



The Use of AI in Enhancing Patient Communication

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ABSTRACT

Artificial Intelligence (AI) has rapidly evolved in the healthcare sector, significantly transforming patient-provider communication. This paper examines the application of AI, particularly through tools like chatbots and virtual assistants, to enhance patient interaction and address communication barriers. It examines how AI-based tools improve patient accessibility, streamline information exchange, and aid in patient care, particularly in countries like Australia. The study also highlights the benefits and challenges associated with AI-driven communication, including efficiency, patient satisfaction, privacy concerns, and ethical considerations. Ultimately, it suggests that AI technology offers promising solutions for improving patient communication but requires further research and careful implementation to overcome challenges.

Keywords: AI in healthcare, patient communication, chatbots, virtual assistants, telemedicine, healthcare technology.

INTRODUCTION

Increasingly, information technology tools are being employed at varying levels in all sectors, including healthcare. There has been growing attention in recent years to the role of technology in the management and delivery of effective healthcare services. The rise of technology in healthcare, including telehealth and telemedicine, has meant that patient-healthcare communication is a critical issue of discussion. This paper highlights the significance of the interaction between AI, like chatbots, and healthcare providers and patients that arise from communication. The paper discusses how AI-based chatbots can be utilized to enhance the interaction between patients and healthcare providers. It finally discusses how AI chatbots can help in overcoming barriers in patient and healthcare provider communication in a country like Australia. The overall paper combines a critical analysis of the literature with an empirical basis [1]. This paper aims to examine the importance of using AI in improving the interaction between patients and healthcare providers in healthcare settings. The objective is to look at how AI tools can be utilized to provide a responsive and communicative process between people and human healthcare providers. The need to work on this study comes from the increasing demand for a highly effective level of patient-focused outputs. Patients are growing and demanding responsive healthcare and accessibility to the healthcare system. Overall communication with patients in Australia, however, is inefficient due to various barriers. With high demand and progress in technology, the AI chatbot is expected to provide a significant level of improvement in business, low cost, and wide acceptability. Hence, the review in this paper will provide evidence to support the positive and negative efficiency of currently developing AI tools in Australia [2].

Theoretical Framework

This study plays at the intersection of three established theoretical approaches: the social scientific examination of communication, the practical application of communication studies to healthcare interactions, and the socio-political and ethical concerns around new communication technologies. In the field of communication studies, scholars deconstruct the process by which people interact using language

and other telecommunication systems. This study has a particular focus on the healthcare environment, another well-established field of communication studies. In healthcare provider-patient interaction, the goal has been to optimize patient satisfaction and outcomes, particularly for those from marginalized populations [3]. Using communication in this way, we propose, can offer some insights into how AI can be usefully designed to enhance human-technology or robot-assisted interaction in the contemporary global-digital society. Hence, to understand the changes in patient and provider communication, it is important first to understand the general methods of communication study described above. In turn, this will help lay the groundwork for understanding the applications and benefits of existing and forthcoming AI tools. The focus of AI has thus far been on improving human technology interaction by automating processes while ensuring transparency, interpretability, and technical accountability. To continue guiding the policy and ethics of AI in healthcare (and beyond), much intellectual work should also be done toward a contextual understanding of AI's role in human interaction [4].

AI and Communication Theories

Researchers from diverse fields examine the capabilities and implications of AI technologies within communication theories, particularly in healthcare. Different backgrounds contribute to theories that support AI tools developed for health applications. Communication studies have a rich tradition that highlights the impact within this field. Building on previous content, we will explore theoretical perspectives concerning feedback in communication and control system theories to clarify the effects of AI tools in healthcare communication. Various communication models inform meaning-making and exchange. While communication often aims to share meaning for action or change, existing theories analyze this exchange at the motivational level. We focus on AI models emphasizing feedback in these interactions. Communication is circular, with messages moving from sender to receiver, creating a continuous loop through feedback. Feedback is vital in mathematical models as well. AI and communication operate teleologically, aiming for specific outputs, particularly in healthcare, where goals include cost efficiency and improved patient outcomes [5].

Applications of AI in Patient Communication

AI has vastly facilitated many fields, and the healthcare industry is no exception. The technology has been used in many health-related applications, where its key purpose is to understand, learn, and behave intelligently. AI covers all areas of communication with patients. Technological progress and increased availability of natural language processing have resulted in many innovative systems that use AI to support communication with patients. The main applications of AI in the area of patient communication include virtual assistants, chatbots, and voice recognition. AI-designed virtual assistants are becoming essential tools in healthcare, serving a wide range of purposes from answering simple questions to performing more complicated customer service tasks. Applications and tools that employ virtual assistants include interactive voice robots, chatbots, virtual nurses, and virtual assistants [6]. The technology is designed to assist and support scheduling appointments, managing treatment plans, prescribing medication, providing reminders, patient education, and sending health-related advice. Many of these are available 24/7, offering immediate assistance and access to the required information, professional advice, or support. The application receives, processes, and translates the spoken or typed message into a machine-readable format. The conversion of speech into a machine-readable format is essential in real-world healthcare settings where a large number of patients dictate their messages. The chat-based interface offers a comprehensive way to deploy user-friendly and scalable health management systems. Voice recognition is a tool designed to convert spoken words into on-screen text. The technology captures what the patient is saying and converses with the chatbot, and from a practical-dynamic point of view, it is designed to streamline instant communication, removing common barriers such as phone queues. This technology could potentially enhance communicative processes as it would allow for seamless interaction via speech. Communication would become more efficient, reducing waiting times and creating an engaging community that fully realizes the patient-centered approach [7].

Chatbots and Virtual Assistants

Chatbots and virtual assistants play a crucial role in healthcare by providing 24/7 responses to patient inquiries. They are utilized for appointment scheduling, drug lookup, and reporting service issues. Their applications extend to symptom checking, clinical queries, auxiliary diagnosis based on histories, tracking new symptoms, long-term follow-ups, and psychological counseling. Chatbots can enhance patient satisfaction, particularly in organ transplantation, appealing to users accustomed to smartphones and social media. However, privacy issues and the absence of doctor-patient relationships may limit their use.

Emotional chatbots need further refinement to match healthcare contexts. The shift from rule-based to intelligent systems improves monitoring and personalization. Voice assistants also support medication adherence but face challenges like inconsistent application models and low-tech penetration. The patient experience is evolving quickly, signaling a hopeful future for AI-based healthcare tools [8].

Voice Recognition Technology

Voice recognition technology is evolving, enabling a fusion of modern technology and human resource capabilities. Its potential to transform various sectors, especially healthcare, is significant as demand increases for better patient communication and data management. This technology can aid individuals with speech disabilities in expressing themselves, highlighting the need for healthcare systems to ensure effortless communication for all patients. In documentation, voice recordings can be transcribed in real time, enriching patient profiles. Currently, voice recognition is primarily used in clinical documentation, supported by over eight billion digital voice assistants and the anticipated surge in voice commerce. Utilizing natural language processing and machine learning, these systems can swiftly transcribe voice data into electronic health records, allowing healthcare providers to efficiently enter patient information and enhance data collection through asynchronous voice-to-text communication, which could improve treatment pathways and care. Nevertheless, challenges such as documentation errors and data privacy concerns remain. As voice recognition continues to advance, it must align with consumer technology trends. A forthcoming review will explore recent developments, acceptance challenges, and future implications for healthcare practices [9].

Benefits and Challenges

AI-enhanced patient communication offers multiple benefits. Accessibility of health information can be expanded, increasing the coverage of vulnerable populations to medical advice. Additionally, AI can offload the repetitive aspects of patient-provider communication, allowing patients to receive quick standard information and decision support. It can also be used to efficiently summarize the most important information from the medical record and present this information linearly, reformatting the inputs and interpreting these to make predictions based on large heterogeneous data points. Clinicians and administrators alike could benefit indirectly from improving patient communication and, more widely, by using AI to automate administrative tasks that keep them away from patients or take time away from more analytical work [10]. Integrating AI in patient communication poses challenges that must be addressed for greater acceptance of disease chatbots. Firstly, attracting those resistant to technology is crucial, as their reluctance may worsen health disparities. Secondly, chatbots must evolve from being seen merely as conversational tools to providing genuine medical contributions while safeguarding data privacy. Thirdly, overcoming healthcare providers' resistance at the point of care is essential, which necessitates strategic communication to analyze successful digital technology usage patterns. Furthermore, technology can enhance healthcare only if used correctly; despite the public's general acceptance of technology, AI integration requires careful consideration of user comfort levels. This implies the need for new communication methods and real-time training to foster chatbot acceptance. Key recommendations include comprehensive user acceptance studies, regular interdisciplinary research, public engagement to tackle challenges, and compliance with ethical committee guidelines in clinical research startups [11].

Future Directions and Ethical Considerations

A recent review of AI technologies in health informatics projected significant future growth in applications for patient communication. It is likely that AI will experience continued creativity within healthcare, as seen through radiology and in the implementation of decision support systems. Many other medical specialty fields are expected to continue to grow their evidence base that reports the successful administration of treatment, changes in clinical operations, or impacts on both clinical and financial outcomes. Although there are no current publications describing the use of AI for hospitalized or perioperative patient communication, it is anticipated that AI technology will be used to assist with and/or carry out to some extent much of the high demand, inpatient postoperative and hospital system communications shortly as client demand and consumer wearable information use increases [12]. Integrating text conversation agents into secure hospital websites can enable direct patient-to-hospital communication, providing instant answers via chat. Ethical considerations include appropriateness, transparency, responsibility, and establishing best practices. These imply a need for machine learning research to create guidelines and public policies. Ethical guidance is crucial, especially given biases in AI outcomes across various industries. As the technology evolves, transparency and collaboration among AI

developers, the public, medical professionals, and policymakers are vital to addressing ethical issues. The effectiveness of AI in enhancing patient communication, particularly during the pandemic video visit era, relies on ongoing assessment by users [13].

CONCLUSION

AI has the potential to revolutionize patient-provider communication by improving accessibility, efficiency, and satisfaction, particularly through chatbots and virtual assistants. These technologies can overcome common communication barriers by offering real-time, accurate responses and personalized care. However, challenges such as privacy concerns, healthcare providers' resistance, and ethical implications must be addressed. Future efforts should focus on refining AI tools for more nuanced and empathetic communication while ensuring transparency and data protection. By integrating AI responsibly, healthcare systems can achieve more patient-centered care and better outcomes in the long run.

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