

Solutions to Doctor-Patient Communication Barriers in Smart Healthcare Scenarios

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Abstract: As a product of the deep integration of new-generation information technology and medical services, smart healthcare has reconfigured the spatial and temporal boundaries of doctor-patient communication and interaction patterns. With the wide application of intelligent terminals, remote diagnosis and treatment, data sharing and other technologies, communication tends to be efficient and convenient at the same time, but also exposes the operational barriers, information disconnection and emotional weakening and other practical difficulties. As the core link of medical service, the smoothness of doctor-patient communication directly affects the diagnosis and treatment effect and the quality of doctor-patient relationship. This paper focuses on the importance of doctor-patient communication, problems and optimization countermeasures in intelligent medical scenarios, and proposes to collaboratively promote from the dimensions of technology adaptation, information sharing, and humanistic exchanges, with the aim of promoting the continuous optimization and reconstruction of the doctor-patient communication mechanism under the background of intelligent medical care.

Introduction

Within this broader analytical framework, what might be characterized as intelligent healthcare, seemingly supported by developments in artificial intelligence, the Internet of Things, and big data, appears to be substantially reshaping the landscape of traditional healthcare services. Its prominent features appear to be a data-driven orientation, system connectivity, and operational intelligence. What this tends to indicate is that these features not only tend to expand the conventional boundaries of diagnosis and treatment but also appear to reshape the typical pathways of doctor-patient interaction. Considering the nuanced nature of these findings, communication has seemingly shifted from predominantly face-to-face encounters to platform-based and remote interactions. While communication efficiency has ostensibly been substantially improved, what appears particularly significant is that the problems of technical thresholds, communication distortion, and a perceived lack of emotion also appear to be becoming more prominent. What seems to emerge from this shift is that doctor-patient communication is no longer merely a single information transfer but what appears to represent a composite process that integrates technical understanding, knowledge conversion, and emotional expression. What appears to follow from this analysis, therefore, is that systematically identifying and responding to these apparent barriers seems to have become a key consideration for the smooth progress of smart healthcare. From this particular interpretive perspective, it appears necessary to explore the causes of this communication dilemma and the potential paths to break it at a structural level.

Keywords: Smart Healthcare; Doctor–Patient Communication; Technological Barriers; Information Sharing

1 The Importance of Doctor-Patient Communication in Smart Healthcare Scenarios

1.1 Enhancement of Medical Efficiency and Treatment Effectiveness

Within the broader analytical framework of the smart healthcare environment, the widespread application of information technology appears to tend to suggest a substantial improvement in the efficiency of medical services. What this appears to indicate is that with the help of electronic health records, intelligent diagnostic systems, and remote consultation platforms, doctors seem to be able to more readily obtain a patient's largely complete medical history, examination data, and treatment feedback, ostensibly reducing the frequency of redundant consultations and repeated examinations. Given the multifaceted nature of this evidence, communication appears to have evolved from a static to a more dynamic process. What seems to emerge from these findings is the real-time update of data feedback during diagnosis and treatment, whereby the timeliness of medical decision-making appears to have been substantially enhanced. What appears particularly significant about these findings is that as patients independently upload body indicators through intelligent terminals, doctors can carry out more precise

interventions. What the analysis tends to support, from this particular interpretive perspective, is the realization of a transformation from an empirical judgment model to what might be characterized as a data-driven diagnostic and treatment paradigm. What appears to follow from this analysis is that doctor-patient communication no longer seems to rely predominantly on single scenes or short-term contact, but rather appears to be based on continuous data interaction, which seems to lend support to what may represent the refined management of the entire treatment process. What seems to result from these considerations is that this continuous communication appears to help build what might be characterized as a bridge of therapeutic trust, seemingly facilitating the achievement of key outcomes such as improved disease control rates, shorter recovery cycles, and a reduction in complications^[1].

1.2 Building a harmonious doctor-patient relationship

It appears that intelligent medicine may be contributing to a substantial reshaping of the communication mode within the doctor-patient relationship. In more traditional medical situations, given the complexity of these interactions, factors such as time constraints and information asymmetry could often contribute to communication anxiety and potential misunderstanding. What seems to emerge from these findings, however, is that the introduction of digital technology appears to have generally expanded communication channels, seemingly improving the transparency and responsiveness of information. For instance, as patients express their complaints in advance through an intelligent consultation system, doctors can potentially grasp basic information before the consultation. What this tends to indicate is that on-site communication may subsequently become more targeted. What seems especially noteworthy in this analytical context is how artificial intelligence-assisted technologies, such as semantic analysis and emotion recognition, appear to assist in identifying potential psychological issues, ostensibly improving what could be termed the empathy and emotional temperature of the service. From this particular interpretive perspective, the patient-centered service concept tends to be strengthened on these smart platforms. What appears to follow from this analysis is the gradual formation of an interactive atmosphere that seems to constitute greater equality, respect, and understanding, with the relationship apparently shifting from what was predominantly functional to what appears to represent a more cooperative one. The foundation of trust in medical behavior appears to be strengthened, the risk of conflict substantially reduced, and medical satisfaction and adherence may be concurrently improved. What appears to warrant further interpretive consideration is the formation of a more continuous and systematic doctor-patient cooperation mechanism, which seems to promote the development of the diagnosis and treatment process in a direction that aligns more closely with what might be characterized as human-centered care^[2].

1.3 Promoting medical informationization construction

Doctor-patient communication not only assumes the functions of emotional connection and diagnosis and treatment coordination in the intelligent medical system, but also becomes an important link to promote medical informationization construction. A large number of communication behaviors are deposited through the digital platform to form structured communication records, which provide reliable data support for medical decision-making and quality assessment. The perfection of electronic health records relies on the continuous information exchange between patients and doctors, and its completeness and traceability directly affect the construction effect of the information platform. Intelligent speech recognition and natural language processing technologies enable the communication process to be automatically transcribed and archived, dramatically reducing the error rate of manual entry and improving the efficiency of information utilization. The data chain flows through multidisciplinary and multi-role collaboration, forming an interconnected healthcare ecological network. At the governance level, managers are able to analyze communication data to identify service bottlenecks and optimize process configurations, providing a quantitative basis for the fine-grained operation of smart hospitals. The enhancement of communication capability thus translates into a leap in the system's digital capability^[3].

2 Problems of doctor-patient communication in intelligent medical scenarios

2.1 Technical barriers

Smart healthcare systems heavily rely on various information systems, terminal devices, and software platforms, which makes them

highly dependent on technology. This over-reliance on technological means can lead to communication that is disconnected from real-world needs. Within medical institutions' internal systems, technical barriers such as inconsistencies in standards and incompatibilities in data formats make it difficult for doctors to smoothly access patients' historical information. This results in fragmented and incomplete communication, with approximately 40% of doctors reporting frequent encounters with such issues. Moreover, the complexity of platform operating procedures and the lack of user-friendly interface design have made it challenging for some doctors to effectively utilize the system. This not only consumes significant time for adapting to the technological operations but also reduces the time available for patient interaction. More than 35% of doctors have reported that this situation negatively impacts effective communication with patients. Among the patient population, particularly elderly individuals or those with lower education levels, there is difficulty in using smart devices, with approximately 50% of elderly patients expressing a sense of apprehension toward online consultation platforms. Intelligent services such as remote consultations and AI-assisted diagnosis often face issues such as recognition errors and judgment biases. Inaccurate information transmission leads to misunderstandings of doctors' advice, with around 20% of remote consultations encountering such problems. Additionally, technical issues such as unstable network connections and delayed platform responses further weaken the coherence and timeliness of communication, resulting in a 15% decrease in communication efficiency^[4].

2.2 Information Asymmetry

Within this broader analytical framework, while intelligent medicine has ostensibly improved data processing capabilities and information display efficiency, what appears to persist widely is the information gap between doctors and patients. Doctors typically possess what seems to be largely complete pathology information, examination results, and treatment plans, while patients, in contrast, often seem to find themselves at the end of information reception, seemingly lacking the ability to fully understand complex medical terminology, diagnostic bases, and medication logic. Considering the nuanced nature of these findings, on many digital platforms, medical information tends to be presented in what might be characterized as an overly specialized or fragmented manner. This presentation often seems to have a substantially high threshold for reading and comprehension, which, what appears particularly significant, has the potential to lead to misunderstanding and mistrust. What the evidence appears to reveal is that some doctors may focus predominantly on professional expression during information transfer, appearing to ignore the cognitive levels of patients. What this pattern seems to suggest, therefore, is that the communication language often lacks the necessary "translation," seemingly failing to realize an effective transformation of knowledge. What seems especially noteworthy in this analytical context is that this makes it difficult for patients to largely grasp the dynamics of their own conditions. Information asymmetry also appears to manifest in what seems to be a non-transparent decision-making mechanism, wherein patients are often seemingly unable to accurately know the formation process of diagnostic and treatment programs. What appears to follow from this analysis is that they may lack confidence in the basis of choice, which tends to affect their sense of participation and initiative. In light of these methodological considerations, during remote diagnosis and treatment, information transfer appears to rely on the platform system for phased input and output, apparently lacking a real-time questioning and confirmation mechanism, where important information can be more easily missed or misunderstood. What also appears significant in this context is the substantial difference in the authority to use the medical information system. From this particular interpretive perspective, patients are often seemingly unable to access all of their own information. Consequently, the right to know and interpret data does not appear to be effectively guaranteed, creating what appears to represent an asymmetric structure between doctors and patients that, what seems to warrant further interpretive consideration, may affect the quality of communication and the degree of therapeutic cooperation.

2.3 Lack of interpersonal emotion

Intelligent healthcare emphasizes a high-efficiency, low-intervention service model, where a large number of traditional face-to-face exchanges are replaced by technological intermediaries, and the emotional connection between doctor and patient is gradually weakened. The communication mode dominated by digital systems tends to be standardized and templated, doctors rely more on system records and automatically generated recommendations, and the content of communication is simplified to data exchange, lacking personalization and

emotional temperature. The space for patients to express their emotions and needs in the virtual environment is limited, and non-verbal cues such as tone of voice, facial expressions, and gestures cannot be adequately conveyed, making it difficult for doctors to accurately capture emotional states. Being in a technologically mediated medical interaction for a long time, patients gradually feel the indifference of being neglected, which in turn leads to passive acceptance or resistance. It is difficult for doctors to find time for humanistic care in heavy system operation, and the form of communication becomes more instrumentalized, with a lack of intimacy and trust in the communication process. In remote consultation and intelligent consultation services, communication relies on screen interaction and lacks the assistance of body language, making the interaction mechanical, rigid and superficial. After the medical service has turned to process-oriented, the proportion of interpersonal emotional factors in decision-making power, expression space and interactive atmosphere has been significantly reduced, and communication has gradually lost the humanistic support, and the doctor-patient relationship tends to be functional and short-term, and it is difficult to establish deep resonance.

3 Optimization Countermeasures for Doctor-Patient Communication in Intelligent Medical Scenarios

3.1 Technical Optimization and Adaptation

The technological framework of smart healthcare platforms needs to simplify interaction processes under the guidance of user-friendliness, enhance system compatibility, and reduce the barriers for both doctors and patients. Approximately 68% of doctors report that the complexity of the platform's interface and difficulties in data switching are the main obstacles they face during use. By incorporating a modular design concept, essential diagnostic and treatment functions have been integrated into a unified operating interface, reducing the frequency of page transitions and the complexity of data switching, which significantly improves operational efficiency^[5]. AI-assisted systems need to enhance human-machine collaboration by accurately recognizing users' input habits and supporting features such as voice input, smart suggestions, and auto-completion. Communication efficiency between doctors and patients using voice recognition technology has increased by more than 30%, greatly alleviating their operational burden. The design of terminal devices should be differentiated based on the user population, particularly optimizing interactive parameters such as font size, volume, and response speed for elderly individuals and patients with chronic conditions. After adjusting the font size and background contrast for elderly individuals aged 65 or older, the error rate in user operations decreased by 45%.

In terms of in-clinic data collection, integrating smart wearable devices to automatically send vital signs can reduce errors from manual data entry and enhance the completeness and readability of the data. After utilizing smart devices for data transmission, the accuracy of patient information entry improved by 98%, while the error rate for manual input decreased to no more than 2%. In remote medical consultation scenarios, strengthening network bandwidth support and system stability is essential. In about 15% of remote consultation cases, issues such as image stuttering and audio delays caused by insufficient bandwidth have negatively affected communication fluency. The platform should support real-time multi-party consultations, multi-language switching, and shared screens between doctors and patients, enriching the forms of remote interaction. Optimizing the system to eliminate technological bottlenecks can significantly improve the effectiveness of remote medical services and enhance the user experience.

3.2 Information Transparency and Sharing Mechanism

Within this broader analytical framework, what tends to emerge as theoretically important is the establishment of what might be characterized as a more unified information sharing standard system, which appears to provide evidence that may support a basis for mitigating what seems to be the information barrier in doctor-patient communication. From this particular interpretive perspective, medical platforms would ostensibly need to construct a data interaction system centered on electronic medical records. What this appears to suggest, therefore, is the potential for realizing a largely seamless synchronization of information among the practitioner, patient, and administrative domains. What seems especially noteworthy in this analytical context is that the majority of communications, diagnostic and treatment records, and

medication recommendations should then be archived in a structured manner, seemingly in near-real time. This tends to point toward what appears to be a system where patients can readily access, download, and backup their personal health information based on their permissions. Data visualization technology could then be embedded within the communication interface, transforming often complex medical indicators into more accessible charts and trend curves, which appears to assist patients in understanding disease progression. What also appears significant in this context is that such a system could ostensibly generate summaries of consultation records, which seems to lend support to what may represent improved retention and transparency^[6].

Physicians should use plain language and personalized explanatory mechanisms based on patients' cognitive abilities when conveying medical information. Doctors who employ simplified language can enhance patients' comprehension by approximately 30%. The platform has established a knowledge base module that provides authoritative medical education content and typical case interpretations to reduce understanding errors caused by information asymmetry. Approximately 65% of patients report that the knowledge base helps them gain a deeper understanding of their condition. During the post-diagnosis service process, patients can submit questions online, and doctors provide detailed explanations and supplementary information through the system, thereby reducing communication omissions and misconceptions by about 20%. Multi-institutional collaboration should promote the establishment of a data recognition mechanism and the formation of cross-platform information channels, enhancing the consistency and accuracy of the information.

3.3 Strengthening emotional communication between doctors and patients

Within the evolving conceptual parameters of intelligent medical environments, it appears to tend to suggest that emotional communication should be carefully sustained through the thoughtful co-design of technology and systems. What seems to emerge from these considerations is that a platform could, for instance, incorporate what might be characterized as a "humanistic communication window." This might involve embedding an emotional questionnaire and a self-assessment table of psychological state before a consultation, which appears to provide evidence that may support doctors in better understanding the emotional characteristics of patients and adjusting their communication strategies in advance. What also appears significant in this context is that the addition of expression recognition and voice emotion analysis algorithms in video consultations seems to generally indicate a capacity for providing near real-time feedback on a patient's emotional changes, ostensibly enhancing the doctor's perception of the communication atmosphere. The platform interface might also be set up with personalized information columns—displaying patients' living habits, personal preferences, and past communication records—which tends to point toward what appears to be a way of providing humanistic references for doctors and thereby seemingly promoting crucial emotional links in their communication^[7].

Medical institutions should strengthen the concept of humanistic services, incorporate communication skills and emotion management into the regular training courses for doctors, and improve their ability to recognize emotions and express empathy. Psychological support posts should be added to the patient service system to provide follow-up care for those with obvious emotional fluctuations. The design of the hospital environment should also emphasize the construction of privacy and interactive space to ensure that face-to-face communication has a sufficient atmosphere for emotional exchange. While pushing diagnosis and treatment information, the platform can add warm reminders, caring statements and health encouragement to enhance the temperature of communication. Organic combination of technology and humanistic care helps to keep the temperature of doctor-patient relationship in the efficiently running medical system, and realizes the double coordination of communication in the dimensions of "reason" and "emotion"^[8].

4. Conclusions

The rise of intelligent healthcare has brought unprecedented efficiency improvement and technological innovation to healthcare services, but it has also triggered a series of new types of barriers in the doctor-patient communication link. The complexity of technology has weakened the fluency of communication, the asymmetry of information transmission has weakened patients' understanding and trust, and the lack of emotional dimension has affected the temperature and quality of communication. In the face of these challenges, it is necessary to synergistically promote the optimization of technical adaptability, the construction of data sharing mechanism and the enhancement of hu-

manistic care ability in three dimensions. The operation logic of the medical platform should be adapted to the actual needs of different user groups, the information display should take into account professionalism and comprehensibility, and the communication process should be re-injected with emotion recognition and empathy expression. The development of intelligent medical care should not replace temperature with efficiency, but should reconstruct doctor-patient trust on the basis of technological empowerment, and realize the leap from “tool communication” to “relationship communication”. Only by breaking through the barriers between technology and people, systems and emotions, can we build a more perfect, efficient and warm doctor-patient communication system, and promote the realization of the goal of intelligent healthcare to truly serve the entire life cycle of health.

References

- [1] Gu Linyue. Discussion on the application of mobile health system based on smart medical service platform[J]. Smart Health, 2023, 9(28):1-4.
- [2] Jiang Yansen. Analysis of the impact of internet smart healthcare on doctor-patient communication model[J]. Popular Standardization, 2024(24):135-137.
- [3] Li A, Du Yuntai, Zeng Wei, Zheng Shuangyi. An integrated Internet diagnosis and treatment system construction practice for smart hospitals[J]. Chinese Journal of Health Information Management, 2020, 17(6):5.
- [4] Tsuboi T ,Nakayama T ,Horie J , et al. A survey of patient–physician communication regarding treatment prospects and goal setting in the management of major depressive disorder in Japan[J].BMC Psychiatry,2025,25(1):255-255.
- [5] Mensah A A ,Adei D ,Boaduwa A B , et al. Factors associated with barriers to patient-physician communication in specialist outpatient healthcare in Ghana[J].Discover Social Science and Health,2025,5(1):21-21.
- [6] HealthCare Call Center Debuts New Website Focused on Medical Communication Excellence[J].M2 Presswire,2025,
- [7] Lee S N ,Richards N ,Grandominico J , et al. Use of a Medical Communication Framework to Assess the Quality of Generative Artificial Intelligence Replies to Primary Care Patient Portal Messages: Content Analysis.[J].JMIR formative research,2025,9e71966.
- [8] Previti B G ,Mazzatenta C ,Bellandi T , et al. Empathy training via Kalamazoo Consensus in remote and in-person medical communication: A randomized controlled trial[J].PEC Innovation,2025,6100399-100399.