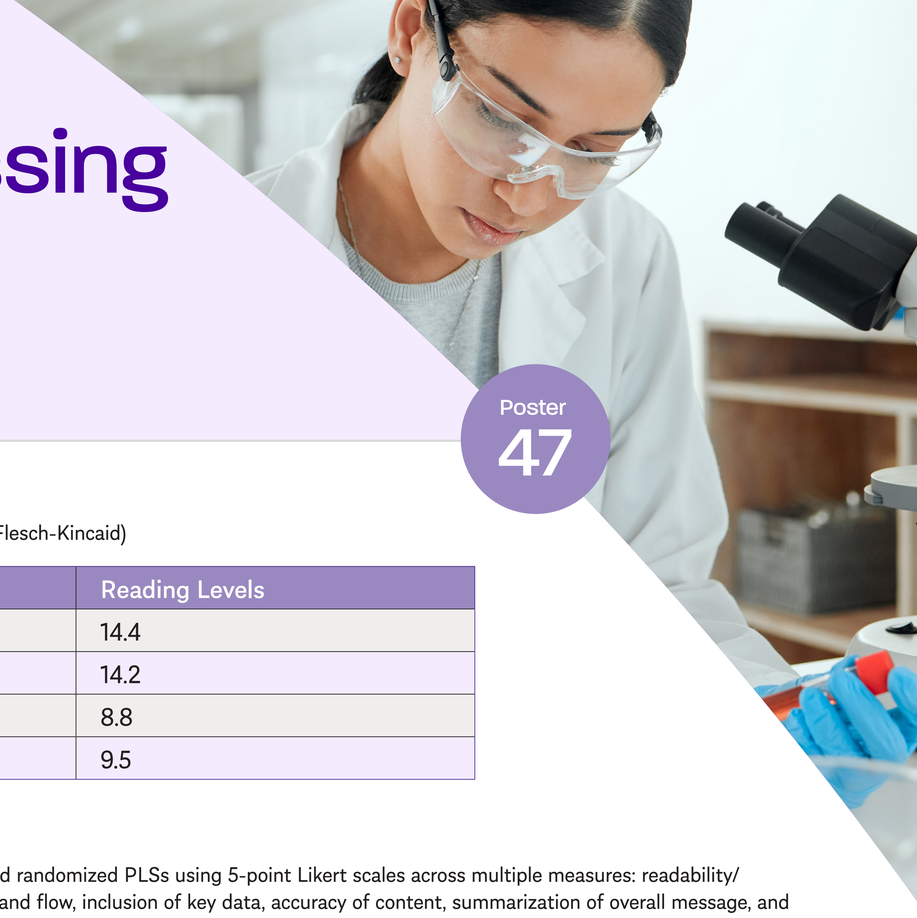
Efficacy of Targeted AI Tools for Addressing Vaccine Skepticism: A Pilot Study

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Poster 47

Key Takeaway

The time saved using generative AI can be used to create PLSs tailored to target diverse audiences.

Objectives

Vaccine skepticism is a public health challenge that reduces vaccination rates and increases vulnerability to disease[1]. An approach to combating vaccine skepticism is through effective communication:[2-5] understanding the audience, culturally appropriate messaging, and empathetic engagement. This pilot study evaluates bespoke AI-generated plain language summaries[6] (PLSs) designed to help primary care physicians (PCPs) communicate effectively with vaccine skeptics.

Methods

Two original scientific abstracts on vaccinations with corresponding medical writer-created PLSs were selected. A bespoke AI system was used to generate one generic AI-PLS and three variants targeting vaccine skeptics (targeted AI-PLS). Blinded PCPs (n=3) assessed randomized PLSs using 5-point Likert scales across multiple measures: readability, clarity, data inclusion, accuracy, and message summarization. Measures specific to the target audience included: relevancy, actionability, cultural appropriateness, and empathy.[7] Comments from the PCPs were also solicited.

Results

The results are shown in Figure 1. Reading level scores are reported in Table 1.

The targeted AI-PLS scored highest in empathy 3.8 (0.7), actionability 4.3 (0.7), message summarization 4.8 (0.5), and relevancy 4.6 (0.5), compared to generic AI-PLS[3.5 (0.5), 3.8 (1.5), 4.3 (0.8), 4.5 (0.8)] and medical writer PLS [2.8 (0.4), 3.8 (1.0), 3.3 (1.5), 3.5 (1.5)]. Medical writer PLS 4.0 (0.9) outperformed both AI versions [3.0 (0.6), 3.2 (1.1)] in key data inclusion.

Discussion

Limitations: (1) due to a small sample size, no significant inferences could be drawn; (2) the study surveyed PCP but did not assess the impact of discussions with their patients.

The targeted AI-PLS scored highest in empathy, actionability, message summarization, and relevancy, suggesting the need for further study of the efficacy of targeting PLS – for assisting PCPs to tailor their communication both with vaccine skeptics and, potentially, other target audiences. While medical writer PLSs outperformed AI in the inclusion of key data, PCP feedback suggests that the numbers are not as important as the story that the numbers tell.

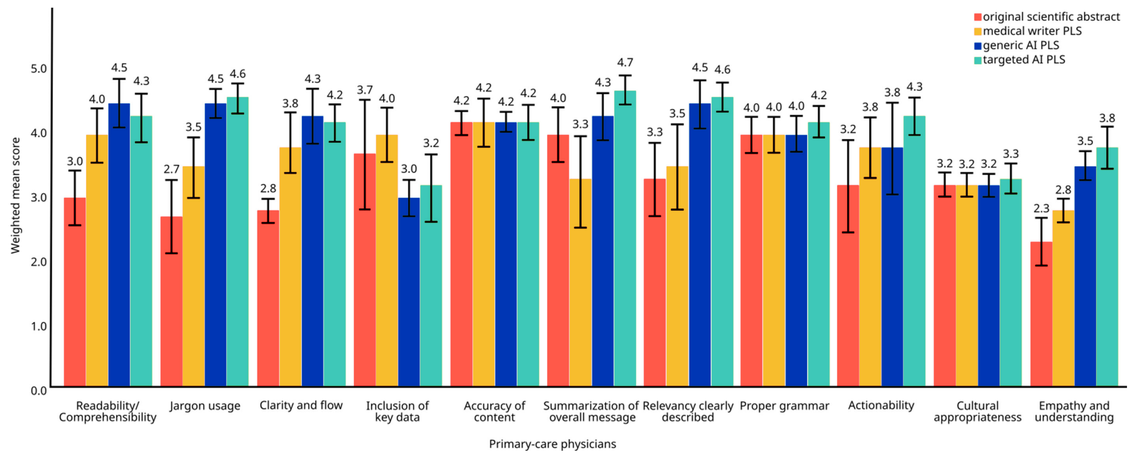
> The numbers–key data–are not important to my patients. Efficacy is about communicating the story the numbers tell. *-PCP*

> How I explain things to patients usually starts with figuring out what they know already and what information will help them make a decision. Same for cultural appropriateness. I think the basic information is helpful when it's summarized concisely so I can tailor it to specific patients. *-PCP*

Table 1: Reading grade-level scores (Flesch-Kincaid)

	Reading Levels
Original scientific abstract	14.4
Medical writer PLS	14.2
Generic AI PLS	8.8
Targeted AI PLS	9.5

Figure 1: Blinded PCPs (n=3) assessed randomized PLSs using 5-point Likert scales across multiple measures: readability/ comprehension, jargon usage, clarity and flow, inclusion of key data, accuracy of content, summarization of overall message, and proper grammar. Additional measures specific to the target audience included: relevancy clearly described, actionability, cultural appropriateness, and empathy and understanding.



Conclusions

By demonstrating enhanced actionability and empathy compared to conventional or generic AI-assisted approaches, targeted generative AI shows promise in communicating scientific information to PCPs tasked with engaging specific audiences like vaccine skeptics. This aligns with established principles of physician-patient communication, where presentation of contextually relevant data is more efficacious than comprehensive data dissemination.[8,9] This suggests a paradigm where AI-assisted communication can be optimized for both information relevance and audience receptivity.

Key words

Artificial Intelligence (AI), Plain Language Summaries (PLS)

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References

1. Browne M. Epistemic divides and ontological confusions: The psychology of vaccine scepticism. Hum Vaccin Immunother. 2018;14(10):2540-2542. doi: 10.1080/21645515.2018.1480244.
2. Fasce A, Schmid P, Holford DL, Bates L, Gurevych I, Lewandowsky S. A taxonomy of anti-vaccination arguments from a systematic literature review and text modelling. Nat Hum Behav. 2023 Sep;7(9):1462-1480. doi: 10.1038/s41562-023-01644-3.
3. Whitehead HS, French CE, Caldwell DM, Letley L, Mounier-Jack S. A systematic review of communication interventions for countering vaccine misinformation. Vaccine. 2023 Jan 27;41(5):1018-1034. doi: 10.1016/j.vaccine.2022.12.059.
4. Schmitz B. Improving accessibility of scientific research by artificial intelligence-An example for lay abstract generation. Digit Health. 2023 Jun 29;9:20552076231186245. doi: 10.1177/20552076231186245.
5. Eppler MB, Ganjavi C, Knudsen JE, et al. Bridging the Gap Between Urological Research and Patient Understanding: The Role of Large Language Models in Automated Generation of Layperson's Summaries. Urol Pract. 2023 Sep;10(5):436-443. doi: 10.1097/UPJ.0000000000000428.
6. Bender W, Grant T, Porkess V, et al. Examining the time- and effort-saving utility of tailored AI-tooling for abstract plain language summary development. Presented at: International Society for Medical Publication Professionals (ISMPP) 20th Annual Meeting 29 April-1 May 2024; Washington, DC, USA. Poster #10.
7. Watts L, McMinn D, Bender W, et al. Comparative analysis of plain language summary abstracts: generative artificial intelligence versus human medical writers. Presented at: International Society for Medical Publication Professionals (ISMPP) 20th Annual Meeting 29 April-1 May 2024; Washington, DC, USA. Poster #9.
8. Jarrett C, Wilson R, O'Leary M, Eckersberger E, Larson HJ; SAGE Working Group on Vaccine Hesitancy. Strategies for addressing vaccine hesitancy - A systematic review. Vaccine. 2015 Aug 14;33(34):4180-90. doi: 10.1016/j.vaccine.2015.04.040.
9. Brewer NT, Chapman GB, Rothman AJ, Leask J, Kempe A. Increasing Vaccination: Putting Psychological Science Into Action. Psychol Sci Public Interest. 2017 Dec;18(3):149-207. doi: 10.1177/1529100618760521. PMID: 29611455.

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