

Original Research Article

The role and impact of artificial intelligence in health communication: A reflective paper

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Abstract: This paper, based on the author's experience of collaborating with AI in a health communication project for depression prevention and treatment, reviews the cooperation process, analyzes the effectiveness and limitations of AI in health communication by combining relevant theories and literature, explores the boundaries between AI and humans and the possibility of future collaboration, and reflects on the impact on the improvement of the author's own relevant knowledge and abilities.

Keywords: Health communication; Depression prevention and treatment; Human-machine collaboration; Communication effectiveness; Emotional communication

1. Introduction

With the rapid development of Artificial Intelligence technology, its application in the field of health communication has attracted widespread attention. As an important part of public health practice, health communication is not only a process of transmitting health information, but also about promoting behavioral changes, improving health literacy and improving overall health levels. Driven by the wave of digitalization, AI is highly expected and is regarded as an important tool to improve communication efficiency and expand the scope of communication. However, can AI really play a positive role in disease prevention and health promotion communication? Can it replace the ingenuity, empathy and cultural insight that are indispensable to humans? These issues urgently need to be reflected and tested based on actual experience.

Based on my personal experience of collaborating with AI in the health communication project for depression prevention and treatment, this paper critically analyzes the effectiveness and limitations of AI in health communication practice. By combining course learning content and external research literature, this paper explores the respective boundaries and future collaboration possibilities of AI and humans in health communication practice, and reflects on the impact of this process on my own health communication knowledge and ability improvement.

2. Reporting: A detailed review of the AI collaboration process

In this study, I focused on the topic of depression prevention and treatment, and completed the preliminary design of the health communication strategy with the help of AI. The collaboration process mainly includes the following links:

First, topic selection and knowledge sorting. Using AI to retrieve and integrate epidemiological data, etiological theories and intervention pathways on depression, AI demonstrates excellent information integration capabilities, and can quickly summarize the biological, psychological, and social multi-factor models of depression, providing solid support for the theoretical framework of the communication strategy.

Second, identification of communication barriers. Through natural language processing technology, AI extracts a large amount of user discussion data from social media platforms and analyzes the public's labeling, generalization, and entertainment expression trends of depression. This data-driven analysis helps reveal the

cognitive biases in health communication, which is closely related to the phenomenon of information misunderstanding among low-literacy groups emphasized in the theory of health literacy. It is worth noting that existing studies have pointed out that the effectiveness of public health communication depends not only on the control of the disease itself, but also on whether the communication information can be close to the real experience and cultural context of diverse groups (Hu et al., 2023).

In the strategic design stage, AI generates a preliminary communication plan based on Social Cognitive Theory, emphasizing the promotion of audience cognition and behavior change through role model demonstration, enhancing self-efficacy and simplifying information expression. AI also proposes a communication framework based on the Health Belief Model, which constructs information content around the logic of perceived susceptibility, perceived severity, perceived benefits and barriers.

Finally, in actual use, I conducted a detailed analysis of the communication content generated by AI. Although these contents perform well in terms of information structure and logic, they show obvious deficiencies in emotional temperature, cultural adaptation and situational understanding. The overall style tends to be standardized and instrumental, lacking language details that stimulate emotional resonance, making the content more like a general template for a wide audience, which is difficult to trigger the psychological resonance of a specific group, thereby weakening the communication effect.

3. Responding: Personal initial reaction and feelings

In the early stage of collaboration with AI, I was impressed by its information integration capabilities and literature sorting speed. AI can complete the literature induction that traditional manual labor takes several days in a very short time, showing information processing capabilities beyond human power. This high efficiency once made me look forward to the application prospects of AI in the field of health communication.

However, as the project progressed, especially after generating communication strategies and analyzing output content, my feelings changed subtly. Although AI has shown the advantages of clear logic and rigorous structure in the construction of theoretical frameworks, its output content obviously lacks warmth in emotional expression. Especially when dealing with the highly sensitive issue of depression, AI's expression is calm and alienated, and fails to reflect the delicate care for the audience's emotional state. This is in stark contrast to my original assumption that "AI can improve efficiency while improving communication effectiveness." In fact, AI can certainly undertake tasks such as scanning images and processing data, but "interaction between people is the core that no matter how complex a machine is, it cannot replicate" (Topol, 2019), especially in medical and health communication scenarios, AI cannot replace the role of humans in empathy, comfort and cultural judgment. At the same time, some scholars have pointed out that the operating effect of AI depends not only on its technical mechanism, but also on the way humans use it, social experience and cultural embedding (Coeckelbergh, 2020). Therefore, when there is no interactive context support, its communication ability often shows obvious limitations.

4. Relating: Theoretical combination and analysis

Combining actual experience with health communication theory helps to understand the role of AI in health communication more systematically, and also prompted me to deeply reflect on my growth in theoretical application and critical thinking.

First, the Health Belief Model emphasizes the role of individual perceived susceptibility, severity, expected benefits and barriers in behavioral decision-making. AI can quickly build a logical framework based on HBM in strategy design, which strengthens the structure and logic of communication content. Through this process, I have a deeper understanding of the logical core of HBM in practice, and realize that communication strategy design must take into account the scientific nature of the cognitive level. However, the content generated by AI

is obviously insufficient in emotional mobilization and it is difficult to truly drive behavioral change. Through reflection, I realized that although HBM provides a logical framework, there is a theoretical blind spot when it comes to emotional communication, which also prompted me to pay attention to the communication theory that emphasizes both emotion and cognition in subsequent learning, and improved my theoretical integration ability.

The theory of health literacy emphasizes the differences in the audience's cognitive ability and background. Although AI maintains a high standard in terms of scientificity, it fails to effectively adapt to the needs of different health literacy groups and has a high language threshold. By reflecting on this issue, I realized that the communication barriers of low-literacy people are far more complicated than I previously understood, and the design of health communication strategies must focus on language accessibility and cultural adaptability. Existing studies have pointed out that health promotion needs to expand the scope of traditional evidence, pay attention to the differences in health needs of different social groups, and emphasize the use of more situational and culturally adaptable multi-methods (Raphael, 2000). This understanding further enhances my understanding of the fairness and universality of health communication.

Risk Communication theory advocates taking into account both scientificity and emotional care when dealing with highly sensitive topics. When AI generates content for mental health communication, it lacks the necessary emotional regulation mechanism, which can easily cause emotional alienation of the audience. Through reflection, I realized that risk communication is not only the transmission of scientific knowledge, but also an important way of emotional support and psychological comfort. In the future, health communication practice must pay attention to the emotional needs of the audience.

5. Reasoning: Critical interpretation and external literature support

The positive role of artificial intelligence in health communication cannot be ignored. Research has pointed out that with the advancement of the Internet and cloud computing technology, the access and distribution of medical data have become more convenient, and the integration of health and disease-related big data has created unprecedented opportunities for medical information management (He et al., 2019). This is highly consistent with the AI efficiency and information integration capabilities I experienced during the collaboration process, further verifying the great potential of AI in improving basic information processing and communication efficiency.

However, while improving efficiency, AI has also exposed obvious limitations in health communication, especially in emotional communication and cultural adaptability. Research shows that in order to improve acceptability, health communication often simplifies complex causal relationships in the communication process, trying to "cut off" the social structural factors behind health problems, thereby weakening the depth of information and situational complexity (Piggin, 2012). Similarly, in pursuit of efficiency and standardization, AI tends to ignore the diversity of emotional, cultural and social contexts in health issues. Although this trend has increased the coverage of communication, it has also intensified the homogenization and shallowness of communication content, weakening the potential of health communication to promote deep behavioral change.

Furthermore, even if the existing AI systems integrate cognitive and emotional intelligence elements to some extent, they still have fundamental flaws in truly understanding complex human emotions and social situations. Although existing AI systems have cognitive and emotional intelligence elements, they still lack true understanding and awareness (Kaplan & Haenlein, 2019). My actual experience confirms this view. The communication content generated by AI is highly standardized, lacks the necessary emotional warmth and cultural adaptation, and is difficult to establish a deep emotional connection with the audience.

This limitation is particularly evident in highly sensitive communication fields such as mental health. Although artificial intelligence has undeniable advantages in information screening and communication efficiency, its standardized generation mechanism often ignores the individual differences of the audience in cultural back-

ground, psychological state and language understanding. The result is: seemingly accurate content lacks the warmth that really touches people's hearts. In the practice of health communication, this kind of content output that lacks emotional adjustment and cultural response ability can easily lead to information homogeneity and is difficult to adapt to the diverse and complex social context, thereby weakening the humanistic characteristics of communication. Especially in the field of mental health, content should not only be based on professional knowledge and logic, but also need to convey care, understanding and empathy. If the communicator only relies on AI to generate text, but lacks the response to the audience's emotions and grasp of the cultural context, it will not only be difficult to inspire trust and resonance, but may also increase the audience's sense of distance and resistance, and reduce the effectiveness of health intervention. Therefore, in highly sensitive communication scenarios such as mental health, AI tools should not be given a dominant position, but should be used as an auxiliary mechanism to serve a more humane and culturally adaptable communication strategy. Only in this way can health communication truly achieve the transition from "reaching" to "arriving".

From a broader perspective, emotional interaction and cultural understanding are always the boundaries that artificial intelligence cannot reach. Although AI can process huge amounts of data, identify potential patterns, and demonstrate amazing efficiency in standardized tasks, once it comes to the subtle flow of human emotions and the cultural implications behind the context, the algorithmic logic that AI relies on becomes particularly slow. Existing research points out that machines lack empathy and cannot truly understand human emotions and complex social situations, which makes AI unable to cope with tasks that require emotional communication and cultural adaptability (Topol, 2019). Health communication, especially in highly sensitive topics such as mental health, relies on deep interpersonal interaction and cultural resonance to build audience trust, stimulate emotional identification, and guide behavioral changes. Since AI is not competent for these high-level cognitive and emotional interaction needs, health communication practice still needs to rely on the emotional wisdom and cultural insight of human communicators to achieve truly effective information transmission and health promotion.

References

- [1] Coeckelbergh, M. (2020). *Ai ethics*. MIT Press.
- [2] Gross, A. (1999). A theory of the rhetorical audience: Reflections on chaim perelman. *Quarterly Journal of Speech*, 85(2), 203–211. <https://doi.org/10.1080/00335639909384254>.
- [3] He, J., Baxter, S. L., Xu, J., Xu, J., Zhou, X., & Zhang, K. (2019). The practical implementation of Artificial Intelligence Technologies in medicine. *Nature Medicine*, 25(1), 30–36. <https://doi.org/10.1038/s41591-018-0307-0>.
- [4] Hu, Z., Wu, C., & Sacco, P. L. (2023). Editorial: Public health policy and health communication challenges in the COVID-19 pandemic and infodemic. *Frontiers in Public Health*, 11. <https://doi.org/10.3389/fpubh.2023.1251503>.
- [5] Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., Wang, Y., Dong, Q., Shen, H., & Wang, Y. (2017). Artificial intelligence in healthcare: Past, present and future. *Stroke and Vascular Neurology*, 2(2), e000101. <https://doi.org/10.1136/svn-2017-000101>.
- [6] Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? on the interpretations, illustrations, and implications of Artificial Intelligence. *Business Horizons*, 62(1), 15–25. <https://doi.org/10.1016/j.bushor.2018.08.004>.
- [7] Paris, C., Thomas, P., & Wan, S. (2012). Differences in language and style between two social media communities. *Proceedings of the International AAAI Conference on Web and Social Media*, 6(1), 539–542. <https://doi.org/10.1609/icwsm.v6i1.14307>.
- [8] Parrish-Sprowl, J., & Parrish-Sprowl, S. (2023). A case for a quantum informed approach to health

- communication research. *Frontiers in Communication*, 8. <https://doi.org/10.3389/fcomm.2023.1232616>.
- [9] Piggan, J. (2012). Turning health research into health promotion: A study of causality and ‘critical insights’ in a united kingdom health campaign. *Health Policy*, 107(2–3), 296–303. <https://doi.org/10.1016/j.healthpol.2012.06.002>.
- [10] Raphael, D. (2000). The question of evidence in health promotion. *Health Promotion International*, 15(4), 355–367. <https://doi.org/10.1093/heapro/15.4.355>.
- [11] Topol, E. J. (2019). *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*. Basic Books.