



Health-Literacy Innovation for Countering Medical Misinformation on Social Platforms

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Abstract

The growing dependence on social platforms for health information has created a communication environment in which evidence-based medical guidance, personal testimony, advertising, influencer content, outdated recommendations, and unsupported therapeutic claims can circulate within the same information stream. Consequently, the ability to obtain health information is no longer sufficient; individuals also require the competencies necessary to evaluate source credibility, interpret evidence, recognize persuasive manipulation, distinguish scientific uncertainty from falsehood, and make appropriate decisions before acting on or redistributing medical claims.

This study examines health-literacy innovation as a multidimensional strategy for countering medical misinformation on social platforms. A structured integrative evidence-synthesis methodology was used to analyze contemporary research on health literacy, digital literacy, misinformation discernment, media literacy, expert correction, accuracy prompts, psychological inoculation, online education, and platform-mediated intervention. The World Health Organization's contemporary health-literacy framework emphasizes the ability to access, understand, appraise, and use health information while recognizing the responsibility of institutions to provide trustworthy and actionable information environments. Population-level evidence demonstrates substantial difficulty in applying these competencies online. Gaysynsky and colleagues found that 35.61% of U.S. social-media users perceived high levels of health misinformation, whereas 66.56% reported substantial difficulty distinguishing true health information from false information.

Lower subjective digital literacy and numeracy were associated with greater discernment difficulty. Intervention evidence is promising but requires careful interpretation. A 2025 scoping review identified 30 online health-misinformation intervention studies, of which 23 incorporated theoretical foundations, but intervention designs varied substantially. Experimental studies further indicate that interventions designed primarily to encourage skepticism may reduce acceptance of both misinformation and accurate information. The present study therefore proposes an Integrated Health-Literacy Innovation Model combining source authentication, evidence appraisal, contextual verification, uncertainty interpretation, prebunking, corrective communication, professional guidance, and trust calibration. The analysis concludes that counter-misinformation interventions should aim to improve discernment rather than generalized skepticism and should operate at individual, professional, organizational, educational, and platform levels.



Keywords: Health literacy; medical misinformation; digital health literacy; social platforms; health communication; misinformation discernment; media literacy; prebunking; infodemic management; public health

1. Introduction

Social platforms have become important components of the contemporary health-information ecosystem. Individuals increasingly encounter explanations of symptoms, medicines, diets, vaccination, mental health, chronic disease, reproductive health, alternative therapies, and emerging medical technologies through short videos, posts, discussion groups, podcasts, influencers, and user-generated communities. These channels can increase access to useful health information and enable rapid communication during public-health emergencies. At the same time, the structure of social platforms allows evidence-supported information to circulate alongside personal anecdotes, commercial promotion, conspiracy narratives, selectively interpreted research, outdated clinical recommendations, and claims that have little or no scientific support. A systematic review by Suarez-Lledo and Alvarez-Galvez identified 69 studies of health misinformation across multiple topics and platforms, including vaccines, drugs and smoking, noncommunicable diseases, pandemics, eating disorders, and medical treatments. The proportion of misinformation varied substantially across subject areas, demonstrating that medical misinformation is neither uniform nor restricted to a single disease or platform.

The central difficulty is therefore not simply whether inaccurate information exists, but whether users possess the competencies needed to distinguish reliable medical evidence from misleading content under realistic online conditions. The World Health Organization describes health literacy as the ability to access, understand, appraise, and use information and services in ways that support health and well-being. Importantly, WHO's current framework does not treat health literacy solely as an individual reading skill. It recognizes that health literacy is affected by organizational structures, resource availability, information environments, and whether institutions provide information in forms that people can understand and use. Applied to social platforms, this perspective means that countering medical misinformation requires both more capable information users and better-designed systems for communicating credible health evidence.

Recent population research illustrates the importance of this distinction. Using data from the 2022 U.S. Health Information National Trends Survey involving 6,252 adults, Gaysynsky and colleagues found that 35.61% of social-media users perceived a high amount of false or misleading health information, while 66.56% reported high difficulty determining whether health information encountered on social media was true or false. Lower subjective digital literacy was associated with increased odds of reporting both high misinformation exposure and high discernment difficulty; lower numeracy was also associated with greater discernment difficulty. Particularly important from a behavioral perspective, difficulty distinguishing accurate from inaccurate information was associated with greater reported use of social-media information in health decisions and discussions with health-care providers. The findings indicate that discernment skills may have direct relevance to clinically consequential information use.



2. Objectives of the Study

2.1 To Examine Health Literacy as a Protective Information Competency

The first objective is to examine how health literacy and digital literacy may protect individuals from medical misinformation encountered on social platforms. Particular attention is given to source identification, evaluation of professional expertise, interpretation of supporting evidence, assessment of numerical claims, recognition of commercial influence, understanding of scientific uncertainty, comparison with independent sources, and the ability to identify circumstances requiring professional medical consultation.

2.2 To Evaluate Contemporary Counter-Misinformation Interventions

The second objective is to examine evidence concerning educational interventions, expert corrections, fact-checking, media-literacy prompts, psychological inoculation, accuracy reminders, social corrections, and related approaches. The analysis focuses not merely on whether interventions reduce belief in false claims but on whether they improve accurate-versus-inaccurate information discernment without generating unnecessary distrust of legitimate medical information.

2.3 To Develop an Integrated Health-Literacy Innovation Model

The third objective is to develop a practical framework that connects individual literacy competencies with professional communication, organizational health literacy, educational interventions, public-health social listening, and platform-level information design. The proposed model is intended to strengthen resilience to medical misinformation while maintaining appropriate confidence in credible health institutions and evidence-based information.

3. Review of Literature

3.1 Health Misinformation Within the Social-Platform Environment

Health misinformation is more complex than a simple collection of false statements. Content can become misleading through incomplete context, exaggerated causal claims, selective presentation of research, use of nonrepresentative personal experiences, inappropriate generalization, omission of treatment risks, outdated evidence, or presentation of preliminary scientific findings as established clinical conclusions. Suarez-Lledo and Alvarez-Galvez found that among 69 studies included in their systematic review, vaccines accounted for 32% of investigated topics, drugs or smoking for 22%, noncommunicable diseases for 19%, pandemics for 10%, eating disorders for 9%, and medical treatments for 7%. Some studies concerning smoking products and drugs reported misinformation proportions as high as 87%. These values should not be interpreted as universal prevalence estimates for entire platforms because the included studies differed substantially in sampling, definitions, and subject matter.

Kbaier and colleagues expanded this evidence through a 2024 scoping review synthesizing 70 sources published between 2012 and March 2024. Their analysis emphasized that users frequently seek trustworthy health information but may lack sufficient health and digital literacy to evaluate what they encounter. The authors also identified socioeconomic inequalities, cultural factors, politicization, malicious information actors, and communication pressures experienced by health professionals as



relevant dimensions of the problem. Medical misinformation should consequently be understood as a system-level communication problem rather than as a deficiency located exclusively within individual users.

The distinction between misinformation and scientific uncertainty is particularly important in medicine. Clinical recommendations can change because evidence develops, new adverse effects become known, treatments are compared in larger populations, or disease conditions change. Health-literacy interventions that teach users to interpret every change in professional guidance as evidence of unreliability may inadvertently damage trust in legitimate scientific processes. Effective literacy should instead explain why scientific knowledge can be provisional while still allowing users to distinguish responsible evidence revision from unsupported claims.

3.2 Digital Literacy and the Development of Discernment

Health literacy in the social-media era requires traditional health-information competencies to be combined with digital verification behavior. A user evaluating a medical claim should ideally identify who created it, determine whether the creator has relevant expertise, establish whether the cited research actually exists, examine the date and context of the evidence, and compare the claim with independent credible sources. Digital literacy additionally requires awareness that engagement metrics, popularity, visual professionalism, verification badges, personal testimonials, and confident presentation are not equivalent to scientific validity.

Gaysynsky and colleagues provide direct health-specific evidence supporting this relationship. Individuals with lower subjective digital literacy had greater odds of experiencing high discernment difficulty, while lower numeracy was also associated with difficulty distinguishing reliable from unreliable health information. This result suggests that numerical health literacy deserves particular attention because medical misinformation frequently relies on percentages, relative risks, isolated statistics, before-and-after comparisons, and numerical claims presented without denominators or appropriate clinical context.

Evidence from broader digital-media research also demonstrates that literacy interventions can improve discrimination. Guess and colleagues evaluated an intervention modeled on a large international media-literacy campaign in the United States and India. Their results showed improved discernment between mainstream and false news, including a 26.5% improvement in the nationally representative U.S. sample. Although the intervention was not exclusively health-specific, its findings support the principle that relatively concise digital-literacy guidance can influence information evaluation.

3.3 From Correction to Preventive Information Resilience

Correcting misinformation after exposure remains an important strategy. Vraga and Bode demonstrated that expert-source corrections can reduce health misperceptions in social-media environments, while Bode and Vraga found that both algorithmic and social correction could reduce Zika-related misperceptions. Correction is particularly valuable when an inaccurate medical claim has already circulated widely and can be addressed with clear evidence.

Preventive approaches attempt to strengthen resistance before exposure occurs. Roozenbeek and colleagues demonstrated that short psychological-inoculation interventions delivered through social-



media contexts could improve recognition of manipulation strategies, increase confidence in identifying manipulation, improve discrimination between trustworthy and untrustworthy content, and improve sharing decisions. Accuracy prompts similarly attempt to interrupt impulsive sharing by temporarily redirecting attention toward whether information is likely to be true rather than merely interesting or emotionally engaging.

However, intervention design requires careful calibration. Hoes and colleagues demonstrated that several prominent misinformation interventions can create skepticism toward factual content as well as misinformation. Altay, De Angelis, and Hoes subsequently showed that media-literacy guidance can be designed to address both sides of the problem: encouraging skepticism toward unreliable material while simultaneously promoting recognition and trust of reliable information. In their U.S. experiment involving 3,919 participants, mixed trust-and-skepticism messaging improved discernment, and the authors argued that literacy interventions should avoid focusing exclusively on skepticism.

4. Research Methodology

4.1 Research Design and Evidence Strategy

The present study employed a **structured integrative review and conceptual analytical design**. The methodology was selected because the objective was to synthesize evidence across health communication, digital health literacy, behavioral science, public health, and misinformation research rather than to report an original clinical or population survey.

Evidence available up to June 10, 2020 was considered. Priority was given to peer-reviewed systematic reviews, scoping reviews, population studies, randomized or controlled misinformation experiments, major behavioral intervention studies, and authoritative World Health Organization guidance. Key search concepts included health literacy, digital health literacy, medical misinformation, health misinformation, social media, misinformation discernment, media literacy, correction, accuracy prompts, inoculation, prebunking, and infodemic management.

4.2 Evidence Inclusion and Analytical Framework

Studies were prioritized when they addressed at least one of four domains: prevalence or perception of medical misinformation; literacy-related susceptibility; evaluation of a misinformation intervention; or system-level strategies for improving health-information quality.

Table 1: Research and Analytical Framework

Analytical Domain	Operational Focus	Intended Contribution
Health literacy	Access, understanding, appraisal, use	Evaluate health-information competency
Digital literacy	Source tracing, verification, navigation	Strengthen online evaluation
Numeracy	Interpretation of numerical health claims	Reduce statistical misunderstanding
Misinformation	False, misleading, decontextualized	Define information risk



exposure	medical claims	
Discernment	Difference in evaluation of accurate and inaccurate claims	Primary outcome
Correction	Expert, social, algorithmic, fact-checking responses	Post-exposure mitigation
Prebunking	Recognition of manipulation techniques	Pre-exposure protection
Accuracy prompting	Attention to truth before sharing	Reduce impulsive dissemination
Organizational literacy	Accessible and trustworthy communication	Shift responsibility beyond individuals
Trust calibration	Appropriate confidence in credible information	Prevent generalized cynicism

4.3 Evidence Synthesis and Quality Interpretation

Evidence was synthesized narratively according to study design, population, intervention type, outcome measurement, and direction of findings. Intervention evidence from controlled experiments was interpreted more strongly than descriptive associations, while systematic and scoping reviews were used primarily to identify research patterns and implementation gaps.

A deliberate distinction was maintained between misinformation rejection and information discernment. An intervention that reduces perceived credibility of both false and accurate health information may appear effective if only misinformation ratings are measured, but it can fail when accuracy discrimination is considered. The methodology therefore treated discernment as the preferred conceptual outcome.

No new human participants, identifiable medical records, or social-media user data were collected for this study. Consequently, new institutional ethics approval was not required for the present evidence-synthesis design. Any future experimental validation involving participants should obtain appropriate ethics review and informed consent.

5. Analysis

5.1 Evidence Mapping of Health-Literacy Interventions

The literature demonstrates that no single intervention addresses every mechanism through which medical misinformation gains influence.

Table 2: Comparative Evidence on Strategies for Countering Medical Misinformation

Intervention Approach	Principal Mechanism	Evidence Direction	Important Limitation
Digital health-literacy education	Improves source and evidence evaluation	Generally favorable	Effects may diminish over time

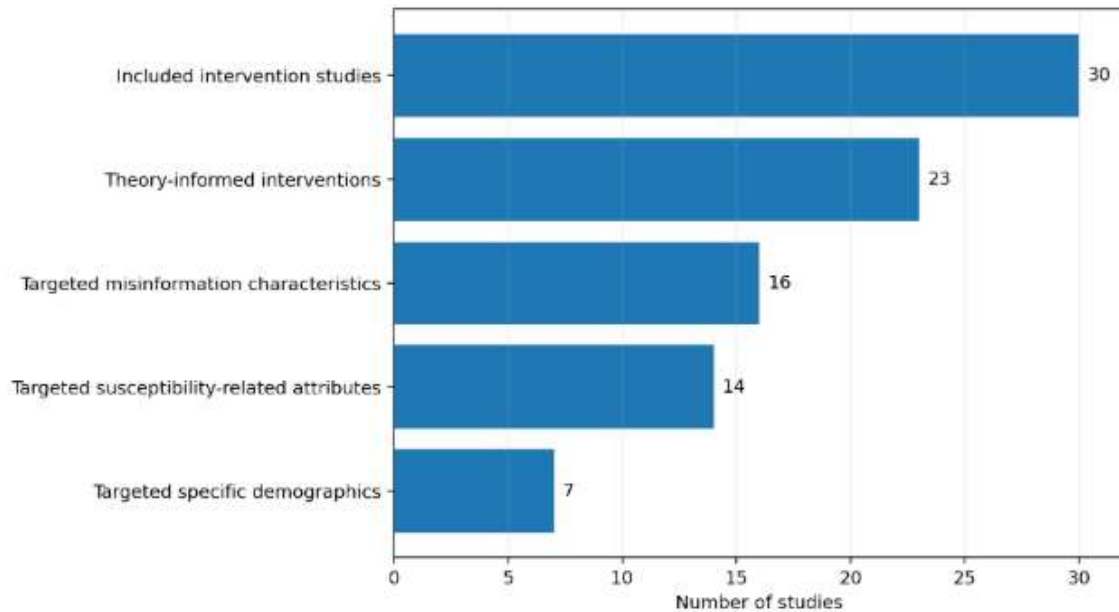


Expert correction	Replaces false claim with credible evidence	Favorable	Requires timely expert response
Social correction	Enables peer-level rebuttal	Favorable in experimental settings	Quality of correction varies
Accuracy prompts	Redirects attention toward truth	Favorable for sharing quality	Usually brief behavioral effect
Psychological inoculation	Prepares users to recognize manipulation	Favorable	Transfer across topics requires validation
Fact-checking	Corrects specific claims	Generally favorable	Primarily reactive
Source-verification training	Encourages evaluation of provenance	Strong conceptual value	Requires digital competence
Skepticism-focused literacy	Reduces acceptance of questionable claims	Mixed	Can reduce trust in accurate information
Trust-plus-skepticism literacy	Promotes reliable content and challenges falsehoods	Promising	Requires more health-specific validation
Organizational health literacy	Improves availability of understandable trusted information	Strong policy rationale	Depends on institutional capacity

5.2 Intervention-Design Patterns in Contemporary Research

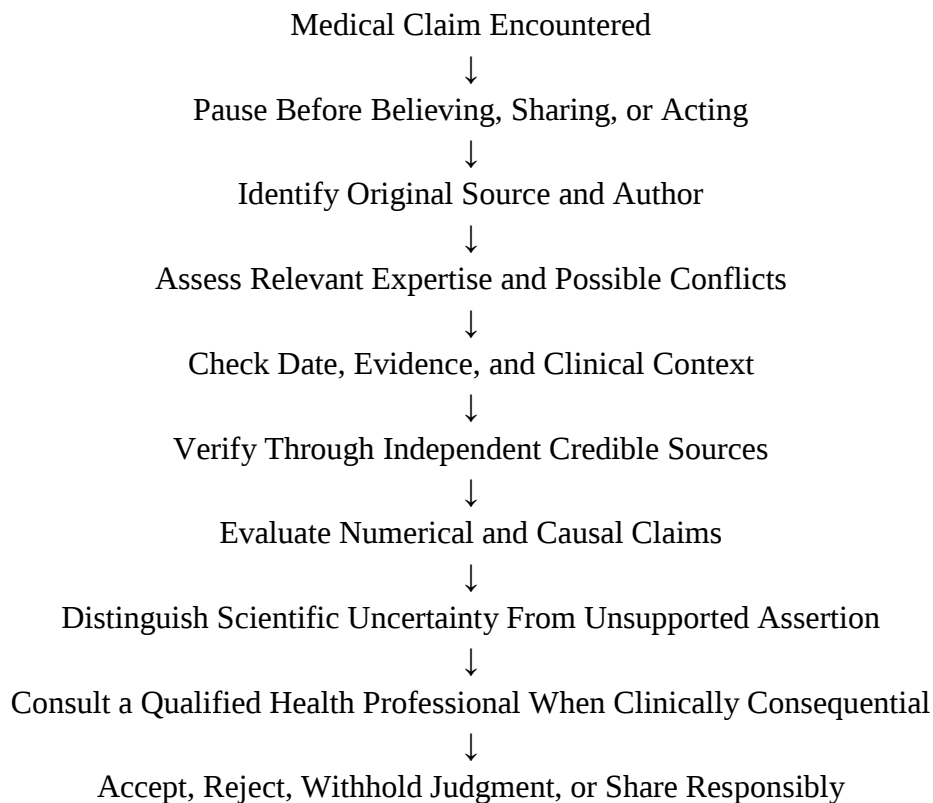
A 2025 scoping review by Grover and colleagues examined online interventions addressing health misinformation and identified 30 eligible studies published between 2018 and 2024. Twenty-three studies, representing 77% of the included evidence base, reported theoretical foundations. Twenty-two used educational courses, seven incorporated counter-speech approaches, and one used inoculation games, with some strategies overlapping. Sixteen interventions targeted characteristics of misinformation, 14 addressed human attributes related to susceptibility, and seven explicitly targeted demographic characteristics.

Figure 1: Design Characteristics of Online Health-Misinformation Interventions



5.3 Integrated Health-Literacy Innovation Model

The synthesis supports the following conceptual sequence for processing medical information encountered on social platforms:





6. Discussion

6.1 Discernment Should Replace Generalized Skepticism as the Primary Goal

The most important implication of the reviewed evidence is that misinformation interventions should be evaluated according to whether they improve **discernment** rather than whether they simply lower belief ratings. The cancer-media-literacy experiment conducted by Lyons and colleagues illustrates the problem particularly clearly. The intervention reduced endorsement of inaccurate cancer information by 5.6%, but accurate information declined by 7.6%, resulting in no meaningful improvement in discrimination between the two categories.

Hoes and colleagues reached a related conclusion across broader misinformation interventions, finding that counter-misinformation strategies can generate increased skepticism toward factual information. The finding has significant relevance for medicine because unjustified distrust of accurate information can itself create health risks. Patients who become indiscriminately suspicious may reject evidence-based prevention, medication guidance, professional recommendations, or appropriate screening.

6.2 Preventive and Corrective Strategies Should Operate Together

A second implication is that health systems should avoid relying on a single temporal point of intervention. Misinformation resistance can be strengthened before exposure, during evaluation, and after exposure.

Before exposure, psychological inoculation can familiarize users with manipulation strategies. Roozenbeek and colleagues demonstrated that short inoculation videos could increase recognition of manipulation techniques and improve information-sharing decisions.

During exposure, health-literacy cues can prompt users to examine source, evidence, context, and accuracy before reacting. Digital literacy training can strengthen the habit of leaving the original post and examining external evidence rather than evaluating credibility only from the presentation style of the content.

6.3 Responsibility Extends Beyond Individual Users

A third implication is that countering medical misinformation cannot be treated entirely as a responsibility of individual social-media users. WHO's health-literacy framework explicitly recognizes organizational and structural influences on people's ability to obtain and use health information. Information providers have a responsibility to make trustworthy material understandable and actionable. Health institutions should therefore communicate evidence in formats appropriate to digital environments rather than expecting users to locate and interpret technical documents independently. This may include concise evidence summaries, short explanatory videos, multilingual content, infographics, accessible clarification of risks, and rapid responses to emerging public questions. Communication should preserve scientific accuracy without excessive technical complexity.

Health professionals also remain important trusted intermediaries. Kbaier and colleagues found that health practitioners occupy an important position in responding to misinformation but face practical barriers, including communication pressure and the difficulty of operating within politicized information



environments. Clinical encounters can therefore be used not merely to correct individual myths but to strengthen patients' future evaluation skills.

7. Conclusion

Health-literacy innovation offers a credible foundation for countering medical misinformation on social platforms, but effective interventions must extend beyond traditional patient education. Contemporary users require competencies in digital source verification, evidence interpretation, numerical reasoning, recognition of manipulation, contextual comparison, and appropriate management of scientific uncertainty.

Published evidence shows that misinformation discernment remains a substantial challenge. Gaysynsky and colleagues found that approximately two-thirds of U.S. social-media users in their analysis reported difficulty distinguishing true from false health information, with poorer subjective digital literacy associated with greater difficulty. At the same time, the emerging intervention literature demonstrates that education, correction, inoculation, and accuracy-focused approaches can strengthen resistance to misinformation.

The central caution is that misinformation resistance should not be equated with indiscriminate skepticism. Interventions that decrease trust in accurate information can undermine the same public-health goals they are intended to protect. Future programs should therefore optimize discernment, calibrated trust, and responsible action rather than simple rejection.

A sustainable response requires coordination among individuals, health professionals, educational institutions, public-health agencies, researchers, and social-platform providers. Health-literacy innovation should ultimately help users answer not only “Is this claim suspicious?” but also “What evidence would justify believing it, what remains uncertain, and what should I do before making a health decision?”

References

1. World Health Organization, “Health literacy,” WHO, Geneva, Switzerland, Dec. 22, 2025.
Gaysynsky, N. S. Everson, K. Heley, and W.-Y. S. Chou, “Perceptions of health misinformation on social media: Cross-sectional survey study,” *JMIR Infodemiology*, vol. 4, e51127, 2024, doi: 10.2196/51127.
2. H. Grover, R. Nour, N. Zary, and L. Powell, “Online interventions addressing health misinformation: Scoping review,” *Journal of Medical Internet Research*, vol. 27, e69618, 2025, doi: 10.2196/69618.
3. V. Suarez-Lledo and J. Alvarez-Galvez, “Prevalence of health misinformation on social media: Systematic review,” *Journal of Medical Internet Research*, vol. 23, no. 1, e17187, 2021, doi: 10.2196/17187.
4. D. Kbaier, A. Kane, M. McJury, and I. Kenny, “Prevalence of health misinformation on social media—Challenges and mitigation before, during, and beyond the COVID-19 pandemic: Scoping literature review,” *Journal of Medical Internet Research*, vol. 26, e38786, 2024, doi: 10.2196/38786.
5. B. Lyons, A. J. King, and K. A. Kaphingst, “A health media literacy intervention increases skepticism of both inaccurate and accurate cancer news among U.S. adults,” *Annals of Behavioral Medicine*, vol. 58, no. 12, pp. 820–831, 2024, doi: 10.1093/abm/kaae054.



6. E. Hoes, B. Aitken, J. Zhang, T. Gackowski, and M. Wojcieszak, "Prominent misinformation interventions reduce misperceptions but increase scepticism," *Nature Human Behaviour*, vol. 8, pp. 1545–1553, 2024, doi: 10.1038/s41562-024-01884-x.
7. S. Altay, A. De Angelis, and E. Hoes, "Media literacy tips promoting reliable news improve discernment and enhance trust in traditional media," *Communications Psychology*, vol. 2, Art. no. 74, 2024, doi: 10.1038/s44271-024-00121-5.
8. [9] J. Roozenbeek, S. van der Linden, B. Goldberg, S. Rathje, and S. Lewandowsky, "Psychological inoculation improves resilience against misinformation on social media," *Science Advances*, vol. 8, no. 34, eabo6254, 2022, doi: 10.1126/sciadv.abo6254.
- A. M. Guess, M. Lerner, B. Lyons, J. M. Montgomery, B. Nyhan, J. Reifler, and N. Sircar, "A digital media literacy intervention increases discernment between mainstream and false news in the United States and India," *Proceedings of the National Academy of Sciences*, vol. 117, no. 27, pp. 15536–15545, 2020, doi: 10.1073/pnas.1920498117.
9. E. K. Vraga and L. Bode, "Using expert sources to correct health misinformation in social media," *Science Communication*, vol. 39, no. 5, pp. 621–645, 2017, doi: 10.1177/1075547017731776.
10. L. Bode and E. K. Vraga, "See something, say something: Correction of global health misinformation on social media," *Health Communication*, vol. 33, no. 9, pp. 1131–1140, 2018, doi: 10.1080/10410236.2017.1331312.
11. G. Pennycook, Z. Epstein, M. Mosleh, A. A. Arechar, D. Eckles, and D. G. Rand, "Shifting attention to accuracy can reduce misinformation online," *Nature*, vol. 592, pp. 590–595, 2021, doi: 10.1038/s41586-021-03344-2.
12. J. B. do Nascimento et al., "Infodemics and health misinformation: A systematic review of reviews," *Bulletin of the World Health Organization*, vol. 100, no. 9, pp. 544–561, 2022, doi: 10.2471/BLT.21.287654.
13. U. K. H. Ecker et al., "The psychological drivers of misinformation belief and its resistance to correction," *Nature Reviews Psychology*, vol. 1, pp. 13–29, 2022, doi: 10.1038/s44159-021-00006-y.
- A. Kozyreva et al., "Toolbox of individual-level interventions against online misinformation," *Nature Human Behaviour*, vol. 8, pp. 1044–1052, 2024, doi: 10.1038/s41562-024-01881-0.
14. Y. Wang, M. McKee, A. Torbica, and D. Stuckler, "Systematic literature review on the spread of health-related misinformation on social media," *Social Science & Medicine*, vol. 240, 112552, 2019, doi: 10.1016/j.socscimed.2019.112552.
15. E. K. Vraga and L. Bode, "Correction as a solution for health misinformation on social media," *American Behavioral Scientist*, vol. 64, 2020.
16. R. Kyabaggu, D. Marshall, P. Ebuwei, and U. Ikenyei, "Health literacy, equity, and communication in the COVID-19 era of misinformation: Emergence of health information professionals in infodemic management," *JMIR Infodemiology*, vol. 2, no. 1, e35014, 2022, doi: 10.2196/35014.
17. M. Tully, L. Bode, and E. K. Vraga, "Mobilizing users: Does exposure to misinformation and its correction affect users' responses to a health misinformation post?" *Social Media + Society*, vol. 6, no. 4, 2020, doi: 10.1177/2056305120978377.