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THE ROLE OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE

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ABSTRACT

Artificial Intelligence (AI) applications have revolutionized healthcare. Based on a comprehensive literature review, this study highlights the role of AI in healthcare by focusing on the following key areas: (i) diagnosis and prognosis, (ii) virtual patient care, (iii) medical and pharmaceutical research. discovery, (iv) patient cooperation and compliance, (v) rehabilitation, and (vi) other management. The impact of AI can be seen in the diagnosis and prognosis of cases, the control of coronavirus disease 2019 (COVID-19) caused by early detection, the use of AI-driven tools to provide virtual patient care, the management of electronic medical records, the improvement of patients' ability to participate in and adhere to treatment plans, reducing administrative burdens for healthcare professionals (HCPs), the discovery of new drugs and vaccines, the control of medical prescriptions, comprehensive data collection and analysis, and the recovery of technology. However, this research proposal faces many ethical and social challenges, including privacy, security, decision-making and testing, cost, data and consent, access, and efficiency, while bringing together expertise in healthcare. Governance of AI applications is important for patient safety and accountability, as well as increasing healthcare provider acceptance and trust in supporting essential healthcare services. Good governance is a prerequisite for addressing legal, ethical, and trust issues while ensuring the acceptance and adoption of AI. The concept of AI has transformed

healthcare as COVID-19 impacts global health, and this attack could be another step in addressing future healthcare needs.

KEYPOINTS: Artificial Intelligence, challenges, healthcare, ethics.

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

In recent years, the applications of artificial intelligence in various fields have become quite popular. The increasing demand for health has encouraged the development of artificial intelligence (AI) in the field of complementary medicine.[1] There are many concepts related to artificial intelligence, such as machine learning, deep learning and traditional neural networks.[2]

Artificial intelligence is seen as a digital transformation that will become one of the most effective tools in healthcare in the future. Medical costs are developing at a rate far above GDP growth to support health security.[3] With the spread of the coronavirus disease 2019 (COVID-19) worldwide and the war in Ukraine, these questions have become very simple. This is a combination of financial constraints, an aging population, an increase in chronic diseases, and stress on availability and accessibility of healthcare services that previously struggled to prevent mental illness. In addition, the COVID-19 pandemic has led to deterioration of health in some countries such as India, Brazil, and Indonesia.[4]

The application of AI in medical robots is also becoming increasingly popular. The technology is widely used in many situations such as surgery, imaging, medical education, nursing, counseling, and pain relief to the hospital. It frees people's hands and improves health at the same time (by using AI technology to free doctors' hands, they can effectively re-use their skills and knowledge to improve healthcare). Robotic surgery can successfully perform incision and wound healing.[5] Rehabilitation robots are an important way to protect the elderly and the increasing need for medical care Nonsurgical diagnostic and treatment robots can help read images, evaluate the postoperative process, and improve the accuracy of diagnosis and treatment.[6] Robotic assistance can provide high efficiency, high productivity, and long-term medical care by relieving physicians from difficult, difficult, and repetitive tasks. The database is designed to include a wide range of patient information, diagnoses, medical records and test results, radiographs, medical images, medical procedures, medical results, etc. The existence of such large data pools is one of the important prerequisites for the development of machine learning and artificial intelligence in all areas of medicine. Today,

the number of areas where AI is used in medicine is increasing. Since it is almost impossible to cover all the areas where AI is used in medicine today, only a few of them will be discussed in this article. Just 15-20 years ago, the use of AI in medicine was mostly experimental and limited to developed and wealthy countries.[7] Today, AI can be used in many ways to improve health and medicine:

AI can help firefighters Radiologists and other medical professionals examine medical images such as CT scans and X-rays to diagnose and diagnose diseases.[8] Artificial intelligence can help doctors and other healthcare professionals make better decisions with real-time information and alerts based on patient inform.

BACKGROUND

Artificial Intelligence (AI) is widely used for technology that well simulates the tools of human intelligence, such as reasoning, deep learning, transformation, collaboration, and understanding.[9] Some devices can often play roles that involve human interpretation and decision-making.

This technology is integrated and can be used in many areas such as medicine and health. Artificial intelligence began to enter the medical field in the early 1950s, when doctors first tried to use computer aids to improve diagnosis.[10] In recent years, interest and progress in medical intelligence has increased due to the great improvements in the computing power of modern computers and the large amount of digital data that can be written and used.[11]

AI is slowly changing healthcare. AI has many applications in medicine and can be used in various medical fields such as treatment, diagnosis, rehabilitation, surgery, and prognosis. Another important aspect of medicine that has a cognitive impact is clinical decision making and disease diagnosis. AI technologies can consume, analyze, and report on large amounts of data across different samples to diagnose diseases and inform treatment decisions.[12]

Artificial intelligence applications can process the large amount of information generated in medicine and find new information that was originally hidden in large medical databases.[13] This technology can also identify new drugs to be used in health management and patient care.[14]

The quest for big scientific data demonstrates the courage in using intelligence. However, according to Meská et al., this technology has the potential to reduce the costs of care and

rework by allowing the medical community to focus on critical thinking and creative pain management. Cho et al. and Doyle et al.[15] added that the concept of artificial intelligence is very exciting; however, new research is needed to determine the effectiveness and use of these capabilities in clinical practice.[16] Our paper will also focus on AI strategies from accounting, marketing and management in healthcare. The authors used the Structured Literature Review (SLR) method due to its reliable and flexible search and chose bibliometric variables to perform the search. The use of bibliometrics leads to the analysis of the main results of the research stream.[17]

This method will help identify the detailed information required for specific research topics, including authors, publications, key points of interaction between exchanges (policy, ownership and governance), and country information.[18] It also allows the use of technical drawing techniques. Our paper uses the Bibliometrix R suite and the biblioshiny web interface as analysis tools.[19]

The investigation offers the following insights for future researchers and practitioners: Bibliometric data on 288 peer-reviewed English literature volumes in the Scopus collection. Journal of Medical Sciences, Research in Health Technology and Informatics, IEEE Journal of Biomedical and Health Informatics ve Support Systems Judgment gibi alandaki önemli dergileri inceleyin.

Specific national studies are being conducted to assess the delivery and effectiveness of AI in healthcare, and its availability and collaboration in each region. A research thematic dendrogram identified five research groups: health management, predictive medicine, patient information, diagnostics, and finally clinical decision making. An in-depth discussion develops theoretical and practical implications for future research.

The History of Intelligence Development

Advanced AI tools such as computed tomography (CT), magnetic resonance imaging (MRI) and ultrasound can be reproducible, easier to process and have lower medical costs. reduce errors, reduce costs and encourage early diagnosis and intervention before serious diseases.[20]

For example, an Israeli startup has developed intelligent algorithms to diagnose diseases such as osteoporosis, brain hemorrhages, malignant tissue on mammography and coronary artery

aneurysms with the same or better results.[21] These are powerful examples of avoiding manual and time-consuming processes and thus reducing costs. According to a recent Newsweek article, AI has demonstrated 99% accuracy in evaluating and analyzing mammograms faster than humans. This enables faster detection of cancer and therefore lowers the cost of diagnosis.[22]

The same applies to healthcare, where big data can be collected by AI-powered algorithms that can analyze patterns based on results to improve the analysis of the body of the order.[23] Doctors are starting to turn to intelligence-based solutions to predict outcomes that can help choose the best drug based on patient information, thus reducing costs in the long run. AI can improve decision-making in hospitals and provide medical care by tailoring appropriate and personalized treatments for each patient.[24] Outcomes will improve immediately and significantly, and costs associated with post-treatment complications, which are a significant cost of treatment in most parts of the world, will be reduced. Billions of dollars can be used to maintain a healthy ecosystem.[25]

A startup supported by the University of Toronto recently developed a computer-based algorithm that can test and evaluate millions of potential drugs and help predict their effectiveness against Ebola. This directly helps reduce costs, reduce time, and most importantly, save lives by improving existing treatments.[26] Advances in gene-based biomarkers that can quickly identify millions of patient points from blood samples using home equipment can enable intelligence-based development in clinical trials and directly impact drug prices.[27]

AI can help people make better health choices. Many people around the world already use wearable devices to record daily data, including heart rate and sleep.[28] With this AI information, individuals at risk for certain diseases can be stratified into risk strata before the threat becomes serious, ultimately reducing costs.[29] AI-based smartphone applications are already providing fine-grained patient profile details that will help patients with chronic diseases manage their conditions and help people live healthier lives. This has a direct impact on health economics.

The Role of AI in medicine

AI is a powerful imaging tool increasingly used by radiologists to reduce diagnosis in early detection and prevention of different diseases. Similarly, AI is an intelligent tool and has the

ability to analyze electrocardiograms and echocardiograms, which cardiologists use to support their decisions. The Ultromics platform at an Oxford hospital reportedly used AI to analyze echocardiogram scans to recognize heart rhythm patterns and detect ischemic heart disease.[30]

Since AI is widely used in many medical fields to improve patient health outcomes and provide treatment at a lower cost, this review aimed to present the role of AI in healthcare by focusing on the following points (Figure 1): (i) Diagnosis and prognosis, (ii) virtual patient care, (iii) medical research and review drug therapy, (iv) patient collaboration and compliance, (v) recovery, and (vi) other regulatory applications. The authors also discuss some of the challenges of using AI in healthcare. These results contribute to the existing literature and further explore the benefits of AI in healthcare.

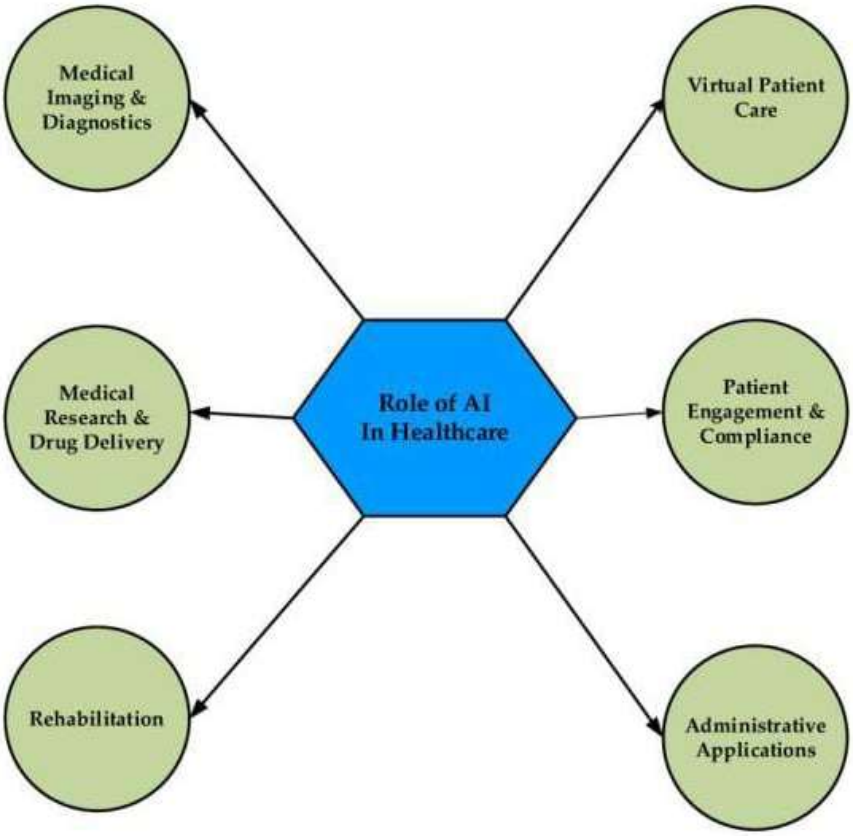

Figure 1.

In addition, medical applications based on AI, especially imaging of diagnosis and treatment, are driven by the metadata of "Medical Technology and Artificial Intelligence" (MeTAI). The main applications of MeTAI include "virtual comparison", "raw data sharing", "advanced

scientific management" and "meta-heterogeneous clinical intervention". The full model of the MeTAI ecosystem is described as follows: Before the patient receives the actual CT scan, the patient's scan is first simulated using a virtual machine to display the results. Based on this information, the actual examination is performed. Then, with the patient's consent, the images of the virtual world are shared with the patient's healthcare team. Following security procedures, the tomography raw data and images will be shared with medical researchers. The collection of real and simulated images, data, and other medical evidence can be combined in a metadata repository and used to improve clinical trials. Finally, patients will receive VR-supported remote robotic manipulation and rehabilitation follow-up with treatment recommendations. However, MeTAI faces issues such as security, inequality, investment, and privacy.[31]

These cognitive processes can reduce the time and cost of diagnostic analysis and potentially allow more effective monitoring for optimal management.[32] AI continues to impact clinical decision-making and disease diagnosis. It can process, analyze, and report big data across different types of diagnoses and medical decision-making. It can support doctors in making better medical decisions and even change people’s decisions in the medical field.[33] In addition, computer-aided diagnostic studies have been shown to have good sensitivity, accuracy, and specificity in detecting subtle radiographic changes, with the ability to improve public health. However, assessment results in AI imaging studies are often described as wound detection, ignoring the severity and nature/type of disease, which can give a distorted view of AI output. Additionally, administering radiation and patients with unrelated pathological disease will increase costs and allow for more diagnostic testing to detect abnormalities that may cause subclinical disease.[34]

Baig et al. stated that with the advancement of technology and the ability to use machine learning and artificial intelligence in healthcare is an idea that is currently being explored. As a result, patient care and management through virtual care and cognitive technology has become a reality and part of the standard of care. Furthermore, artificial intelligence is playing a role in the treatment of chronic diseases such as diabetes, hypertension, sleep apnea, pneumonia, asthma using wearable, non-invasive devices.[35] In a previous study, it was proposed to use smart technology based on the integration of sensors to monitor the person's home and surroundings, to obtain inform.

Medical Research and Drug Research: AI is good for analyzing large and complex data used

in medical research.[36] It can also be used to investigate functional studies, integrate different types of data, and promote new drug use.[37] Pharmaceutical organizations are looking to AI for drug development. Researchers can use predictive analytics to identify participants in clinical trials and develop biologically accurate process models. In clinical research, AI can be used to create synthetic products to improve data and increase diversity.[38] In addition, researchers can use the Metaverse application to conduct experiments in a convenient and controlled environment. A virtual world allows researchers to work together in a virtual environment, as if they were in the same room.[39] Another AI-based tool, ChatGPT, can be used to support data collection in clinical research and provide information about clinical trials. This technology can reduce the high cost and time required for new drug discovery. An early study showed that an AI-based robot scientist (Eve) was fast and cost-effective in performing drug development procedures.[40] Furthermore, the development of AI in medicine is supporting the reconstruction of the family genome of the Covid-19 virus and its variants. It is also useful in the development of vaccines and drugs (including non-drugs) to obtain vaccines and treatments for the control of the Group-19 epidemic.[41]

Patient Participation and Adherence: Patient participation and adherence are "outcomes" issues in healthcare and the ultimate impact of drinking on good and bad health. Non-adherence is when a patient does not follow treatment or take the recommended medication. Health outcomes such as healthcare utilization, costs, and patient experience are improved if patients participate in treatment.[42] A survey of healthcare administrators and senior managers reported that less than 50% of patients participate in healthcare planning.[43] Physicians use medical professionals to develop treatment plans to improve patients' acute or chronic conditions. However, in most cases, this is not important unless patients require behavioral changes such as weight management, follow-up appointments, and adherence to pain management plans.[44] This problem has led to the use of artificial intelligence to improve collaboration between patients. Machine learning and automation are increasingly being used to enable integrated intervention and monitoring.[45] Alerts and appropriate information that prompt people to take action at specific times are good topics for research. Improve by 60% or more. Healthcare applications collect, store, and distribute patient data in the cloud. These applications also allow users to access information anytime, anywhere and have the ability to improve patient health outcomes. These are AI-based interactive medical applications that allow patients to receive information (not urgently). Some applications can also track patients and provide reminders about medications.[46] Chat GPT is also used in

many clinical applications, including long-term tasks such as writing, typing, and generating reports, making these tasks time-saving and more efficient. It helps patients diagnose symptoms, plan and administer medications, assist patients with compliance and education, and self-management of chronic diseases.[47]

Rehabilitation: Artificial intelligence has new applications in the field of rehabilitation. The concept covers both physical (robotics) and virtual (informatics) branches. In addition, the process of artificial intelligence (also called machine learning) refers to the process of creating algorithms that are always improved by practice. In the field of medicine, machine learning is used in perioperative medicine, brain-computer interface technology, myoelectric control, symbiotic neural prostheses, etc. Machine learning techniques are also used in the field of musculoskeletal systems, such as patient profile analysis, medical decision support, and diagnosis. In healthcare, cognitive applications are used to determine rehabilitation based on signals from machines.[48] For example, smart homes can assist residents with daily tasks and alert caregivers when assistance is needed. In addition, smart devices and wearables can be used to collect data and provide information to users to measure health improvement and review progress toward self-healing goals[49], to check whether the worker is performing the exercise appropriately and can follow it.[50] Compliance with this exercise was assessed after normal individuals performed rotator cuff exercises while wearing an Apple iWatch. Several observational studies were used to validate the accuracy of each algorithm.[51] The neural network achieved 99.4% detection accuracy, demonstrating the potential of hardware and machine learning in motion tracking. However, using wearable devices alone to measure performance may not be sufficient to improve compliance due to the many barriers to effective compliance.[52]

In addition, robots that support physical and social interactions can be used to help people recover from injuries or illnesses. These robots can bridge the gaps caused by cognitive, physical, or sensory deficits. These technologies play an important role in helping people increase their work capacity, independence, health and well-being.[53] Simple treatment for patients with musculoskeletal dysfunction using a dexterous or soft robotic hand. However, the effectiveness of this long-term treatment has not been proven.[54] A recent study has shown that artificial intelligence can better monitor patients' strengths and help them perform better in the future.[55]

Metaverse neuro rehabilitation also includes artificial intelligence based on the whole body

function classification system (GMFCS), rehabilitation information as a reward from rehabilitation, behavioral movement using gravity instead, and deep learning-based motion measurement. The program promotes interest and fun, provides medical care through expertise, and limits the risk of COVID-19 infection.[56] 19 disease and improved cardiopulmonary function, improved total motor function and total motor function compared to physical therapy for the treatment of children with CP.[57] In addition, artificial intelligence has also been used for gait analysis, where machine learning-assisted video analysis has demonstrated the ability of computers to detect abnormalities and disorders affecting patients with osteoarthritis and Parkinson's disease.[58] Home physical therapy can be provided through physician consultation/advice, real-time monitoring, and remote monitoring.

This home healthcare program has a significant impact on mental health care during and after the KEVID-19 pandemic. It improves long-term functional outcomes, increases independence, and makes life good for stroke patients by providing many efficiency, consistency, and high clinical efficacy.[59] Commitment to technology integration. Processing data from sensors, AI technology can track spatial and kinematic data as well as physical measurement patterns to suggest ways athletes can improve their performance. AI can improve injury prediction models, improve the accuracy of risk classification systems, provide reliable tools for monitoring patient health consumption data, and improve the quality of patient experience. Despite the benefits of AI in sports medicine, several challenges may hinder its adoption into wearable devices.[60]

These challenges include missing data, job bias, data security, electronic devices, signal noise, and adoption of good information technology.[61] For example, a sensor that monitors heart rate will detect artifacts caused by the movement of the arm during physical activity: this can be addressed by sophisticated equipment that volunteers and collects and transmits clean data. For example, a sensor that monitors heart rate will detect artifacts caused by the movement of the arm during physical activity: this can be addressed by sophisticated devices that are highly capable of collecting and transmitting clean data. Another important issue in their adoption is patient acceptance. Previous studies have shown that half of consumers who own wearables stop using them, while a third do so within six months.[62] In a previous study, it was reported that half of the patients believe that the use of AI in technology is a significant opportunity, while 11% believe it is dangerous. Patients are concerned that their knowledge of technology can be misused and abused and that it can affect people’s healthcare.

Therefore, patients should be educated on how AI can assist doctors and its capabilities and limitations to increase acceptance and adoption of AI.[63]

Challenges faced by the use of AI in healthcare

The vision of AI in healthcare also faces some challenges such as ethical issues, algorithmic integrity, information integrity, governance and security.[64]

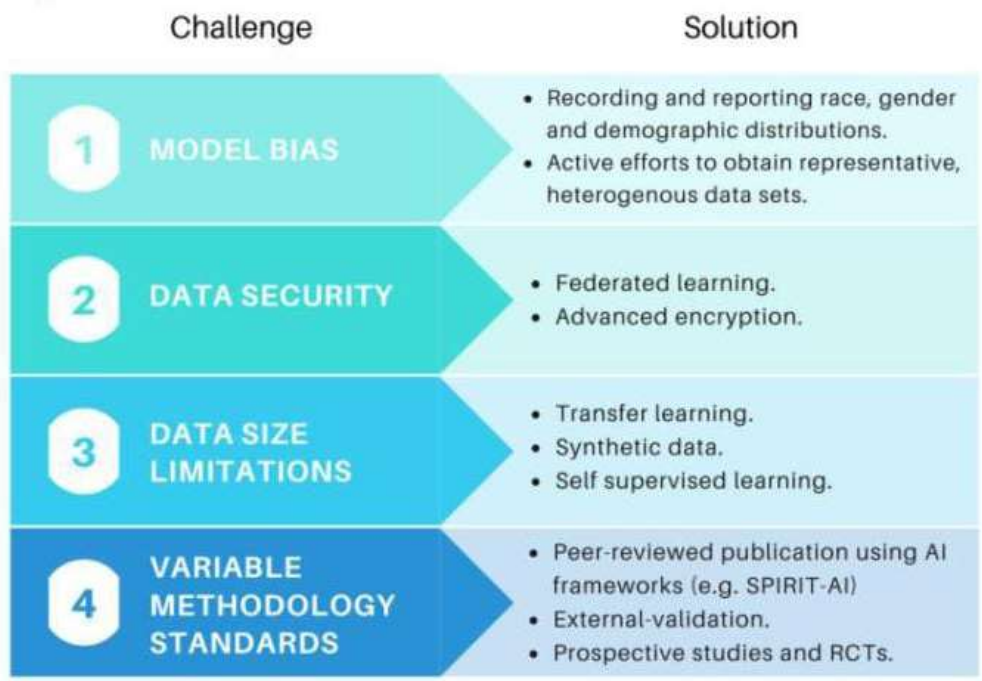

Figure 2.

Establishing ethical standards and guidelines is an important part of ongoing work on AI in healthcare.[65] The World Health Organization calls on AI partners in healthcare to ensure that new technologies ensure ethics and human rights wherever they are created and used.[66] Although a detailed analysis of ethical issues is beyond the scope of this review, we have previously discussed issues related to patient experience and shared decision-making, such as the black box of AI decision-making and where responsibility lies when AI fails to make accurate predictions.[67]

Challenges faced by medical intelligence-assisted treatment Market fragmentation: In the medical field, artificial intelligence has the potential to be widely used, but it still faces some challenges. Intellectually, many companies are involved in this business for business expansion.[68] However, in addition to certain technologies, there is also some competition between enterprises in terms of market, and this hinders the innovation and growth of other

competitors. Lack of communication and a sense of collapse between companies leads to further fragmentation and hinders the development of healthcare skills.

Limitations of AI technology: Nowadays, the use of artificial intelligence in many fields has been successful. However, many companies blindly follow the trend and enter this cross-industry field due to the distribution policy, without considering whether they have sufficient capacity to solve the problem. High-performance artificial intelligence models face problems such as training difficulty, data collection difficulty, and high hardware requirements. The products and technologies currently on the market still need to be improved in terms of independent research and development capabilities. There are still some controversies in collaborative algorithm due to the lack of clinical data against prevention.[69]

Data Sharing: The best clinical data are important to improve the results of AI in medicine.[70] Although there is a lot of medical knowledge in many countries, it is often not necessary, the lack of common understanding and the Shared model makes it difficult to understand the accuracy of the information. For some diseases, only some models can be written, although rarely. It can also provide enough information for the AI model to work. Small data can be generated. It can affect the final AI model and have negative effects on patients when used for treatment. However, there are currently no unified standards and guidelines to provide clear guidelines on the protection of confidentiality and legal liability of intellectual property.[71]

In public health in particular, the interpretation model has been considered a barrier to the use of AI technology, where public health and risk aversion tendencies of government and policy makers can be attributed to the population.[72] Some machine learning models are considered easier to define than others, including penalty and single decision methods; however, this recommendation is mostly based on the performance model.[73] It is therefore not surprising that studies evaluating AI for predictive analytics based on limited resources have found little advantage of machine learning compared to statistical models.[74]

Using AI to improve public health

The production and availability of new health-related information has increased dramatically over the past 20 years, providing unprecedented detail on social, behavioral, and environmental factors. For example, information obtained from social media, online surveys and forums, news, mobile devices and applications provide more information about higher

health decision than normal data.[75] Wearable devices can collect detailed information about a person's body movements and body measurements.[76]

Environmental sensors collect spatial data on air pollution, water quality, ambient noise, air quality, and green space.[77] Much of this information is generated continuously and can be analyzed instantly using powerful and increasingly powerful application programming interfaces (APIs).

Additionally, linking these new sources to public health data, including administrative records, electronic health records, censuses, and health surveys, is very interesting to use. The increase in the type, size, and complexity of health-related data presents new opportunities for healthcare organizations to use AI to advance six important roles for public health (Table 1).[78]

Table 1.

Public health functions

1) Health promotion
2) Health surveillance
3) Health protection
4) Population health assessment
5) Disease and injury prevention
6) Emergency prediction, prepardness and response.

AI has been proposed as the foundation of precision medicine, but also has the potential to contribute to the development of public health goals and policies for citizens who want it most. AI has been called “public health” and can be used to show how to deliver the right interventions to the right population at the right time.[79]

Health promotion has the ability to use AI to improve the quality of goals and increase the effectiveness of work.[80] For example, sentiment analysis of Twitter data can contribute to public health goals for the target audience by identifying people with different opinions on hookah.[81]

Similar data and language processing methods have been used to identify individuals at risk of suicide.[82] Online chat tools or applications supported by AI technology can provide easy access to personalized risk assessments and mitigation recommendations that are more

relevant and supportive than traditional methods, such as prevention of chronic diseases and management or support for behavioral change.[83]

The World Health Organization recently named Florence a "digital doctor" as part of her expertise on smoking. Florence aims to use computer-generated images, animations, and artificial intelligence to help people quit smoking and combat misinformation about COVID-19 through face-to-face online discussions.[84]

Traditionally, public health assessments have been conducted through public health surveys, medical records, and clean health education programs for the public. Access to new information and AI provides the opportunity to identify health threats and gain a better understanding of population diseases and risk factors that often spread with the development of the region. An AI-driven approach can also provide new data because data can be collected, processed, and analyzed instantly.

Public health monitoring dashboards powered by online news and social media databases have been developed to present health status by geography and time.[85] For example, SENTINEL, a symptom tracking tool built using language processing and neural network algorithms, processes more than 1.8 million tweets per day to predict disease outbreaks and instantly detect possible conditions.

The bulletin is written to provide context and the user understands the impact of showing the area of the incident in a timely manner and comparing it to the weekly count from the US Centers for Disease Control. AI can also be used to collect surveillance data from unblocked locations. For example, text analysis of white paper death certificates was used to identify potential drug overdose.

Advantages

In general, the pros and cons of using AI in medicine are similar to those of using AI in everyday life. There are many advantages to applying AI in medicine:

- Increase accuracy and efficiency: AI can help doctors and other healthcare professionals analyze large amounts of medical data, such as images and patient records, to provide faster and more accurate diagnoses and treatments.[86]
- Personalized Medicine: AI can be used to analyze genetic and patient data to create treatment plans and personalize treatments to the specific needs of people's pain.

- Decision support: AI can provide real-time information and alerts based on patient data to help physicians and other healthcare professionals make informed decisions.[87]
- Early detection and prevention: AI can help monitor vital signs, symptoms, and other data to detect health problems early, especially chronic diseases, to prevent complications.[88]
- Scientific Research: Based on patient data, AI can help predict the occurrence of certain diseases and disorders and help prevent and treat them.
- Medical research: AI can be used to analyze large amounts of medical data, identify patterns and generate new discoveries, helping to understand the causes of diseases and when the last innovation emerged.
- Reduce costs: Using AI to perform certain tasks, such as analyzing images and patient data, can reduce the need for manual labor and therefore save costs.[89]
- Telecare: AI can help provide remote care to patients, which is especially useful for people living in remote areas or with limited mobility to access medical care.[90]

Disadvantages of AI

The AI in medicine has several drawbacks, including:

- Bias and discrimination: AI systems may perpetuate or even reinforce biases and discrimination inherent in the data they learn, which may lead to misdiagnosis or mistreatment in some groups.[91]
- Lack of transparency and accountability: It is difficult to understand how AI systems make decisions, making it difficult to explain or hold them accountable.[92]
- Privacy and security issues: AI systems require a lot of patient data to operate, which can lead to privacy and security issues, especially with the increasing number of electronic medical records.[93]
- Dependency on technology: AI may become a tool that doctors and other healthcare professionals rely on so heavily that some may not be able to function without the help of wisdom.[94]
- Limited understanding: AI systems may have limited understanding of context and may have difficulty understanding the nuances and subtleties of human health and disease.[95]
- Ethical issues: AI may create ethical issues around autonomy and decision-making in healthcare, such as the illegal use of surgical machines.[96]

Application of AI technology in medical field

Design AI that can be trusted with patient care: AI healthcare plans must be trusted to achieve

safe patient care. Engaging end users throughout the process and educating HCPs on case studies can go a long way toward achieving this goal. But CST needs to ensure that algorithms are modified based on available data, be transparent, and make it clear how AI solutions will support HCPs rather than replace them. The UK Government's Data-Driven Health Technology Code of Conduct, research standards such as CONSORT-AI, and physician-focused lists are an important layer to achieving these goals.

CST must adjust the algorithms it uses according to the characteristics of the available data. For example, deep neural networks have very good performance when processing large data, but when using small data, they can cause overfitting, which may be the only option in some medical facilities. In this case, a number of other techniques can be used and combined to achieve good results, including random forest, linear regression, support vector machines, and K-nearest neighbors.[97] These factors can be utilized and combined to produce positive results.

Choosing the right algorithm also addresses concerns from HCPs who may be concerned about using AI algorithms in healthcare if they cannot explain them. In this case, the so-called black box solution.[98] It may need to be avoided. Alternatively, CST can use a variety of techniques, such as descriptive, model-free interpreters, heuristic paradigms, or fallacies that may provide insight into how the black box might play out.[99]

To minimize errors and patient safety issues, degradation in algorithm performance should be minimized. CST should ensure that AI algorithms can be applied as efficiently and fairly as possible across all patient groups and geographies. Algorithms will also demonstrate stability in the presentation of new information (e.g., less "forgetting damage").[100]

To achieve this, it is important for the CST to have expertise in CST for home use of AI algorithms. There should be a clear idea to externally validate the algorithm using non-visible data, using the size of the population and the area appropriately.

AI Tool Application in Dosage Form Designs: To understand the effects of drug delivery, human systems are compartmentalized. These compartments are easily added as biofilms. Physicochemical problems are important for biological diseases and can be used as a form of drug delivery in the body. One of the most important criteria for effective control of drug delivery is permeability as a route of administration. Once oral drugs enter the intestinal

environment, they must pass through the intestine or intestinal epithelium. This step is important for further distribution of the drug into the bloodstream. The distribution step delivers the drug to the target, which can be a tissue or a specific cell.[101]

Intracellular molecules can also serve as targets for drugs to enter the body. Drug penetration is often facilitated or activated by biological organisms. Passive diffusion depends on the molecular properties of the drug. Computer models are used to predict drug distribution through statistical analysis, but these results differ somewhat from drug distribution studies. Chemicals in the biological environment and interactions between chemicals affect the fate of chemicals in the body. This process is controlled by the molecular properties of the drug. For many bioactive sites and small molecules, passive permeation is ineffective and requires the use of special chemicals. Active osmotic processes are driven by membrane transport and rely on biological interactions. This complex process needs to be investigated by computational and modeling methods using a variety of special properties. This new computational model is used to study the pharmacokinetics of drug delivery. One of the biggest challenges in the pharmaceutical R&D industry is the prediction.

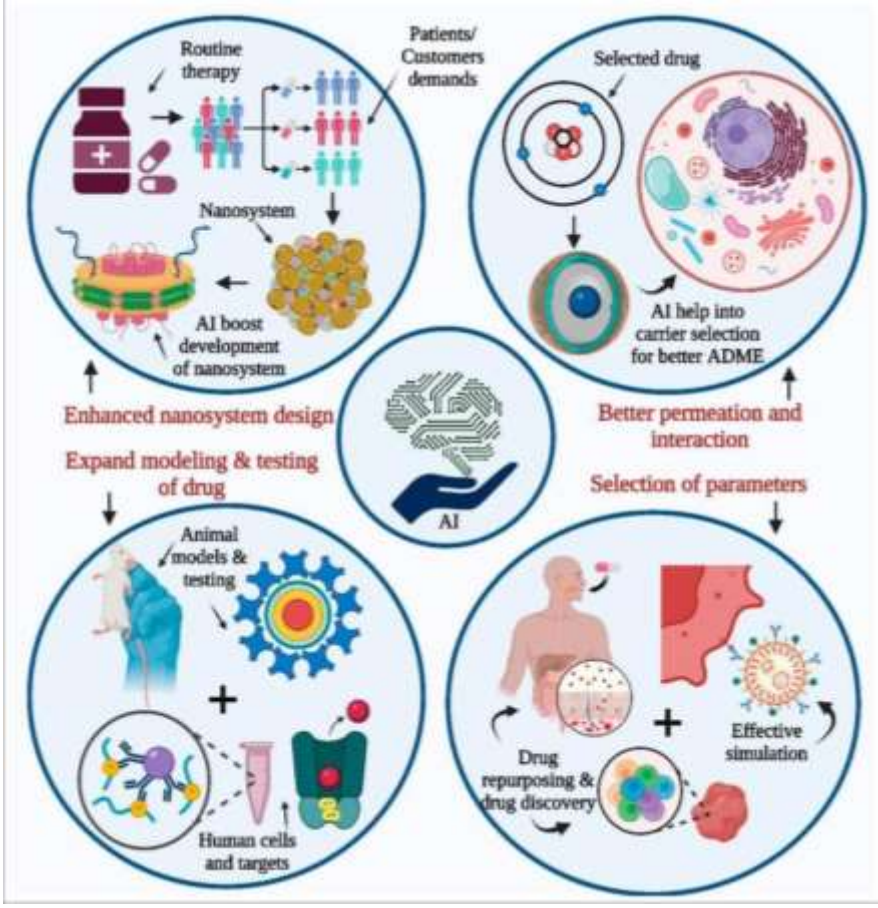

Figure 3.

CONCLUSION

Artificial Intelligence technology is used in many medical applications. These technologies are designed to facilitate clinical and diagnostic services, combat infections, provide virtual patient care, improve patient engagement and medical conditions, reduce healthcare costs, promote new drugs and vaccines, and monitor patient compliance and perform gait analysis. However, the development of clinical skills for technology-assisted rehabilitation still faces many challenges, both ethical and regulatory. It raises issues related to data security and privacy, as it utilizes sensitive and confidential information that is subject to a legal panel. The use of AI to solve problems will be limited by the quality of available health data, and AI will not be able to reflect certain human characteristics such as understanding. AI can be more effective when used well, but it cannot replace the connections between people who make up a team. Human tasks such as collaboration and team management are not possible because machines cannot connect with people. A major challenge to address in the future management of AI technology is to ensure that AI can be designed and used in ways that are in line with human interests, including work processing, justice, and relationships. This study contributes to existing literature on AI applications in diagnosis and treatment, virtual patient care, clinical research and drug discovery, patient engagement and compliance, rehabilitation, and other management. Additionally, this is a new update to the literature addressing the ethical, social, regulatory, and challenges HCPs face when using AI therapy.

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