Healthcare Meets AI: Innovations, Applications, and Ethical Considerations

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Abstract: AI is transforming healthcare through enhancing diagnostic capability, treatment planning, and drug discovery or even in the management of care organizations. AI technologies are used for differential diagnostics, individual management of patients, increasing the effectiveness of treatment in different branches of medicine and optimizing the work of health care systems. The use of machines in diagnostics, risks and outcomes forecast, and treatments like individualized cancer therapies, are already being seen to provide realistic value and enhance the quality of patients' lives and yield as well as the pace of scientific discovery faster. The author believes that similar to creating new drugs, applying Artificial Intelligence in drug discovery process and other Healthcare aspects shows how beneficial it can be. Nevertheless, people can use AI extensively in healthcare practices, appearing to come up with certain ethical concerns. These are among the emerging issues: safe and secure data and, in particular, avoiding the risks of bias within artificial intelligence models, and respondent to transparency of decisions made by artificial intelligence. To reduce the unfair treatment of certain populations AI systems should be trained on diverse data and the data used to make decisions should be understandable. However, questions arising from patient self-determination, and especially informed consent can also be a challenge to such innovations in this regard hence the need to handle with care. This review aims at reviewing current AI advances and health care, review the ethical issues arising from these gadgets and lastly the importance of a responsible use. The things to do to augment its possibilities and avoid potential risks will entail retaining patient sovereignty; governing the impact of AI systems to be fair; and deem AI accountability. With involvement of stakeholders from the healthcare, informational technology, and the government, AI has the potential to revolutionize health care service delivery for improved efficiency and social justice.

Key words: Health care applications of artificial intelligence, using AI for diagnostics, treatment planning, drugs discovery, health care management, radiology diagnosis, data privacy, artificial intelligence transparency and informed consent, patient's liberty and ethical considerations.

INTRODUCTION

AI is gradually becoming the defining innovation influencing various industries, not exempting the health industry. The implementation of artificial intelligence throughout healthcare facilities may prove to be highly beneficial in drastically improving the quality of services as well as decreasing the expenses and improving adjusting the results in patients. Healthcare is not just about robotic process automation with the new technology, but helping the decisions doctors make to reduce misdiagnoses, and implementing individual treatments [1]. The promise is clear, that for many fields ranging from the bureaucratic to clinical, and even the pharmaceutical, that there is potential for complete reinvention through the use of AI. AI is certainly still developing but already the healthcare field is seeing numerous, beneficial uses since it provides brand new strategies to solve existing problems.

Artificial Intelligence is described as the method through which computers and particularly intelligent computers imitate human intelligence processes [2]. Such processes as learning, reasoning and self-correcting are other processes that are involved in ds. In the presence of the fast-growing interest of AI technologies in healthcare, particularly in the fields of ML, DL, and NLP, these technologies are used in different areas aimed for tasks usually too complicated or requires too much time than just human professionals. These technologies allow for systems to extract loads of medical data and make sense of them in as far as they are capable of delivering patterns and insights from them that can enhance the delivery of care to patients and also augment the efficiency of healthcare organizations [3].

The area of diagnostic support on which a lot of AI leaders are focusing is perhaps one of the most promising. It is still important to emphasize that AI technologies can help diagnose conditions based on medical images – X-rays, MRI, and CT scans far better and faster than conventional techniques. These systems employ deep learning techniques that allow them to define with a high level of detail whether or not a particular signal pattern is a normal or an abnormal one, whether this is a tumor or a fracture. Research has found that in some cases AI is capable of diagnosing certain forms of cancers more accurately than a radiologist, which in turn results in increased cancer

diagnosis rate and improved patient prognosis [4]. Apart from imaging applications, AI diagnostic algorithms are now implemented in pathology labs to review histology slides, ECGs and to forecast kidney disease outcomes in chronic kidney disease. One of the more promising application that has been suggested is within the treatment of personalized medicine. This way, the AI can use genetic data, medical history, and patient habits to come up with individualized approaches to care that will provide the greatest bang for the buck in terms of care effectiveness and bleeding risks. For instance, when it comes to treating cancer, AI has been adopted to predict the outcomes of patients to certain chemotherapy drugs to ensure the clinician identifies the most efficient treatment for their patient. In addition, AI is also breaking the speed barrier in finding out potential drug leads, and thus, contributes to faster drug development and therefore saving the long years that it would take to have the new medication to the market [5].

Other than the clinical care, AI is also transforming all the spheres of healthcare management. The adoption of AI is also meant to free health care providers to spend more time in treating patients as more tasks turn into automated processes like scheduling, billings, and patients records. Finally, various novel AI applications in healthcare can allow for a better understanding of the potential of predictive analytics in regard to patient admission rates and bed occupancy, as well as the optimal distribution of work in healthcare facilities in general and hospitals in particular, to achieve a greater level of functioning. AI is also changing the manner in which patients engage with providers through telemedicine by providing distant consultations and constant supervision of diseases like diabetics; this is the means through which access to clinical services is being opened up especially in areas which are underdeveloped [6]. Nevertheless, crucial problems arise due to the swift integration of AI in the healthcare sector also. There is a big problem of privacy and security of the patient data because, for example, for training the AI, the system needs to collect a huge amount of data about the patient. US also includes further ethical concerns such as algorithms bias, algorithms accountability and transparency of the decision made by AI systems. Some researchers have argued that AI systems may only reinforce or even deepen the current gap in healthcare; if the data used to feed these models is non-inclusive.

Future development of AI in healthcare has already started to revolutionize the healthcare industry and improve outcomes of diagnoses and treatments. Yet as these technologies become a increasingly relevant within health-care, it is important for patient, providers, governments, and regulatory agencies to co-operate and guarantee an ethical, equitable and transparent integration of the technology. Saving millions and improving everyone's quality of life are the potential promises of AI in healthcare that must be utilized appropriately, and offer a positive impact for all people during their lifetime [7].

ADVANCED TECHNOLOGIES & APPLICATIONS OF MEDICAL ARTIFICIAL INTELLIGENCE

Applying Artificial intelligence in medical field is comprehensively changing the practice in medical that was difficult to solve. AI and all fields connected with it are used in diagnosing, treatment planning, and patient management because of its potential to analyze large amounts of data and recognize patterns in it. AI advancement is not only a plus for healthcare delivery organization but also a boost to the health management systems. In this Section, details concerning significant advancements in artificial intelligence and how the technologies are being integrated into the medical practice are discussed [8]. Diagnostics is one of the areas where AI has perhaps the most potential of making a difference in healthcare. Machine learning (ML) and deep learning (DL), which are artificial intelligence subfields, reveal a capability of diagnosing medical images, laboratory data and clinical records more effectively and faster than the human doctor. In the application of AI, diagnostic tools that are already in practice include radiology, pathology, and ophthalmology among others.

In radiology using and analyzing medical images including X-rays, CT scans, as well as MRIs, instances of applying AI algorithms have already been enhanced. Machine learning algorithms can identifying diseases including tumors, fracture or any other diseases on the medical images sometimes much before conventionally used techniques [9]. For instance, in detecting lung and breast cancer from imaging studies, a study revealed that AI was much better than radiologists. It can also enable the radiologists to sort the various cases in terms of urgency; do the most severe cases first. Depending on the type, AI in pathology is applied for recognizing elements in the anatomical samples and biopsy slides contributing to the diagnosis of diseases such as cancer. Other benefits include the ability of the AI tools to see things about cells that a human may not be able to observe resulting in better diagnosis. Likewise, in ophthalmology, it is gradually incorporated to identify diseases such as retinopathy in diabetic patients, as well as aging macular degeneration by analyzing images of the retina with considerable accuracy [10].

Figure: 1 showing role of AI in healthcare
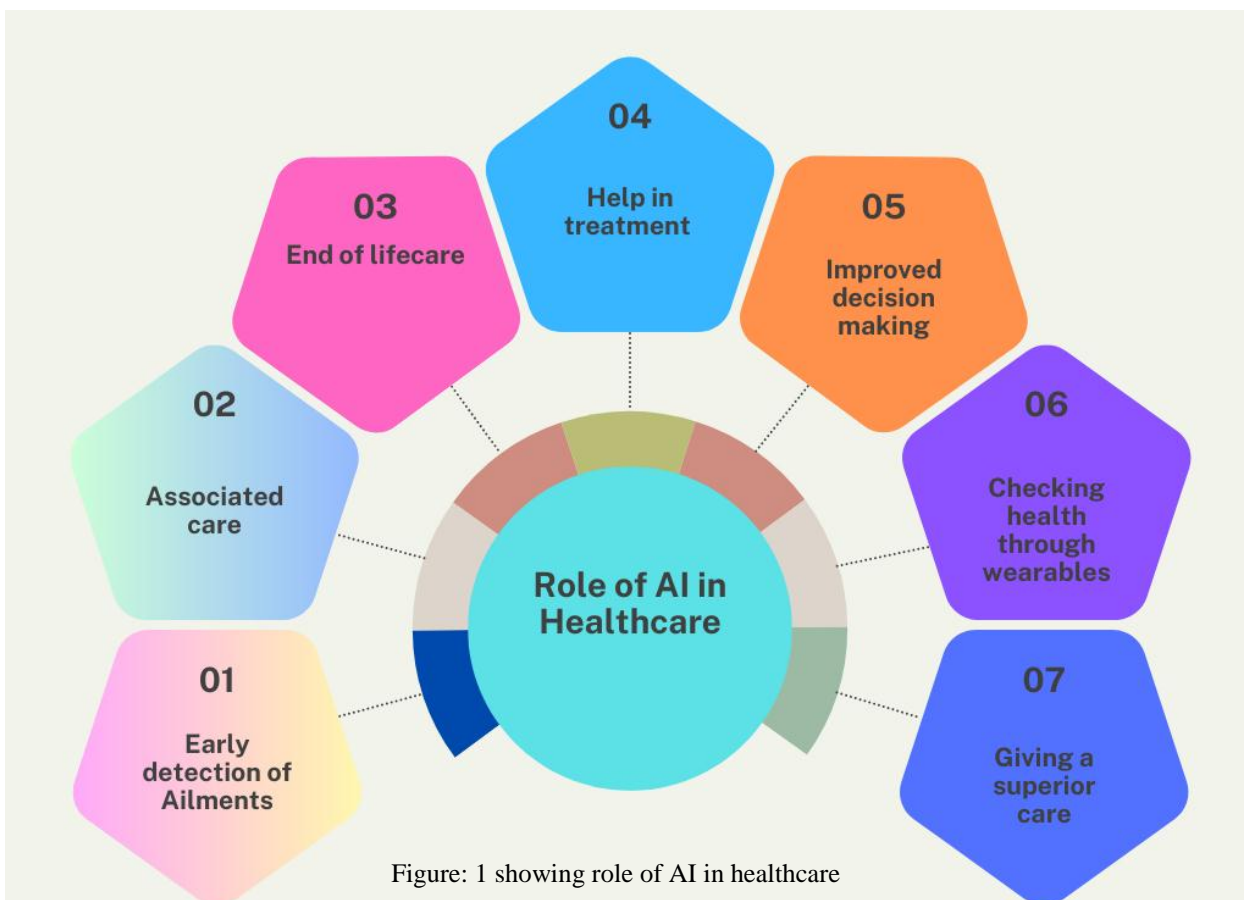
AI is also applied to the development of new methods of individualized medicine that is the approach to the patient as an individual organism with genotypic and phenotypic individuality, as well as with considering his /her everyday life and medical experience. Applied on genomic data, for instance, AI systems can discover certain correlations that aid to indicate how a patient will react to concrete treatment methods, thereby ensuring treatment efficiency. Oncology is perhaps the largest area where AI has made a monumental impact in, especially regarding customized treatments [11]. The same way, existing data is being analyzed on patient with cancer the AI tools are proving useful in determining the best treatment method based on mutations or other genetic markers within the tumor. For instance, it is now possible to use AI in developing solutions that will predict how certain carcinogenic treatments will affect a patient to reduce side effects while increasing efficacy. Besides, AI's capability for designing new drugs or determining which compounds are more likely to be effective in fighting one or another type of a cancer or any other illness is also priceless [12].

Other closely related life sciences have also been impacted by AI, for example, the time-consuming and costly, usually years, process to develop drugs has also been disrupted. AI has improved the preclinical drug discovery process because traditional drug development is a process of trial and error, while AI finds better candidates faster. Pattern-recognition capabilities of big biological data, including genotypic information, protein structure, and pathways, can be utilized to identify the impact of compounds on certain diseases and to make prognoses about their efficacy. For instance, technology solution recently has adopted AI-enabled platforms for OSCC screening of chemical databases to determine potential drug molecules [13]. It has also been used in the redeployment of existing drugs for a new disease, which is important when the new diseases begin to surface. The application of AI during the COVID-19 allowed for the models to predict that some existing drugs might be effective against the virus and help to reduce the time that normally is taken on the development of the effective treatment protocol.

CDSSs that incorporate the use of artificial intelligence are slowly becoming one of the most important tools for clinicians to use in order to make more sound clinical decisions. These systems are Decision Support System that employs calculation to review patents' information such as the medical history, lab results, and clinical standard to give recommendations of diagnosis, treatment, and future management [14]. CDSS based on artificial

intelligence can reduce the incidence of either inaccurate diagnosis or the prescription of the wrong treatment for patients, increase the efficiency of diagnosis and treatment and guarantee the application of evidence-based medicine. It can also inform healthcare providers of such factors as drug interactions, allergies or depart from clinical best practice and thus reduce on medical mistakes. Therefore, when implemented to assist clinicians in making decisions AI-Enabled CDSS improves overall health care [15].

Robotics integrated with AI is changing surgery by enhancing the precision, dexterity and control in surgery. They enable the surgeon to control a robotic operation system, which in turn accomplishes minimally invasive operations with greater precision and minimal effects of complications thus offering the patient a short recovery period. AI technology in surgery, for example the da Vinci robotic surgical system assist surgeons to operate with better precision through real-time information, stereoscopic vision and image enhancement [16]. These systems can also complement the surgeon in automate some portion of the surgery, for instance, stitching. It is noteworthy that the use of AI in cooperation with robotic operating has promising possibilities in urology, gynecology, and orthopedic surgeries.

Health care management is also being transformed by AI in its simplest and most obvious form, namely, better administration of repetitive administrative procedures. Automations like appointment setting, billing, and claims can be reduced or done by a machine to give health care practitioners more time on their patients. AI systems can forecast the number of patents that will visit the health care facilities, manage the resources efficiently and shorten the time that patients wait, meaning that the health care facilities will run more efficiently as patients will be treated faster. Also, intelligent chatbots and virtual assistants are popular in delivering patients' information as well as scheduling appointments, and even preliminary health check-ups. These tools are making work easy and effective for healthcare organizations in engaging with the patient whilst at the same time cutting down the time spent on administrative work [17].

AI in medical practice is an astounding concept with innovations and applications that have rápltecly revolutionized health systems models of health care delivery. Machine learning is increasing diagnostic precision, delivered treatments, identification of new drugs, and organizational management [18]. These are not only enhancing patient satisfaction, but also solving problems like availability, cost and scarcity of resources. Owing to the growing development of artificial intelligence, more fields related to medicine will open up thereby leading to enhancement of health of people all over the world. However, as AI is increasingly being adopted in healthcare, issues to do with data privacy, ethical concerns, and equal distribution of the technologies in question to a variety of patients must be considered [19].

NEW DIRECTIONS AND ETHICAL CONSIDERATIONS OF THE INCORPORATION OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE.

The field of healthcare provides an exciting range of AI-based solutions that have hastened diagnostics, individual treatment making, drug finding, and organizational effectiveness. Through the improved innovation in the recent past, AI systems are now an important tool in diagnosing diseases earlier, simplification of diseases treatment, and improvement of the services to be offered to patients [20]. However, the adoption of these technologies involves ensuring compliance with the best ethical principles that relate to, among others, data protection, fairness in the used algorithms, the amount of explanation given to the user and being held accountable for the decision made by the technology utilized. He noted that even as the makes use of AI in patient management increases, patient's self-governance and trust are still important [21].
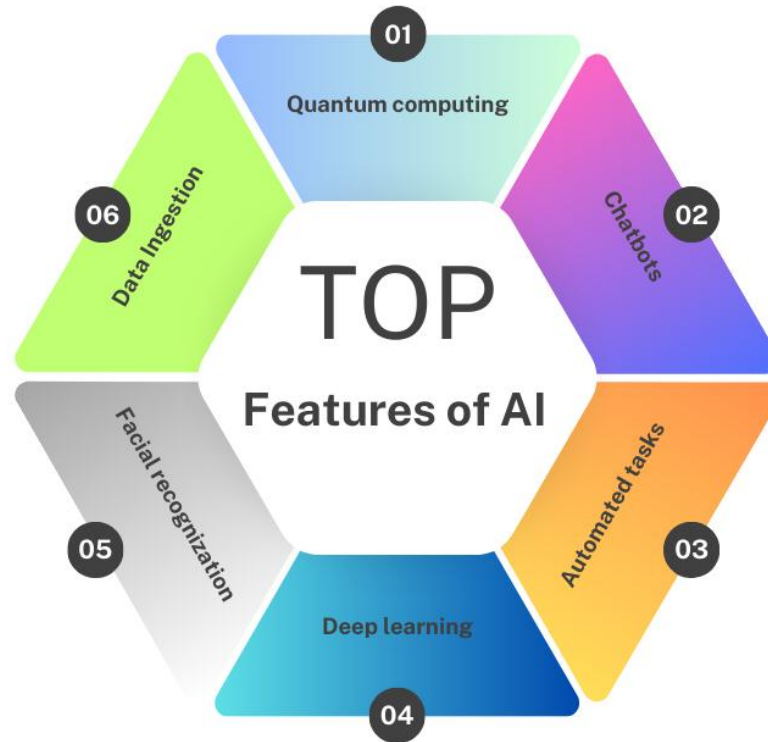
Figure: 2 showing features of AI

AI Techniques and Insights from Cybersecurity: Here are amazing features that can be incorporated from AI application in cybersecurity to that in healthcare. In cybersecurity, machine learning and anomaly detection are used by AI techniques which focuses on preventing the malicious access of data by identifying threats and preventing them [22]. Likewise, the requirements of AI noted in such fields as analyzing large datasets, predicting and safeguarding patient risks in healthcare. The progress made in cybersecurity concerning ethical and security issues offer healthcare the format of protecting sensitive data while attaining positive results through AI's use with sufficient ethical consideration [23].

AI Transforming Diagnostics and Treatment: The complex reality in diagnosing patients has been greatly accelerated by AI, in fact analyzing medical images, detecting patterns and even predicting diseases. Artificial intelligence in the diagnosis and staging of diseases using radiology; pathology, and oncology is providing better and faster disease detection and treatment plans. AI can help organizations increase their patient care's quality and relevance [24].

Personalized Medicine: Advanced Intelligence Instrument in the Future of Patient Care: AI in healthcare is evolving patient care systems that are unique to patient requirements. Having collected the genetic data, and the lifestyle characteristics of the patient and comprehensive history of the illnesses treated, the AI-driven systems design individual therapy courses [25]. Such methodology allows increasing the chance of treatment and reducing side effects, so individualized medicine has a bright future.

Data Privacy and Security in AI-Driven Systems: Since, AI systems work with a large number of medical data, privacy and security become the key concerns. Legal issues relating to data violation, unauthorized access and consent requires high level of measures. Stakeholders' trust is imperative in AI healthcare apps; anonymizing data, encrypting data and following all set legal requirements improve this [26].

AI IN HEALTHCARE: ACTUAL SCENARIOS AND BENEFITS

Artificial Intelligence (AI) is being deployed more and more in the health care industry at a visibly rapid pace. From medical imaging to clinical decision support, from population health management to genomics, artificial intelligence systems are being applied in clinical works and healthcare interventions in manners that redefine and transform healthcare services. In this section, the author shares several examples and use cases of AI to show key areas of impact of the technology across the healthcare industry. Radiology is perhaps the best illustration of how AI is changing the system in the healthcare industry [27]. Based on data published in 2016, researchers at Stanford University School of Medicine created an AI model, which would diagnose pneumonia from X-ray images of the chest more effectively than a radiologist. A deep learning algorithm which was based on thousands of labelled X-ray images was effective in recognition of pneumonia symptoms including early stages when it is challenging for human practitioners to do the same [28].

Similarly there have been studies done on breast cancer screening, where models have applied AI for breast cancer detection from mammograms with better performance than the radiologists. A well-known example is the project of Google Health that designed an AI model that recognizes cancer and minimize false positives better than doctors. With this AI, accuracy should drastically improve, and the number of lives lost due to human error should reduce, and the speed that critical diseases can be diagnosed should increase. Sepsis, a systemic, critical illness occasioned by an infection, is among the leading mortality causes in hospitals globally [29]. Whereas early identification is important, sepsis often goes unrecognized at this stage because initial signs are often non-specific. Instead, AI has been employed in the application of early sepsis identification to enable effective interventions in sepsis development to increase the survival rate.

One good example from this is the relationship between Google Health and the National Health Service of the United Kingdom. Here, AI models were trained to predict sepsis based on patients' numerical data such as vital signs and laboratory reports some 48 hours before clinical diagnosis of sepsis. This has created the ability in ARG to predict, increasing the ability of those in the enteral healthcare setting to intervene early, specifically decreasing the mortality rate for sepsis associated diseases [30]. The imposed model also revealed a dramatic decrease in the rate of missed diagnoses, so that the applied approaches equipped healthcare professionals with a valuable working tool that aimed at enhancing the patients' quality of life. AI's place in oncology has been revolutionary on numerous occasions, starting with enhanced diagnostic potential and culminating in individualized treatments. Artificial intelligence is particularly helpful in screening and diagnosing diseases from medical images and analyzing genomic data, patient records to help with early diagnosis of cancer, treatment strategy and prognosis [31].

The most common example of cancer diagnosis with the help of Artificial Intelligence is machine learning for the detection of skin cancer. The AI system was trained by researchers from MIT and Harvard to detect skin cancer from dermatological images with the effectiveness of dermatologists. In one of the studies it was confirmed that the developed AI was better at diagnosing melanoma, an aggressive form of skin cancer, than board certified dermatologists [32]. This particular technology is helpful in accelerating and providing efficient diagnosis that benefits clinicians in handling their patients well. AI has played an important role in achieving better patient outcomes in individualized therapies in cancer treatment. An example is Watson, an oncology computer system whose capability involves computations with medical literature, clinical trial data, and patient data in order to create a treatment plan for cancer patients. The use of the system has been conducted in India and United States where oncologists benefit from the system to make better decisions in a treatment. Watson goes through patient's genetic data, medical records, and the type of cancer; thus, assisting the doctors in selecting the proper treatments that could minimize the random use of chemotherapy and radiation, which are typical kinds of treatment for cancer [33].

AI IN DRUG DISCOVERY: SPEARHEADING THE WAY TO CURE

The prospective of AI is to help in the drastic shortening of the time and expenses needed for creating new drugs. The conventional approach in drug discovery is a tiresome, cumbersome and time-consuming method that admits extensive research, clinical evaluations, and approval. AI models, despite this, can learn about the different biomedical data and calculate which compounds are likely to be potent in the treatment of various diseases and can bring together new drug discoveries in a shorter amount of time. Insilco Medicine is another example of the successful use of AI to discover a new drug for fibrosis, a disease that causes scarring of the lungs and liver at the University of Toronto [34]. Insilco Medicine utilized such techniques of operational artificial intelligence to predict and analyze the molecular patterns of genetic data; Insilco found a potential drug candidate in merely 46 days, while the entire process can take about years in normal traditional drug development. This fast pace of discovery

is actually good sign of the advances that AI has delivered in terms of research speed and in getting new treatments to patients quicker.

Another example includes Atom wise; a company that applies an artificial neural network in order to estimate the ability of chemical compounds in treating diseases. It is worth to note that using Atom Wise AI system a list of existing drugs was identified that can be used in COVID-19 treatment. The system enabled innovative researcher to accelerate the search for potential cures by analyzing millions of molecular compounds faster than ever in records [35].
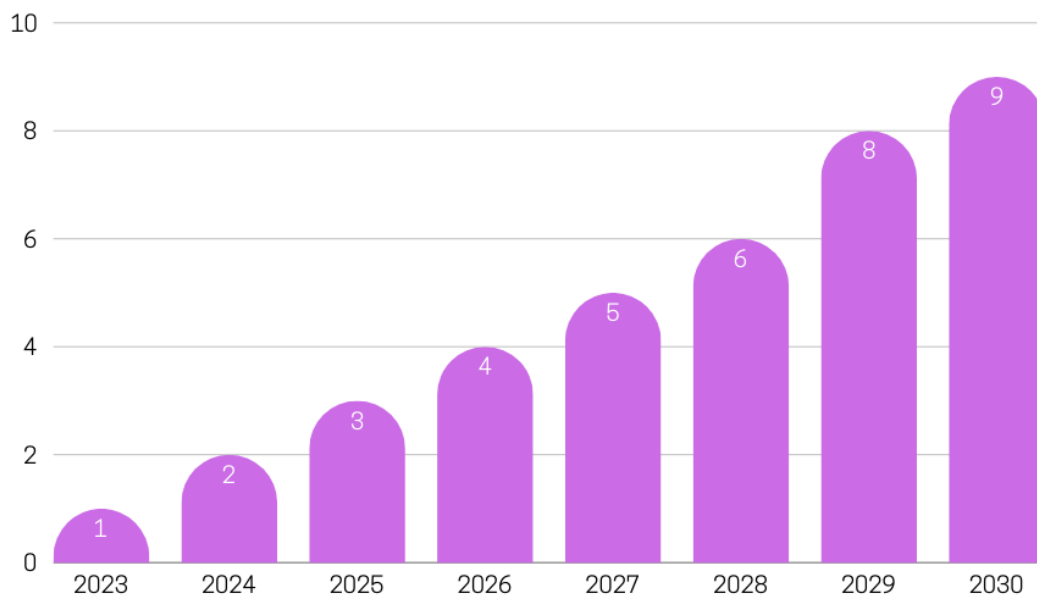

Figure: 3 showing generative Ai in healthcare market

AI in Administration: Cost savings are a key component for enhancing the operational efficiency of business in the food chain. Many people may assume that AI is only used in terms of clinical care but it has also made its way in the administrative side of healthcare as well. Most of the healthcare industries are finding ways to use AI in managing their resources especially in regard to staffing, managing time in ward schedules, as well as the payment sections through charge/billings and claims [36]. The first success story in relation to the utilization of AI in the field of healthcare management involves AI chatbots for patient relation. Virtual assistants developed through the help of AI are incorporated into the patient's care as appointment fixing, symptom evaluation, and follow-up care tools like Babylon Health. The above mentioned AI tools can help to lessen the workload of the administrative personnel and bring greater and faster benefits to patients. They also decrease time that patients spend waiting and increase patient satisfaction as well as the efficiency of administrative work [37].

AI also bestows its utilization in increasing the efficiency of the health care organization in predictive analytics for hospital management. Nowadays the AI models are applied for estimating the patient admissions, forecasting, and bed occupancy rates. For instance, New York based Mount Sinai health systems deployed an artificial Intelligence real time predictive analytics to develop better discharge management and decreased emergency department patients' wait. Not only did this improve the functionality of the hospital by increasing five-star ratings and timely completion of patient reports and tasks assigned, but also it also contributed to the quality of the service because patients were enrolled and treated as quickly as possible and to the extent that available resources can allow [38]. The applications of the AI in healthcare do not remain theoretical and now various cases show the effectiveness of AI in diagnostics, treatment, drug discovery, and even administration of the healthcare systems. It means that the diagnoses themselves are more accurate, the process of developing drugs is faster, the care plans are much more suited to individual patients; last but not least, the processes involved in operations of the healthcare systems in their efficient resolution are better as well. Such technologies are promising to increase the efficacy of treatment,

decrease the costs for the delivery of the services, and redefine the specificity of the resolutions of the Health Care worldwide. But AI is still becoming more established and anybody with a problem or concern has to have it solved by AI has to work on solving the problem of ethics, data privacy, and equity so that AI is properly used and developed as it should. In the years to come the integration of AI in healthcare only seems to promise more improvement and development in the healthcare industry [39].

ETHICAL ISSUE AND RISKS OF AI IMPLEMENTATION IN HEALTHCARE CONTEXT

Artificial Intelligence, it is mainly noteworthy for bringing great opportunities in healthcare through diagnosis increasing accuracy, more efficient and individualized approach to treatment methods, as well as improving the mechanisms of the healthcare system. Yet the more we witness integration of AI technologies into clinical settings, the more ethical problems and concerns are emerging, which should be solved to ensure the proper usage of AI [40]. Of course, healthcare is not devoid of such problems when AI is applied to it, though many problems in it can be solved by applying artificial intelligence AI, but it also poses new problems in dealing with patient care, healthcare providers and the health system.

One of the great ethical challenges of AI healthcare applications is the problem of patient data protection and confidentiality. Assistant AI dependent on massive volume of patient data – papers, scans, genetics – to deliver result. As much as this information is vital in the development of AI solutions and as diagnostic tools within health care this comes with risks implicating patient privacy and data abuse [41]. Especially there has been challenges on how to handle and store data especially because of use of AI systems because of such occurrences in the health sector involving violation of patient data. For example, sets of patients and other health data may be in danger if there is low protection to the information; it is a tragedy for many patients whose records are vulnerable to hackers. Further, the storage and the subsequent dissemination or distribution of the said data to actors in health research and development, health care establishments, and firms specializing in AI technology becomes an issue of fragmentation – and, data security. To deal with these risks, it is required that DP measures should be implemented hence giving AI system an option to operate under provisions of laws such as the Health Insurance Portability and Accountability Act (HIPAA) of USA to protect health information. Also, there is the possibility of engaging various methods of data masking or even encryption for preserving the patients' information, but such steps have to be equally adequately aligned with the need of the AI models to get sufficient amounts of high-quality data for the AI models to work fairly [42].
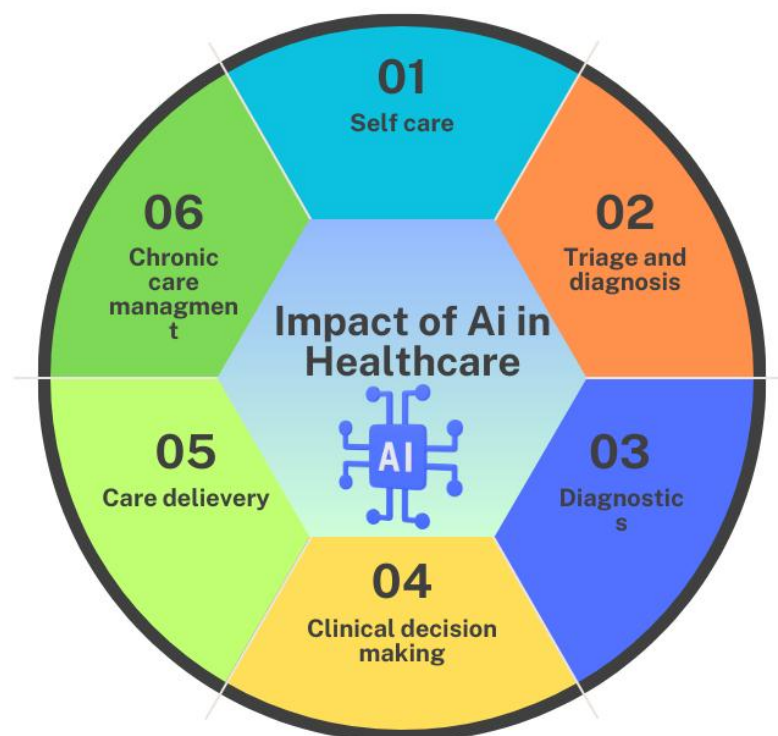

Figure: 4 showing Impact of AI in healthcare

Algorithm bias is the final supplier-side ethical issue with the application of AI in healthcare. The specialists develop Healthcare AI systems and if the provided data for the AI model is demography based, then the AI system will also be demography based and will only worsen the health inequalities if provided. For instance, an AI model training data includes mainly white patients, while patients from other races or ethnicity groups may be quite different in some cases and the program may give wrong diagnosis or recommend wrong treatment [43]. In healthcare alone, there has been an instance where racially discriminative AI was observed; in a study done by Science in 2019, it was revealed that an AI tool meant to diagnose a patient's health risk, was much less accurate when it was fed a picture of a black patient than a white one. The reason for this variation is that the fact that black patients' healthcare indication appears to be out of proportion based on socioeconomic factors rather than clinical concerns. Such biases can have impacts on a patient for example; populations that are underserved are likely to be provided with low quality diagnosis, treatment or care [44].

As a result, some of the ways through which these biases can be minimized are as follows; the use of Big data that is a broad class of statistical methods, we use a diverse dataset, all the class of demography in the training set. Also, it is clear that, managing and enhancing the process of ruling out bias, could be conducted through auditing and testing the process quite frequently and, therefore, the bias should be blocked at once in order to reduce the probability of bias appearing. It is also important, what AI models are trained and validated with which brings trust among the healthcare providers and the patients in AI and what it offers. These systems can also be considered to be 'black box' since great efforts by the authors of such systems to explain how the decision making process was arrived at are unlikely to be achieved [45]. To which, this lack of transparency raises some absolute core ethical issue of accountability. Specifically, if an application or system comes up with a conclusion that is around a diagnosis or a treatment, it may be nearly impossible to evaluate why the application reached that conclusion and hence it can be nearly impossible to assign blame. What is imperative in healthcare where a wrong decision equals a disastrous result; is the understanding of how the AI system arrived at the decision made.

The concept knowledge, which was related to informed consent as a set of measures and procedures where the patient is to be informed on the whole about his condition and the treatment plan developed for him and the possibility of AI to be involved in any capacity as an enabler also had to be fitted to the current status [46]. This also includes areas of concern such as; how the models in AI work, the type of data being captured and by extension, how that data can be utilized. Further, the idea of AI advantages and disadvantages must be explained to the patients, every kind of mistake AI can create, and it is an AI system which cannot and will not make decisions on its own. Another value highlighted here regards patient independence as being very significant. For the reason that they do not want to be treated by an AI system or they rather trust their doctors to assist them treat their sicknesses, the patients should be given a chance to opt out of being treated by an AI system. Personalized choice means that they even should have a right to choose constantly how much artificial intelligence must to be implemented in the healthcare system [47].

When the usage of an AI is progressively infiltrating the healthcare delivery system the overall communication between the providers and the patients is gradually shifting. This is because AI is primarily developed for use by health care workers but it must function in ways that will not erode the trust that patients place in physicians. One of the largest areas of concern is that technology – in particular, when presented in the form of an algorithm – will come to replace practitioner-patient relations due to an excess concentration on the technology itself more sensitive feelings of care and concern in favor of the patients [48]. This is why healthcare players have to make sure they take on the effort of informing patient relations where they may need to appease those patients and in the process make them understand why technology is being integrated in their care process: to avoid the human being behind their positive transformations but to enhance it. This indicates that both the providers and the patients must be educated on the pros and cons of applying Artificial Intelligence in the provision of healthcare and most importantly the two are supposed to have a chance to communicate their needs in healthcare setting [49].

There are many ethical considerations in recourse to Ai technologies in healthcare some of which are as discussed below: Issues like; data privacy and protection, issues to do with bias in algorithms, responsibility and openness of such algorithms, patients',(scores missing here) and generation of trust must be addressed to ensure that the introduction of AI into the healthcare sector does not pose a danger to the patient, or compromise patient directed care [50]. To overcome these barriers it calls for combined effort and cooperation of the healthcare profession, technologists and suppliers of AI, policy makers and legal system to develop the right ethical and legal framework of deployment of AI in the health care that will serve the best interest of all patients, ensure fairness and nondiscrimination by other AI suppliers. This way people are just expected to try to be able to lead happy, productive lives, which then translates to AI being able to make its most significant beneficial effect on healthcare.

CONCLUSION

The introduction of artificial intelligence affects the healthcare system as revolution which has infinite potential on existing trends in medical practice. Autonomous vehicles, biometric identification, AI has become ingrained in medical decision making, drug design and health care management. As AI progresses is improving patients' experiences and bringing value, equality and efficiency in the solving of critical tasks within the healthcare system new and urgent ethical, legal and social challenges arise. In fact, numerous of those AI advancements and examples have been integrated into medical practice with positive outcomes. Application in radiology, oncology, pathology, etc., has enhanced the plans' precision and development detection of disease besides enhancing the speed of treatment in clinical applications. Personal information including data of entire populations and individual's genome by the help of AI processing characteristics can enable doctors to improve the targeting of therapy and the efficiency outcomes. Similarly, in drug discovery AI is driving the possibility to move faster through the different phases and stages of getting new drugs to the market, and in clinical decision support systems AI is assisting clinical decision makers feel more confident in their clinical decisions based on the evidence available.

However, the application of artificial intelligence in healthcare sector attracts various ethical questionnaires and it becomes even more popular. For any practitioners there are frightening questions to professionalism and patient data that transforms into the material for AI training. Ensuring extensive principles of implementation of data protection with encryption and anonymization in fractional to ensure the integrated patients' confidentiality by all the healthcare providers and developers. The equally important question is how bias gets into the AI equations? This implies that the data which is used in training should be representative and be in a position of drawing from different population to avoid compromise of both. They work for the patient with a doctor as another client who also should understand how the decision has been made to trust the artificial intelligence, especially more specific and accurate in areas like diagnostics or a treatment plan. The aspect of informed consent is also a shield of the patient's self-determination; any patient who has been told that his treatment will involve an AI system is in a good position to decide what should be done for him. As it has been observed that the health care industry reaps maximum benefits from the AI predictions patient choice should not be eliminated but should be made more enhanced by providing more timely relevant choice. In addition, the authors mentioned that the clinician or any other healthcare provider need to know how the AI technology has to be introduced or described to the patients and have introduced the human element into complex technologies.

Implementation of artificial intelligence in healthcare can in fact alter the very type of delivery of medical services by improving diagnosis, treatment and delivery of health care services. However to achieve these the ethical issues that come with its roll out must be well handled to ensure that the gain that is made comes without compromising the patients' rights or fairness or trust. New technologies, coordinated technologies of Technology developers, healthcare organizations and leaders, legislative organizations and the public in general will continue to develop and improve on the process of designing the AI driven health care delivery system for delivery of patient health care optimality with due consideration of the ethical majority concerns. Therefore, by reaching the optimum correlation of the capacities of the superpower and AI, it is only possible to free the potential of technology in order to revolutionize the sphere of healthcare.

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