The Effects of Artificial Intelligence and Medical Technology on the Life of Human

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Authors’ contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study explores because of the rising complexity and volume of data in medical technology, artificial intelligence (AI) will be used more frequently. Various forms of artificial intelligence (AI) have already been used by consumers and providers of care, as well as health sciences firms. Diagnose and therapy suggestions, patient involvement and compliance, and administrative tasks

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are the most common types of applications. Although there are numerous cases where AI can do medical technology activities as well as or superior than humans, operational issues will prohibit large-scale automation of medical technology professional positions for a long time. Moral considerations about the use of AI in medical technologies are also addressed. Healthcare is one of the most significant great achievements of modern time. Medical research and technology have advanced fast, increasing life expectancy across the worldwide. However, as life expectancy rises, healthcare systems face increased demands for their operations, rising expenses, and a staff that is failing to fulfill the requirements of its patients. Aging population, changing patients’ expectations, a shift in lifestyle decisions, and the never-ending cycle of development are just a few of the inexorable forces driving need. The consequences of an ageing population stand out among these. Healthcare expenditure just isn’t keeping pace. Medical technology will struggle to stay sustainable unless substantial structural and transformation changes are made. Healthcare also requires a larger staff, but while the world economy might produce 40 million new health-care jobs by 2030, the World Health Organization predicts a 9.9 million doctor, nurse, and midwife shortage over the same time frame. Without a question, contemporary technology has had a significant influence on every area of our lives.

Keywords: Artificial intelligence (AI); medical technology; healthcare; staff; management; applications; humans.

1. INTRODUCTION

Artificial intelligence (AI) and associated technologies are becoming more common in community and enterprise, and they are starting to be used in healthcare. Many parts of treating patients, as well as administrative procedures within providers, consumer, and healthcare companies, have the ability to be transformed by these technologies. A lot of studies have already found that AI can operate as well as or superior than humans in essential healthcare activities such as illness diagnosis. Techniques are already beating doctors in detecting dangerous tumors. However, we predict that it will be several decades before AI substitutes humans in large medical process areas for a number of causes. In this essay, we discuss the potential for AI to automate elements of treatment as well as some of the hurdles to quick AI deployment in healthcare.

Artificial intelligence (AI) refers to computing technologies that mimic human intelligence-assisted systems such as thinking, deep learning, adaptability, interaction, and sensory comprehension. Certain gadgets can do tasks that would normally need human interpretation and decision-making. These approaches use an interdisciplinary perspective and may be used in a variety of disciplines, including science and treatment. AI has been used in healthcare since the 1950s, when physicians attempted to enhance their diagnosis using computer-aided algorithms. Research in and advancements in medical AI applications have risen in latest decades of modern computers significantly increased computational capacity and the huge quantity of digitized information accessible for gathering and use. Artificial intelligence is progressively altering medical practice. AI applications in healthcare may be implemented in a variety of medical disciplines, including clinical, diagnostic, rehabilitative, surgical, and prognostic procedures.

Medical decision and illness diagnosis are two additional key areas of medicine where AI is having an influence. AI technology can identify disease and guide healthcare choices by ingesting, analyzing, and reporting enormous amounts of data across several senses. AI applications can cope with the massive amounts of information generated in medicine and uncover fresh data that otherwise would have been lost in the sea of medical big data. These technologies can also be used to discover novel medicines for health-care management and patient-care therapies. A study of main research sources reveals bravery in the use of AI. However, by concentrating the medical profession on clinical reasoning innovation, the technology has the ability to cut care costs and repetitious procedures. The AI perspective is intriguing; nevertheless, further research will be required to demonstrate the efficacy and applicability of AI in the medical area.

2. DEFINE ARTIFICIAL INTELLIGENCE?

Artificial intelligence (AI) is defined differently by different people; most consider it to be the
technology that enables computers and machines to perform intelligently. Several perceive it as a machine that substitutes human labor to provide a more effective and faster outcome for people. Some see it as a system capable of accurately interpreting external input, understanding from it, and applying that learning to fulfill specified objectives and activities through flexible adaptability [1].

Regardless of the many definitions, the general idea of AI is that it is related with automated machinery to assist humanity in solving issues and facilitating operating procedures. In a nutshell, it is intelligence created by people and shown by computers. The concept artificial intelligence (AI) refers to the capabilities of a human-made technology that mimics the cognitive skills of human minds' inherent intelligence [2]. With the fast evolution of artificially intelligent technological advances over the years, AI has been seen nearly in all of our life groups, and some of it may no longer be considered AI as it is so prevalent these days that we are far used to being, such as character recognition or the Siri (speech interpretation and recognition functionality) of data searching machinery on computer [3].

3. THE EFFECTS OF ARTIFICIAL INTELLIGENCE ON HUMAN LIFE

3.1 Negative Impact

Let us examine the negative effect of AI on human life [4]:

- There will be a massive societal change that will upset the way we live in the human community. Humans must work hard to make a living, but with AI, we can just instruct the computer to accomplish anything for everyone without even picking up the tools. As AI replaces the necessity for humans to meet face to face for concept sharing, human intimacy will progressively dwindle. As personal gatherings are no longer required for communication, AI will act as a bridge between individuals.
- The next issue will be unemployment, since many jobs will be eliminated by equipment. Many automotive assembly lines are now packed with machines and robots, driving conventional people out of employment. Even in supermarkets, retail employees will be obsolete as digital devices replace human work.
- Wealth disparity will be generated when AI investors grab the lion's share of profits. The wealth disparity between affluent and poor will increase. The so-called "M" form of distribution of wealth will become increasingly visible.
- New challenges emerge not just in a societal perspective, but also in AI itself, as the AI getting taught and learns how to perform the particular task might ultimately take off to the point where human control is lost, resulting in unforeseen challenges and repercussions. It pertains to AI's ability to act autonomously after being equipped with the necessary algorithms, ignoring the instruction issued by the human operator.
- The human developers of AI may develop anything with racial bias or that is egocentrically focused in order to damage specific people or objects. For example, the United Nations has decided to restrict the spreading of nuclear energy for concern of its indiscriminate application in killing humanity or targeting specific groups or regions to establish dominance. AI has the potential to target specific races or programmed items in order to carry out the programmers' command of destruction, resulting in global calamity.

3.2 Positive Impact

However, there are several good effects on people, particularly in the realm of healthcare. AI enables computers to learn, analyze, and apply logic. When scientists, medical researchers, doctors, mathematicians, and engineers collaborate, they can create an AI focused at diagnosis and therapy, resulting in dependable and secure health-care delivery systems [5]. As health professors and medical researchers work to uncover new and more effective ways to cure diseases, not only can digitized computers help with analysis, but robotic systems can also be developed to perform delicate medical operations with accuracy. Here is an example of AI's contributions to health care [6].
3.3 Robotic Systems that are Socially Therapeutic

Pets are suggested for older adults to relieve stress, lower blood pressure, anxiety, loneliness, and promote social contact. Now, cyborgs are being proposed to follow those lonely elderly people, even to assist with housework. Therapeutic robots and socially assistive robot technologies enable elderly and the physically handicapped enhance their quality of life [7].

3.4 Surgical Contributions Based on Artificial Intelligence

Humans have had the option of undergoing AI-based surgical treatments. Even though this AI will still need to be managed by a health expert, it will be able to accomplish the task with much less harm to the person. Many hospitals now have the da Vinci surgical system, a robotics device that allows surgeons to conduct minimally invasive surgeries. These technologies allow for considerably better sensitivity and efficiency than manual methods. The less intrusive the operation, the less pain and blood loss there will be, and the less anxious the patients will be.

3.5 Virtual Presence

Diseases may be diagnosed from a distance using virtual presence technology. The patient is not need to exit his or her bed, but doctors may examine on patients while physically being there by utilizing a remote monitoring robot. Health practitioners may move around it and engage with patients almost as successfully as if they were present physically. This enables professionals to provide care to patients who are unable to travel.

3.6 Enhances Radiology

In 1971, the first computed tomography monitors were launched. In 1977, the first magnetic resonance imaging (MRI) scan of the human body was performed. Cardiac MRI, body MRI, and prenatal scanning were commonplace by the early 2000s. The quest for innovative techniques to identify particular illnesses and interpret scan findings persists [8]. All of them are the results of AI technologies.

3.7 Minimize Mistakes Caused by Human Fatigue

Human mistakes in the workplace is unavoidable and frequently expensive; the larger the amount of tiredness, the greater the chance of inaccuracies happening. However, no technology suffers from tiredness or emotional attention. It reduces mistakes and allows you to complete the task faster and more precisely (1995) [9].
3.8 Rapid and Precise Diagnoses

The Watson computer from IBM was employed to diagnose, with intriguing results. Loading the information into the computer results in an immediate AI diagnostic. AI can also present clinicians with a variety of therapeutic options to explore (1956) [10]. The method is as follows: Load the digital findings of a physical examination into a computer, which will examine all options and autonomously diagnose whether or not patient has deficits or sickness, as well as recommend several types of possible therapy.

4. APPLICATIONS OF AI IN MEDICAL TECHNOLOGY

In Table 1, AI has proved to be a benefit for the medical sector, whether it is used to identify linkages between genetic sequences, surgical robots, or even to maximize hospital efficiency [11].

<table>
<thead>
<tr>
<th>Table 1. Benefit for the medical sector</th>
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<tbody>
<tr>
<td><strong>Enhance Primary Care and Triage through Chat bots</strong></td>
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<td><strong>Virtual nursing assistants</strong></td>
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<td><strong>Minimizing the burden of EHR use</strong></td>
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<td><strong>Aiding in the accurate diagnosis</strong></td>
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<td><strong>Robotic Surgeries</strong></td>
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<td><strong>Support in Clinical Decisions</strong></td>
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Table 2. Risks connected with Artificial Intelligence

| 1 | Information accessibility | Additional concern presented by AI systems is that training them necessitates large volumes of data from many sources, such as pharmaceutical records, electronic health records, insurance claims files, and so on. Because the information is scattered and patients frequently see various doctors or move health insurers, the information becomes more difficult and less understandable, increasing the risk of mistake and the expense of information gathering. |
| 2 | Bias and inequality | Because AI systems acquire and learn from the information with which they are trained, they can also acquire the information's prejudices. For instance, if the information used in AI is mostly gathered in academic medical facilities, emerging AI technologies will be less conscious of, and hence less successful in treating, patients from groups who do not normally visit scientific medical centers. |
| 3 | It is possible that the profession will change as a result of this. | In the long term, the use of AI systems may result in changes in the medical profession. Especially in fields such as radiology, where the majority of the labor is mechanized [16]. This brings up the question that a high level of AI use may result in a decline in human knowledge and ability over time, causing clinicians to fail in recognizing AI mistakes as well as the future growth of medical expertise. |
| 4 | Concerns about privacy | Many patients believe that the collecting of massive datasets and the sharing of information between health institutions and AI programmers to allow AI systems violates their security, resulting to the lodging of litigation. Another instance where the use of AI systems presents this concern is the capacity of AI to anticipate private data of patients even if the patient has never supplied the data. |
| 5 | Injuries and Mistakes | One of the most significant dangers of AI in medical technology is that the AI system may be incorrect at sometimes, such as when it offers the wrong medicine to a patient or makes an error in detecting a tumor in a radiology scan, which might result in the patient's damage or grave health-related repercussions [17]. AI mistakes may differ from one another for at least two causes. While errors can occur among human medical experts, what makes this important is that a root issue, an error in an AI system, might result in damage for thousands of individuals. |

5. DANGERS OF ARTIFICIAL INTELLIGENCE IN MEDICAL TECHNOLOGY?

In Table 2, There really are numerous risks connected with artificial intelligence in medical technology that must be resolved [15].

6. THE FUTURE OF AI IN HEALTH CARE

The future of AI in medical technology may encompass activities that range from simple to advanced. It may involve receiving phones, evaluating medical information, tracking public health, and analytics in the coming years [18]. Devising pharmaceuticals and medical equipment, interpreting radiological images, developing medical diagnostic and treatment plans, and even talking with patients are all part of AI's advancement.

- On the other side, some physicians believe that AI in healthcare will have the following effects on the profession: Take medication apart.
- Allow non-experts to irritate the profession.

Fig. 2. Future of AI in healthcare

- Will almost certainly obviate the need for doctors.
- Boost inefficiency

Although these are valid issues, it will be very hard to decrease the use of AI in medicine at this time [19]. The only option remains effective surveillance and adequate restrictions.
7. CONCLUSION

The study shows that AI will play a significant role in future healthcare services. It is the fundamental capacity driving the development of precision medicine, which is universally acknowledged to be a much-needed breakthrough in treatment. Although initial attempts to provide diagnostic and treatment suggestions have been difficult, we anticipate that AI will eventually master that domain as well. Given the fast advancements in artificial intelligence for imaging processing, it is probable that most radiology and pathology pictures will be reviewed by a computer at some time. Speech and text recognition are already employed for tasks like patient communication and capture of clinical notes, and their usage will increase. In this topic, we examine the artificial intelligence and positive and negative impact of artificial intelligence on human life. We also discuss the dangers of artificial intelligence in medical technology and application of AI in medical technology. And last, we study about the future of AI in healthcare.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

12. Jain, A. Yadav, Shrivastava Y. Modelling and optimization of different quality


