

Enhancing Patient Communication and Health Literacy through AI-Enabled Services: A Pathway to Improved Patient Experience

Chirag Vijaybhai Parmar

Department of Healthcare Management, Kennedy University

Abstract

This research explores the impact of AI-driven services on improving the patient experience, emphasizing the quality of communication and health literacy. Employing a cross-sectional, quantitative method, information was gathered from 200 individuals in the Delhi/NCR area who had engaged with AI-driven healthcare technologies such as chatbots, virtual assistants, and mobile apps. The results indicate a statistically significant positive relationship between the utilization of AI-powered services and enhanced communication between patients and healthcare professionals ($r = 0.536$, $p < 0.01$). Additionally, the research noted a moderate but significant relationship between AI-driven instructional resources and enhanced patient comprehension of health information ($r = 0.376$, $p < 0.01$). These findings indicate that AI can enhance patient empowerment through timely, consistent, and easily accessible communication and educational materials. The research highlights the importance of combining AI tools with human-led assistance to enhance their effectiveness, particularly in boosting health literacy. The study finds that AI acts as an important addition to conventional care, improving patient satisfaction and aiding patient-focused healthcare delivery, especially in advancing digital healthcare systems.

Keywords: Artificial Intelligence (AI), Patient Communication, Health Literacy, AI-enabled Healthcare, Virtual Health Assistants, Patient Experience, Healthcare Technology, Digital Health

1. Introduction

Globally, healthcare systems are under increasing pressure from an aging population, rising burden of chronic disease, and workforce shortages. These current challenges have increased the value for patient-centered aims within quality improvement frameworks. For example, the Institute for Healthcare Improvement's "Quadruple Aim" identifies the improvement of the patient's experience to be one of its fundamental aims (along with population health improvement and cost reduction) [1]. In this regard, we consider patient experience as the sum of all interactions with the healthcare system. For instance, Avlijas et al. (2023) describe patient experience as the, "sum of both the external and internal processes of the hospital, patient-centered attributes, and patient, staff, and staff-staff interactions throughout each healthcare episode" [2]. They recognized communication and information/education to be two key patient-centered attributes of patient experience [3], both suggesting that how information gets exchanged influences how patients perceive the quality of care they receive. Patient empowerment requires effective communication and education. Providing education about health and care needs gives patients the information they need to make informed decisions and increase adherence to treatments[4]. Likewise,

transparency and communication between a clinician and the patient builds trust as well as patient satisfaction and is, therefore, itself an influence on health outcomes. Patients who are engaged and better informed are much more likely to carry out what was requested and have a positive experience overall. As such, provider communication and educational clarity are both identified as critical to the patient experience[5].

Artificial intelligence (AI) refers to algorithmic techniques to mimic human cognitive functions. AI has been broadly defined as the area of computer science that designs and creates systems that can perform tasks that require human intelligence, namely tasks that require learning, reasoning, problem-solving, perception, and decision making[6]. Sub-disciplines of AI include machine learning (ML), in which algorithms learn relationships based on data patterns, and natural language processing (NLP) where machines can learn and generate human language. NLP can utilize text data from electronic health records (EHR), patient inquiries, or online information sources to glean contextually relevant information and generate answers and/or guidance[7]. A frequently described AI application in health care is a chatbot, which is a software agent that simulates human conversational abilities. An AI-enabled chatbot is programmed to receive and interpret patient messages (text and voice) to produce information and/or guidance. Chatbots can parse natural language input and provide appropriate answers and support via the use of NLP algorithms (i.e., conversationally). The utilization of chatbots to produce timely and relevant information is growing as a tool to improve patient-related communication and engagement in health care[8]. AI technologies are now rapidly being implemented across healthcare domains. Bajwa et al. (2021) state that the convergence of large-scale data, sophisticated computing, and cloud tools are literally transforming models in the delivery of healthcare[4]. Technology leaders have called out healthcare as an optimal area for AI innovation. For example, Bajwa et al. note that leaders like Satya Nadella, and executives from Google Health stated that AI's "transform medicine" and enable providers to better care and serve patients. The transition to digital health is not just computerized diagnostic support or automated workflows. In fact, advances in large language models and virtual assistants are changing the way information is disseminated to patients. Golan et al. (2024) have noted that interest in AI and language models is not limited to clinical decision support but is also "transforming physician patient communication," and patient education[9]. In other words, AI's promise in healthcare includes an explicit focus on improving the quality and efficiency of patient-provider interactions.

AI & Patient Communication Augmenting patient communication is one distinct area for AI in healthcare. Sophisticated chatbots and virtual assistants that function around the clock can give patients constant access to information and support. For example, hybrid AI chatbots (AI that offers automated responses with an option for human intervention) have been designed to manage functions such as symptom triage, appointment scheduling, reminders and follow-up care[10]. Hybrid AI solutions can ease the load on clinicians and provide patients with immediate replies. Importantly, research has shown that AI medical communication experiences have built patient satisfaction: When chatbot access is built on patient accessibility and engagement when patients then access answers and guidance at any time, there are no wait times. In reality, when a patient asks a question from the virtual assistant, the natural language processing engine interprets the question to provide accurate and reliable medical information from the medical knowledge bases. By providing clear, consistent responses (in the language required) and addressing routine questions, AI communication tools reassure the patient that they are being heard and supported on their care journey.

AI for Patient Education: AI provides also powerful capabilities to improve patient education. Selective AI-generated content can clarify complex medical information by personalizing it to the person's level of literacy. For example, large language models, have shown that they were able to translate dense patient education content into more readable consumer-friendly content. Will et al. (2024) report that when researchers applied state-of-the-art AI to online patient information, there was an increase in readability scores to reach the target audience ie. reading at or close to a recommended reading level[11]. In practice, generative AI can summarize test results, discharge instructions, or plans of care for patients to provide them with more patient-friendly information. Beyond text, AI-powered virtual reality and interactive modules can develop an educational VR experience (e.g. a simulated diagnostic test or simulated surgery) to alleviate anxiety and augment understanding in order to reinforce knowledge acquisition. Education through AI-driven accessible explanations can mitigate related barriers such as low health literacy levels and gaps in language understanding including automated translations to the preferred language of patients. Thorat et al. (2024) also advocate for AI-enabled innovations that create personalized education plans, personalized communication strategies including virtual consultation, timed reminders to reach patients, generally contribute to patient satisfaction and understanding as it relates to a positive healthcare experience[5].

Implications for Patient Satisfaction: The usage of AI in communication and education is likely to lead to greater patient satisfaction and patient engagement. The theory of patient-centered care describes that individuals feeling informed and supported describe better experiences of care. AI-supported systems that increase access and decrease confusion can create more comfortable and reassuring healthcare experiences for patients. Empirical studies have been found to support this perspective: Hybrid AI chatbots in healthcare have been found to enhance patient satisfaction by increasing patient engagement and responsiveness [12]. Additionally, offering easily understood educational content meets patients' needs for knowledge and respect. Collectively, the AI-driven enhancements correspond with models of patient engagement, where empowerment and clear communication leads to improved adherence and satisfaction. In practical terms, a patient who can get immediate clarification on medical concerns using an AI assistant, or someone who receives a simple explanation of their condition in a personalized approach, is likely to feel more confident and satisfied with care.

AI innovations in health care will come to influence core aspects of patient experience. AI technologies, and especially natural language processing (NLP), chatbots, and machine learning (ML) afford scalable, personalized communication and education means – both of which support patient engagement [13]. As digital health innovations continue to emerge, research must be connected to the conceptual framework developed here. Understanding how communication and education can be enhanced by patient engagement through AI provides the conceptual basis for improving patient satisfaction. This introduction thus serves to provide the conceptual framework for understanding AI-based approaches to enhance patient experience, and builds the foundation for exploring more broadly the role of technology in the next generation of more patient-centered healthcare.

2. Review of Literature

Unanah and Aidoo (2025) examined how healthcare inequalities, shaped by socioeconomic, racial, and geographic elements, persisted in obstructing worldwide access to quality care. Conventional healthcare systems frequently fell short in providing fair services, leading to disparities in prevention, diagnosis, and treatment results. The authors emphasized that artificial intelligence (AI) technologies have developed

into a revolutionary resource, providing tailored, effective, and easily accessible care. AI demonstrated its ability to aid in the early detection of diseases through sophisticated diagnostics and predictive analytics, boost accessibility with telemedicine and automated triage systems, and improve care by offering personalized treatment plans and monitoring adherence. Algorithms in machine learning have been utilized to pinpoint social factors affecting health, directing focused interventions. Chatbots and virtual assistants powered by AI had likewise enhanced patient interaction and education, especially in rural areas. Nonetheless, the research highlighted the importance of tackling ethical concerns like bias, data privacy, and fair AI training. Strong governance and intersectoral cooperation were considered essential for fair healthcare progress via AI [14] .

Singh and Kaunert (2025) investigated the transformative effects of Artificial Intelligence (AI) on healthcare, highlighting its importance in improving patient experience during the digital age. They observed that AI included technologies like machine learning, natural language processing, and predictive analytics, all of which had progressively been incorporated into healthcare systems. These tools enhanced clinical workflows, increased diagnostic precision, and delivered data-informed insights that aided healthcare professionals in making better decisions. Applications using AI for diagnostics proved especially successful in the early identification of illnesses, leading to improved treatment strategies and results. The authors contended that AI has fundamentally transformed the healthcare sector by speeding up clinical results and enhancing patient experiences. Their section provided a comprehensive examination of how AI has revolutionized conventional healthcare delivery systems and aided in creating a more efficient, patient-focused, and technologically enhanced care setting[15] .

Talyshinskii et al. (2024) performed a literature review analyzing the impact of AI-powered chatbots in urology, emphasizing their capacity to improve patient care and physician productivity. The researchers discovered that chatbots provided prompt and personalized medical guidance, assisted in prioritizing symptoms, and directed patients to suitable treatments. They also mentioned that chatbots might streamline administrative duties and support clinicians in their decision-making processes. Even with these advantages, the review highlighted multiple challenges, such as technical constraints impacting diagnostic precision, concerns regarding data privacy, and the necessity for legal adherence. The authors highlighted that opposition from both patients and providers—stemming from worries about reliability and a preference for face-to-face interactions—created obstacles to adoption. They determined that although AI chatbots showed potential for revolutionizing urology, their extensive deployment would necessitate thorough validation, improved data protection, and smooth incorporation into current clinical processes. The research provided an even perspective on the advantages and drawbacks of using chatbots in urological settings[16] .

Sharmila et al. (2024) examined how Artificial Intelligence (AI) transformed healthcare by improving disease detection, treatment, and management. The research noted that healthcare organizations had progressively embraced AI technologies to enhance results, optimize processes, and lower expenses. Utilizing technologies like robotics, computer vision, natural language processing, and machine learning, AI has improved diagnostics—especially in image analysis for early disease identification such as cancer. Predictive analytics facilitated the creation of individualized and preventive treatment strategies through the analysis of large patient datasets. Aside from clinical environments, AI transformed healthcare services via telemedicine, online consultations, and remote patient monitoring. Virtual health assistants powered by AI provided patients with tailored information, medication alerts, and guidance on lifestyle, enhancing engagement and compliance. Additionally, telemedicine platforms enhanced by AI increased access and

resource distribution in rural locations. The authors determined that AI's capabilities in automation and data analysis made it a powerful agent for addressing intricate healthcare issues and promoting innovation throughout the industry[17].

Jeyaraj and Narayanan (2023) explored the revolutionary incorporation of Artificial Intelligence (AI) in healthcare, emphasizing its impact on redefining medical diagnostics, treatment, and delivery. The research revealed that AI technologies—spanning medical imaging and diagnostics to drug development, virtual health assistants, and remote monitoring—greatly enhanced patient care. Imaging tools driven by AI enabled early disease identification, while predictive models sped up drug development and allowed for personalized treatments. Virtual assistants and chatbots improved patient interaction and accessibility, while remote monitoring systems facilitated ongoing health tracking and proactive care, decreasing hospital admissions. Moreover, AI's predictive analytics facilitated tailored preventive approaches and public health initiatives. The authors sought to evaluate the present status of AI implementation via case studies, showcasing its effects on clinical practice and healthcare logistics. They also tackled the ethical issues and barriers to implementation related to AI in healthcare, suggesting careful approaches to manage these challenges while optimizing AI's capabilities[18].

Oye (2022) explored the revolutionary effect of Artificial Intelligence (AI) in healthcare, emphasizing its ability to increase diagnostic precision, tailor treatments, and boost patient results. The research examined AI uses including predictive analytics, tailored medicine, virtual assistants, and administrative enhancement. Utilizing machine learning and natural language processing, AI systems could examine extensive datasets, recognize patterns, and assist in clinical decision-making. These technologies enhanced diagnostic accuracy and operational effectiveness considerably. The paper also tackled obstacles obstructing AI implementation, such as data quality problems, difficulties in system integration, professional pushback, and ethical issues like privacy, bias, and the necessity for human supervision. Oye highlighted the significance of regulatory structures, collaboration among stakeholders, and ongoing innovation to guarantee the responsible and fair implementation of AI in healthcare. The results underscored the importance of collaborative approaches to completely unlock AI's capabilities in creating a more efficient, effective, and patient-focused healthcare system[19].

3. Research Gap

The current research literature has established a solid recognition about the potential of Artificial Intelligence (AI) to impact the healthcare sector, including overall diagnostic accuracy (Oye, 2022; Jeyaraj & Narayanan, 2023), operational efficiency (Sharmila et al., 2024), and access to health care services (Unanah & Aidoo, 2025). Research studies (e.g. medical imaging, predictive analytics, clinical decision support, and administrative efficiencies) in AI have showcased multiple applications. Papers have also referred to the use of virtual health assistants and AI chatbots to facilitate engagement for patients with providing tailored information (Talyshinskii et al., 2024; Sharmila et al., 2024). Despite these contributions being important, they are fundamentally technologies-centric, specifically looking at system capabilities, algorithm actions, and operational capacities.

Nonetheless, there is a glaring omission in the literature on the patient-side experience, especially in terms of the quality of communication between patients and healthcare providers and the patients' understanding of health-related information once provided an AI-enabled service. The literature contains very few studies exploring AI effects on health literacy, that is, how well patients can understand, remember and apply medical advice given to them in an AI related service. While there has been some work to discuss patient

engagement and access to AI-enabled health (Unanah & Aidoo, 2025), empirical studies researching AI-enabled educational tools and how they positively impact healthcare and health outcomes - particularly in relation to non-clinical and everyday health management - are still developing. Relevant empirical work from places like Delhi/NCR is even less common, despite the rapid digitalization of healthcare services in urban India. This study aims to address an important gap in the literature by looking empirically at AI about patient-provider communication and patient understanding of health information, exploring the shift from traditional technical affordances to patients outcomes. This will create one more dimension in the literature on AI health care.

4. Objective of the Study

- To examine the impact of AI-enabled services on the quality of communication between patients and healthcare providers.
- To evaluate the effectiveness of AI-based instructional tools in enhancing patient's understanding of health information.

5. Hypothesis of the Study

H0₁: There is no significant difference in the quality of communication between patients and healthcare providers using AI-enabled services and those using traditional services.

H1₁: There is a significant difference in the quality of communication between patients and healthcare providers using AI-enabled services and those using traditional services.

H0₂ : AI-based instructional tools do not significantly improve patients' understanding of health information.

H1₂: AI-based instructional tools significantly improve patients' understanding of health information.

6. Scope of Study

This learning lays out the scope of this research - to evaluate how AI-enabled services promote the patient experience while focusing particularly on two categories; 1) improving communication quality between patient and providers and 2) evaluating the role of AI novel educational tools that can be used to clarify comprehension of health-related information. The designated geographic area is limited to the Delhi/NCR area. This area was selected due to its increased adoption of digital health care technologies, as well as greater diversity of patients being served.

The research incorporated both public and private healthcare institutions, to encompass as complete a perspective as possible. The research specifically focused on individuals who had prior experience with AI-enabled healthcare platforms (chatbots, virtual assistants, mobile health applications) so that the research could provide relevant responses and reflections. As a cross-sectional, quantitative study, it presented patient perceptions at a single point in time, without assessing long-term behavioral impacts or clinical efficacy. The research did not address the technical operation of AI online tools, or the ethical/regulatory considerations. The idea was to present factors that extend the conversation about how AI technologies can enable communication and health literacy in real-world healthcare situations, and to provide practical information to health care policymakers, health service providers, and technology developers.

7. Research Methodology

7.1 Research Design

This study used a quantitative, cross-sectional research design to assess the effect of AI-enabled healthcare services on patient communication and health education. This design allowed for an empirical assessment of testable variables using structured data drawn from individuals who had been exposed to relevant AI healthcare.

7.2 Research Region

Participants provided data from chosen public and private healthcare establishments within the Delhi/National Capital Region (NCR) of India. This urban region was selected because of the greater adoption of digital health technologies and diverse patient demographics, allowing us to develop a comprehensive and contextual understanding of AI adoption in healthcare settings.

7.3 Method for Sampling and Size of Sample

The study employed purposeful sampling to gather participants who had direct experience with AI-driven healthcare services, including chatbots, mobile health apps, virtual health assistants, or smart patient portals. This sampling technique enabled us to gather responses from people who had genuine interaction with AI, whether as a clinical service or wellness solution.

The final sample included 200 participants from urban and semi-urban healthcare centers throughout Delhi/NCR. The sample included a variety of ages, educational backgrounds, and healthcare utilization

7.4 Data Collection Instrument

The primary data were collected through a structured questionnaire consisting of items on:

- The general perception of quality and responsiveness on AI based communication tools
- Effectiveness of AI based educational platforms to enhance understanding of health-related information
- Overall satisfaction with AI enabled healthcare experience

The responses were noted as a five-point Likert scale by categories from “Strongly Disagree” (1) to “Strongly Agree” (5). The questionnaires were administered online (email, digital forms) and face-to-face in clinical environments (OPDs, reception).

7.5 Data Analysis Techniques

The analysis of the data was performed using IBM SPSS Statistics software. Data were analyzed using the following statistical techniques:

- Descriptive Statistics to illustrate the demographic profiles of the respondents, as well as response frequencies from each item
- Pearson’s Correlation Analysis to identify relatedness between AI service usage and patient outcomes

7.6 Ethical Consideration

Participants fully understood the study purpose, and participation was entirely voluntary. No personally identifiable information was collected, and anonymity and confidentiality was maintained. Participants also had the right to withdraw at any time, without negative consequences. Data collection was undertaken for academic purposes only, and the study was conducted in accordance with ethical guidelines set forth by the associated academic institution.

8. Result & Analysis

Objective 1: To examine the impact of AI-enabled services on the quality of communication between patients and healthcare providers

Table 1: Descriptive Statistics

	Mean	Std. Deviation	N
AI-Enabled Services	13.8308	3.34743	65
Patient–Provider Communication Quality	13.1692	3.04943	65

The descriptive statistics provided reviewed the correlation of services provided with AI and the quality of communication between patients and healthcare providers from the responses of 65 participants. The mean score of the AI-enabled services was 13.83 with a standard deviation of 3.35. This means that on average the participants would provide positive feedback about their experience using AI-enabled services but there was some variation in the perception of AI-enabled services. This value for AI-enabled services was a little higher as the mean score for quality of patient-provider communication was 13.17 with standard deviation of 3.05 meaning that the level of perception of quality of efficacy of communication was still fairly high, although with variation, of course.

The proximity in the mean score values indicates the possibility of a relationship between the AI tool use and communication improvement in medical facilities. The standard deviations on the two variables are moderate and not extremely spread out which means that the data would not be represented by very high values or scores as opposed to very low values or scores on both variables. Overall, the descriptive statistics indicate that services facilitated with AI do have a relatively positive influence on the efficaciousness of patient-provider communication which can positively lead to clarity, comprehension, and levels of patient responsiveness of communication in the healthcare industry.

Table 2: Correlations

		AI-Enabled Services	Patient–Provider Communication Quality
AI-Enabled Services	Pearson Correlation	1	.536**
	Sig. (2-tailed)		.000
	N	65	65
Patient–Provider Communication Quality	Pearson Correlation	.536**	1
	Sig. (2-tailed)	.000	
	N	65	65

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation examination indicates a moderate positive association between the use of AI-supported services and the quality of communication between patients and providers, with the correlation coefficient, Pearson correlation coefficient (r), being 0.536. The correlation is significant at the 0.01 level ($p = 0.000$), indicating that the observed relationship is highly improbable to have occurred by chance.

This discovery suggests that increased exposure to AI-driven services leads to improved communication between a patient and a healthcare provider. The positive correlation suggests that AI technologies, such as chatbots, automated alerts, telemedicine systems, or intelligent diagnostic instruments, could be taking on supporting roles in enhancing the clarity, consistency, and accessibility of communications within the healthcare setting.

The relationship is statistically significant and its strength is considerable ($r = 0.59 \geq 0.5$). It shows that there is a fairly strong connection, though not entirely flawless, indicating that other factors may also influence communication quality. Nonetheless, this finding supports the notion that AI could act as an intermediary in patient involvement and healthcare delivery systems. These lessons could serve as a valuable source of insight if healthcare organizations aim to enhance service delivery by integrating AI.

Objective 2: To evaluate the effectiveness of AI-based instructional tools in enhancing patients' understanding of health information.

Table 3: Descriptive Statistics

	Mean	Std. Deviation	N
AI-Based Instructional Tools	12.4923	3.36398	65
Health Literacy	13.6923	3.12711	65

Using data from 65 respondents, descriptive statistics would be developed to determine the uses of AI-based instructional tools and the implications for patients' understanding of health information (health literacy). The mean score on the AI-based instructional tools is 12.49 with a standard deviation of 3.36, which indicates the moderate use of AI-based instructional tools, and some variation in response to using AI-based tools. In contrast, the mean indicator of health literacy is somewhat better at 13.69 and a standard deviation of 3.13 which indicates an adequate degree of awareness of health-related information by the participants overall.

The closeness of the means indicates a potential positive correlation of employing AI-based educational tools (i.e., using interactive apps, virtual health assistants and videos generated by AI) and patients understanding health information. The homogeneity of responses of the as indicated by the standard deviations, shows that a large proportion of the respondents had responses near the means and very few outliers.

These findings appear to suggest an optimistic impact that AI-improved educational initiatives might have on teaching practice patients to learn the medical vocabulary, procedures, and self-management recommendations. The evidence suggests that the automated portion of the AI software would be an enhancement to the health education strategy, utilizing health communication that is more interactive, available, and tailored, with the outcome of improving their general health literacy.

Table 4: Correlations

		AI-Based Instructional Tools	Health Literacy
AI-Based Instructional Tools	Pearson Correlation	1	.376**
	Sig. (2-tailed)		.002
	N	65	65
Health Literacy	Pearson Correlation	.376**	1
	Sig. (2-tailed)	.002	
	N	65	65

** . Correlation is significant at the 0.01 level (2-tailed).

The aim of correlation analysis was to delineate the use of AI-based learning tools and health literacy within the sample of 65 respondents. The resulting positive Pearson correlation coefficient was 0.376 with the .01 ($p = 0.002$) level of confidence, indicating a positive and moderate degree of correlation of meaningfulness between the two variables. To put it more plainly, the more frequent application of AI-based learning tools the higher the rate of patient understanding with respect to the health information provided. Examples of the tools can include - AI-enabled applications for learning, chatbots, health-related tutorials, and digital interactive products which present complicated medical topics in ways that are understandable. The significance level of ($p < 0.01$) suggest that the likelihood of this causal association being due to coincidence is unlikely.

Although the correlation was not very high, it is consistent and stable enough to suggest that AI-based instructional supports can serve as adjuncts to improving health literacy. Patients who have access to these tools will be likely to feel more empowered, more in control, and better prepared to make health related decisions. The outcomes affirm the important role of intelligent instructional technologies in any patient education program to make health care communication more effective, accessible, and personalized.

9. Discussion

This study emphasizes the growing importance of artificial intelligence to change the patient experience, especially through enhanced communication and improved health literacy. The first outcome, which examined the impact of AI-enabled services on patient-provider communication revealed a moderately strong positive correlation ($r = 0.536$, $p < 0.01$). This implies that as the patient interacts more with an AI service provided by a health organization, such as chatbots, virtual assistants, or automated messaging service, the quality of their communication with their health-care provider improved; having better clarity, more responsive communication and consistent communication with their provider.

The table of means values between AI-enabled services, patient-provider communication quality is close together, indicating that patients feel that AI tools created an extra layer of effectiveness in their interaction with health-care providers. The results also demonstrate that AI technologies enable standardized communication, reduced wait time, and can provide timely information are results ultimately allowed AI to bridge the communication gap ingrained in the traditional provider-patient experience. In addition, in our work, the second objective - to explore the impact of AI-based instructional tools to improve a patient's understanding of health information, similarly, produced a positive but weaker relationship ($r = 0.376$ $p < 0.01$) - less strong than the communication outcome, but still statistically significant. This suggests that AI-based educational platforms - not limited to health literacy apps, interactive videos, and automated tools for explanation - should be meaningful in facilitating patient understanding of medical information. However, the moderate correlation indicates that instructional tools alone may not significantly elevate health literacy without human accompaniment, personalized counselling, and contextual assistance. Therefore, it is crucial that the AI-based educational tools encourage a complementary blended approach to health education where the tools come into play within face-to-face human health education rather than at that replace it. Consistent with prior literature, these results emphasize the need for a considered and strategic approach to integrating AI into healthcare systems to ensure that tools are developed and designed not just to function efficiently from a technical standpoint, but to develop tools and systems which will be accessible, inclusive and user friendly. The results also highlighted the importance of a patient-centric development of AI which is transparent, adjustable, and ethical around the use of patient data.

Ultimately, our work suggests AI is in a supportive role in positively improving both the delivery and understanding of healthcare information. The statistical significance of a greater than modest correlations also demonstrates that the AI applications can support a catalyst to a more informed, engaged and responsive patient cohort, but is not devoid of challenges. The correlations are not perfect, which suggests there are clearly other influencing factors related to health literacy outcomes including digital literacy, cultural consideration, and health care accessibility.

10. Conclusion

This study sought to explore the transformative effects of AI-enabled services on facilitating patient-provider communication and improving patients' understanding of health information. The findings strongly suggest that AI technologies are beginning to have a meaningful and supportive role to play in influencing around patient experience in the health delivery process in the urban and semi-urban healthcare contexts in Delhi/NCR. The analysis of responses provided by 200 respondents revealed a moderate to strong and statistically significant correlation between the AI-enabled service use and quality of communication with healthcare providers. This means that the technologies referred to as chatbots, virtual assistants and intelligent messaging are likely capable of improving communication clarity, responsiveness and consistency - key dimensions of patient engagement. Our findings reinforce the role of AI in overcoming the long-standing challenges in communication between patients and healthcare providers.

In addition, this study identified a positive but weaker correlation, compared to the other tools, between AI-based instructional tools and patient health literacy, indicating the potential of AI to be used in delivering personalized, simplified, and accessible health education information to patients. Although AI tools can help clarify complex medical data and information for patients, it seems that these tools are most useful when used in a blended learning format with human guidance and assistance with context as part of the learning and decision-making process. Together these results support the idea that AI is becoming more relevant to enhancing the dissemination and comprehension of healthcare information. However, it also strongly emphasizes that AI will not be able to be an entire substitute for human communication. Digital literacy, culture, accessibility, and trust will still be critical aspects for how patients interface with AI.

In summary, AI is emerging as a very valuable tool in the healthcare space to enhance rather than replace how patients gather and contextualize healthcare information. When used appropriately, AI-enabled communication and instructional tools can provide enormous contributions to designing a better-informed, activated, and satisfied patient population and achieving patient-centred care objectives.

Reference

1. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. *The Annals of Family Medicine*. 2014 Nov 1;12(6):573-6.
2. Avlijas RN, Squires RN, Janet E, Lalonde RN, Backman RN. A concept analysis of the patient experience. *Patient Experience Journal*. 2023;10(1):15-63.
3. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health affairs*. 2008 May;27(3):759-69.
4. Bajwa J, Munir U, Nori A, Williams B. Artificial intelligence in healthcare: transforming the practice of medicine. *Future healthcare journal*. 2021 Jul 1;8(2):e188-94.

5. Thorat V, Rao P, Joshi N, Talreja P, Shetty AR, RAO P. Role of artificial intelligence (AI) in patient education and communication in dentistry. *Cureus*. 2024 May 7;16(5).
6. King S, Thaliph A, Laranjo L, Smith BJ, Eberhard J. Oral health literacy, knowledge and perceptions in a socially and culturally diverse population: a mixed methods study. *BMC public health*. 2023 Jul 28;23(1):1446.
7. Patil S, Joda T, Soffe B, Awan KH, Fageeh HN, Tovani-Palone MR, Licari FW. Efficacy of artificial intelligence in the detection of periodontal bone loss and classification of periodontal diseases: a systematic review. *The Journal of the American Dental Association*. 2023 Sep 1;154(9):795-804.
8. Tseng W, Pleasants E, Ivey SL, Sokal-Gutierrez K, Kumar J, Hoeft KS, Horowitz AM, Ramos-Gomez F, Sodhi M, Liu J, Neuhauser L. Barriers and facilitators to promoting oral health literacy and patient communication among dental providers in California. *International journal of environmental research and public health*. 2021 Jan;18(1):216.
9. Golan R, Reddy R, Ramasamy R. The rise of artificial intelligence-driven health communication. *Translational andrology and urology*. 2024 Feb 23;13(2):356.
10. Wah JN. Revolutionizing e-health: the transformative role of AI-powered hybrid chatbots in healthcare solutions. *Frontiers in Public Health*. 2025 Feb 13;13:1530799.
11. Will J, Gupta M, Zaretsky J, Dowlath A, Testa P, Feldman J. Enhancing the Readability of Online Patient Education Materials Using Large Language Models: Cross-Sectional Study. *Journal of Medical Internet Research*. 2025 Jun 4;27:e69955.
12. Aggarwal A, Tam CC, Wu D, Li X, Qiao S. Artificial intelligence–based chatbots for promoting health behavioral changes: systematic review. *Journal of medical Internet research*. 2023 Feb 24;25:e40789.
13. Coen E, Del Fiore G, Kaphingst KA, Borsato E, Shannon J, Smith HS, Masino A, Allen CG. Chatbot for the return of positive genetic screening results for hereditary Cancer syndromes: a prompt engineering study. *Research Square*. 2024 Aug 29:rs-3.
14. Unanah OV, Aidoo EM. The potential of AI technologies to address and reduce disparities within the healthcare system by enabling more personalized and efficient patient engagement and care management. *World Journal of Advanced Research and Reviews*. 2025;25(2):2643-64.
15. Singh B, Kaunert C. Accelerating Healthcare Outcomes Uplifting Patient Experiences Pairing Artificial intelligence (AI): Transforming the Healthcare Industry in the Digital Arena. In *Impact of Digital Solutions for Improved Healthcare Delivery 2025* (pp. 121-146). IGI Global.
16. Talyshinskii A, Naik N, Hameed BZ, Juliebø-Jones P, Somani BK. Potential of AI-driven chatbots in urology: revolutionizing patient care through artificial intelligence. *Current Urology Reports*. 2024 Jan;25(1):9-18.
17. Sharmila Nirojini P, Kanaga K, Devika S, Pradeep P. Exploring the impact of artificial intelligence on patient care: a comprehensive review of healthcare advancements. *Sch Acad J Pharm*. 2024 Feb;13(2):67-81.
18. Jeyaraj P, Narayanan T. Role of artificial intelligence in enhancing healthcare delivery. *International Journal of Innovative Science and Modern Engineering*. 2023;11(12):1-3.
19. Oye, Emma & Moise, Jame & Owen, Antony. (2022). *The Role of Artificial Intelligence in Enhancing Patient Care*.