing illnesses like diabetes and heart disease was examined in the research under the disease management area [20-21]. Figure 3 shows the number of reviews regarding the applications of AI in medical studies such as medical imaging, diagnosis, and treatment (50%), Physiotherapy (17%), drug development (17%), clinical trials (10%), and disease management (6%).

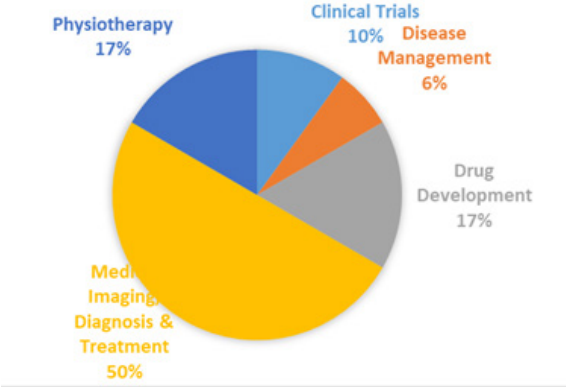

Figure 3: Number of Reviews regarding Applications of AI in Medical Studies

According to the review, AI systems can help with these aspects of medical diagnosis and therapy, especially in medical imaging, where they can accurately detect anomalies and lesions in images. For instance, an AI system was able to accurately identify breast cancer in mammograms with a sensitivity and specificity equivalent to those of human radiologists, according to research

published in the Journal of the American Medical Association (JAMA). According to various research published in Radiology, an AI system successfully detected lung nodules in CT images with sensitivity and specificity similar to those of human radiologists. [6-8, 21,22].

Classification

Classification is a task that involves assigning an input sample to one of a finite number of predetermined classes. It can be based on artificial intelligence models such as decision trees, machine learning, neural networks, or deep learning models. In this review, a total of 30 papers were identified; their main features are briefly reported as follows:

- Six studies on artificial Intelligence
- One study on medical diagnosis
- Five studies on physiotherapy included:
  - Two studies on low back pain
  - Two studies on spine surgery
  - One study on other physiotherapy-related matters
- One study on MRI
- Seven studies on medical imaging included:
  - Two studies focused on X-ray images
  - Three studies exploring other types of medical images
  - Two studies analyzing brain MRI
- Five studies on drug discovery
- Three studies on clinical trials
- Two studies on disease management

AI can analyze patient data, such as medical history, imaging results, and pain assessments, to develop personalized treatment plans for low back pain. This may include targeted exercises, manual therapies, and lifestyle modifications. By tailoring the treatment approach, physiotherapists can potentially improve patient outcomes and reduce the risk of recurrence. AI can assist in pre-operative planning by analyzing patient data to predict the likelihood of successful surgery and identify potential complications. This can help physiotherapists and surgeons develop more effective post-operative rehabilitation plans, ensuring better recovery and reducing the risk of post-surgical complications.

However, the assessment also draws attention to the possible drawbacks and difficulties of using AI in healthcare, such as the risk that AI algorithms would exacerbate already-existing health inequities. Patients from underrepresented groups encounter differences in diagnosis and treatment plans because AI algorithms trained on datasets with a high proportion of white and male individuals may not perform as well on datasets with more diversity. Nevertheless, AI engages with socioeconomic, gender, and ethnic health disparities at various levels and has the potential to either exacerbate or alleviate these inequities, depending on application and implementation [7].

DISCUSSION

This study presents a comprehensive review that emphasizes the potential influence of Artificial Intelligence (AI) on medical diagnosis and therapy, focusing on clinical trials, medical imaging, drug development, physiotherapy, and illness management (Table 1 describes included studies). According to the review, AI systems can help with medical diagnosis and therapy, especially in medical imaging, where they can precisely detect anomalies and lesions in pictures. However, the assessment also draws attention to the possible drawbacks and difficulties of using AI in healthcare, such as the risk that AI algorithms would exacerbate already-existing health inequities. AI algorithms in medical imaging have demonstrated encouraging outcomes in the detection and tracking of several medical disorders, including brain tumors, lung cancer, and breast cancer. For instance, an AI system could precisely identify breast cancer in mammograms with a sensitivity and specificity equivalent to those of human radiologists, according to research published in the Journal of the American Medical Association (JAMA). An AI system could precisely detect lung nodules in CT images with a sensitivity and specificity similar to those of human radiologists, according to different research published in Radiology. These results imply that AI algorithms may increase the precision and effectiveness of medical diagnosis in these fields, especially for less skilled medical personnel [22-24].

However, the analysis also draws attention to the possible drawbacks and restrictions of using AI in healthcare, such as the possibility that AI algorithms might maintain the status quo regarding health difficulties. Patients from underrepresented groups may encounter differences in diagnosis and treatment plans because AI algorithms trained on datasets with a high proportion of White and Male individuals may not perform as well on datasets with more extensive diversity. This is a serious issue because it may make already-existing health inequities worse and result in uneven access to medical treatment. Ensuring AI algorithms are trained on various datasets and verified on datasets representative of the community being served is crucial to overcoming this problem. AI algorithms can help drug development by identifying novel medication candidates based on their safety and effectiveness characteristics.

Given that AI algorithms are faster and more accurate than human researchers at screening vast numbers of compounds, this can drastically reduce the time and expense involved with traditional drug development approaches. The paper also emphasizes the necessity of carefully validating and evaluating medication candidates that AI generates, as these algorithms might not always find the most promising choices. It's also critical to ensure AI algorithms are utilized under strict regulatory supervision and safely and helpfully for patients [13,19,25].

Table 1: Description of included studies

Author(s)	Year	Study Design	Methods				Major Results
			Setting	Diagnosis	Number of studies	Tools	
Park and Han	2018	Clinical evaluation	Community	Medical diagnosis and prediction	-	Artificial Intelligence	This review discusses the significance of clinical trials and observational outcome studies for the thorough clinical validation of diagnostic or predictive AI tools via patient outcomes, extending beyond mere performance metrics, as well as the design of these studies.
Kumar et al.	2023	Patient care intelligent health systems disease diagnosis drug discovery patient risk identification	Community	Chronic heart disease, Hypertension, Liver disease, Diabetes, Cerebrovascular and Stroke, Alzheimer's and Skin disease	-	Machine learning Deep learning Artificial Intelligence	The results are compared using multiple quality parameters, including prediction rate, sensitivity and specificity, accuracy, precision, recall, area under the curve, and F1-score.
Nagendran et al.	2020	Artificial Intelligence versus clinicians	Community	Medical Imaging	81	Deep learning convolutional neural networks	There are few prospective studies and randomized trials in medical imaging regarding deep learning. Most non-randomized trials lack a prospective design, carry a high risk of bias, and do not adhere to current reporting standards.
Albahri et al.	2020	Medical imaging	Community	COVID-19	36	Deep analysis, Critical review	This study outlines a comprehensive approach for assessing and comparing AI methods applied to all classification tasks involving COVID-19 medical images, presented through three sequential phases.
Liu et al.	2019	Medical imaging	Community	Detecting diseases	69	Deep learning	The review concluded that deep learning models' diagnostic performance matches that of healthcare professionals. Nonetheless, a significant observation is that limited studies have provided externally validated results or directly compared the performance of deep learning models with that of healthcare professionals using the same dataset.
Rovini et al.	2017	Diagnostic and Prediction	Community	-	136	Body Motion Analysis Motor Fluctuations	This review examines wearable devices tailored for Parkinson's disease applications. It highlights the importance of clinical trials and observational outcome studies for the ultimate validation of diagnostic and predictive artificial intelligence tools, emphasizing patient outcomes rather than just performance metrics, and discusses strategies for designing these studies.
Kelly et al.	2019	Delivering clinical impact	Community	AI in Healthcare	-	Artificial Intelligence Machine learning, Logistical difficulties	Translating AI research into clinically validated and well-regulated systems that benefit all is a complex process. Effective clinical evaluation is crucial; it employs metrics that resonate with clinicians. These metrics should ideally extend beyond mere technical accuracy to encompass the quality of care and patient outcomes.
Liang et al.	2019	Precise diagnosis of pediatric diseases	Community	Medical Care	-	AI, machine learning classifiers image-based diagnoses electronic health record	It demonstrates a proof of concept for an AI system designed to assist physicians in managing extensive data, enhancing diagnostic assessments, and offering clinical decision support in scenarios of diagnostic uncertainty or complexity. While the most significant impact may be observed in regions with a relative shortage of healthcare providers, the advantages of this AI system are expected to be widespread.

Ahuja	2019	AI in Medicine Role of Physicians	Community	Medicine Radiology	-	New AI methods for machine learning	It suggests that AI systems will enhance physicians' roles without replacing the traditional doctor-patient connection.
Kashyap et al.	2021	Automated knee rehabilitation system powered by AI	Community	Knee physiotherapy	-	Artificial Intelligence Osteo Arthritis	The proposed model's accuracy surpassed that of several leading algorithms in assessing knee severity. It leverages gyroscopic parameters while minimizing computational costs.
Dilsizian & Siegel	2014	Cardiac Imaging and Medicine	Community	Medical Diagnosis and Treatment	-	AI Machine Learning Harnessing Big Data Advanced Computing	Combining AI, big data, and extensive parallel computing can transform the practice of evidence-based, personalized medicine.
Murray et al.	2019	Stroke diagnosis and identification of large vessels occlusions	Community	Ischemic stroke large vessel occlusions	28	Artificial Intelligence Machine learning	AI has the potential to enhance early stroke detection and facilitate swift triage for expedited treatment. However, future studies must standardize performance assessment.
Tack	2019	AI in musculoskeletal Physiotherapy orthopedic images	Community	Musculoskeletal physiotherapy	-	AI Machine Learning Neural networks mathematical engineering	Intelligent machines can significantly improve different aspects of physiotherapy by automating tasks related to data analysis, classification, and prediction. The integration of machine learning applications into service delivery should motivate physiotherapists to enhance their understanding and experiences with new developments and technologies.
Pannu	2015	AI in healthcare and different fields	Community	AI in Health care and medicine	-	AI intelligent machines	This study examines how Artificial Intelligence technologies are currently utilized in various domains: in Power System Services (PSS) designed to reduce oscillations from disturbances, in Network Intrusion systems to secure computer and communication networks against attackers, in healthcare to enhance inpatient care, in medical imaging for classification purposes, in accounting databases to address prevalent issues, and in computer gaming.
Laranjo et al.	2018	AI in healthcare	Community	Healthcare professionals	17	AI unconstrained natural language input	Research on conversational agents that allow for unrestricted natural language input in health contexts is a developing area. Most of the limited studies published so far were primarily quasi-experimental and seldom assessed efficacy safety.
Dong et al.	2020	Medical Imaging	Community	COVID-19 Lung Infection	-	CT, Magnetic Resonance Imaging (MRI), Positron emission tomography - CT	This suggests that standard imaging features and their variations are vital for detecting and managing COVID-19. Furthermore, the urgent implementation of AI or other quantitative image analysis techniques is required to enhance the utility of imaging in this context management.
Liu et al.	2020	Clinical trials	Community	Healthcare	29	AI SPIRIT-AI	CONSORT-AI guides researchers to offer detailed descriptions of the AI intervention. This includes outlining the necessary instructions and skills for implementation, the context in which the AI is utilized, how inputs and outputs are managed, and the nature of human-AI interaction, along with an analysis of potential error cases.
Jamshidi et al.	2020	AI and COVID-19	Community	COVID-19	212	Deep Machine learning Neural Network	Specific inputs for each platform, like clinical data and medical imaging, can enhance the effectiveness of the proposed methods, leading to optimal responses in real-world applications.
Rivera et al.	2020	Clinical trial protocols SPIRIT-AI	Community	Clinical Study	103	AI	SPIRIT-AI suggests that researchers offer detailed descriptions of the AI intervention. These should encompass the instructions and skills necessary for its use, the environment where the AI will be applied, guidelines for managing input and output data, aspects of human-AI interaction, and the evaluation of error cases.

Mazur-Bialy et al.	2020	Urinary incontinence Effects of Pelvic floor muscle (PFM) exercises	Community	Pre- and post-operative physiotherapy	32	Meta-Analysis Systematic Review	This systematic review explores the potential of physiotherapeutic techniques for treating urinary incontinence (UI) in women, with a focus on pelvic floor muscle (PFM) technique activation
Radder et al.	2020	Physiotherapy interventions	Community	Parkinson's disease (PD)	191	Randomized controlled trials and Meta-analysis	This meta-analysis offers a thorough summary of the evidence regarding the effectiveness of various physiotherapy interventions in managing PD, enabling clinicians and patients to make informed, evidence-based choices about specific treatment methods.
Azari & Barney	2013	Conjunctivitis Diagnosis and Treatment	Community	Conjunctivitis	86	Conjunctivitis-Diagnosis, management, and treatment	Most bacterial conjunctivitis cases resolve on their own, and uncomplicated instances don't require treatment. In contrast, conjunctivitis resulting from gonorrhea or chlamydia, as well as cases in contact lens users, necessitate antibiotic treatment. Supportive care is recommended for viral conjunctivitis. Antihistamines and mast cell stabilizers can be effective in easing symptoms of allergic conjunctivitis.
Contreras & Vehi	2018	Medical equipment Portable computing Sensor technology	Community	Diabetes	141	Diabetes management AI and functional taxonomy	Results show that artificial intelligence techniques are increasingly becoming viable for daily clinical applications and self-management for diabetes.
Magrabi et al.	2019	Clinical decision artificial Intelligence	Community	AI in Healthcare	-	Big Data	A strong commitment to thorough initial and continuous evaluation will be essential for the safe and efficient integration of AI into complex sociotechnical environments. The practical implementation will highlight the precise improvements needed for the latest generation of AI-assisted clinical decision-making support.
Bohr & Memarzadeh	2020	Behavioral understanding predicting healthcare trends	Community	Diagnostics to treatment	-	Big Data Machine Learning	AI is prepared to assist healthcare professionals in numerous tasks, including administrative workflows, clinical documentation, and patient outreach. It also offers specialized support, such as image analysis, medical device automation, and patient monitoring.
Bagdasarian et al.	2015	Diagnosis and Treatment of Clostridium difficile in adults	Community	Clostridium Difficile Infection (CDI)	116	Artificial Intelligence	Diagnostic testing for CDI should only be conducted in patients displaying symptoms. Treatment approaches must consider the severity of the disease, the patient's history of previous CDI, and their specific risk of recurrence. For severe or complicated CDI, vancomycin is the preferred treatment, whether or not other adjunctive therapies are used therapies.
Patrício & Rieder	2018	AI Applications	Community	AI	25	Artificial Intelligence Machine Learning	This study provides a comprehensive review aimed at determining how computer vision can be applied across various fields.
sGolinelli et al.	2020	Diagnosis Surveillance Prevention	Community affected by COVID-19	COVID-19	124	Artificial Intelligence Contact-tracing apps	In diagnosis, digital solutions that combine traditional methods—like AI-driven diagnostic algorithms utilizing imaging and clinical data—seem to be promising.
Alshehri et al.	2020	Aetiology of conjunctivitis	Community	Conjunctivitis	-	Risk factors Clinical presentation Diagnosis Management	Cases of conjunctivitis require careful attention, since history-taking and physical examination are crucial for accurate diagnosis, more so than laboratory and imaging tests testing
Jadhwani & Harjpal	2023	Diagnosis and Treatment Wearable Technologies	Community	Parkinson's Disease	16	Artificial Intelligence Early diagnosis, assessment of gait variables, and gait patterns	Parkinson's disease (PD) is a prevalent and debilitating condition, marked by motor and non-motor symptoms, impacting millions globally. This overview highlights various wearable technologies used for managing Parkinson's disease.

AI algorithms can help in clinical trials by helping with patient recruitment and classification. AI algorithms can help identify patients most likely to benefit from the studied intervention. This ensures that clinical trials better reflect the community receiving treatment. However, the research also emphasizes the importance of carefully weighing the risks and drawbacks of using AI in clinical trials, especially regarding data protection and privacy. Ensuring patient data protection and providing patients with information on AI usage in clinical trials and the option to opt-out if desired are crucial. AI systems can help predict and prevent diseases like diabetes and heart disease in the context of illness management. This can assist in identifying patients who are most likely to acquire certain illnesses and manage or prevent them with focused therapies. However, the assessment also emphasizes the importance of carefully weighing the risks and drawbacks of using AI in illness management, especially regarding data security and privacy. Ensuring the security of patient data and providing patients with information on AI's application in illness care, along with the option to withdraw consent if desired, are crucial [26-28].

The prospective effects of AI on medical diagnosis and treatment are highlighted in this comprehensive review, with specific attention on medical imaging, drug development, clinical trials, and illness. Although AI algorithms can potentially increase the precision and effectiveness of medical diagnosis and treatment, their use may also present certain difficulties and restrictions, notably regarding data security and privacy. It is crucial to take caution while using AI and to ensure that it is closely regulated to guarantee that it is applied in a safe, efficient, and fair way for all patients. It will be critical for legislators and healthcare professionals to remain aware of AI's potential advantages and disadvantages as the technology develops and grows and to make sure that its application optimizes benefits while reducing risks and adverse effects [4,19,26,28-30].

However, it is essential to address AI's philosophical and practical implications in physiotherapy to ensure responsible implementation. Some key considerations include: As AI systems rely on patient data, it is crucial to establish robust security measures to protect sensitive information. This is particularly important in physiotherapy, where patients may share personal and intimate details about their health and well-being. Physiotherapists must critically evaluate the accuracy and validity of AI-based diagnostic and treatment recommendations. This ensures that patients receive evidence-based care and that AI is not used as a replacement for professional expertise but rather as a valuable tool to enhance decision-making. As AI technology advances, it is essential to understand the boundaries between human and machine capabilities in physiotherapy. Physiotherapists should continue to develop their critical thinking, problem-solving, and interpersonal skills, as these remain crucial for providing holistic patient care.

Limitations

This systematic review might face limitations due to the selection of studies. It may only cover a subset of relevant studies published in specific languages, indexed in certain databases, or meeting specific methodological criteria. This could result in an incomplete or biased representation of the overall impact of AI in these fields. The studies included in the review might employ different methodologies, sample sizes, and AI models. This heterogeneity might make it challenging to draw clear conclusions about the effectiveness and relevance of AI in medical diagnosis and physiotherapy treatment.

CONCLUSION

The present level of Artificial Intelligence in healthcare has been assessed by this systematic review, emphasizing how it affects medical diagnosis and treatment. According to the review, AI systems can help with illness management, medication development, medical imaging, clinical trials, and medical diagnosis and therapy. However, the assessment also draws attention to the possible drawbacks and difficulties of using AI in healthcare, such as the risk that AI algorithms would exacerbate already-existing health inequities. It's critical to apply caution when implementing AI in healthcare and ensure that all patients benefit equally from its safe, efficient application. It will be critical for legislators and healthcare professionals to remain aware of AI's potential advantages and disadvantages as the technology develops and grows and to ensure its application optimizes benefits while reducing risks and adverse effects.

In conclusion, integrating AI in physiotherapy can revolutionize the field by offering personalized care, improving patient outcomes, and enhancing the efficiency of treatment plans. To guarantee its responsible and effective use, it is essential to consider both AI's philosophical and practical implications. This approach allows physiotherapists to leverage AI's capabilities, enhancing care for patients suffering from low back pain and spine surgery.

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