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RESEARCH ARTICLE

RESEARCH QUESTION: CAN AI REPLACE DOCTORS IN THE MEDICAL FIELD?

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ABSTRACT

Technology is crucial for the advances in human life and in determining habits of society. In the recent century this advancement has been by leaps and bounds, however with the advent of computers and internet it has been exponential. The launch of AI will place the human race in an era of unprecedented advancement which will change the very fabric of our society. This article focuses on the possibility of AI replacing doctors in the medical field.

INTRODUCTION

Artificial intelligence, or AI, is a form of technology, its function is to take over some of the tasks performed by our minds¹. It takes in data from a net of sources and processes it to produce information at a much quicker rate. It is able to perform these tasks using qualities associated with humans such as reasoning, deduction, analytical thinking, application and decision making. Its knowledge is ever expanding as its system is built with the ability to collect data and 'learn' from it to provide better responses and suggestions in the future. AI has been introduced into the medical field, especially in recent years. (Kanadpriya Basu, Ritwik Sinha, Aihui Ong, Treena Basu, 2020) For example, during the global pandemic COVID-19, it played a key role in gathering data on where the disease had appeared from and through various systems could track its spread. Using this data it was able to predict its next appearance.² This research dives into the possibility of substitution of actual physicians with AI in the medical field. This research asks the question 'Can AI replace doctors in the medical field'. With this research the aim is to see the limitations, advantages, disadvantages and the extent of integrating AI into today's clinical setup. With the advancements of AI in many fields of life and its growth, which is occurring at an exponential rate, it seems inevitable that AI will have a strong foothold in the field of medicine soon. Therefore, it is necessary to preempt and predict the challenges that lie ahead.

Statement of Problem: As AI becomes more integrated into the medical field, concerns arise about a possible reduction in medical practitioners and whether this change would positively or negatively affect patient care.

Research Questions

- Can AI replace Doctors?
- Is it ever ethical to give a software complete access to patient information?
- Will the benefits of AI outweigh its disadvantages?

Significance

This study contributes to the existing literature by giving the point of view of medical practitioners, on the use of AI and its possible role in the future. The findings may lay down the groundworks of how best to integrate AI and to what extent. It may also help devise a privacy policy to ensure the safety of data related to patients and doctors.

LITERATURE REVIEW

It is believed that the complete integration of AI into the medical field is not completely achievable, although this is not to say that AI is not being used. Due to the continuous evolution of AI software and its apparent use in the world around us, it would be sensible to assume that AI has found its way into the lives of medical professionals. (Mitchell Goldenberg, 2025) Doctors claim AI has been a great help in smaller, data based tasks, administrative tasks and more technical work; however it can only be limited to these tasks³. (Keragon, 2024) Its ability to sift through enormous data sources like medical journals, research papers, articles, reference books is proving to be valuable while diagnosing patients. Due to this it is able to 'double check' diagnosis and treatment plans decided by doctors or pick up smaller details that they might not notice but that may be valuable to

¹ McKinsey, What is AI?, <https://www.oracle.com/sa/artificial-intelligence/what-is-ai/>

²National Library of Medicine, Indian Journal of Dermatology, Artificial Intelligence: How is it changing Medical Sciences and its future, <https://pmc.ncbi.nlm.nih.gov/articles/PMC7640807/#sec1-3>

³ Keck Medicine of USC, Can Artificial Intelligence Replace Doctors?, <https://www.keckmedicine.org/physician-hub/can-artificial-intelligence-replace-doctors/>

treatment plans. Some specialties may benefit from the use of AI more so than others, as AI can aid in the reading and interpreting of medical scans such as CT, MRI, FMRI and X-rays which coupled with the radiologists views can help in deciding best forms of treatment. AI can make treatment plans more personalised to patients as it can take into account aspects of the patient's socio-economic background, environment, and family history to provide efficient advice to the patient. At this time AI is expected to serve as an assistant to doctors as it generally takes care of the theoretical, more menial tasks freeing up time for doctors to spend on clinical practice and patient care⁴

However, the continuous use of AI breeds various problems as well:

It is not completely reliable: It depends upon the data collected and imputed by humans. This data may be inputted incorrectly, the system may not be updated regularly, data can be outdated, and additionally due to privacy concerns institutes become reluctant on sharing patient data to AI systems therefore leading to the data not being entirely correct or complete.

Ethical Issues: AI systems are exceedingly complicated and the average person is unable to interpret this. Because of this lack of explanation behind the reasoning people are unable to trust it and therefore accountability for the decision is unclear. Traditionally the doctor or team who form the treatment plan would be held accountable for the decision no matter the outcome but because of AI's influence this becomes more vague.

Legal boundaries: A lack of a regulatory body results in no set rules or boundaries that AI should have when dealing with sensitive information. Therefore there is confusion as to who should take the blame as there is no clear explanation on who is wrong. This creates legal issues when confronted by patients.

Issues with AI and clinical practice: There is simply not much testing of AI in a clinical setting. Most testing is done in developmental centres by developers and not by medical professionals in a clinical setup, therefore this makes them hesitant to incorporate it into their own institutes. In addition to this it remains quite difficult to incorporate AI into an institute, this process takes time and runs the risk of slowing down productivity. Making the use of AI more unpopular.

Social issues: Due to the rise of AI's use in daily life people have become concerned about the security of their employment, fearing AI would take over them. People believe that AI will remove jobs completely, but this is not the case, instead jobs will have to be reorganised to accommodate AI's role. In spite of this people are still skeptical about its role in the future and are unsure what it means for them. This means its incorporation into the medical field has been slow, causing it not to be used to its full potential and we are unable to benefit from it.⁵

METHODOLOGY

The relatively newer aspect of this topic means that there is not enough data available to come to a definitive conclusion to help in answering the research question. However I have read a lot of the available material and used it to compile information that has helped to equip me in writing this report. Therefore I based my research mostly on the available literature. In addition to existing research I devised a survey and circulated this survey to various medical professionals in different fields from different parts of the world.

Using quantitative data obtained from my results, I was able to obtain comprehensive answers, clearing my initial thoughts on this topic. This improved my own understanding of AI's role in medicine and brought me closer to coming to a conclusion in my research. The biggest challenge is the fact that AI has not been incorporated in every practice and is not widely available globally. Therefore in order to improve the scope of my research I would require a larger cohort in which there are medical professionals using AI and others who are not. The sample size of the survey was quite small, providing limited viewpoints for each question. So, increasing the sample size of the medical professionals participating in the survey would have afforded greater clarity and removed any bias.

RESULTS AND DISCUSSION

The survey was able to get authentic opinions from practicing doctors on whether or not they believe that AI would be beneficial in the medical field and to what extent they believed that AI would take over. Quantitative results obtained from the survey showed that 50% of physicians had absolutely no issues with incorporating AI into their own practices and also believed that it should be incorporated in mainstream medical care centres. 26.7% agreed with the usage of AI into their medical practices but insisted that there should be a limit and believed that AI should only be introduced in certain tasks but with oversight. And the rest believed that AI should not be incorporated into medical practices. When they were asked if they believed that AI's benefits outweighed its limitations, approximately 60% of them believed so, 20% had agreed to an extent as they firmly believed that without the correct monitoring AI would not help, and 20% disagreed with this claim entirely. Surprisingly, 60% of the physicians had no issues with being a part of a clinical study that uses AI, 10% had reservations but were willing and only 30% of the responders had rejected the idea. This showed that despite rejecting the idea of incorporating AI into their medical practices, the majority of the people were not against being a part of a clinical trial using AI. This demonstrated the physician's curiosity and willingness for development of research into AI despite being hesitant of it. The general consensus was that AI could not replace the physical and emotional qualities that go into patient care. Furthermore, they all agreed that the extent that should be implemented in the medical field would be in the analysis of data and reading of medical scans. The majority of the responders believe that AI is not likely to replace doctors in the field, instead its role is more likely as a partner, helping doctors with smaller data based tasks. Some of the responders believed that it is almost impossible to fully integrate AI into the medical field. It is true that with the integration of AI it will cause a shift in the responsibilities of the doctors as it would free up more of their time to focus on patient interaction. Additionally, specialisations such as Radiology and Pathology are likely to be replaced. AI can provide a more detailed and thorough explanation of medical scans at a much faster rate than what humans can produce. However, the need for human supervision will always be needed wherever AI is being used. Ultimately, due to the small sample size the data becomes unrepresentative of the population. While it is good that we got responses from all over the world, there were not enough samples from each country to confirm the data, this questioned the generalizability of the data. Various responses had included the reasoning behind their opinions, providing an explanation behind their point. This proved that their responses were well thought out and thus were reliable.

CONCLUSION

The research while insightful does have a lot of room for improvement. Ideally in order to harness a more precise and definitive answer we should create two groups of physicians practicing in the same field and same region. One of which has fully incorporated AI in their practice and the other that hasn't. Then over a substantial period of time their opinions need to be reviewed and the changes to their practice and the reduction in the duties of the physicians and their numbers considered.

⁴ Keragon, Will AI Replace Doctors? The Potential, Risks & Challenges of AI for Doctors, [https://www.keragon.com/blog/will-ai-replace-doctors#:~:text=The%20American%20Medical%20Association%20\(AMA,splanting%20the%20doctors%20role%20entirely](https://www.keragon.com/blog/will-ai-replace-doctors#:~:text=The%20American%20Medical%20Association%20(AMA,splanting%20the%20doctors%20role%20entirely).

⁵ National Library of Medicine, Biomedical Materials & Devices (New York, N.Y.), Drawbacks of Artificial Intelligence and Their Potential Solutions in the Healthcare Sector, <https://pmc.ncbi.nlm.nih.gov/articles/PMC9908503/>

However at the conclusion of this research it is apparent that AI will play a big role in the medical field and in the near future it is going to be used widely. There will be more advanced forms of AI used in interventional diagnostics and radiology in the more developed nations resulting in the decrease of practitioners needed there. The lesser developed nations will also be using AI in the form of software and document related tasks. However, it is apparent that to an extent there will be a reduction in the overall numbers of physicians employed by big hospital groups. One major concern will be the data confidentiality, we have seen with all the softwares that exist today data that belongs to the certain groups is used in consumer manipulation, who is to say that this will also not happen with AI being incharge of medical information. There are many cases in which when you try to destroy the AI system it realises it and tries to self preserve. What if it starts to alter the course of treatment if the treating physicians are not on the same page as the AI system they are employing. There seems to be an inevitability to the prospect of AI being used at many levels of the medical practice in the very near future, as many countries USA, China, UK, have started to incorporate it into practices and started to train physicians in its use. It will still need human input but in terms of efficiency this will be great but the benefit that humans have from a doctor patient relationship will be lost.

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Appendix:

Link of the survey: https://docs.google.com/forms/d/e/1FAIpQLSdosaT_ERCRZrg9Ew5bK5bUsux0KEZ07dlvO0SbYG2XHCrUwg/viewform?usp=sharing&oid=109920453596976978429

Link to the responses:

<https://docs.google.com/spreadsheets/d/12gDEVJXKuhuSHBgo73ItojcolHSju36rHtnBd-NQKU/edit?usp=sharing>
