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Effects of a News Literacy Video on News Literacy Perceptions and Misinformation Evaluation

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Abstract

The mixing of misinformation with high-quality news and information on social media has reinvigorated interest in the value of news literacy (NL) to build audience resiliency to misinformation. Optimizing NL messages for social media environments—where they may be seen alongside misinformation—allows these messages to reach audiences when they are most likely to benefit from them. Using a 2 (NL video vs. control video) × 2 (sunscreen promotion video vs. sunscreen misinformation video) online survey experiment ($N = 780$), we examine whether exposure to an NL video improves perceived personal NL skills and value for news literacy, as well as enables participants to recognize and avoid engaging with misinformation. Our findings suggest that after watching the NL video, individuals valued NL more but their self-perceived news literacy did not improve. Furthermore, watching the NL video made individuals rate the second video as less credible and reduced engagement with it no matter whether the second video contained misinformation or quality information. This research has several important implications. While watching an NL video could protect individuals by discrediting and decreasing engagement with misinformation, it may do so at the expense of high-quality information. We discuss the difficulty in designing NL messages that lead people to be appropriately skeptical and able to discern between high- and low-quality health information, rather than cynically disengaging with media content altogether.

Keywords

health information; media literacy; misinformation; news literacy; skepticism

1. Introduction

Media literacy has been posited as one way to protect people from the risks (Joris & Livingstone, 2020) of mis- and disinformation (Vissenberg et al., 2023), which can result in concrete harms to both individuals and the public (S. K. Lee et al., 2022), although others contest such harms are often overstated (Budak et al., 2024). Specifically, prior research suggests that exposure to misinformation could increase misperceptions (Vraga, Bode, & Tully, 2022), and reduce vaccination intentions (Thaker & Subramanian, 2021). Existing research on media literacy education in classrooms (Wineburg et al., 2022) and interventions designed for the web and social media, including short videos, posts, and comments, suggest that both formal and informal media literacy efforts can affect perceptions of information quality and discernment (Guess et al., 2020; Hameleers, 2022; Tully et al., 2020; Vraga & Tully, 2015). Creating news literacy (NL) messages optimized for online sharing offers important advantages over in-classroom approaches: These messages can be implemented at a larger scale and for a more diverse population than classroom campaigns, which are often limited to K–12 education. They also may intervene near the point of exposure to online misinformation, boosting their potential impact.

In this study, we explore whether exposure to a short video communicating key NL tenets shared on social media can lead people to not only feel more confident in their NL skills but also apply those skills to distinguishing between misinformation and high-quality information—like verified news or scientific communication (Singh et al., 2020)—online. Although a short video, designed to mimic an online public service announcement (PSA), cannot provide in-depth media literacy education, it can offer key concepts and tips for how to approach news and information, including how to avoid or recognize mis- and disinformation (Vraga & Tully, 2015). For some viewers, these videos serve as reminders of media literacy concepts and skills that they already know. For others, they provide manageable tips and key pieces of information that could serve as a starting point for further education. If these short messages can shape perceptions and responses to information, they provide an additional mechanism to address misinformation as part of regular media consumption (Hameleers, 2022). Intervening on social media platforms with short media literacy messages, videos, and graphics could serve as both reminders and prompts for responding to misinformation in a way that leverages the potential of the platforms as conveyors of both real and false information.

1.1. Misinformation on Social Media

Although misinformation is an evergreen problem (Uscinski et al., 2022), concerns about misinformation have grown in part because social media has made it easier to share information—true or false—quickly (Wang et al., 2019). Indeed some research shows that misinformation may even spread more quickly than true information online (Vosoughi et al., 2018). Misinformation on social media is concerning given that belief in misinformation is often associated with harmful behaviors (Pierri et al., 2022; Porter & Wood, 2022). Given these concerns, researchers and educators have proposed several mechanisms to address the spread and belief in misinformation, including education-based approaches like media literacy interventions. While media literacy interventions might be most appropriate for identifying disinformation, defined as false information that is intentionally created and disseminated (Guess & Lyons, 2020), we think they should also apply to any situation requiring assessing the veracity of information—including misinformation and low-quality information (Singh et al., 2020). For this reason, we use the broader and more inclusive *misinformation* throughout the manuscript, while recognizing that there could be differential impacts for different types of false information.

1.2. NL to Counteract the Influence of Misinformation

1.2.1. NL as a Form of Media Literacy

NL is often considered a type or subfield of media literacy and is related to other literacies, including information and digital literacy (Jones-Jang et al., 2021; Potter & Thai, 2019). Jones-Jang et al. (2021) tested whether individuals with greater media, news, information, and digital literacy were better at recognizing misinformation (which they call fake news). They found that those with higher information literacy were better at recognizing false news, but the other literacies did not produce the same results. Others, however, have found that higher NL is related to identification of misinformation and rejection of conspiracy beliefs (Craft et al., 2017). Cho et al. (2024) propose a conceptual framework for "social media literacy" that builds on the same basic premises—considering content and competencies—for navigating social media environments.

In this study we focus on NL, using the definition proposed by Vraga et al. (2021, p. 15) as "knowledge of the personal and social processes by which news is produced, distributed, and consumed, and skills that allow users some control over these processes." This definition emphasizes knowledge, skills, and individual control, building on earlier theoretical work on media literacy from Potter (2004) and definitional work from Maksl et al. (2015). We focus on NL given its theoretical and practical relationship with misinformation (Vraga et al., 2021).

NL also emphasizes the role of news and misinformation in civic life on both the individual and societal levels (Geers et al., 2020; Tully & Vraga, 2018) as people make decisions, in part, based on the true and false news they consume. The emphasis on the knowledge and skills to distinguish between high- and low-quality information is particularly relevant to the study of misinformation, which is often designed to look like news or share similar (albeit inaccurate) characteristics (Damstra et al., 2021). Therefore, NL is a particularly relevant form of literacy to address misinformation perceptions and behaviors.

1.2.2. The Effects of an NL Video on News Literacy Perceptions

Designed to look like a PSA, the NL video in this study describes the online information environment as one in which credible news and false information are often mixed up. NL has been increasingly integrated into PSAs and promotional campaigns (van der Meer & Hameleers, 2021; Vraga & Tully, 2016a, 2016b). Just as PSAs, ads, and broader promotional campaigns have been used to influence individuals' beliefs and attitudes toward health behaviors (Kowitt et al., 2023), NL PSAs aim to enhance the public's ability to navigate complex information environments, where credible news and misinformation often coexist.

Our NL video contained three elements designed to increase its ability to shift people's attitudes and help them recognize misinformation. First, the NL video gave a warning that people may be exposed to misinformation. Based on the inoculation literature, this forewarning of possible misinformation exposure should raise people's awareness and defenses to misinformation (Banas & Rains, 2010; Compton et al., 2021). Second, the NL video provided concrete suggestions for how to recognize misinformation, specifically in terms of paying attention to the source and intent of messages and questioning whether claims are true. Previous works using these types of NL tips have shown that they can help people distinguish between misinformation versus vetted news sources (Guess et al., 2020; Hameleers, 2022). Finally, the NL message

contained a "call to action"—encouraging people to think about the accuracy of messages and to be critical news consumers. These accuracy nudges can help people recognize misinformation and improve the quality of the information they share (Pennycook et al., 2020; Pennycook & Rand, 2022). Because we designed this video to be part of a social media campaign, we focus on online misinformation in particular.

We first consider the effects of the NL video on two attitudes, SPNL and VNL, both of which have been adapted from earlier work on self-perceived media literacy and value for media literacy (Vraga, Tully, & Bode, 2022). These two measures capture NL perceptions related to the individual level (SPNL) and societal level (VNL).

Individual agency and self-efficacy are important to developing SPNL (Vraga & Tully, 2021; Vraga et al., 2021). SPNL measures individuals' assessment of their NL, rather than an objective measure of their actual NL, an important distinction because these two measures are theoretically and empirically distinct (Vraga et al., 2021). Building on the theory of planned behavior, Vraga et al. (2021) propose that perceived behavioral control—"whether individuals believe the behavior in question is within their control"—is an important factor in predicting NL behaviors (p. 15). SPNL captures this perception by asking for self-evaluations of NL. In addition to providing information that should contribute to building actual NL (e.g., highlighting that misinformation often lacks evidence to support its claims), the NL video emphasizes individual agency and action to promote critical evaluation and engagement to build SPNL. This is important because SPNL is positively correlated with intentions to refute rumors (Borah & Lorenzano, 2023) and could potentially drive people to apply their NL in real life (Su et al., 2022), although Vraga and Tully (2021) found that higher self-perceived media literacy contributed to less skepticism toward information on social media. Similarly, research has found that increased media and news literacy can lead to skepticism toward all information, including accurate information, suggesting the potential for unintended effects (Blair et al., 2024; Hoes et al., 2024). Therefore, it is important to assess the effectiveness of the NL video to promote both increased self-efficacy (H1) and actual ability to assess credibility (H2) as a means of understanding the relationship between the intervention, efficacy, and information perceptions. We expect exposure to the NL video to increase SPNL because it focuses on individual action and control in finding and evaluating the quality of information, directly tapping into SPNL constructs.

In addition, the NL video puts news and misinformation in context and describes the importance and function of news in society, which should encourage people to recognize the importance of NL to society, measured as VNL. VNL captures the perception that NL is important to an informed society moving beyond the individual level to connect to society at large. Vraga et al. (2015) found that higher value for media literacy was associated with news skepticism and Vraga and Tully (2021) found that respondents with higher value for media literacy were less likely to post on social media, suggesting that value for media literacy is linked to NL behaviors (Vraga et al., 2021). By connecting NL to an informed society, VNL attempts to capture social norms surrounding NL, another component of the model for news literacy behaviors (Vraga et al., 2021).

Given the focus of the NL video on individual action and its connection to critical news consumption, we propose the following hypothesis:

> H1: Exposure to the NL video will produce higher levels of (a) SPNL and (b) perceived VNL, compared to exposure to a control video.

The context in which the NL video appears may also influence SPNL and VNL. Vraga and Tully (2015) found that the context in which a media literacy PSA video was shown affected perceptions of the PSA and of adjacent content. For example, viewing the NL video in combination with an accurate video may make NL seem less important as the adjacent content may not raise concerns about misinformation (the focus of the NL video). Viewing the video in combination with a misinformation video could remind viewers of the key messages in the NL video and bolster SPNL and VNL, or it could make viewers feel less sure of their abilities or the value of NL. Given these possibilities, we ask:

> RQ1: Will the effects of the NL video on (a) SPNL and (b) perceived VNL differ depending on the content of the second video (sunscreen promotion video vs. sunscreen misinformation video)?

1.2.3. The Effects of an NL Video on the Evaluation of Videos

While the NL video should ideally lead people to recognize the value of NL and feel more confident in their own NL skills, fundamentally NL is about giving people the ability to more carefully navigate their media environment by applying their knowledge and skills to media consumption. As such, the best test of the success of an NL intervention is whether it helps people distinguish between high- and low-quality information, an example of an NL behavior (Vraga et al., 2020).

Theoretically, there is strong evidence to believe the NL video should do exactly that. While some studies have found that NL messages were not effective in helping people recognize misinformation (Vraga, Tully, & Bode, 2022) nor reduce the persuasive power of misinformation (Hameleers, 2022; Vraga, Bode, & Tully, 2022), we designed our NL video to incorporate three best practices: a warning, concrete suggestions to recognize misinformation, and a call to action to serve as a nudge towards accuracy. Therefore, we believe that the combination of these three elements will make viewers of the NL video more likely to recognize a misinformation video as less credible than a promotional message about sunscreen use, a task that should be more difficult without such exposure:

> H2: Exposure to an NL video will produce higher assessments of the credibility of the sunscreen promotion video and lower assessments of the credibility of the sunscreen misinformation video, compared to exposure to a control video.

1.2.4. The Effects of an NL Video on Engagement With Videos

Beyond effects on NL and credibility, we further expect the NL video to affect whether people engage with the video—by which we mean like, share, comment on, or follow the creator of the video. Most research on misinformation and engagement has focused directly on the question of sharing misinformation (rather than the other outcomes we consider as part of engagement, including liking, commenting, and following). Within that literature, a growing consensus suggests that people share misinformation, not necessarily because they believe it is true, or even because they think it supports their identity, but simply because they are not thinking about accuracy (Pennycook et al., 2021; Pennycook & Rand, 2019). Interventions that have prompted people to think about the veracity of information have seen resulting decreases in intention to share misinformation (Pennycook et al., 2020; Pennycook & Rand, 2022).

Along those same lines, we would expect that the NL video, by drawing attention to the problem of misinformation and a general awareness of veracity as a concept, would similarly remind people to consider accuracy before deciding whether or not to engage with content. However, because our measurement is different from most research on this topic, we offer a research question rather than a directional hypothesis:

> RQ2: Will the effects of the NL video on engagement—like, share, comment, and follow—with the sunscreen video differ depending on the content of the second video (sunscreen promotion video vs. sunscreen misinformation video)?

2. Methods

2.1. Materials and Procedure

We used a 2 (NL video vs. control video) x 2 (sunscreen promotion video vs. sunscreen misinformation video) online survey experiment (N = 780) to test our expectations (n = 176 for the NL video + sunscreen promotion video condition; n = 194 for the NL video + sunscreen misinformation video condition; n = 219 for the control video + sunscreen promotion video condition; n = 191 for the control video + sunscreen misinformation video condition). After answering a pretest questionnaire including their demographic information and their preexisting attitudes toward sunscreen, participants were randomly assigned to one of four conditions and watched two separate videos. Video 1 lasted roughly 30 seconds, with participants randomly assigned to see either an NL video (emphasizing the importance of assessing information quality, see https://www.youtube.com/watch?v=O-8DV9QiZXI) or a control video (about the dangers of texting and driving, see https://www.youtube.com/watch?v=G7SlVJ4xtyw). Participants then evaluated the quality of Video 1 and their engagement with Video 1 before being randomly assigned to watch one of two sunscreen videos. Both videos were roughly 50 seconds long and covered either the benefits of different types of sunscreen (promotion video, see https://www.youtube.com/watch?v=djieZNLiCas) or contained inaccurate information about the health risks of sunscreen (misinformation video, see the Supplementary File for transcript). Finally, participants completed the post-test questionnaire, containing our four key outcome measures: sunscreen video credibility, engagement with the sunscreen video, VNL, and SPNL. Participants were compensated for their participation at the end of the questionnaire, via the Lucid platform.

We hired 2,173 participants using Lucid in August 2019, and after data cleaning (eliminating those who did not complete the survey experiment, or did not pass data quality measures, including finishing the survey in less than 5 minutes, offering identical responses across many questions, failing the attention check, or reporting not seeing or hearing both videos) 1,348 participants were eligible for the data analysis. Seven conditions were included in the original design, but this study dropped those in the two sunscreen correction conditions (n = 382) and the pure control condition (n = 186) to focus on how the NL video affects individuals' processing of misinformation (as compared to high-quality information), with a total of N = 780. In this study, 52.8% of the participants were female, 76% were White (with 11% African-American, 4.5% Asian, 0.8% Native-American or Inuit, and 7.7% other races), 15.3% of Hispanic, Latino, or Spanish origin, median education was some college (no degree), median income was $50,000–75,000 per year, and median age was 45–54 years old.

2.2. Measures

VNL is measured by asking the participants to rate their agreement on two statements on a 7-point Likert scale (*strongly disagree* to *strongly agree*). These two statements are "News literacy is important for society" and "People need to carefully evaluate news content to make informed decisions," adapted from Vraga, Tully, and Bode (2022), $r = .48$, $p < .001$, $M = 5.76$, $SD = 1.02$.

SPNL is measured by asking the participants to rate their agreement on two statements on a 7-point Likert scale (*strongly disagree* to *strongly agree*). These two statements are "I am confident in my ability to distinguish high and low-quality content" and "I have the skills to interpret news content," adapted from Vraga, Tully, and Bode (2022), $r = .59$, $p < .001$, $M = 5.26$, $SD = 1.12$. Results from a Pearson correlation analysis suggest that VNL and SPNL are significantly correlated ($r = .530$, $p < .001$).

Sunscreen video credibility is measured by asking the participants to rate their perceptions of the sunscreen video using seven pairs of adjectives, ranging from "inaccurate/accurate" to "not trustworthy/trustworthy" on a 7-point bipolar scale, adapted from Roberts (2010), $\alpha = .94$, $M = 4.51$, $SD = 1.76$.

Engagement with sunscreen video is measured by asking the participants to rate their likelihood to "Like the video," "Share the video," "Comment on the video," and "Follow the creator of the video" on a 5-point Likert scale (*extremely unlikely* to *extremely likely*), $\alpha = .92$, $M = 2.42$, $SD = 1.22$.

3. Results

To test H1 and H2, and to answer RQ1 and RQ2, a MANOVA was used to estimate each dependent variable. One single MANOVA was used, with all independent variables (including the interaction term) and all outcome variables put as the dependent variables into the MANOVA model.

H1 hypothesized that exposure to the NL video would produce higher SPNL (H1a) and VNL (H1b) as compared to the control condition. H1 was partially supported. H1a was rejected as SPNL didn't differ significantly between the two conditions (see Table 1). H1b was supported, as participants rated the VNL significantly higher in the NL condition compared to the control condition (see Table 1).

RQ1 asked whether the effects of the NL on (a) SPNL and (b) VNL differ depending on the content of the second video (i.e., sunscreen promotion video vs. sunscreen misinformation video). Results suggest that the content of the sunscreen video did not interact with the NL video to explain SPNL ($F = 2.09$, $p = .15$) or VNL ($F = .01$, $p = .95$).

Similarly, H2 hypothesized that exposure to the NL video would boost the credibility of the sunscreen promotion video and reduce the credibility of the sunscreen misinformation video, compared to not seeing the NL video. RQ2 asked whether the effects of the NL video on engagement with the sunscreen video differ depending on the content of the second video (promotion vs. misinformation). H2 was rejected. Results suggest that the content of the sunscreen video did not interact with exposure to the NL video to predict sunscreen video credibility ($F = .00$, $p = .99$) nor engagement with the sunscreen video (RQ2, $F = .36$, $p = .55$). However, there was a main effect of exposure to the NL video on both sunscreen video credibility

and engagement with the sunscreen video (see Table 1). Specifically, people who saw the NL video rated the sunscreen video as less credible and reported *lower* intentions to engage with the video regardless of the content of that video—specifically, whether that video contained accurate information promoting the use of sunscreen or contained misinformation about sunscreen's effects on the body.

Table 1. Comparing the NL video condition against the control video condition on dependent variables.

Dependent variable	F-test	η_p^2	NL video (mean)	NL video (*SD*)	Control video (mean)	Control video (*SD*)
VNL	4.71*	.006	5.84^{+}_{a}	1.07	5.69_{b}	.98
SPNL	.02	.000	5.26_{a}	1.15	5.27_{a}	1.10
Sunscreen video credibility	10.21**	.013	4.27^{+}_{a}	1.74	4.72_{b}	1.76
Engagement with sunscreen video	5.68*	.007	2.30^{+}_{a}	1.18	2.52_{b}	1.25

Notes: Different subscripts ($_{a,b}$) indicate significant differences between conditions for that dependent variable, $p < .05$; $^{+}$ significant effects; *** $p < .001$; ** $p < .01$; * $p < .05$; also, please note that the first three dependent variables, including VNL, SPNL, and sunscreen video credibility were measured on a 7-point Likert scale, and engagement with sunscreen video was measured on a 5-point Likert scale; though 780 participants in total completed the study, only 776 participants were included in the MANOVA analysis given missing responses to the dependent variables.

4. Discussion

This research aimed to understand how exposure to a short NL video created for social media could influence participants' NL perceptions, as well as their subsequent evaluation of an online video and engagement with it depending on whether it shared misinformation. Our findings reveal that exposure to the NL video produced significantly higher perceived VNL compared to a control condition. This suggests that even short, targeted interventions can improve the awareness of how valuable being news literate is: Participants who watched the NL video recognized the societal importance of NL and the need for careful evaluation of news content to make informed decisions. However, the NL video was *not* successful in producing higher estimates of SPNL as compared to the control. This adds to research reporting mixed effects of textual and image-based NL messages (tweets) in boosting these perceptions of one's own NL skills (Tully et al., 2020; Vraga, Tully, & Bode, 2022). These findings reinforce the potential disconnect between recognizing the importance of NL and feeling personally efficacious in navigating news content (Geers et al., 2020), which may be the precursor of applying NL in real life (Su et al., 2022) and is positively correlated with intentions to refute rumors (Borah & Lorenzano, 2023). This also highlights the challenge of translating awareness and appreciation of NL into value for and self-confidence in one's abilities. Thus, improving SPNL may require more intensive or repeated interventions across a number of modalities, a research area that needs further investigation.

In addition, this study demonstrates that the NL video influenced how participants evaluated subsequent videos, regardless of their content. Specifically, participants who watched the NL video rated the sunscreen videos—whether promoting accurate information or containing misinformation—as less credible and reported lower intentions of engaging with those videos. This outcome highlights a potential unintended consequence of NL interventions: a generalized cynicism and reticence towards both misinformation *and* accurate information (Ashley et al., 2023; Guess et al., 2020; Hameleers, 2022). While skepticism can be protective against misinformation, a blanket distrust of information, including high-quality content, is

harmful for democracy (Hoes et al., 2024; Vraga & Tully, 2021). Likewise, wariness towards engaging with media content can indicate a cautious approach to media consumption post-exposure to the NL video, but it also raises concerns about reduced engagement with valuable content, which is crucial for informed citizenship and effective public health communication. Another more hopeful possibility is that these results indicate participants are maintaining skepticism and withholding engagement until they can investigate the credibility of the sunscreen video, something they are unable to do in this context. Future research should explore whether people engage in more proactive verification behaviors after seeing an NL message, especially when confronted with new or unfamiliar information.

Our study has several important implications for the design and implementation of NL interventions. Our NL video was designed with best practices in mind. Based on inoculation theory, we warned people about likely misinformation exposure and taught them how to recognize it (Banas & Rains, 2010; Compton et al., 2021). Then, we incorporated a call-to-action, encouraging people to think about accuracy and be critical consumers to hopefully boost efficacy. Despite these efforts, the NL video still appeared to create cynicism rather than skepticism towards subsequent health messages. While increasing skepticism towards misinformation is a key goal of NL, balancing this with promoting engagement with high-quality information is essential. Future interventions might need to more clearly distinguish between skepticism towards dubious sources and trust in credible ones to avoid fostering a generalized distrust of media. It is crucial to design these messages in ways that encourage critical thinking without leading to disengagement from all media content. This may involve developing interventions that aim not only to alert users to the presence of misinformation but also to reinforce the characteristics of trustworthy information. This dual approach could help mitigate the unintended consequence of generalized cynicism.

Additionally, this study suggests that interventions should not only highlight the importance of NL but also include elements that build self-efficacy to improve SPNL. Practical tips, repeated exposure, and efficacy messages, including elements of both self-efficacy (i.e., "I can do this") and response efficacy (i.e., "NL works"), might help boost participants' confidence in their NL skills and their application when exposed to misinformation.

This research is not without limitations. One limitation of this study is the short duration of exposure to a single NL video. The long-term effects of repeated exposure to diverse NL content and modalities remain unclear. Future research should explore the impact of sustained and varied interventions on both actual NL (measured as knowledge and skills) and SPNL, as these two distinct concepts theoretically predict NL behaviors (Vraga et al., 2021). Also, the use of a five-point response scale for the engagement items is a limitation of our study, as it means there is less variance in these responses compared to the other outcome variables. Second, the sample is not fully representative of the general population. Future research should aim to replicate these findings with more diverse samples to enhance generalizability, as well as identify and target groups who may be most in need of NL messages. For example, prior research suggests that those with lower education levels, and people from racial minority communities may be more susceptible to misinformation (Nan et al., 2022) and therefore most in need of NL messages. Future research can design NL messages intended for these groups, which might be helpful to increase discernment, i.e., the ability to distinguish misinformation from accurate information, instead of general skepticism toward online information (A. Y. Lee et al., 2024). Additionally, future research should examine the effects of NL interventions in different contexts and among diverse populations, which can provide more nuanced insights into their effectiveness and potential unintended consequences.

5. Conclusion

Ultimately, this study highlights the potential of short NL videos to increase the perceived value of NL and influence media evaluation and engagement behaviors. It also demonstrates the complexity of designing effective interventions that foster appropriate skepticism without leading to cynicism and disengagement from quality information. As misinformation continues to pose challenges in the digital age, refining NL efforts to address these nuances is essential for building a well-informed and resilient public.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

The authors are willing to share their data, analytics methods, and study materials with other researchers upon reasonable request.

Supplementary Material

Supplementary material for this article is available online in the format provided by the authors (unedited).

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