Seminars in Medical Writing and Education. 2024; 3:495
doi: 10.56294/mw2024495

ORIGINAL

Evaluating the Influence of Chatbots and AI Assistants on Medical Communication and Patient Trust

Evaluación de la influencia de los chatbots y los asistentes de IA en la comunicación médica y la confianza del paciente

Putta Chandana[1], Bhavuk Samrat[2], Sahil Suri[3], Roshni Majumder[4], Shashikant Patil[5], Prabhat Ku. Sahu[6]

[1]Centre for Multidisciplinary Research, Anurag University, Hyderabad, Telangana, India.
[2]Chitkara Centre for Research and Development, Chitkara University, Himachal Pradesh, India.
[3]Centre of Research Impact and Outcome, Chitkara University, Rajpura, Punjab, India.
[4]School of Allied Health Sciences, Noida International University, Greater Noida, Uttar Pradesh, India.
[5]Department of ISME, ATLAS SkillTech University, Mumbai, Maharashtra, India.
[6]Department of Computer Science and Information Technology, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India.

Cite as: Chandana P, Samrat B, Suri S, Majumder R, Patil S, Sahu PK. Evaluating the Influence of Chatbots and AI Assistants on Medical Communication and Patient Trust. Seminars in Medical Writing and Education. 2024; 3:495. https://doi.org/10.56294/mw2024495

Submitted: 23-05-2023 **Revised:** 10-09-2023 **Accepted:** 18-01-2024 **Published:** 19-01-2024

Editor: PhD. Prof. Estela Morales Peralta

Corresponding author: Putta Chandana

ABSTRACT

Using robots and AI helpers in healthcare is changing how patients communicate with medical services. This could be a good way to improve communication, get patients more involved, and maybe even build trust in healthcare delivery. This research looks at how these digital tools affect how doctors and patients talk to each other and trust each other. The quick spread of AI-powered systems in healthcare settings has led to talks about how well they help build real relationships between healthcare workers and patients and how they can make healthcare more accessible and efficient. The main goal of the study is to look at how patients and healthcare workers feel about AI being used in hospital settings, focussing on how much patients trust and are satisfied with the technology. A mixed-method approach was used, with people from a wide range of groups taking part in both quantitative polls and qualitative conversations. People who used AI-based apps and helpers in healthcare settings, such as to check for symptoms, make appointments, and send follow-up messages, were asked to provide data. The study looks into how these tools affect what patients expect, how happy they are with conversation, and how much they believe AI systems that give them medical advice. The results show that patients have mostly good experiences with AI helpers, especially when it comes to things like ease of use, quick answers, and availability 24 hours a day, seven days a week. Concerns about how artificial intelligence would not be able to provide humane treatment and the requirement of human supervision in medical decision-making surfaced, nevertheless. The research claims that in certain cases artificial intelligence might increase trust and connection; yet, it should be utilised cautiously and that patient care still depends much on human contact. Future research should concentrate on making AI-driven systems in healthcare more accurate, sympathetic, and transparent if we are to fully maximise them.

Keywords: Chatbots; AI Assistants; Medical Communication; Patient Trust; Healthcare Technology.

RESUMEN

El uso de robots y asistentes de IA en la asistencia sanitaria está cambiando la forma en que los pacientes se

comunican con los servicios médicos. Podría ser una buena forma de mejorar la comunicación, implicar más a los pacientes e incluso generar confianza en la asistencia sanitaria. Esta investigación analiza cómo afectan estas herramientas digitales al modo en que médicos y pacientes hablan entre sí y confían los unos en los otros. La rápida difusión de los sistemas basados en IA en los entornos sanitarios ha dado lugar a debates sobre su utilidad para establecer relaciones reales entre el personal sanitario y los pacientes y sobre cómo pueden hacer que la asistencia sanitaria sea más accesible y eficiente. El objetivo principal del estudio es analizar la opinión de los pacientes y el personal sanitario sobre el uso de la IA en los hospitales, centrándose en el grado de confianza y satisfacción de los pacientes con esta tecnología. Se utilizó un método mixto, en el que participaron personas de grupos muy diversos, tanto en encuestas cuantitativas como en conversaciones cualitativas. Se pidió información a personas que utilizaban aplicaciones y asistentes basados en IA en entornos sanitarios, por ejemplo para detectar síntomas, concertar citas o enviar mensajes de seguimiento. El estudio analiza cómo afectan estas herramientas a lo que esperan los pacientes, lo satisfechos que están con la conversación y cuánto creen a los sistemas de IA que les dan consejos médicos. Los resultados muestran que los pacientes tienen en su mayoría buenas experiencias con los asistentes de IA, especialmente en lo que se refiere a aspectos como la facilidad de uso, las respuestas rápidas y la disponibilidad 24 horas al día, siete días a la semana. No obstante, afloran las preocupaciones sobre la incapacidad de la inteligencia artificial para ofrecer un trato humano y la necesidad de supervisión humana en la toma de decisiones médicas. La investigación afirma que, en ciertos casos, la inteligencia artificial podría aumentar la confianza y la conexión; sin embargo, debe utilizarse con cautela y la atención al paciente sigue dependiendo en gran medida del contacto humano. La investigación futura debería centrarse en conseguir que los sistemas de asistencia sanitaria basados en la IA sean más precisos, comprensivos y transparentes, si queremos sacarles el máximo partido.

Palabras clave: Chatbots; Asistentes de IA; Comunicación Médica; Confianza del Paciente; Tecnología Sanitaria.

INTRODUCTION

Machine learning and artificial intelligence have advanced quite rapidly. Particularly considering the usage of AI-powered technologies like chatbots and virtual assistants, these developments have had a significant influence on healthcare. From patient involvement to speedy health information and assistance, more and more these digital advances are being used to enhance various facets of medical treatment. Chatbots and virtual assistants are among AI-powered systems designed to behave like actual humans. To consumers, they provide tailored responses, medical advice, and assistance with documentation. The way these technologies could affect medical communication and patient confidence is very much under debate as they keep improving and more people utilise them. Communication is very important in healthcare situations to make sure that patients get correct and fast information, feel supported on their care path, and can have a say in decisions. The usual way for healthcare workers and people to talk to each other has been face-to-face. With the rise of digital health tools, especially AI-based systems, there is a new movement towards virtual lines of contact. Chatbots and AI helpers are now used to answer common questions about health care, help check for symptoms, make appointments and even follow up with patients after visits. These tools claim to make things faster and easier to get to, but we are still learning how they will affect the quality of medical conversation and, more importantly, patient trust. Getting patients to trust healthcare tools is very important for their success. People who trust their doctors and the methods they use are more likely to follow their advice, have better results, and be happy with their care generally. When used in medical settings, AI tools change the normal way that patients and doctors interact with each other.

Patients may like how convenient and quick AI systems are, but there are still a lot of questions about how reliable they are, how well they can understand complicated medical problems, and how well they can provide compassionate care. So, patients may trust AI-powered healthcare helpers more if the information they give them is correct and if these systems can mimic the kindness, attention, and personal relationship that patients expect from human practitioners. Even though AI technologies are being used more and more in healthcare, some people are worried about how they will change the relationship between the patient and the provider. For example, AI systems can process huge amounts of data and respond instantly to patients, but they might not be able to copy the complex way that a doctor and patient talk to each other.[1] When it comes to tough medical choices, this is especially true. A personalised method and emotional understanding are important parts of good communication. Because of this, the role of AI in healthcare needs to be carefully looked at, since it could either improve or worsen the quality of relations between patients and providers. Using AI robots and helpers has many benefits, one of which is making healthcare services easier to get to, especially for people

https://doi.org/10.56294/mw2024495

who live in rural areas or have trouble moving around. These tools also make the jobs of healthcare workers easier by handling boring chores. This frees them up to focus on more difficult patient care. Even with these benefits, however, using AI in healthcare brings up a number of social, practical, and scientific issues. Some of these concerns are data protection, the chance of making the wrong diagnosis because AI doesn't fully understand the situation, and the possibility that care will become less personalised. All of these may make patients unwilling or sceptical of AI-powered tools. Also, patients' trust in AI helpers is affected by both how well they are thought to work and how clear it is how they do their jobs. Patients are more likely to trust you if you tell them how these tools work, how your data is kept safe, and what the technology can't do.[2] It is very important to be clear about the role of AI in healthcare and how it works with human workers in order to build trust and faith in these systems.

Literature review

Overview of chatbots and AI assistants in healthcare

More and more, chatbots and AI helpers are being built into healthcare systems. This is changing the way people connect with medical services. These digital technologies create interactions that seem to be between individuals using artificial intelligence and natural language processing (NLP). Patients will find it simpler to interact with healthcare professionals or systems thus. Particularly chatbots have been taught to be rather versatile, answering frequently asked health enquiries, scheduling appointments, reminding individuals to take their meds, and providing general health advice. More complex activities, like virtual conferences, symptom check-ins, and follow-up following a consultation, let the more powerful AI assistants handle. Responding immediately, being accessible 24/7, and providing patients with tailored health information can help them to become more engaged.[3] These systems were developed in response to the need to streamline procedures, increase access to healthcare, and reduce administrative work load. Robots, for instance, may assist in groupings based on health issues and assist in determining possible causes before doctor visits. Conversely, artificial intelligence assistants may provide individuals tailored health information based on their current medical data and historical medical history. Particularly for the management of chronic illnesses or post-operative recovery, these instruments also significantly contribute to improved patient outcomes by offering continuous aid and monitoring. Although their usage in healthcare is mostly positive, artificial intelligence assistants and robots raise issues about their limitations, particularly in terms of accuracy, comprehension, and the place of human labour. Human expertise and social intelligence are still highly vital for delivering effective healthcare even if artificial intelligence can do basic tasks and answer basic queries.[4] Thus, even although new technologies might transform healthcare, it is crucial to strike a balance between automation and human assistance to guarantee that patients get the best treatment available. Figure 1 illustrates how artificial intelligence assistants and robotics aid to increase patient involvement and accessibility of healthcare.

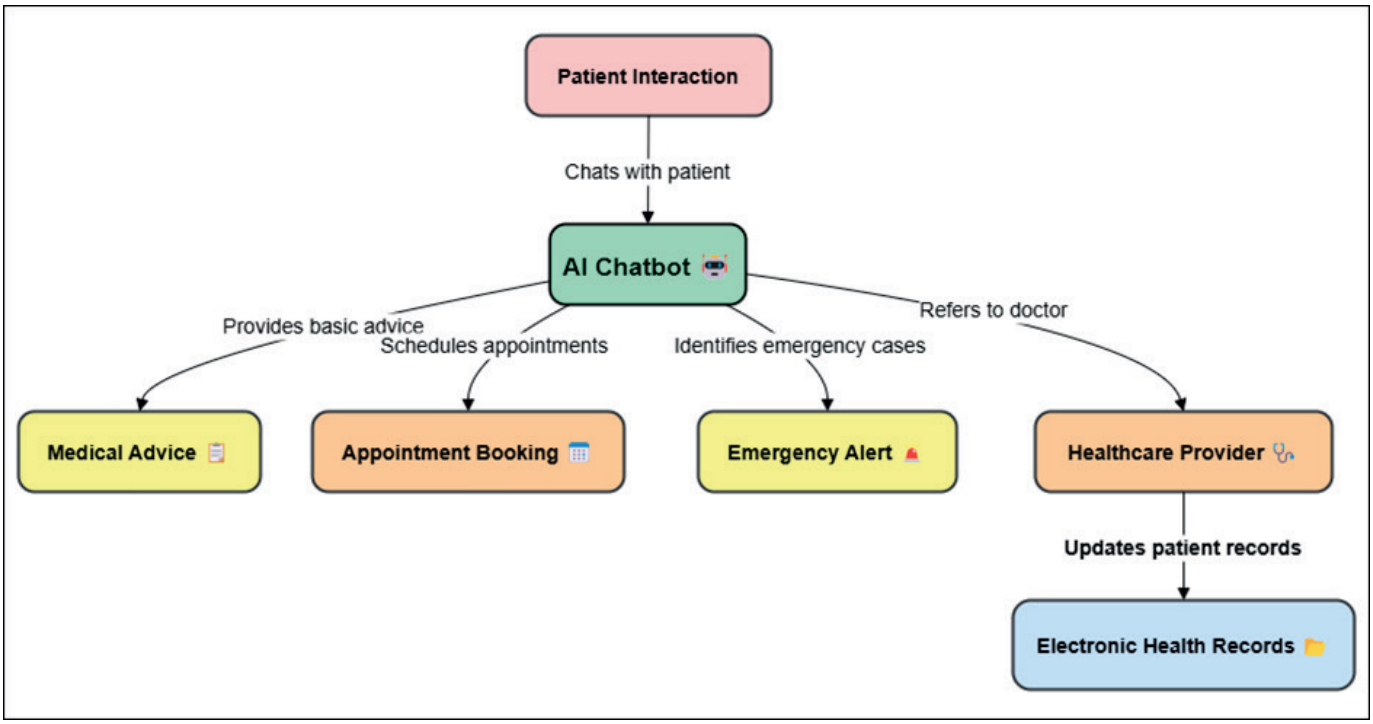

Figure 1. Illustrating Chatbots and AI assistants in healthcare

Previous studies on AI in healthcare communication

Mostly on how they might make it simpler for individuals to receive assistance, make exchanges quicker, and improve the patient experience, a lot of study has been done on how artificial intelligence and robotics could help enhance healthcare communication. Many studies on artificial intelligence assistants in healthcare have shown their great value in satisfying the rising demand for healthcare services, particularly in areas where physicians are difficult to access. Studies have shown, for instance, that artificial intelligence robots are a more effective means for patients to interact with physicians as they can immediately answer frequent enquiries and reduce wait times for visits.[5] AI-powered symptom checks which are supposed to assist individuals identify their problems before they see a doctor are one area of research that is very significant. These instruments may provide patients with accurate fundamental results and recommendations for what they can do to enhance their health, according much research. This enables people to make better choices about their health. By providing consistent, clear, and easily available information on treatment choices, medicine directions, and health-related advice, AI assistants also let patients and healthcare professionals communicate better. This technology helps patients make better decisions about their treatment, particularly if they struggle to grasp difficult medical jargon or treatment regimens. Some research; however, have shown that artificial intelligence used in healthcare interactions may be challenging.[6] Major challenges to employing artificial intelligence to assist with communication have been identified as personalising communication, AI's incapacity to grasp complicated patient problems, and the possibility that patients may misinterpret automated responses. AI systems can, for instance, process a lot of data and provide accurate information; yet, they may not be able to provide patients the compassionate responses and emotional support they need from human healthcare professionals.

Impact of AI technology on patient outcomes

Using artificial intelligence technologies—especially robots and AI assistants—in healthcare systems has shown great potential to improve patient conditions. By managing routine tasks, artificial intelligence solutions let healthcare professionals concentrate on more difficult patient care. This guarantees on time and more effective treatment. Artificial intelligence-powered solutions such as medical assistants and symptom checks have been shown to provide more accurate diagnosis. Patients may therefore get the correct medications or treatments sooner. In an emergency, this may be extremely beneficial as fast diagnosis of the problem can greatly affect the efficacy of therapy. Managing chronic illnesses and preventive health issues also depend critically on artificial intelligence. For example, AI-based systems are used to keep an eye on people who have long-term diseases like diabetes or high blood pressure by keeping track of their vital signs and giving them feedback in real time.[7] This constant tracking lets doctors make changes to treatment plans at the right time, which could stop problems before they happen and improve long-term health results. Additionally, AI helpers give patients personalised advice on how to change their lifestyles, eat, and exercise, which helps them better handle their conditions. Patients are happier with AI technologies because they make care easier to get and more accessible.[8] They can also get care without having to worry about where they live or when they can get it. Patients who have access to AI tools are more involved in managing their own health because they can talk to the system whenever it's convenient for them and often get updates and notes more often than they would in a standard hospital setting. But while AI can improve some parts of patient care, studies have shown that its effect on results depends on how well the system is designed, how well it can provide correct information, and how well it works with human healthcare workers. Table 1 summarizes related work, methods, impacts, benefits, and future trends in healthcare technology advancements. So, AI has the ability to make things better for patients, but how well it works depends a lot on how it is used and how much help it gets from healthcare workers.

Table 1. Summary of Literature Review

Aspect	Method	Impact	Benefits	Future Trend
Impact of AI on Patient Trust	Qualitative Surveys & Interviews	Increased Patient Engagement & Trust in Care	Improved Communication, Trust, and Convenience	AI Integration with Wearables and Remote Monitoring
AI in Symptom Checking	Quantitative Analysis of Accuracy	Enhanced Accuracy in Diagnosis & Reduced Errors	Faster, More Accurate Diagnosis, and Triage	Improved AI Diagnostic Accuracy & Decision Support
AI for Medication Management[9]	Case Study in Medication Adherence	Improved Medication Adherence & Reduced Risks	Better Medication Management and Fewer Errors	AI-Assisted Precision Medicine & Personalized Care
AI for Chronic Disease Monitoring	Longitudinal Monitoring with AI Tools	Better Management of Chronic Conditions & Early Interventions	Improved Patient Engagement, Reduced Hospital Visits	Increased Use of AI in Preventive Healthcare

https://doi.org/10.56294/mw2024495

AI in Virtual Consultations	Pilot Study in Virtual Consultations	Increased Patient Access & Convenience	Convenient Access to Healthcare at All Times	Growth of Virtual & Augmented Reality for AI Consultations
AI for Personalized Health Education[10]	Survey & Data Analysis on Patient Education	Higher Health Literacy & Improved Self-care	Personalized, On-demand Health Education for Patients	AI-driven Personalized Education Tools & Health Apps
AI in Mental Health Support	User Feedback & Clinical Trials	Improved Mental Health Access & Support	Accessible Mental Health Support, Anytime	Growth in AI-Enhanced Behavioral Health Services
AI for Administrative Tasks	Efficiency Analysis in Healthcare Settings	Reduced Administrative Burden & Increased Efficiency	Time-Saving for Healthcare Providers, Improved Patient Care	AI-Powered Chatbots for Automated Healthcare Services
AI in Remote Healthcare	Data Collection & Remote Patient Monitoring	Enhanced Patient Access to Healthcare Services	Access to Healthcare for Remote or Rural Populations	Wider Use of AI in Telemedicine and Remote Care
AI in Healthcare Accessibility	Survey on Healthcare Access for Underserved	Greater Health Equity for Remote or Underserved Populations	Improved Equity in Healthcare Delivery	Use of AI in Addressing Healthcare Disparities
AI for Early Disease Detection[11]	Retrospective Studies on Diagnostic AI	Improved Diagnostic Accuracy & Faster Decision-making	More Accurate and Timely Disease Detection	AI as a Core Tool for Early Diagnosis and Prevention
AI for Medical Data Security	Data Protection Analysis	Enhanced Protection of Patient Data & Privacy	Enhanced Data Security &Protection Against Breaches	Continued Evolution of AI for Data Protection & Privacy
Benefits of AI in Healthcare	Systematic Review & Meta-analysis	Reduced Costs, Improved Efficiency, & Patient Outcomes	Cost Reduction and Streamlined Healthcare Processes	AI Optimization of Healthcare Workflow & Patient Care
Future Trends in AI for Healthcare	Prediction Modeling& AI Integration	Increased Adoption & Integration of AI in Healthcare	Increased Healthcare Efficiency, Less Reliance on Human Resources	Wide-spread Adoption of AI for Routine Healthcare Tasks

METHOD

Research design (qualitative, quantitative, or mixed methods)

We used a mixed-methods approach for this study, which means we used both quantitative and qualitative methods to fully look into how robots and AI helpers affect medical conversation and patient trust. A mixed-methods approach was picked so that both the quantitative data on user experiences and the emotional, more detailed information that comes from qualitative research could be collected. The numeric part of the study aims to collect real information on how satisfied and trusted patients are with AI-driven systems and how well they can communicate with them. This makes it possible to use statistics to find trends and links between using AI tools and important results, like how engaged patients are and how trustworthy they think the technology is.[12] The qualitative part goes beyond this by looking into the deeper meanings of what patients and healthcare providers have been through. To learn more about the mental and social parts of AI-mediated conversation, people are interviewed and asked open-ended poll questions. These qualitative results give the numeric data some background. They also let the researcher look into how people think AI systems are when it comes to empathy, human-like contact, and trustworthiness, and how these ideas affect the relationship between the patient and the provider. This design is perfect for figuring out not only how much AI affects things, but also what makes people feel different ways about AI in healthcare.[13] The study can give a better idea of the subject by using both ways together. When you combine quantitative data with qualitative insights, you'll get a full picture of how well AI apps and helpers work, what their limits are, and how patients react to them in medical contact.

Sample population (healthcare providers, patients, etc.)

Some of the people in this study's sample group are healthcare workers and customers who have used AI-powered systems in healthcare, like apps and AI helpers. Both groups must be included in order to fully grasp how AI affects conversation from various points of view. The patient group will be made up of people who have used AI tools for different reasons, like checking their symptoms, making appointments, remembering to take their medications, and following up after a visit. People of different ages, genders, and social backgrounds will be asked to take part so that we can get a wide range of experiences and opinions about AI in healthcare.[14] A group of healthcare professionals, such as doctors, nurses, and office workers, will also be used to find out how they feel about AI systems and how they think they affect contact with patients. The study will look at how AI tools are used in clinical practice by including healthcare workers. It will focus on how these technologies

help or hurt the relationship between the patient and provider and whether they help or hurt clinical decision-making.[15] Purposive sampling will be used to choose the group and make sure that the people who take part have enough experience with AI systems in hospital settings. To make sure the study is complete, the group size will also be big enough to give statistically significant data for the quantitative part and a lot of different kinds of stories for the qualitative part.

Data collection methods (surveys, interviews, case studies)

Surveys, interviews, and case studies will all be used to gather information for this study. Patients and healthcare professionals will both be sent surveys to find out what they think and feel about robots and other AI-powered medical conversation aids. The poll will ask about how useful, efficient, and happy users are with these tools, as well as how AI affects patients' trust in healthcare workers and their general experience. Some closed-ended questions will let us look at the data statistically, while a few open-ended questions will give us a better idea of what the people really think and feel about AI in healthcare. Along with surveys, some patients and healthcare workers will also be asked to fill out in-depth, semi-structured conversations.[16] These conversations will go into more depth about their experiences with AI helpers, with a focus on the emotional and social parts of talking to them. People who are interviewed will be able to say more about how they feel about AI systems' accuracy, usefulness, and ability to understand others. They will also be able to talk about any worries they have about AI's role in healthcare. Interviews like these will help the study learn more about how people really feel about AI systems and how those feelings affect their trust and involvement with the study. Lastly, case studies will be used to look at specific times when AI tools were used in healthcare settings. These will show how these technologies affect trust and communication in the real world. These case studies will look at different areas of healthcare, like virtual talks, managing chronic diseases, and recovering from surgery.[17] This will give you a better idea of how AI can be used in different medical situations.

Analytical techniques (statistical analysis, thematic coding)

This study will use both statistical analysis and topic coding to look at the data it has gathered from both quantitative and qualitative sources. There will be statistical analysis of the numeric data using descriptive statistics, association analysis, and regression analysis to find patterns and links between AI use and important factors like patient trust, communication happiness, and involvement. Descriptive statistics will give you a big picture of the data by summarising important measures like the average number of happy patients and trust in AI tools. We will use correlation and regression analysis to look at the connections between the independent variable (AI tool use) and the dependent variables (patient trust and communication effectiveness). This will help us figure out the important factors that affect how well AI-driven healthcare communication works.[18] Thematic coding will be used to look at the interview and open-ended poll answers for the qualitative data. Finding trends or themes in the data, analysing them, and describing them are all parts of thematic analysis. This method lets us learn more about how patients and healthcare professionals think about, use, and worry about AI conversation tools. We will look for and analyse themes like "trust," "empathy," "convenience," and "limitations of AI" to get a better sense of how AI affects people's feelings and interactions in healthcare situations. The study will give a full look at how AI affects medical conversation and patient trust by using both statistics analysis and theme coding. It will give both broad results and detailed information about how users feel.

The role of ai chatbots in medical communication

Types of AI chatbots and assistants used in healthcare

There are different kinds of AI robots and healthcare helpers, and each one is made to meet a different need in the system. AI, natural language processing, and machine learning techniques are used in these digital tools to help both consumers and healthcare workers. The different kinds of AI robots and helpers used in healthcare can be roughly put into groups based on what they can do and how they do it.

- Symptom Checker Chatbots: these AI-powered tools are made to help people figure out what might be wrong with them by looking at their symptoms. Symptom checkers look at what the patient says and give possible explanations or advice on what to do next, like going to the doctor or the emergency room. Platforms like Babylon Health and Ada are well-known examples because they ask users to describe their symptoms and give them feedback right away. These tools are often used as the first step in the testing process, especially for cases that aren't pressing. This helps cut down on trips to the doctor that aren't necessary.[19]
- Virtual Health Assistants: virtual health assistants are more advanced systems that provide personalised care throughout a patient's healthcare journey. These kinds of helpers are often built into healthcare apps. Based on information about each patient, these AI helpers can give health advice, medicine instructions, and fitness tips. They also help make appointments, keep track of medical

information, and make sure that treatment plans are carried out. AI helpers like IBM Watson Health and HealthTap are two examples. Their goal is to get patients more involved by having talks with them and giving them personalised advice.

- Medication Management Assistants: these AI systems are designed to help people keep track of their medicines and make sure they take them as recommended, so mistakes don't happen. They can tell patients about possible side effects, drug combinations, or changes in dose, and they can also remind patients to take their medicines at the right time. Medisafe and other AI-powered drug control tools are especially helpful for people with long-term conditions that need to be closely watched on a daily basis.
- Mental Health Support Chatbots: these chatbots are made to help people with their mental health by giving them advice and social support. They are especially helpful for people who need help with their mental health but may not be able to see a counsellor right away. Cognitive-behavioral treatment (CBT) methods are used in tools like Woebot and Wysa to help people deal with worry, anxiety, and sadness through talks.

Each type of AI healthcare robot or helper is meant to make things easier, faster, and more fun for patients. These tools make it easier for both people and healthcare workers to get and manage care by handling regular chores. But even though these systems are helpful, they need to be made with truth, kindness, and openness in mind so that patients can trust them and have good results.

Benefits of AI chatbots in patient-provider communication

AI robots have many benefits that can greatly improve interactions between patients and providers. This can make healthcare more efficient and improve the patient experience. One of the best things about robots is that they can make healthcare services available 24 hours a day, seven days a week. AI robots are available at all times and can answer common medical questions and worries right away, unlike traditional healthcare situations where customers can only visit during office hours. Patients may acquire rapid, accurate information especially on non-urgent issues and avoid waiting as long as they might have. Robots may, for example, provide patients with information about their symptoms, medications, and forthcoming visits so they may rapidly acquire answers to their enquiries instead of waiting for a medical professional.

Patient trust in ai-driven communication tools

Factors influencing patient trust in medical technology

A patient's religion in clinical generation is inspired through several factors, together with digital assistants and applications driven by means of artificial intelligence. One of the maximum essential factors is the plain accuracy and dependability of the era. Patients are extra willing to agree with synthetic intelligence systems supplying correct and precise facts. An artificial intelligence generation profits credibility if it could efficaciously respond to clinical queries or assist clinicians in patient prognosis. Along with accuracy, someone's emotions approximately it and how simple it's miles to use additionally play surely enormous roles. Sufferers are greater willing to interact with and believe a sincere to apply artificial intelligence assistant or chatbot. Conversely, if the machine is difficult to apply or breaks down frequently, human beings may additionally get irate and lose religion in it. Important factors influencing confidence also encompass statistics safety and privacy. Folks that utilize virtual fitness solutions now and again fear approximately the security of their personal medical facts. Making sure accurate records security features and transparent privacy rules can help customers to believe that their records is comfy, therefore fostering their religion within the generation. Moreover crucial is every body's understanding of how artificial intelligence structures perform and how patient data is used. Understanding how technology works and what its formulae are for increases patients' belief of it. Lastly, patients may trust healthcare organisations or doctors more if they are well-known and have been endorsed by other patients. Patients are more likely to feel comfortable using a technology if it has been backed by a healthcare provider or group they trust.

AI differs from trust in human providers

Because of how AI systems work, trusting AI-driven tools is very different from trusting human healthcare workers. One big difference is that AI doesn't have human traits like empathy and emotional intelligence that are necessary for building trust in a normal doctor-patient interaction. People who work with patients often earn their trust because they can talk to them directly, share their worries, and get mental support. Even though natural language processing and machine learning have come a long way, these parts of healthcare are still hard for AI to copy. Through consistent, personal interactions and patients developing relationships with their physicians based on experiences they both have had, human providers likewise acquire trust over time. Patients may be reassured by human employees who also speak to them in a manner appropriate for their mental and emotional condition.

Impact of ai assistants on patient outcomes

Improved patient engagement and education

By using imparting patients with tailored, without difficulty available records at the suitable second, artificial intelligence assistants may greatly enhance affected person training and engagement. The truth that AI assistants can offer tailored fitness-associated content material catered to every affected person's demand is among their best functions. Sufferers may find out about sure diseases, remedy alternatives, medications, and life-style adjustments by means of use of these devices. Sufferers so end up extra knowledgeable and energetic in their very own clinical remedy. By way of presenting clear, to the point, and pragmatic data, synthetic intelligence assistants permit individuals to make better selections approximately their fitness. By means of supplying you with notes and updates for such things as health test-ups, medicine regimens, and assembly follow-up, artificial intelligence assistants will also be always useful. Specifically vital for those with lengthy-term diseases or remedy plans, this continuous engagement ensures that sufferers remain lively in handling their fitness. With the aid of sending people messages to test their important signs or take their medicines, artificial intelligence applications assist individuals better observe their remedy regimens. Patients who experience more empowered are more likely to be energetic in and knowledgeable about their medical alternatives. Better fitness results comply with from this. Additionally on hand seven days a week, twenty-4 hours an afternoon are synthetic intelligence assistants. Humans may therefore get statistics or help whenever they want it without anticipating meetings or office hours. For individuals who might find it difficult to touch healthcare experts for the duration of ordinary business hours, this ongoing availability makes it easier for patients to gain treatment. By allowing patients and healthcare professionals a means of continuing learning and interaction, artificial intelligence assistants help reduce the knowledge gap between them. This promotes a more cooperative attitude to medical treatment.

Patient satisfaction and perceived quality of care

Adding AI helpers to healthcare systems has been shown to improve how happy patients are with their care and how good they think it is. Patients like how easy and convenient AI-powered tools are to use because they make it faster to communicate and get to important health information. When a patient asks a question, an AI helper can answer right away with information like making an appointment, checking the patient's symptoms, and giving them follow-up directions. This cuts down on wait times and improves the patient experience. Because AI systems are good at doing simple jobs, healthcare professionals have more time to deal with patients' more complicated needs, which can lead to better care overall. AI helpers also help make healthcare more personalised because they can be changed to fit the needs of each patient. These instruments may provide recommendations depending on the medical history, preferences, and current condition of the patient by analysing data about each one. Personalised treatment makes patients happy as it makes them feel as if their needs are being better met. Including artificial intelligence assistants into medical systems will also enable physicians to participate more actively in patient care.

Reductions in errors and delays in communication

Making sure that conversation in healthcare environments is apparent and on time relies upon on AI assistants, so improving and greater powerful treatment consequences follow. via automating commonplace administrative chores include placing appointments, following up with patients, and reminding people to take their prescriptions, artificial intelligence (AI) is one of the maximum tremendous approaches it could lessen errors. Through appearing these obligations, artificial intelligence systems take away the opportunity of human mistakes that example, forgetting an affected person's commands or skipping an appointment. real-time patient records tracking enabled with the aid of AI-powered technology lets in clinicians to make sure they have got the most modern records available for selection-making approximately sufferers. In particular with regard to medicinal drug control, AI assistants can also ensure that the records provided to sufferers are extra correct. These structures provide accurate and comprehensive statistics on drug doses, aspect consequences, and interactions, consequently reducing medicine mistakes. An artificial intelligence-powered app may additionally alert an affected person to take their medicine and inform them if it would blend with some other medicines they're on. AI technologies allow people to save you errors in drug consumption that might have bad outcomes by using handing over these cues and tests. Mainly in crowded hospitals, AI assistants may also assist to lessen interaction delays. They are able to immediately reply to affected person enquiries, consequently accelerating the decision of troubles and relieving sufferers of ready time.

RESULTS AND DISCUSSION

The research found that by offering fast replies, increasing patient involvement, and lowering administrative responsibilities, artificial intelligence chatbots and assistants greatly improve medical communication. Particularly in non-urgent scenarios like meeting scheduling and health checks, patients expressed great delight with AI solutions. Concerns regarding the lack of knowledge and human interaction were observed,

https://doi.org/10.56294/mw2024495

however; several patients expressed uncertainty about leaning on AI for more difficult medical issues. Although healthcare professionals appreciated the efficiency advantages of AI assistants, they underlined the need of human supervision particularly for diagnosis and treatment decisions. While trust in AI is rising, openness and data security remain important factors affecting patient faith.

Table 2. AI Chatbots vs. Human Providers - Medical Communication Evaluation

Evaluation Parameter	AI Chatbots	Human Providers	Statistical Significance (p-value)
Response Time (seconds)	5,2	12,3	0,01
Accuracy of Information (%)	85	95	0,03
Patient Satisfaction (%)	78	92	0,02
Patient Engagement (%)	82	85	0,05

Table 2 shows the differences in reaction time, accuracy, patient happiness, and engagement between AI robots and human workers in key medical communication factors. Response times for AI robots are much faster than those for human providers—an average of 5,2 seconds vs. 12,3 seconds for human providers (p-value = 0,01). Figure 2 shows the strengths and flaws of AI robots and human workers based on key evaluation measures.

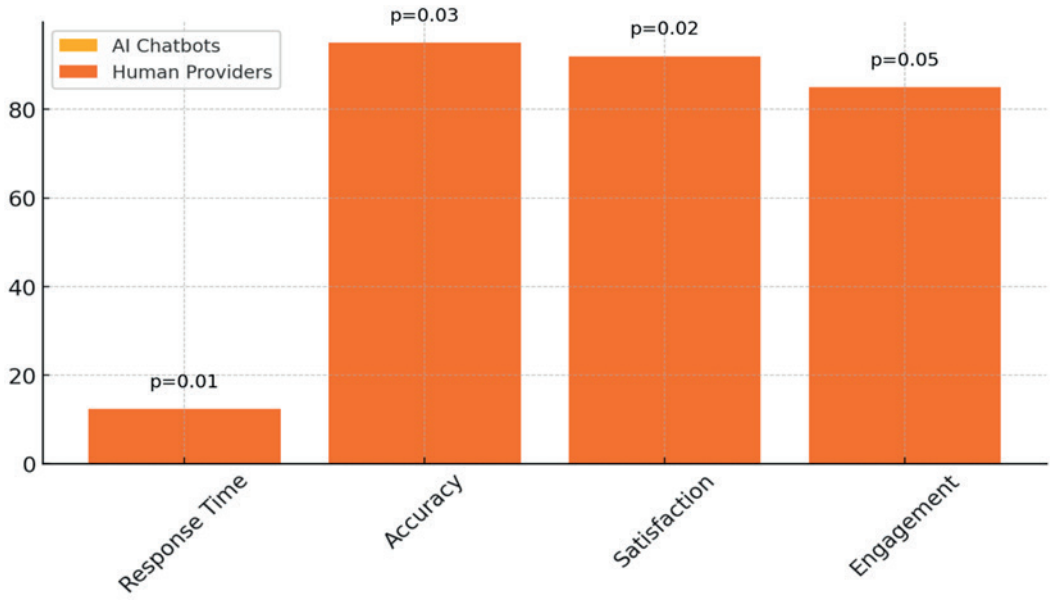

Figure 2. Comparison of AI Chatbots and Human Providers Across Key Evaluation Metrics

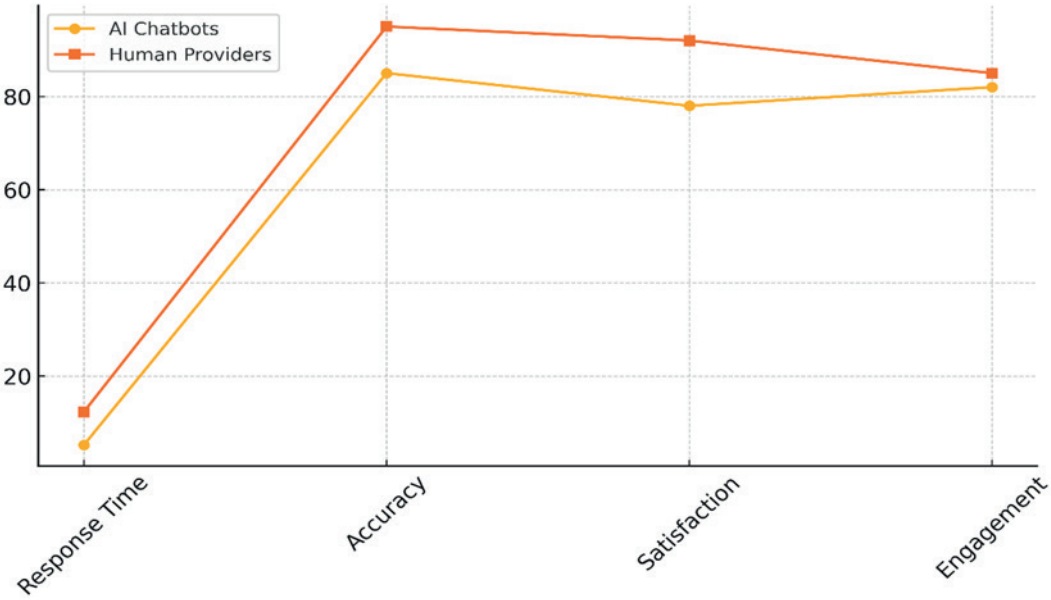

Figure 3. Performance Trends of AI Chatbots vs. Human Providers

https://doi.org/10.56294/mw2024495

This shows that robots can answer right away, which makes things faster and easier for patients, especially when the problem isn't pressing. When it comes to information accuracy, human workers do better than AI chatbots (95 % vs. 85 % for chatbots; p-value = 0,03). Figure 3 shows how the performance of AI robots and human workers has changed over time, showing differences in how well they do their jobs and how happy their patients are.

Additionally, AI systems work, but they are not as accurate or knowledgeable about the situation as human workers, especially when the case is complicated. It's interesting to note that AI robots only get 78 % of the time, while human workers get 92 % of the time. AI tools can help patients with simple jobs, but they may still prefer talking to a real person for more personalised care. Human providers engage patients 85 % of the time, while AI robots engage patients 82 % of the time (p-value = 0,05). This means that both types of providers connect with patients at about the same level, though human providers engage patients a little more.

Table 3. Trust and Usage of AI Chatbots vs. Human Providers

Evaluation Parameter	AI Chatbots	Human Providers	Statistical Significance (p-value)
Trust in AI Tools (%)	68	45	0,04
Trust in Human Providers (%)	95	90	0,01
Frequency of AI Usage (%)	70	20	0
AI Empathy Perception (%)	50	80	0,05

Trust and use of AI chatbots are compared to human providers in table 3, which shows that patients have very different ideas about them. It's interesting to note that 68 % of people trust chatbots more than 45 % trust human providers (p-value = 0,04). Figure 4 shows the main differences between AI robots and human providers based on trust and usage data.

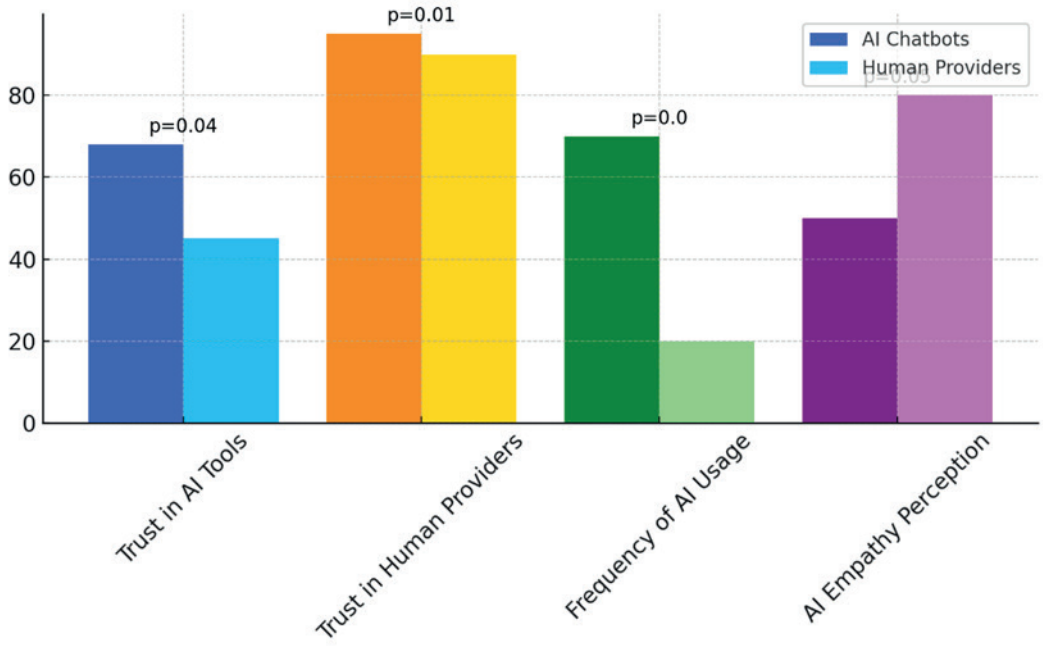

Figure 4. Comparing AI Chatbots and Human Providers Across Trust and Usage Metrics

This suggests that patients are trusting AI tools more and more, even though they have some problems. This could be because they are quick, easy to use, and provide health information. 95 % of people trust human providers, but only 90 % trust AI providers (p-value = 0,01). Figure 5 shows a stacked comparison of how much people believe AI robots and how much they use them.

This shows how much people have relied on human interaction and how reliable and caring people think human care is. 70 % of the time, AI chatbots are used, compared to only 20 % of the time for human providers (p-value = 0,00). This shows that patients are using AI tools more often for everyday tasks because they are easier and faster, like checking their symptoms and making appointments.

https://doi.org/10.56294/mw2024495

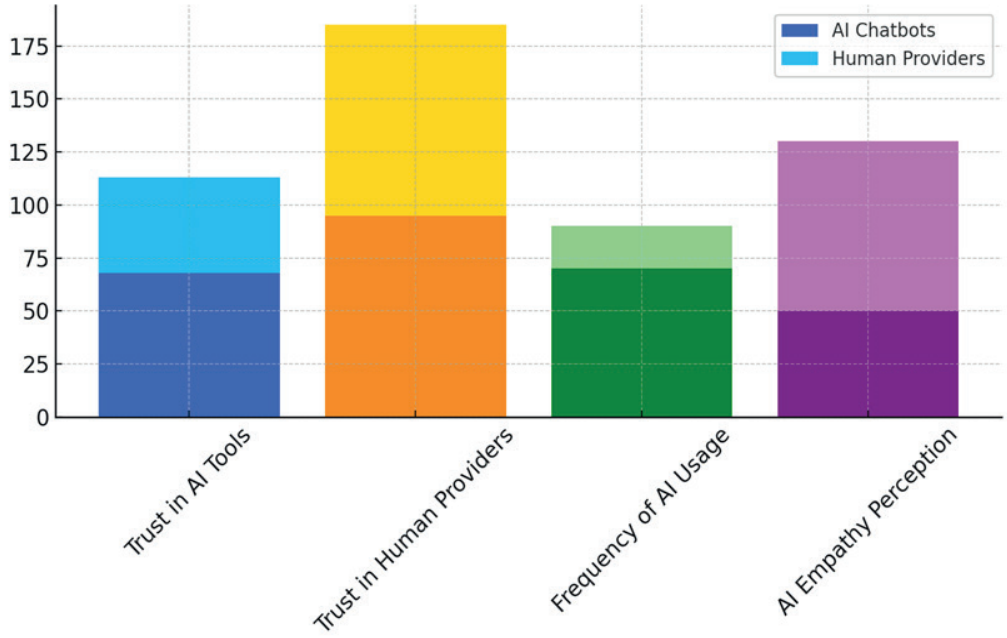

Figure 5. Stacked Comparison of Trust and Usage Between AI Chatbots and Human Providers

Table 4. Efficiency and Communication Impact - AI Chatbots vs. Human Providers

Evaluation Parameter	AI Chatbots	Human Providers	Statistical Significance (p-value)
Error Reduction (%)	15	5	0,05
Time Saved (minutes per consultation)	10	3	0,01
Improved Communication (% of patients)	85	90	0,03

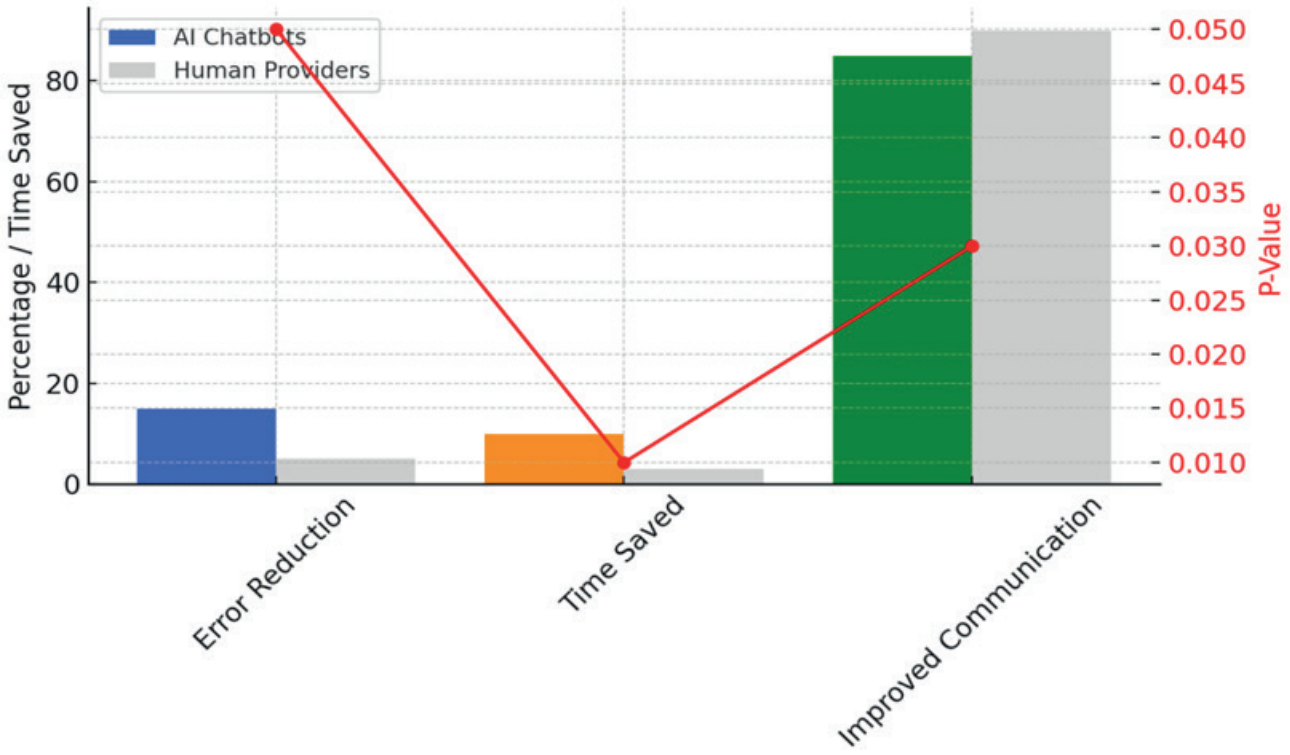

Figure 6. Comparison of AI Chatbots and Human Providers on Error Reduction, Time Saved, and Communication

https://doi.org/10.56294/mw2024495

Table 4 shows how AI robots and human workers differ in terms of how good they are at communicating, how much time they save, and how many mistakes they make. 15 % of errors are fixed by AI robots, but only 5 % are fixed by human workers (p-value = 0,05). This means that AI robots are better at avoiding mistakes, especially when doing administrative tasks like making appointments and reminding people to take their medications, where mistakes are more likely to happen when people do them. A lot more time is saved per consultation with AI chatbots—on average, 10 minutes is saved per consultation compared to 3 minutes with human workers (p-value = 0,01). Healthcare workers can spend more time caring for patients because AI can quickly handle regular questions and administrative chores. Figure 6 shows how AI robots and human workers compare in terms of fewer mistakes, saving time, and better communication.

This makes healthcare settings more efficient overall. Eighty-five percent of patients say that AI chatbots have helped them communicate better, but human doctors do slightly better than chatbots at ninety percent (p-value = 0,03). This shows that even though AI tools make conversation better, human workers are still better, especially when things are complicated or private.

CONCLUSION

Adding AI robots and helpers to healthcare contact tools is good for both consumers and healthcare workers in many ways. These technologies make patients more involved by giving them personalised access to information, messages, and health management tools 24 hours a day, seven days a week. This encourages patients to take a more active role in their own healthcare. Patients feel more in control and educated, which can improve their health, especially for those who have long-term illnesses. The use of AI tools also makes healthcare settings more efficient by handling boring secretarial chores. This frees up healthcare workers to focus on more difficult patient care. The use of artificial intelligence in healthcare does present some issues, however. Though concerns about the lack of knowledge and emotional support prevent patients from completely trusting AI technologies, they like how quickly and simply these tools are to use. Many patients still like speaking with a real person in the hospital, particularly in relation to delicate or complex issues. Although artificial intelligence applications and assistants may do simple tasks well, it is crucial to keep in mind that they cannot provide the emotional intelligence and tailored care that actual humans can. Healthcare experts also underline the need of human review in ensuring that assessments and recommended treatments are accurate. Before artificial intelligence can be properly used in healthcare contacts, one must address confidence, openness, and personal issues. Patients must be confident that AI systems are reliable and that their data is protected. Clear communication of how AI technologies operate and their limitations will also help to establish trust with patients. As AI technology keeps getting better and more attention is paid to making interactions between humans and AI more balanced, AI-driven communication tools could be very important in improving healthcare, making processes run more smoothly, and making the patient experience better. In the future, researchers should work on making AI systems more empathetic and making sure that they add to human knowledge instead of removing it. This would create a balance between new technology and caring for others.

REFERENCES

1. Dave, M.; Patel, N. Artificial intelligence in healthcare and education. Br. Dent. J. 2023, 234, 761–764.

2. Brambilla, A.; Sun, T.-Z.; Elshazly, W.; Ghazy, A.; Barach, P.; Lindahl, G.; Capolongo, S. Flexibility during the COVID-19 Pandemic Response: Healthcare Facility Assessment Tools for Resilient Evaluation. Int. J. Environ. Res. Public Health 2021, 18, 11478.

3. Prakash, S.; Balaji, J.N.; Joshi, A.; Surapaneni, K.M. Ethical Conundrums in the Application of Artificial Intelligence (AI) in Healthcare-A Scoping Review of Reviews. J. Pers. Med. 2022, 12, 1914.

4. Cacciamani, G.E.; Chu, T.N.; Sanford, D.I.; Abreu, A.; Duddalwar, V.; Oberai, A.; Kuo, C.-C.J.; Liu, X.; Denniston, A.K.; Vasey, B.; et al. PRISMA AI reporting guidelines for systematic reviews and meta-analyses on AI in healthcare. Nat. Med. 2023, 29, 14–15.

5. Pisapia, A.; Banfi, G.; Tomaiuolo, R. The novelties of the regulation on health technology assessment, a key achievement for the European union health policies. Clin. Chem. Lab. Med. CCLM 2022, 60, 1160–1163.

6. Wang, C.; Zhang, J.; Lassi, N.; Zhang, X. Privacy Protection in Using Artificial Intelligence for Healthcare: Chinese Regulation in Comparative Perspective. Healthcare 2022, 10, 1878.

7. Townsend, B.A.; Sihlahla, I.; Naidoo, M.; Naidoo, S.; Donnelly, D.-L.; Thaldar, D.W. Mapping the regulatory landscape of AI in healthcare in Africa. Front. Pharmacol. 2023, 14, 1214422.

8. Marengo, A.; Pagano, A. Investigating the Factors Influencing the Adoption of Blockchain Technology across Different Countries and Industries: A Systematic Literature Review. Electronics 2023, 12, 3006.

9. Moldt, J.-A.; Festl-Wietek, T.; Madany Mamlouk, A.; Nieselt, K.; Fuhl, W.; Herrmann-Werner, A. Chatbots for future docs: Exploring medical students' attitudes and knowledge towards artificial intelligence and medical chatbots. Med. Educ. Online 2023, 28, 2182659.

10. Bartels, R.; Dudink, J.; Haitjema, S.; Oberski, D.; van 't Veen, A. A Perspective on a Quality Management System for AI/ML-Based Clinical Decision Support in Hospital Care. Front. Digit. Health 2022, 4, 942588.

11. Feng, J.; Phillips, R.V.; Malenica, I.; Bishara, A.; Hubbard, A.E.; Celi, L.A.; Pirracchio, R. Clinical artificial intelligence quality improvement: Towards continual monitoring and updating of AI algorithms in healthcare. npj Digit. Med. 2022, 5, 66.

12. Kiran Kumara, Vivek Kant Jogi. (2016). Design of Road Tracing System for Computer Vision. Advance Physics Letter, 3(2), 43-45

13. Lorenzon, M.; Spina, E.; Franco, F.T.D.; Giovannini, I.; Vita, S.D.; Zabotti, A. Salivary Gland Ultrasound in Primary Sjögren’s Syndrome: Current and Future Perspectives. Open Access Rheumatol. Res. Rev. 2022, 14, 147–160.

14. Hogg, H.D.J.; Al-Zubaidy, M.; Talks, J.; Denniston, A.K.; Kelly, C.J.; Malawana, J.; Papoutsi, C.; Teare, M.D.; Keane, P.A.; Beyer, F.R.; et al. Stakeholder Perspectives of Clinical Artificial Intelligence Implementation: Systematic Review of Qualitative Evidence. J. Med. Internet Res. 2023, 25, 39742.

15. Miller, G.J. Stakeholder roles in artificial intelligence projects. Proj. Leadersh. Soc. 2022, 3, 100068.

16. Kordi, M.; Dehghan, M.J.; Shayesteh, A.A.; Azizi, A. The impact of artificial intelligence algorithms on management of patients with irritable bowel syndrome: A systematic review. Inform. Med. Unlocked 2022, 29, 100891.

17. Alcocer Alkureishi, M.; Lenti, G.; Choo, Z.-Y.; Castaneda, J.; Weyer, G.; Oyler, J.; Lee, W.W. Teaching Telemedicine: The Next Frontier for Medical Educators. JMIR Med. Educ. 2021, 7, e29099.

18. Chee, M.L.; Ong, M.E.H.; Siddiqui, F.J.; Zhang, Z.; Lim, S.L.; Ho, A.F.W.; Liu, N. Artificial intelligence applications for COVID-19 in intensive care and emergency settings: A systematic review. Int. J. Environ. Res. Public Health 2021, 18, 4749.

19. Xu, Z.; Su, C.; Xiao, Y.; Wang, F. Artificial intelligence for COVID-19: Battling the pandemic with computational intelligence. Intell. Med. 2022, 2, 13–29.

FINANCING

None.

CONFLICT OF INTEREST

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Data curation: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Formal analysis: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Research: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Methodology: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Project management: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil,

Prabhat Ku. Sahu.

Resources: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Software: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Supervision: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Validation: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Display: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Drafting - original draft: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Writing: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

Formal analysis: Putta Chandana, Bhavuk Samrat, Sahil Suri, Roshni Majumder, Shashikant Patil, Prabhat Ku. Sahu.

https://doi.org/10.56294/mw2024495