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Research Article

Assigning Medical Professionals: ChatGPT's Contributions to Medical Education and Health Prediction

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ABSTRACT

Artificial intelligence is increasingly present in many applications that help humans accomplish many tasks. It can support improved results, increased productivity, and high efficiency in providing services. Systems developers seek to integrate improved artificial intelligence models into the development of healthcare services and make a significant qualitative shift in the medical field. One recently invented tool is ChatGPT, which deserves extensive advertising space. This tool provides sample answers that help both healthcare workers and patients answer all their questions. It is an important tool in medical education, increasing knowledge in making decisions that can improve the performance of medical professionals. The impact of this tool must be addressed because it is in a developed stage, and there are a good number of articles widely circulating that speak to and explain its importance at present. In this article, the importance and role of the ChatGPT tool in developing healthcare services and the tangible and informational information that is provided will be described, as well as the possibility of predicting diseases and diagnosing and treating patients.

1. INTRODUCTION

Artificial intelligence models have the ability to change the way service is provided, as it can support improved patient outcomes and increased productivity [1-3]. These models help develop an integrated health system by providing more and better care to a large number of patients. Healthcare systems supported by artificial intelligence models enable the provision of more and better care and help improve the performance of medical professionals and spend more time with patients by providing them with excellent care [4-6]. These models significantly improve care systems more sophisticatedly and allocate resources that can help accomplish many tasks in less time. Artificial Intelligence is the science and engineering of making intelligent machines [7][8]. This science began to be designed in the early 1990s as part of a related computer and systems science field. It seeks to find similarities and characteristics between human intelligence in terms of thinking, reasoning, and even vision and hearing and create intelligent models similar to the human mind [9][10]. The first applications of artificial intelligence were made by analyzing health data and payment options as innovative tools for managing patient information and making highly efficient health decisions. The need for data and decision making has made it possible to respond to health problems. The world of technology witnessed the emergence of an important tool in 2022, which is ChatGPT (Generative pre-trained transformers) [11-13]. It is a tool utilized to create texts similar to texts written by humans, as it can answer all the queries that the user needs. ChatGPT became a scientific sensation shortly after its release. This tool is considered essential in creating a conversation between humans and machines through free web content available to everyone created by OpenAI [14][15]. This company was founded in 2015 in the United States, and Microsoft bought 49% of ChatGPT shares [16]. This tool is essential in developing many tasks through free chat, which is available to everyone except for recent versions requiring subscriptions. The main goal of this tool is to create text automatically based on the information written by humans, as it is pre-trained on a large set of data so that it can understand and create texts with high accuracy and naturalness, similar to human writing in different languages. Since its launch, this tool has sparked controversy in academic,

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scientific, and cultural circles. It has surprised millions of users with its ability to create articles, poetry, stories, and personal advice, as well as compose musical pieces and song results very quickly. Also, ChatGPT has already been listed as a co-author on a few articles since its launch [17][18]. Figure 1 shows the stages of developing GPT models [19].

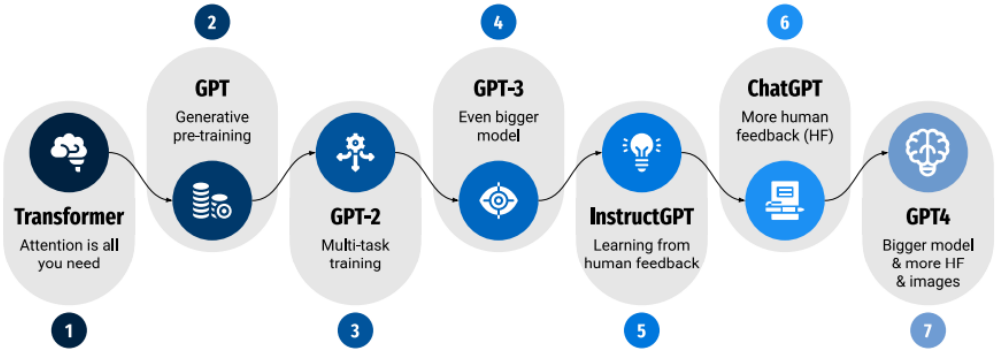

Fig. 1. Development of GPT models [19].

ChatGPT receives negative reviews from information technology workers and academicians despite its importance in many tasks. It was discovered that students began using this tool to assist in tests and preparing reports without admitting to resorting to it, which led to the results they reached not being recognized because it is considered cheating and there is no struggle involved. In scientific publishing, positions are divided regarding the recognition of the ChatGPT tool. Some publishers have banned or restricted its use in preparing manuscripts by updating the editorial policies of journals to prohibit the use of texts generated by this tool and not list this tool as a co-author in manuscripts. At the same time, some Publishing companies did not prohibit the use of this tool, as it was considered helpful in developing scientific articles, especially in providing equal opportunities for non-native English speakers to use artificial intelligence programs to make the language in their jobs more fluent. This tool is important in improving article writing. It is also considered a search engine for finding the answers that the user wants. Authors must be honest when employing this tool and the outcomes generated by ChatGPT. This tool cannot be a co-author of scientific articles because it does not provide a significant academic contribution but rather merely generates texts that help improve the quality of the manuscript [20]. This is the case with applications, as they are tools that help people accomplish tasks. The ChatGPT tool is used for chatting and generating excellent answers for users, but it is not able to provide accurate data. In other words, this tool works by making predictions about what to say rather than grouping ideas as human brains do [21-23].

This article's main contribution is to clarify the essence of the ChatGPT tool in medical education, disease prediction, diagnosis, and treatment, as well as in helping medical professionals develop their scientific and practical skills.

2. CHATGPT WITH HEALTHCARE

Modern technology is constantly evolving, with the emergence of a large number of devices and applications based on artificial intelligence algorithms. It is changing faster than our ability to implement these new developments. Healthcare uses artificial intelligence technologies a large share of the time. These technologies contribute to making the healthcare environment integrated by sorting patients, reducing waiting lists, improving surgical operations, diagnosing diseases, and monitoring the spread of epidemics [24-26]. Therefore, these technologies are working to make a major breakthrough in improving electronic healthcare services through algorithms capable of dealing with large amounts of datasets and information. These technologies are applied in hospitals and medical clinics, where they improve patient outcomes and help doctors make efficient decisions [27-29]. Many technologies exist in the medical field, such as Doctomatic, which relies on artificial intelligence to monitor and collect patient data remotely and transfer it to healthcare providers [30]. Medical specialists analyze and evaluate their patients' data. Doctomatic tools can recognize different data, such as blood pressure monitors and glucose meters. Chatbots have become an important element in the medical field because they allow better patient interaction. These tools were used to monitor patients who have chronic diseases and worsening of their health conditions. One of the most famous chatbots today is ChatGPT, which is widely used daily by millions of people [31-35]. It is a program that has the ability to give responses according to the parameters that were set in the question. This program can be used on the computer to assist in patient evaluation, answer patient questions, and provide educational resources for patients about their diseases and health diagnoses. These tools determine diet, diagnostic exercises, appropriate medication doses, etc. This program depends on knowing the details of patients, and the patient can become more empowered in managing his disease and assist doctors in the diagnosis process by providing revised information about the disease, as well as assisting in appropriate treatment suggestions, which is similar to the primary clinical decision-making system that includes decision-making with high accuracy.

These tools may sometimes be inaccurate and create problems that affect the patient's condition. Therefore, patients must rely only heavily on the information issued by ChatGPT after it has been presented to doctors or healthcare professionals for verification. In fact, ChatGPT contains a large database and is helpful for healthcare professionals. It offers a response similar to that of a physician, so the ChatGPT tool can serve as an adjunct or as a stand-alone alternative to reduce physician shortage issues. The program may generate inaccurate or different information, so much so that the term "ChatGPT hallucination" has been coined. In other words, the program may generate information or reports about diseases that do not exist, leading to the creation of false data or misleading information. It may also unintentionally reveal private information, such as patient data or reports on an epidemiological situation with unconfirmed information. Evaluating and reviewing the responses obtained from ChatGPT to ensure that they are appropriate, accurate, and useful to patients. This program is characterized by a high ability to learn according to user instructions. For example, when it generates incorrect information about a specific treatment, that is, false information, it can change it to an alternative treatment according to the user's requirements. The program requires sufficient training on how to communicate and how to benefit from electronic services, as people who suffer from imperfect access to the Internet or a weak ability to deal with artificial intelligence applications cannot benefit from electronic services. ChatGPT faces intense competition from Google's Bard, which is based on the PaLM language and contains 540 billion parameters developed by Google AI [36-39]. The most important generative AI Tools and Platforms (see Figure 2). ChatGPT was trained on massive data as well as code from GitHub repositories, where it has the ability to create programs based on Python, JavaScript, and others. As for the Bard application, it is broader in scope than ChatGPT, as it includes a more comprehensive range of texts and information that can be used in the medical field. Moreover, it has the ability to evaluate radiographs, dermatological images, X-rays, and mammograms to help improve the results of their interpretation. Artificial intelligence tools improve the search for correct information, especially medical information, and enhance diagnosis and treatment processes [40-43]. Educating patients is one of the topics sought by developers of artificial intelligence technologies, through generating appropriate algorithms to provide the correct answers regarding the disease. These actions will revolutionize patients' access to health care and train specialists in the correct use of these tools.

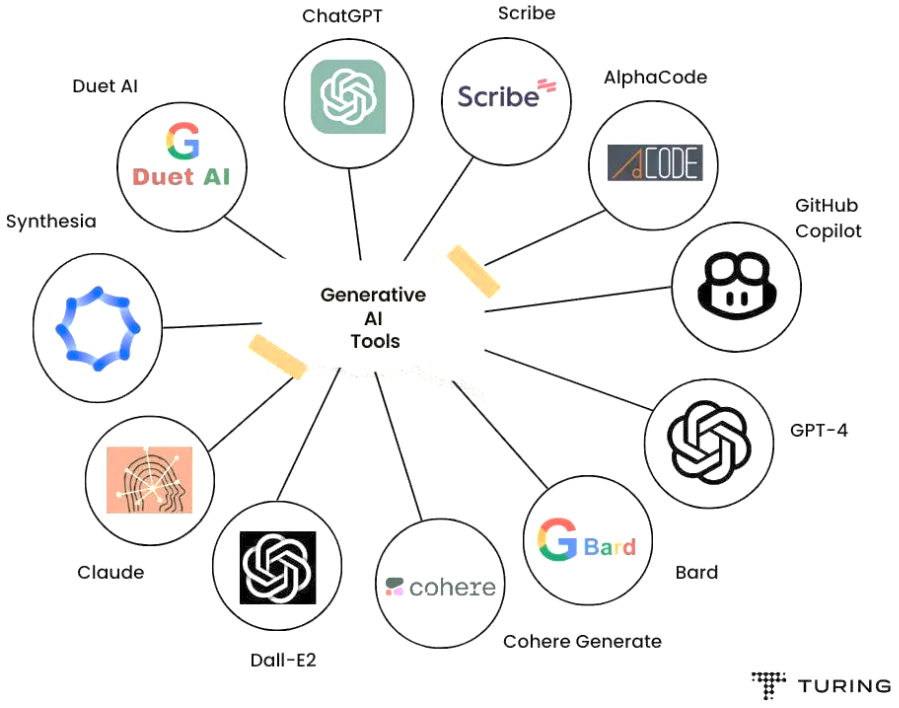

Fig. 2. Generative AI Tools and Platforms [44]

AI technologies benefit patients by making health information more accessible, relevant, and actionable. They have developed rapidly in medicine and healthcare alongside advances in computing, learning, and the availability of large datasets from electronic medical records (EMR). Healthcare data analysis is one of the most important things, and it is primarily carried out through machine learning algorithms that identify patterns in the dataset. For instance, machine learning algorithms have been used in the early detection of heart disease, breast cancer, COVID-19, diabetes, and many others. The primary purpose of data analysis is to take accurate patient data, diagnose it accurately, and reduce patient risks. Artificial intelligence algorithms are computer algorithms that can assist doctors in making decisions and analyzing data. These algorithms are linked to human intelligence as they have sufficient ability to analyze data and extract features from it. With

medical information increasing incredibly, healthcare workers need help keeping up. This makes it difficult for people in the United States to pass medical licensing exams and qualify for residency positions. In addition, doctors and specialists work very long hours to provide health care in a complicated society with many diseases and high healthcare costs. The vision of replacing doctors with artificial intelligence is incorrect. It cannot be implemented because technologies lack the feelings and professional minds that human doctors have about solving the problems posed by their patients. Artificial intelligence's primary role in the healthcare field is to develop diagnostic algorithms for surgical robots. Machine learning algorithms are widely involved in cardiology due to their ability to support decision-making that can improve diagnostic and prognostic performance. They promote a significant paradigm shift in the most diverse fields of medicine. Accordingly, the effects of these algorithms must be evaluated to ensure patient safety, fully personalize healthcare and provide monitoring technology. These practices gradually reinforce machine learning as essential to excellent medical practice. Cardiology needs artificial intelligence to develop algorithms that can identify patterns within a large dataset. Therefore, it does not require many assumptions regarding the existing data, allowing a high level of evidence due to its high performance. This represents a significant change in the medicine paradigm based on evidence. It should be noted that traditional clinical difficulties are usually slow, expensive, time-consuming, and limited in size. In addition, when the database is fed with more health datasets, the algorithms' performance improves overall, allowing studies to be continuous over time.

Machine learning algorithms are a growing research topic in cardiology due to their outstanding data analysis capabilities [45-47]. Echocardiography is currently one of the most widely employed imaging modalities in cardiology. Ultrasound also has advantages in terms of portability, speed, and accessibility. However, it is operator-dependent and requires a long training time to interpret the acquired data accurately. Machine learning algorithms are used to standardize echocardiography images better and reduce operator dependence. These algorithms have already demonstrated the ability to aid in the analysis of echocardiographic images, allowing the generation of critical cardiac variables on the fly through automated classification of echocardiographic views. One of the diseases that faces excellent difficulty and challenges in deciding on treatment and follow-up is diabetes. This disease refers to a group of variations resulting from a dysfunction in the glucose regulatory system. In each category of diabetes, rapid diagnosis, self-care education of patients, and ongoing medical care are required to prevent severe complications such as ketoacidosis, kidney disease, retinopathy, diabetic foot, cardiovascular disease or stroke. In this field, machine learning algorithms are being used to develop tools and applications that can improve the effective management of complex diseases, including diabetes, making machine learning play a significant role in identifying these systems as routine treatment tools for diabetes patients. Generative artificial intelligence is used to create educational experiences in analyzing disease data and diagnosing disease conditions, enabling doctors and specialists to interact with patients naturally [48-50]. The adoption of generative artificial intelligence creates many contents in the learning and interaction processes while generating guidance in educating doctors, especially newly graduated doctors, while increasing their education in dealing with patients and diagnosing pathological conditions. This technology helps organize educational materials by providing high-quality content. It also helps doctors monitor patients and track treatment interactions with them by providing accurate reports on each case. In automation and disease classification, healthcare workers will play a role in evaluating processes, providing electronic services, and making suggestions that contribute to the development of the electronic care environment. Figure 3 briefly illustrates the significance of implementing artificial intelligence in healthcare with its limitations and disadvantages.

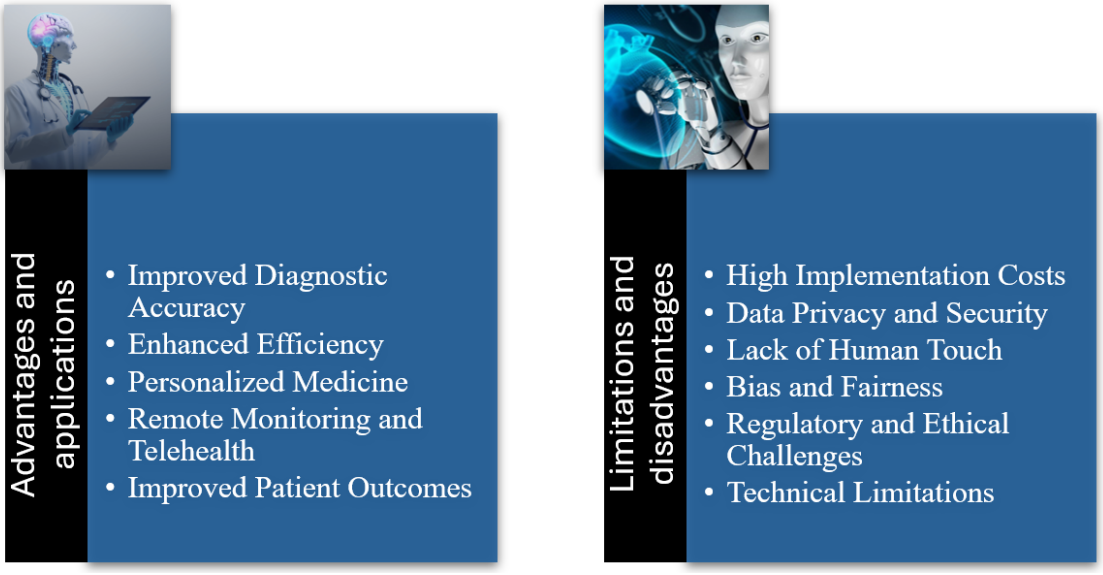

Fig. 3. Advantages and disadvantages of AI in healthcare.

From the figure above, it is evident that artificial intelligence technologies have various capabilities and advantages in developing healthcare services. It is able to improve diagnosis as algorithms make predictions by analyzing large amounts of data and identifying abnormalities present in a specific location in the patient's body. These techniques automate administrative tasks, document tasks and processes, and improve workflow in hospitals and medical clinics. Diagnosis is one of the most important topics in artificial intelligence, as it involves analyzing the patient's genetic information and medical history. Also, these techniques have sufficient capacity to discover drugs and identify compounds that contribute to accelerating the development of new medicines that improve patient outcomes. Devices that operate with artificial intelligence can provide excellent tools for monitoring patients' vital signs, creating reports of health problems and sending them to the people authorized to view them. The advantages mentioned above help improve patient outcomes through the early detection of disease signs, managing chronic conditions, and preventing epidemic outbreaks. The most important disadvantages of artificial intelligence techniques are the costs of implementing modern systems based on AI, as well as the costs of maintenance and updates. AI algorithms deal with large amounts of patient data and may exploit system vulnerabilities and be exposed to electronic attacks. Therefore, it is necessary to continuously train employees on the most important techniques that help protect the privacy and confidentiality of patient data. Excessive reliance on these techniques leads to a lack of dependence on human capabilities and a decrease in interaction between patients and doctors, as fears may arise regarding decisions that may be made without human supervision. In addition, biases in training algorithms on patient data create restrictions that prevent healthcare workers from accessing this data. These techniques may give inaccurate results, and it is preferable to have human oversight to audit all the outputs of these techniques.

3. CONCLUSIONS

Artificial intelligence techniques are vital in medical practice and the development of electronic healthcare services. Machine learning is the core capability behind the evolution of accurate medicine and is widely accepted as a necessary advance in improving patient outcomes and developing clinician skills. Although early efforts to provide diagnosis and treatment recommendations have proven challenging, AI will eventually accompany medical education. It seems increasingly clear that AI systems will not widely replace medical professionals but enhance their efforts in healthcare. ChatGPT is the most widely obtained application for achieving endeavors that contribute to developing the electronic healthcare environment, as it combines curiosity, imagination, and discovery. These techniques have consequences that may involve future medical practices, and the conversational method's outcome is likely to modify teaching, research, and publishing practices, creating both possibilities and concerns. Utilizing this technology based on artificial intelligence is inevitable, so banning it will do nothing. The focus should be on seizing the opportunity and controlling the risks resulting from the application of modern technology. A path that has not been adequately explored or at least posted is the idea of prioritizing the development and implementation of open-source AI technology and educating the community through courses in the use of generative AI tools and platforms. This would help develop advanced artificial intelligence technologies that are open-source, transparent, and controlled safely and without problems. In the future, we will be concerned about how generative AI tools can be used to create tasks in the medical field.

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Conflicts Of Interest

The authors disclosure statement confirms the absence of any conflicts of interest.

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