Review: Evaluating the Impact of Attempts to Correct Health Misinformation on Social Media: A Meta-Analysis

Walter, N., Brooks, J. J., Saucier, C. J., & Suresh, S. (2020)

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Summary

This meta-analysis analyzed 21 studies to assess how well interventions on social media correct health misinformation. The findings show that these interventions are generally effective, especially for non-communicable diseases and when corrections come from experts. Policymakers, social media managers, and website administrators should prioritize combating health misinformation to protect public health.

What is the study about?

In today's digital age, an increasing number of individuals turn to social media platforms as a source of health information (Fox, 2015; Patel, 2015). However, the prevalence of misinformation within the realm of health content on social media poses a significant challenge to public health (WHO, 2022; Trew, 2020). False health claims circulating on these platforms not only contribute to the spread of inaccurate information but also have detrimental effects, such as fostering mistrust in health authorities and potentially exacerbating or prolonging the impact of diseases (WHO, 2020). Recognizing the urgent need to address the dissemination of health misinformation, there has been a growing interest in developing interventions aimed at correcting false claims and promoting accurate health information.

In response to the issue of health misinformation on social media, the meta-analysis by Walter et al. (2020) has been conducted to evaluate the effectiveness of interventions designed to counteract false health claims. This comprehensive study aims to provide insights into the impact of corrective measures on social media in influencing individuals' attitudes, intentions, and behaviors towards health-related misinformation. By synthesizing data from 21 studies and analyzing relevant moderators, the meta-analysis sheds light on the efficacy of social media interventions in combating misinformation. It offers recommendations to guide public health initiatives in addressing the proliferation of false health claims online.

Methods used

To obtain relevant studies for their meta-analysis, Walter and colleagues utilized a comprehensive strategy: (a) they searched seven electronic databases with a focus on Facebook, Twitter, and YouTube, (b) manually reviewed reference lists from included studies, and (c) consulted seven health misinformation and social media experts to review the studies, identify any gaps, and contribute unpublished data. Each study included in the analysis had to meet specific criteria: (a) it aimed to correct health-related misinformation, (b) it used an experimental design in which participants were randomly assigned to a group that either received misinformation, which was then corrected, or to a group without correction or misinformation in general, (c) explicitly stating a social media platform where the correction occurred, and (d) measured the influence of the correction on attitudes, behavioral intentions, or behavior. Through this process, the meta-analysis included 19 research reports, including 24 individual studies, with a total sample size of 6,086 participants (average of 253.58 participants per study, median of 221, standard deviation of 148.86).

Two independent coders coded the studies for various variables, such as the source of misinformation or the social media platform used. Each study's effect size on correcting health misinformation was either extracted or calculated. Different tests and analyses were performed to check if the data were consistent (homogeneity statistics) and to see if the results were influenced by certain factors (moderation analyses) or biased (publication bias tests). Furthermore, they included checking for uniformity in the data, analyzing how different conditions might change the results, testing the stability of the findings, and ensuring the results weren't skewed by selective publication (sensitivity analysis).

What did this study find?

The meta-analysis includes 24 studies from 19 reports with a total sample size of 6,086 participants. Key findings indicate that, overall, corrective interventions are effective in lessening the impact of health misinformation. The main effect size ($d = 0.40$) suggests a moderate effect of corrections. The study additionally identified several significant factors affecting the effectiveness of health misinformation corrections on social media. One of these was the topic, which showed that corrections for non-communicable diseases were more effective than those for infectious diseases. Audience involvement was another key factor; individuals highly involved with the topic responded better to corrections than those with low involvement. Further significant factors were the source of correction, with corrections from expert sources like health professionals being more effective than those from non-experts, and the source of misinformation. Misinformation from news agencies was more effectively corrected than that from peers. These findings highlight the importance of considering the health topic, audience involvement, and the credibility of both misinformation and correction sources when addressing health misinformation on social media.

On the other hand, several of the factors in the correction of health misinformation on social media turned out to be non-significant. The type of sample (college students vs. general adults) and geographical region (U.S. vs. other) did not significantly impact the effectiveness of corrections. Additionally, the type of correction (factual elaboration vs. simple rebuttal), the correction format (text-only vs. text combined with images) and the platform used (Facebook vs. Twitter) also did not significantly affect the success of misinformation correction efforts. These

results suggest that the approach to correcting health misinformation can be applied without tailoring the corrections according to these factors. This is not only saving resources while creating interventions, it can also make them more generalizable.

How do we rate this study?

Based on the MAGIC criteria by Robert Abelson (1995) for assessment, the meta-analysis on correcting health misinformation on social media can be evaluated as follows. The subjective ratings were given independently by four different raters on a scale of 1 to 10 and were then averaged.

Magnitude: On a positive side, the study had a couple of significant effects and identified different factors that influence the correction of health information on social media like the topic category or issue involvement. On a negative note are the magnitude of the effect sizes that range only from weak to moderate ($.24 < d < .63$). This points taken together result in the following rating score:

Articulation: In this meta analysis the results were written quite well. Statistical values were given for every effect and the moderation results were all written down verbally. At the same time, these effects were not extensively elaborated, which would have been desirable for some. Another negative point that caught the eye was the structure of the appendix. It was constructed a bit confusing with a lack of explanations of the individual points. This points resulted in the following rating:

Generality: The findings of the meta-analysis provide insights that can be somewhat generalized. The results can be used for a broader population and each correction type and format that was considered can be used. Additionally these results don't restrict to a specific social media platform or health topic. At the same time, there are some restrictions. First there was only a partition of the regions in the US and the rest of the world, which is summarized too much. Only two types of correction methods and two social media platforms were looked at, which limits the generality. There are also many different factors that divide the population, not only college enrollment. Overall following rating was given:

Interestingness: The study's focus on evaluating the impact of corrective interventions on social media make interesting and relevant contributions to the field of health communication and misinformation research. Especially in respect to the growing number of social media users and the usage of these platforms as a source of information. They are a source and distributor of health misinformation, which can have severe consequences.During the COVID-19 pandemic for example it was seen that many people were unsettled by misinformation. While the analysis engaged in a highly relevant topic, no groundbreaking discoveries were made. No detailed implications of the found effects were given as well. This taken together resulted in this rating:

Credibility: The study demonstrates credibility through its systematic approach to data collection, analysis, and interpretation. Established quality assessment tools like the PRISMA checklist as well as publication bias tests like the funnel plot enhances the credibility of the research findings. The overall sample size was big and the included studies were checked for their quality by three independent raters. But there were a couple of careless mistakes that could have been easily avoided, like the wrongly ordered p-values or a confusing flow diagram. The funnel plot was not described well and the studies that had their effect sizes averaged were not marked. Lastly, they used some unpublished studies that were not peer reviewed. These points taken together add up to this score:

Overall rating: Overall, the meta-analysis scores positively on the MAGIC criteria, indicating an overall well-conducted study. While there are some points to be criticized, the authors proceeded conscientiously. The analysis offers valuable insights into the effectiveness of interventions to correct health misinformation on social media.

Conclusion for stakeholders

1. Policymakers/Regulators:

Government agencies and policymakers involved in health communication and digital regulation may be interested in the study's implications for developing policies and guidelines to address health misinformation on social media. The findings can inform decision-making processes aimed at promoting accurate health information and protecting public health online.

2. Social Media Managers:

Social media managers play a crucial role in mitigating the impact of health misinformation on their platforms. It is essential for social media managers to proactively monitor and address false health claims by implementing robust fact-checking mechanisms and promoting credible health information sources. By fostering a culture of transparency and accuracy in content moderation, social media managers can help build a healthier online environment and protect users from the harmful effects of misinformation.

3. Website Administrators:

Website administrators have a responsibility to ensure the integrity of health information shared on their platforms. It is imperative for website administrators to collaborate with experts in health communication and misinformation correction to develop strategies for effectively countering false health claims. By prioritizing the dissemination of accurate and evidence-based health information, website administrators can contribute to promoting public health literacy and combating the negative impact of misinformation on their platforms.

4. Public Health Authorities:

Organizations and agencies responsible for public health, such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), can benefit from understanding the effectiveness of interventions in combating health misinformation online. The findings can inform their strategies for addressing false health claims and promoting accurate information to the public.

Exemplary studies

Study 1: Debunking rumors on social media: The use of denials
Anjan Pal, Alton Y.K. Chua, Dion Hoe-Lian Goh (2019)

Pal et al. (2019) aimed to develop effective denials to combat online misinformation using the Theory of Planned Behavior (Ajzen, 1991). Through a survey with 276 participants, they identified key beliefs about sharing denials, such as spreading truth, social encouragement, and source credibility. These beliefs were used to design denials for false rumors, including messages highlighting the truth, social appreciation, and a credible logo. An experiment with 206 participants tested these denials, showing that those incorporating all three beliefs had the highest impact on users' intention to share.
The study revealed that comprehensive denials are more effective in encouraging users to share debunking messages on social media. This approach suggests that incorporating beliefs related to truth, social encouragement, and credibility significantly influences user behavior. The research provides practical guidance for social media managers and website administrators in combating misinformation through strategically designed denials.

Study 2: See something, say something: Correction of global health misinformation on social media
Leticia Bode & Emily K. Vraga (2018)

Bode and Vrage (2018) studied correction methods for health misinformation on a simulated Facebook platform with 136 participants. They examined how misinformation about the Zika virus was corrected either by an algorithm, another user, or not at all, and included conspiracy beliefs as a moderating variable.

Both algorithmic and social corrections were equally effective in rectifying misinformation. Algorithmic correction was better than no correction. Credibility ratings of the correction information showed no difference between conditions. Conspiracy beliefs did not influence correction effectiveness, but individuals with higher conspiracy beliefs rated corrective information as less credible.

Both correction methods are viable for addressing health misinformation on social media. Conspiracy beliefs do not affect correction effectiveness, but algorithmic corrections are seen as more credible by those with lower conspiracy beliefs. These results should be considered carefully due to the questionable representativeness of individuals with high conspiracy beliefs.

Study 3: The effects of news source ratings on fake news in social media Kim, A., Moravec, P., & Dennis, A. R. (2017).

Kim et al. (2017) conducted two studies investigating mechanisms for developing source ratings to counter fake news. They examined three mechanisms: expert rating, user article rating, and user source rating. They found that all three mechanisms influenced users' beliefs, with expert and user article ratings having stronger effects on low-rated sources. Also, they found that confirmation bias was prevalent, with users more likely to believe and engage with articles that aligned with their beliefs. Lower ratings decreased believability more than higher ratings increased it. Additionally, exposure to ratings made users more critical of unrated articles, potentially limiting the impact of unvetted sources. These findings highlight the complexity of rating systems and the need for careful design to mitigate fake news effectively.

Study 4: Correcting misinformation about neuroscience via social media Smith, C. N., & Seitz, H. H. (2019)

This study conducted an online survey-based experiment (N = 744), correcting neuroscience myths using a mock Facebook newsfeed. Participants were assigned to one of 16 experimental conditions where they first were shown one out of three neuromyth (e.g. “we only use 10% of our brain”) followed by two related articles that varied through the groups (confirm or correct misinformation, confirm then correct misinformation, correct then confirm misinformation, unrelated or none). The study found that corrective articles significantly reduced belief in the neuromyths. Additionally, the researchers did note a high awareness about myths in neuroscience, but this awareness did not protect participants from believing in these myths. This work supports the use of topically related articles for misinformation correction and expands the previous research into the neuroscience field, enhancing the generalizability of these findings.

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