iJRASET
International Journal For Research in
Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH
IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 Issue: VIII Month of publication: Aug 2023

DOI: https://doi.org/10.22214/ijraset.2023.55211

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue VIII Aug 2023- Available at www.ijraset.com

Role of Artificial Intelligence in Telemedicine

Princal Patel
Doctor of General Medicine, Grodno State Medical University, Belarus

Abstract: This article presents an overview of artificial intelligence's (AI) function in telemedicine, emphasising how revolutionary it has the potential to be. The use of AI in telemedicine improves patient experiences, allows for faster and more accurate diagnosis, and lessens the need for in-person visits. The background, classifications, advantages, and disadvantages of telemedicine are examined. In-depth analysis of how AI is reshaping telemedicine is provided in the paper, including how it affects accurate diagnosis, patient monitoring, geriatric care, hospital visits, and physician weariness. A few benefits of AI for population health management include personalised treatment plans, drug discovery, natural language processing, decision support systems, and predictive analytics. The problems and ethical issues around data privacy and AI algorithm accountability are discussed. Despite challenges, AI in telemedicine holds great promise for enhancing patient outcomes, healthcare delivery, and accessibility to medical care around the world.
Keywords: Artificial Intelligence; Telemedicine; Remote patient monitoring (RPM); Personalized treatment plans; Diagnostic support

I. INTRODUCTION

One of the most important innovations in healthcare is telemedicine. It improves organizational effectiveness, medical care quality, and accessibility to healthcare services [1].Artificial intelligence (AI) can enhance and expand the capabilities of telemedicine, opening up countless opportunities for the creation of custom solutions for individual needs. Both can help doctors give their patients higher-quality medical care. The combination of AI and telemedicine can increase patient experiences and improve health outcomes. Additionally, they can speed up and enhance disease screening and diagnosis, increase the specificity and personalization of the diagnosis, and decrease in-person patient visits [1-4].
The application of AI in telemedicine can significantly aid in the realization of the continuum of healthcare. Throughout the course of a citizen's life, they can encourage and support better access to integrated healthcare [5]. For instance, the management of chronic diseases requires interdisciplinary ongoing and coordinated care. Remote care can facilitate regular interactions and communications among the many components of healthcare delivery. By enabling the intelligent information and communication environment in which health professionals could interact and by supplying a knowledge basis for the care of patients, AI can assist in meeting this demand [6, 7].

II. TELEMEDICINE

Technology is used in telemedicine, a type of remote healthcare delivery, to make it possible for patients and healthcare professionals to communicate. It eliminates distance restrictions and broadens access to healthcare services by enabling medical practitioners to diagnose, treat, and monitor patients from a distance [8]. With technological improvements and the growing demand for accessible healthcare, particularly in cases like the COVID-19 epidemic, telemedicine has grown in popularity and acceptance. Here are further details on telemedicine:
The development of the telephone in the late 19th century laid the groundwork for telemedicine. Alexander Graham Bell was granted a patent for the telephone in 1876, and its use swiftly gained popularity [9]. The ability of this technology to speak with patients remotely has been acknowledged by doctors and other healthcare experts. There were some innovative telemedical consultation initiatives in the early 20th century [10]. The American Radio-Relay League's employment of two-way radios to provide medical advice to ships at sea in 1924 is one famous instance. Through these radio chats, medical professionals were able to direct sailors and offer assistance as necessary. With the advancement of space travel, the idea of telemedicine started to take shape in the 1960s [11]. In order to monitor astronauts' health in space and connect with medical personnel on Earth, organizations like NASA started employing telemedicine. This paved the way for telemedicine applications that go beyond the limits of the planet. In the 1980s and 1990s, telemedicine made major strides, mostly thanks to developments in communication technologies. Remote medical information interchange was made possible by the advent of digital imaging technology and the rise of video conferencing [12-14].

Real-time video consultations between field hospitals and medical facilities became possible because of the employment of telemedicine by the U.S. military in the Gulf War at the beginning of the 1990s [15]. To increase access to medical expertise, telemedicine initiatives have started to appear in a variety of healthcare settings, such as emergency rooms, prisons, and rural health clinics. As the internet grew more widely used and devices like smart phones and high-speed internet connections became more common, telemedicine usage significantly increased in the 2000s [16].

The usage of store-and-forward telemedicine increased, enabling medical professionals to electronically transfer patient records, pictures, and diagnostic data for distant consultation.RPM has grown in prominence, particularly for the management of chronic diseases. RPM entails the use of medical devices to gather and transmit patient health information to healthcare professionals for evaluation and intervention.

During the COVID-19 epidemic, telemedicine usage skyrocketed as governments and healthcare systems around the world tried to reduce in-person interactions. The emergence of telemedicine in conventional medicine was hastened by the current global health crisis [17].

A. Classification of Telemedicine

1) Real-time telemedicine: Using video conferencing or telephone contact, real-time telemedicine involves live interactions between medical professionals and patients. While taking place remotely, it is comparable to conventional face-to-face consultations [18].
2) Store-and-Forward Telemedicine: This technique involves the secure recording and storage of medical information, including pictures, videos, and patient records. Then, these files are delivered to medical experts for subsequent examination and consultation.
3) Remote patient monitoring (RPM): It is a technique for remotely observing a patient's health. Data are gathered and sent to healthcare professionals for analysis and, if necessary, intervention. Examples of this data include blood pressure, glucose levels, heart rate, etc.
4) Mobile health (mHealth): It is the practice of providing healthcare services and information using portable electronic devices like smart phones and tablets. It can include text messaging services, wearable, and mobile apps for health-related uses [19].

B. Advantages

1) Increased Accessibility: Accessibility is improved because telemedicine makes it possible for people to obtain medical treatment without having to travel far [20].
2) Convenience: By consulting with medical specialists online, patients can save time and effort by forgoing in-person consultations [20].
3) Cost-Effectiveness: Because telemedicine eliminates the need for physical infrastructure and administrative costs, it may be more affordable for both patients and healthcare providers.
4) Timely Consultations: Telemedicine makes it possible for quicker consultations, which leads to quicker diagnosis and treatments, especially in circumstances of extreme urgency [21].
5) Chronic Disease Management: By routinely monitoring vital signs and health parameters, remote patient monitoring aids in the management of chronic illnesses.

C. Limitations

1) Technology Roadblocks: Access to reliable internet connections and the right gadgets can be difficult, particularly in remote or undeveloped areas [22, 23].
2) Security and privacy: Concerns concerning data security and patient privacy arise when sending private medical information electronically.
3) Licensing and Regulatory: Since telemedicine sometimes includes crossing state or international borders, healthcare practitioners face difficult licensing and regulatory obstacles [23].
4) Lack of Physical Exam: Not all medical issues may be correctly identified or treated without a hands-on physical exam [24].
5) Communication Barriers: Ineffective communication between patients and healthcare professionals during virtual consultations may be caused by technical difficulties or a lack of nonverbal indicators.

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue VIII Aug 2023- Available at www.ijraset.com

III. AMALGAMATION OF AI IN TELEMEDICINE

The procedure of diagnosis is interdisciplinary and may entail multiple testing modalities, including clinical, imaging, blood, and genetic markers. For thorough mental health examinations, for instance, discipline-specific testing, such as neuropsychological tests, may be required [25]. Some of these tests might not be available or might be too expensive in a telemedicine setting. Innovative data-driven artificial intelligence (AI) techniques may provide a solution by using machine learning to massive datasets of disease populations in order to solve this difficult multivariate problem in order to establish an appropriate diagnostic methodology [26, 27]. These models, which focus on prediction generalizability for diagnostic purposes on varied populations, can learn straight from the data without any prior statistical modeling, leading to more objective outcomes. Since the COVID-19 outbreak, there have been global initiatives utilizing data-driven methods and pooled information for COVID-19 forecasting, prevention, and treatment [28]. Additionally, the ML model includes a crucial analysis that makes it possible to find more affordable methods [29]. Data-driven computational techniques can test for synergistic variable combinations and redundant feature reduction, in contrast to standard statistical hypothesis testing, enabling more successful diagnosis under the unique restrictions of telemedicine [30].

By 2026, according to research by Collier et al., the deployment of AI applications might save the US healthcare system an estimated $150 billion yearly.

According to Wahl et al., there are numerous opportunities to use AI applications to improve public health outcomes in low-income country settings because of the pervasive use of smart phones and growing investments in enabling technologies (such as mHealth, electronic medical records (EMR), and cloud computing).

The rapid adoption of electronic devices has accelerated changes in healthcare that appear to be vital to information sharing between and within healthcare professionals and patients [31].

When it comes to analytical reasoning and problem-solving, AI clearly outperforms humans (particularly when handling massive volumes of data) and can successfully address human function limits. However, if AI is overused, it may result in the loss of critical physician abilities, which must be taken into account or mitigated [32]. Even when using deep machine learning, inflexible algorithm protocols and decision-making trees are still vulnerable to the effects of AI's incapacity to completely incorporate and comprehend contextual information or distinguish between important and irrelevant informational input. In the healthcare industry, contingencies are commonplace, thus the benefits of utilizing AI technology must be carefully evaluated against the human ability needed to negotiate and handle these off-nominal or unpredictable circumstances [33].

Voice recognition and interpretation provide a significant obstacle to the use of AI; hence user interface and data input techniques are crucial. The fact that many care and treatment decisions, particularly in emergent and time-constrained situations, depend on human thought processes that happen subconsciously, such as intuition, insight, subjective evaluation, and the analysis of ambiguous or qualitative data, poses generalized challenges to the use of AI in healthcare [34]. By comparing the statistically substantial reduction in mistakes (85%) in detecting cancer in images of lymph nodes when compared to AI or human interpretation alone, Jarrahi demonstrates the advantage of the symbiotic usage of AI mixed with a human in the loop [34].

During COVID-19, telemedicine has offered a vital patient continuity pathway during moments of service disruption. Additionally, this lessens the risk to healthcare professionals during pandemics, when they are under growing pressure. Telemedicine has the ability to reduce the financial toll that healthcare services and society take. Quarantined physicians can offer these services in hospitals with remote access or care via telecommunications straight to patients, freeing up other physicians to offer prompt aid to more seriously ill patients.

Teleconsultations enable medical professionals to assess patients, spot infection symptoms, and swiftly and easily record patients who could be more susceptible to illness [35].Telemedicine applications function quickly, completing insurance paperwork so that doctors can spend more time actually treating patients.

In order to identify individuals, expedite medical care, and reduce public exposure, clinics are increasing their telemedicine services to test patients for COVID-19 (11, 32). Another key area of discussion is the bundling of several specializations, such as telepathology, tele-oncology, and teleradiology [35].

It is crucial to think about the integration of educational models for doctors and trainees further upstream in the telemedical framework, and in particular how these technologies may address the issues of connecting dispersed learners (particularly in the pandemic era) and providing high-quality teaching, training, and just-in-time training in a way that is trusted, safe, and replicates the quality of "in-person" training, especially when it comes to medical training. Virtual reality and augmented reality are two immersive technologies that have the potential to improve communication between students and practicing doctors [36].

IV. AI TRANSFORMING TELEMEDICINE

A study by MIT found that 75% of healthcare facilities using AI stated it increased their ability to treat patients' illnesses, and 4/5 said it prevented staff burnout. A promising alternative for the future of healthcare delivery is AI in telemedicine. In the present section, we'll talk about how AI is changing telemedicine [37].

A. Establishing a More Accurate Diagnosis

Remote diagnosis is now possible because of telemedicine. Practitioners are now able to diagnose, assess, and treat ailments remotely. For instance, it has assisted in lowering visits for individuals with diabetic retinopathy. The Los Angeles County Department of Health Services discovered that diabetic retinopathy telehealth monitoring reduced patient visits by about 14,000 visits. The number of visits is expected to decrease much further with the addition of artificial intelligence (AI) to screening procedures. If an AI system is used in the screening process, the algorithm will only require retinal images [38].

The AI system can analyze the images and compare them to earlier samples to precisely determine the disease severity. Both the doctors and the patients will benefit greatly from the use of AI in the screening process in terms of time and labor savings. Another business is using patient images to develop an AI system that can detect the existence of rare genetic abnormalities. Today, it takes an average of seven visits to the doctor's office for patients with rare genetic illnesses to receive a correct diagnosis. AI and telemedicine may enable a visit reduction to zero. Simply provide the clinician with a picture of the patient's face, and AI will analyze it and correctly identify the disease. Due to the ease of identification made possible by employing AI in telemedicine, doctors and patients may predict that diagnosis will become a more efficient use of time and money [39].

B. Convenience of Patient Monitoring

The world of possibilities for remotely monitoring a patient's health and mimicking in-person interactions between doctors and patients has been greatly expanded by AI. Artificial intelligence is increasingly being used in telehealth settings. The NextDREAM Consortium Group conducted research on the efficiency of AI in remote diabetes care. The key finding was that remote insulin dosage adjustments made using the tested automated AI system might be just as successful as those made by skilled medical professionals. The AI-based automated solution can be used by doctors and professionals to help with decision-making. The University of San Francisco's Center for Telehealth Innovation is exploring AI that can recognize an early pneumothorax warning indication in X-rays [40].

The most frequent applications of AI in telehealth are data analysis and cooperation, patient monitoring from a distance, and intelligent diagnosis and support. AI has the ability to help physicians diagnose and treat patients, as well as to lessen professional burnout and enhance the overall patient experience.

Healthcare executives are increasingly concentrating on AI and telehealth as a strategy to stay competitive by streamlining clinical operations and releasing predictive potential through patient data analysis due to the ongoing public health crisis. This year, due to the implementation of lockdown procedures, there has been a decrease in the actual necessity for in-person consultations. The monitoring of clients' wellness in their homes has benefited greatly from AI [41].

C. Providing Better Medical Care For Elderly Patients

Numerous telemedicine applications have been developed with the purpose of helping users manage their medical issues, fitness objectives, doctor visits, and insurance claims more effectively. Mobile devices and telemedicine are frequently related. However, assistive robots will eventually be used in telehealth [42]. These robots will be crucial in providing healthcare to locals, especially the elderly. Intelligent robots can assist people with tasks like walking and moving about the house, delivering medicines on time, and alerting authorities in case of an emergency.

The robots are capable of moving somewhat autonomously and doing the tasks that have been given to them. Thanks to AI capabilities, the robots can comprehend the surroundings, the patient's behavior and movement patterns, and the interior settings of the residence. As a result, it might develop the skills necessary to help the patient more effectively and take on the role of caretaker. The development of AI robots to assist the elderly is already being funded by the Japanese government [43]. These robots can assist people in moving around, taking a shower, getting rid of their waste, and getting real-time health checks. While working as efficiently as people, these robots have the potential to reduce healthcare delivery costs. Giving elderly people round-the-clock care may even help patients improve their quality of life.

D. Streamlining Hospital Visits

Even though telemedicine claims to reduce hospital visits, some of them are still necessary. In these circumstances, AI might help shorten wait times for patients and guarantee that they get seen as soon as possible. The hospital's patient flow, urgent cases, the need for additional beds, and other information pertaining to patient care are all kept up to date by the AI system, which also informs staff members. The approach has increased the hospital's ability to take on patients with complex medical issues by 60%.With ambulances being dispatched an hour earlier, ambulance services have increased their efficiency as well. Patients in the emergency room are sometimes given a bed up to 30% sooner thanks to AI and predictive analytics [44].

E. Preventing Doctors' Burnout

Medical professionals are prone to anxiety throughout long workdays. It could affect work habits and result in weariness and unhappiness. Burnout is typically brought on by prolonged patient contact or spending a lot of time using technology. Instead of talking to patients, doctors interact with the EMR. Telehealth has already become widely used by clinicians to combat burnout. The benefits increase by double when AI and telehealth are coupled. Doctors may spend less time on their laptops thanks to AI [45].AI may also help in the identification of indicators that could point to burnout symptoms. It can even predict how many patients a physician can see before becoming worn out.

V. ASPECTS OF AI IN TELEMEDICINE

By increasing diagnostic precision, promoting patient outcomes, and streamlining medical workflows, the incorporation of artificial intelligence (AI) in telemedicine has the potential to transform healthcare delivery. Here are a few examples of how AI is being applied to telemedicine:

1) Diagnostic Support: AI-powered systems can examine patient records, test results, and other medical data to help doctors diagnose patients correctly. AI, for instance, can review X-rays and MRI scans for potential abnormalities and flag them, assisting radiologists in more effectively identifying diseases [46].
2) Chatbots and Virtual Assistants: In telemedicine platforms, AI-driven chatbots and virtual assistants can be used to communicate with patients, respond to their questions, and prioritize their medical issues. These chatbots can set up appointments, give people basic medical advice, and point them in the direction of the best healthcare options.
3) Remote Patient Monitoring (RPM): By evaluating the data gathered from wearable and remote monitoring sensors, AI plays a vital role in RPM. Data trends and abnormalities can be found by AI algorithms, alerting healthcare professionals to any outliers and enabling prompt interventions for patients with chronic diseases [47].
4) Personalized Treatment Plans: Using extensive patient data processing, AI can create customized treatment plans based on each patient's unique health issues, genetic makeup, and lifestyle [48]. AI can help healthcare professionals choose the best course of treatment by examining past patient data and medical literature.
5) Drug Discovery and Development: By analyzing sizable datasets, simulating drug interactions, and forecasting therapeutic efficacy, AI is being utilized to speed up drug discovery and development processes. This may result in the development of novel pharmaceuticals or the adaptation of current ones to treat various illnesses.
6) Natural Language Processing (NLP): Artificial intelligence (AI) can extract pertinent information from unstructured data, such as research papers and medical notes, by using a process known as natural language processing (NLP), which enables AI to comprehend and analyze human language. NLP can assist medical professionals in keeping abreast of the most recent research in medicine and clinical recommendations [49].
7) Decision Support Systems: AI-powered decision support systems can aid healthcare professionals in making difficult medical judgments. AI can offer treatment alternatives and prospective results by evaluating patient data and comparing it to enormous libraries of medical information, assisting doctors in making well-informed judgments.
8) Enhancing teleconsultations: During teleconsultations, AI can assist in a number of ways, including providing context-specific advice, summarizing and presenting patient data to providers during the consultation, and translating languages in real-time for multilingual communication between patients and providers.
9) Population health management and predictive analytics: AI can analyze big databases to forecast disease outbreaks, pinpoint at-risk populations, and improve public health measures. Controlling and avoiding infectious infections and other health-related emergencies, can be extremely helpful [50].

10) Quality Assurance and Error Reduction: AI can help with quality assurance by evaluating medical records and treatment plans to find flaws or inconsistencies, lowering the likelihood of medical errors and enhancing patient safety [51].

While telemedicine's use of AI has a lot of potential, it also presents certain difficulties in terms of data protection, ethics, and ensuring AI algorithms are open and accountable. Telemedicine will undoubtedly profit from increasingly complex AI solutions as technology and AI continue to advance, resulting in more effective and individualized healthcare services.

VI. CONCLUSION

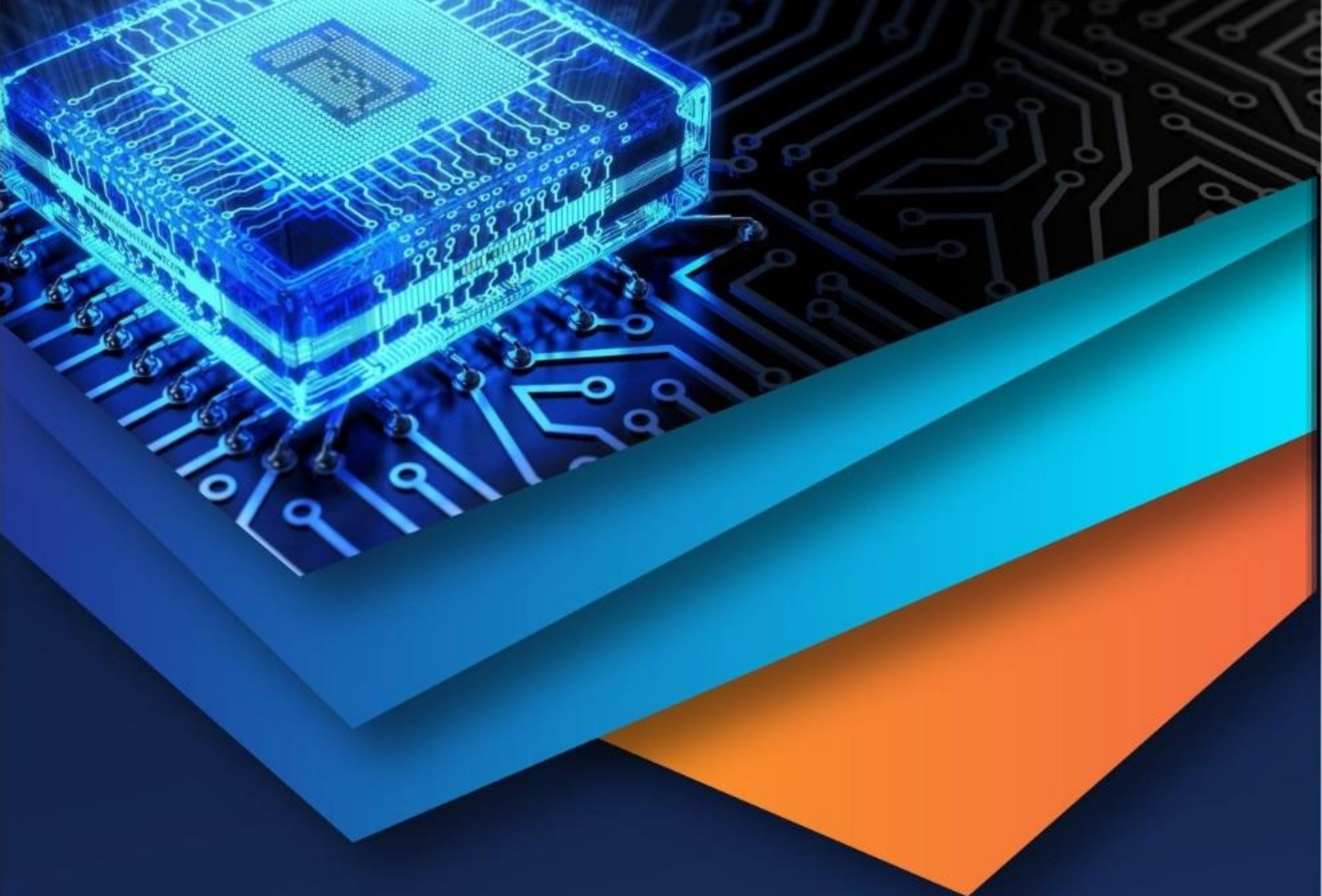
In conclusion, the use of AI in telemedicine has significantly improved the provision of remote medical treatment. Improved patient experiences, quicker and more precise diagnoses, and fewer in-person consultations are just a few of the benefits of AI in telemedicine.

AI in telemedicine has the potential to transform the medical industry by delivering specialised and effective healthcare services on a global scale. AI and telemedicine work together to improve patient outcomes and make healthcare more accessible, especially in underprivileged areas. We anticipate future advancements in AI-driven telemedicine as technology develops. Collaboration between medical practitioners, AI specialists, and legislators is crucial if AI in telemedicine is to reach its full potential.

REFERENCES

[1] Cornet G. Chapter 4. Robot companions and ethics: a pragmatic approach of ethical design. J Int Bioethique 2013; 24: 49–58.
[2] Larson JA, Johnson MH, Bhayani SB. Application of surgical safety standards to robotic surgery: five principles of ethics for nonmaleficence. J Am Coll Surg 2014; 218: 290–293
[3] Miyake S, Higurashi T, Kato H, et al. Evaluation of a combination protocol of CT-first triage and active telemedicine methods by a selected team tackling COVID-19: an experimental research study. J Infect Public Health 2021; 14: 1212–1217.
[4] Alodat M. Using deep learning model for adapting and managing COVID-19 pandemic crisis. Procedia Comput Sci 2021; 184: 558–564.
[5] Assam NA, Hussain SA, Qaraghuli AA, et al. IoT based wearable device to monitor the signs of quarantined remote patients of COVID-19. Inform Med Unlocked 2021; 24: 100588.
[6] Sharma N, Mangla M, Mohanty SN, et al. A smart ontology-based IoT framework for remote patient monitoring. Biomed Signal Process Control 2021; 68: 102717.
[7] Faris H, Habib M, Faris Met al. et al. An intelligent multimodal medical diagnosis system based on patients' medical questions and structured symptoms for telemedicine. Inform Med Unlocked 2021; 23: 100513.
[8] Dawoodbhoy FM, Delaney J, Cecula P, et al. AI in patient flow: applications of artificial intelligence to improve patient flow in NHS acute mental health inpatient units. Heliyon 2021; 7: e06993.
[9] Adly AS, Adly MS, Adly AS. Telemanagement of home-isolated COVID-19 patients using oxygen therapy with noninvasive positive pressure ventilation and physical therapy techniques: randomized clinical trial. J Med Internet Res 2021; 23: e23446.
[10] Keenan TDL, Goldstein M, Goldenberg Det al. et al. Prospective, longitudinal pilot study: daily self-imaging with patient-operated home OCT in neovascular age-related macular degeneration. Ophthalmol Sci 2021; 1: 100034.
[11] Chae SH, Kim Y, Lee KSet al. et al. Development and clinical evaluation of a web-based upper limb home rehabilitation system using a smartwatch and machine learning model for chronic stroke survivors: prospective comparative study. JMIR MHealth UHealth 2020; 8: e17216.
[12] Maghdid HS, Ghafoor KZ, Sadiq ASet al. et al. A novel AI-enabled framework to diagnose coronavirus COVID 19 using smartphone embedded sensors: design study. ArXiv200307434 Cs Q-Bio 2020; 0: 180–187.
[13] Alom MZ, Rahman MMS, Nasrin MSet al. et al. COVID_MTNet: COVID-19 detection with multi-task deep learning approaches. ArXiv200403747 Cs Eess 2020; 3: 1–10.
[14] Bohadana A, Izbicki G, Kraman SS. Fundamentals of lung auscultation. N Engl J Med 2014; 370: 744–751.
[15] Glangetas A, Hartley MA, Cantais A, et al. Deep learning diagnostic and risk-stratification pattern detection for COVID-19 in digital lung auscultations: clinical protocol for a case-control and prospective cohort study. BMC Pulm Med 2021; 21: 03.
[16] Haenssle H A, Fink C, Schneiderbauer R, Toberer F, Buhl T, Blum Aet al. Man against machine: diagnostic performance of a deep learning convolutional neural network for dermoscopic melanoma recognition in comparison to 58 dermatologists Ann Oncol 2018. May 2829081836–42.
[17] Esteva A, Kuprel B, Novoa R A, Ko J, Swetter S M.Blau HMet al. Dermatologist-level classification of skin cancer with deep neural networks Nature 2017. Feb;542(7639)115.
[18] Goldstein B A, Navar A M, Pencina M J, Ioannidis J P. Opportunities and challenges in developing risk prediction models with electronic health records data: a systematic review. J Am Med Inform Assoc. 2017;24(01):198–208.
[19] Hendy J, Chrysanthaki T, Barlow J, Knapp M, Rogers A, Sanders Cet al. An organisational analysis of the implementation of telecare and telehealth: the whole systems demonstrator BMC Health Serv Res 2012. Dec;1201403.
[20] Bara A, Klein B, Proudfoot J G.Defining internet-supported therapeutic interventions Ann Behav Med 2009. Aug 138014–17.
[21] Hoermann S, McCabe K L, Milne D N, Calvo R A.Application of synchronous text-based dialogue systems in mental health interventions: systematic reviewJ Med Internet Res2017. Aug;19(8)
[22] Laranjo L, Dunn A G, Tong H L, Kocaballi A B, Chen J, Bashir Ret al. Conversational agents in healthcare: a systematic review J Am Med Inform Assoc 2018. Jul 1125091248–58.

[23] Schumaker R P, Ginsburg M, Chen H, Liu Y.An evaluation of the chat and knowledge delivery components of a low-level dialog system: The az-alice experiment Decis Support Syst 2007. January;422236–46.
[24] Weizenbaum J. ELIZA – A computer program for the study of natural language communication between man and machine. Communications of the ACM. 1966;9(01):36–45.
[25] Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, et al. Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2018;49:e46–99.
[26] Agrawal K, Raman R, Ernstrom K, Claycomb RJ, Meyer DM, Hemmen TM, et al. Accuracy of stroke diagnosis in telestroke-guided tissue plasminogen activator patients. J Stroke Cerebrovasc Dis. 2016;25: 2942–6.
[27] Ali F, Hamid U, Zaidat O, Bhatti D, Kalia JS. Role of artificial intelligence in TeleStroke: an overview. Front Neurol. 2020;11:559322.
[28] Vagal A, Wintermark M, Nael K, Bivard A, Parsons M, Grossman AW, et al. Automated CT perfusion imaging for acute ischemic stroke. Neurology. 2019;93:888.
[29] Soun JE, Chow DS, Nagamine M, Takhtawala RS, Filippi CG, Yu W, Chang PD. Artificial intelligence and acute stroke imaging. Am J Neuroradiol. 2020;
[30] Albers GW, Marks MP, Kemp S, et al. Thrombectomy for stroke at 6 to 16 hours with selection by perfusion imaging. N Engl J Med. 2018;378:708–18.
[31] Nagel S, Sinha D, Day D, et al. e-ASPECTS software is non-inferior to neuroradiologists in applying the ASPECT score to computed tomography scans of acute ischemic stroke patients. Int J Stroke. 2017;12: 615–22.
[32] Guberina N, Dietrich U, Radbruch A, et al. Detection of early infarction signs with machine learning-based diagnosis by means of the Alberta Stroke Program Early CT score (ASPECTS) in the clinical routine. Neuroradiology. 2018;60:889–901.
[33] Kauw F, Heit JJ, Martin BW, van Ommen F, Kappelle LJ, Velthuis BK, et al. Computed tomography perfu- sion data for acute ischemic stroke evaluation using rapid software: pitfalls of automated postprocessing. J Comput Assist Tomogr. 2020;44:75–7.
[34] Finnane A, Dallest K, Janda M, Soyer HP. Teledermatology for the diagnosis and manage- ment of skin cancer: a systematic review. JAMA Dermatol. 2017;153:319–27.
[35] Esteva A, Kuprel B, Novoa RA, et al. Dermatologist level classification of skin cancer with deep neural networks. Nature. 2017;542(7639):115–8.
[36] Aractingi S, Pellacani G. Computational neural network in melanocytic lesions diagnosis: artificial intelligence to improve diagnosis in dermatology? Eur J Dermatol. (2019) 29:4–7.
[37] Luo EM, Newman S, Amat M, Charpignon ML, Duralde ER, Jain S, et al. MIT COVID-19 datathon: data without boundaries. BMJ Innovations. (2020).
[38] Ahuja AS. The impact of artificial intelligence in medicine on the future role of the physician. PeerJ. (2019) 7:e7702.
[39] Pacis DMM, Subido EDC, Bugtai NT. Trends in telemedicine utilizing artificial intelligence. AIP Conf Proc. (2018) 1933:040009.
[40] Wahl B, Cossy-Gantner A, Germann S, Schwalbe NR. Artificial intelligence (AI) and global health: how can AI contribute to health in resource-poor settings? BMJ Global Health. (2018) 3:e000798.
[41] Thierry JP. [The human resource: cornerstone of the digital transformation of the healthcare plan]. Soins. (2020) 65:46–7.
[42] Huang M-H, Rust RT. Artificial intelligence in service. J Serv Res. (2018) 21:155–72.
[43] Heinrichs B, Eickhoff SB. Your evidence? Machine learning algorithms for medical diagnosis and prediction. Hum Brain Mapp. (2020) 41:1435–44.
[44] Grote T, Berens P. On the ethics of algorithmic decision-making in healthcare. J Med Ethics. (2020) 46:205–11.
[45] London AJ. Artificial intelligence and black-box medical decisions: accuracy versus explainability. Hastings Cent Rep. (2019) 49:15–21.
[46] McDougall RJ. Computer knows best? The need for value-flexibility in medical AI. J Med Ethics. (2019) 45:156–60.
[47] Sun W, Nasraoui O, Shafto P. Evolution and impact of bias in human and machine learning algorithm interaction. PLoS ONE. (2020) 15:e0235502.
[48] Ash JS, Berg M, Coiera E. Some unintended consequences of information technology in health care: the nature of patient care information system-related errors. J Am Med Inform Assoc. (2004) 11:104–12.
[49] Davenport T, Kalakota R. The potential for artificial intelligence in healthcare. Future Healthc J. (2019) 6:94–8.
[50] Jarrahi MH. Artificial intelligence and the future of work: human-AI symbiosis in organizational decision making. Bus Horiz. (2018) 61:577–86.
[51] Bhaskar S, Bradley S, Israeli-Korn S, Menon B, Chattu VK, Thomas P, et al. Chronic neurology in COVID-19 era: clinical considerations and recommendations from the REPROGRAM consortium. Front Neurol. (2020) 11:664.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY