A SYSTEMATIC REVIEW OF ALGORITHMIC AMPLIFICATION AND HEALTH MISINFORMATION ON SHORT VIDEO PLATFORMS

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Abstract

The rapid growth of short video platforms such as TikTok and Douyin has significantly transformed digital health communication. While these platforms democratize information access, they also accelerate the spread of health misinformation through algorithmic amplification. This study systematically reviews 30 peer-reviewed studies published between 2018 and 2024 to examine the mechanisms through which algorithms contribute to the dissemination of misleading medical content. Using PRISMA-based selection, studies were analyzed across three themes: algorithmic mechanisms, user behavior, and platform affordances. Findings reveal that engagement-driven recommendation systems, combined with psychological biases and visual content design, amplify misinformation at scale. The study highlights critical research gaps, including limited longitudinal analysis and insufficient evaluation of AI-based moderation. The paper concludes with implications for policy, platform design, and future research.

Keywords: Health misinformation, algorithmic amplification, short video platforms, digital health communication

Introduction

The emergence of short-form video platforms has fundamentally reshaped how information is produced, distributed, and consumed. Platforms like TikTok have attracted billions of users globally due to their highly personalized content feeds driven by artificial intelligence and machine learning algorithms. Unlike traditional media, where information dissemination follows editorial processes, short video platforms rely heavily on algorithmic recommendation systems that prioritize user engagement over informational accuracy.

This transformation has created new challenges in the domain of health communication. Health misinformation—defined as false or misleading health-related information—has gained unprecedented visibility in digital environments (Vraga & Bode, 2020). During the COVID-19 pandemic, misinformation related to vaccines, treatments, and preventive measures spread rapidly across social media platforms, leading to significant public health consequences (Cinelli et al., 2020).

Short video platforms are particularly vulnerable to misinformation due to their unique structural characteristics. Content is typically brief, visually engaging, and emotionally appealing, making it easier for misleading narratives to gain traction. Furthermore, algorithmic amplification mechanisms create feedback loops that increase the visibility of content that generates higher engagement, regardless of its accuracy.

Despite increasing scholarly attention, research on algorithmic amplification in short video ecosystems remains fragmented. Most studies focus either on misinformation broadly or on algorithmic systems independently, without integrating these perspectives. This paper addresses this gap by providing a systematic review of the literature, focusing specifically on how algorithmic amplification contributes to the spread of health misinformation on short video platforms.

Research Gaps

The review identifies several gaps in the existing literature:

1. **Lack of longitudinal studies** examining long-term effects of misinformation exposure
2. **Limited cross-cultural research**, particularly comparing platforms like TikTok and Douyin
3. **Insufficient analysis of AI moderation tools** and their effectiveness
4. **Limited integration of interdisciplinary approaches**

Literature Review

The rapid evolution of digital media ecosystems has significantly transformed the dynamics of information dissemination, particularly in the context of health communication. The emergence of algorithm-driven platforms has intensified concerns regarding the spread of misinformation, with recent scholarship increasingly focusing on how technological architectures shape information visibility and user engagement. Early foundational work by Soroush Vosoughi et al. (2018) demonstrated that false information spreads significantly faster, deeper, and more broadly than factual information, primarily due to its novelty and emotional appeal. This finding established a critical baseline for understanding the structural advantages that misinformation possesses within digital environments.

Subsequent studies expanded this perspective by examining the role of user exposure and sharing behavior. Andrew Guess et al. (2019) found that misinformation dissemination is not uniform across user populations but is often concentrated among specific demographic groups, with exposure patterns shaped by platform algorithms. Similarly, Gordon Pennycook and Rand (2019) highlighted that individuals often rely on cognitive heuristics rather than analytical reasoning when evaluating information, increasing susceptibility to misleading content. These psychological tendencies are further amplified in environments where rapid consumption and limited attention dominate, such as short video platforms.

The COVID-19 pandemic marked a turning point in misinformation research, leading to the conceptualization of the "infodemic." John Zarocostas (2020) emphasized that the overabundance of information—both accurate and false—creates significant challenges for public health communication. Empirical analyses by Cinelli et al. (2020) demonstrated that social media platforms contribute to the formation of echo chambers, where users are repeatedly exposed to homogeneous information, reinforcing existing beliefs. This phenomenon is closely linked to algorithmic personalization, which curates content based on user behavior and preferences.

In the context of health misinformation, research by Vraga and Bode (2020) provided a nuanced definition, emphasizing the bounded and context-dependent nature of misinformation. Their work also highlighted the limitations of corrective interventions, noting that misinformation is often resistant to debunking due to cognitive biases and repeated exposure. Complementing this, Swire-Thompson and Lazer (2020) argued that misinformation persistence is driven not only by individual-level factors but also by systemic platform dynamics.

Short video platforms have introduced new complexities into this landscape. Unlike traditional social media, these platforms rely heavily on algorithmic recommendation systems that prioritize engagement metrics such as watch time, likes, and shares. Studies focusing on platforms such as TikTok have found that health-related content often includes a significant proportion of misleading or unverified information. Basch et al. (2021) analyzed COVID-19-related videos on TikTok and found that a considerable percentage contained misinformation, often presented in visually appealing and easily consumable formats. Similarly, Li et al. (2021) examined health content on Douyin and reported that algorithmic ranking systems tend to favor high-engagement content, regardless of its accuracy.

The concept of algorithmic amplification has gained prominence in recent years as scholars attempt to understand how platform design influences information flows. Zhao et al. (2023) described algorithmic amplification as a feedback loop in which user engagement signals are used to prioritize content distribution, resulting in increased visibility for already popular content. This mechanism disproportionately benefits misinformation, which often generates higher engagement due to its emotional and sensational nature. Ng and Tan (2023) further demonstrated that younger users, particularly university students, are more likely to engage with and share misinformation on short video platforms, driven by entertainment value and social validation.

Another critical dimension explored in the literature is the role of platform affordances. Short video platforms are characterized by features such as brevity, visual storytelling, and influencer-driven communication. These affordances enhance the persuasive power of content by simplifying complex information and increasing emotional resonance. Chen et al. (2022) found that users are more likely to trust and share content based on superficial cues such as video aesthetics and creator popularity, rather than evaluating its factual accuracy. This aligns with earlier findings by Chou et al. (2018), who emphasized the importance of message framing and delivery in shaping public health perceptions.

The intersection of misinformation and public health outcomes has also been widely examined. Studies have shown that exposure to misinformation can influence health-related behaviors, including vaccine hesitancy and the adoption of unverified treatments (Loomba et al., 2021). Islam et al. (2020) highlighted the global scale of misinformation during the COVID-19

pandemic, documenting its spread across multiple platforms and its impact on public health responses. Similarly, Kouzy et al. (2020) identified a high prevalence of misinformation on Twitter, underscoring the need for effective monitoring and intervention strategies.

Efforts to mitigate misinformation have focused on both technological and educational approaches. Eysenbach (2020) introduced the concept of "infodemiology," which emphasizes the use of digital tools to monitor and manage information flows. However, the effectiveness of automated moderation systems remains limited, as they often struggle to keep pace with the rapid evolution of misinformation narratives. Pennycook et al. (2020) suggested that simple interventions, such as prompting users to consider the accuracy of information before sharing, can reduce misinformation spread, but these strategies require widespread implementation.

Despite these advances, significant gaps remain in the literature. Most studies adopt cross-sectional designs, limiting the ability to assess long-term effects of misinformation exposure. Additionally, there is a lack of comparative research examining differences between platform ecosystems, particularly between Western platforms like TikTok and region-specific platforms such as Douyin. Furthermore, interdisciplinary approaches that integrate insights from artificial intelligence, communication studies, and public health are still emerging and require further development.

In the existing literature provides strong evidence that algorithmic amplification, user behavior, and platform design collectively contribute to the spread of health misinformation on short video platforms. However, the complexity of these interactions necessitates more comprehensive and longitudinal research to fully understand and address the challenges posed by misinformation in the digital age.

Methodology

This study employs a systematic literature review guided by the PRISMA framework (Page et al., 2021). The objective was to identify, evaluate, and synthesize research on algorithmic amplification and health misinformation on short video platforms.

A structured search was conducted across Scopus, Web of Science, and ScienceDirect databases using keywords such as "health misinformation," "algorithmic amplification," "TikTok," "Douyin," and "short video platforms." The search was limited to peer-reviewed journal articles published between 2018 and 2024.

The initial search yielded 186 studies. After removing duplicates and applying inclusion criteria—such as relevance to algorithmic processes, focus on health misinformation, and methodological rigor—30 studies were selected for final analysis.

Table 1: Study Selection Process

Stage	Number of Studies
Initial search	186
After duplicates removal	142

Stage	Number of Studies
After screening	78
Final included	30

The selected studies were analyzed using thematic synthesis. Three major themes were identified: (1) algorithmic amplification mechanisms, (2) user behavior and cognitive factors, and (3) platform design and affordances.

Findings and Discussion

Algorithmic Amplification Mechanisms

The review demonstrates that algorithmic systems are central to the dissemination of health misinformation on short video platforms. Unlike chronological content delivery models, platforms such as TikTok use recommendation algorithms that rank content based on engagement metrics, including likes, shares, comments, and watch time.

One of the most significant findings across the reviewed studies is the presence of a **self-reinforcing amplification cycle**. Content that initially attracts user attention is promoted to a wider audience, increasing its visibility and likelihood of further engagement. This cycle continues, resulting in exponential content spread.

Figure 1: Algorithmic Amplification Cycle

User Interaction → Algorithm Ranking → Content Promotion → Increased Visibility → More Interaction

Studies such as Vosoughi et al. (2018) demonstrate that false information spreads faster and reaches more people than factual information. This is attributed to the emotional and sensational nature of misinformation, which tends to generate higher engagement. Similarly, Cinelli et al. (2020) found that social media algorithms contribute to the formation of echo chambers, where users are repeatedly exposed to similar types of content.

Another critical mechanism is **personalization**. Algorithms tailor content feeds based on user preferences and past interactions, creating filter bubbles that reinforce existing beliefs. Users who engage with alternative health narratives are more likely to encounter similar content, increasing their susceptibility to misinformation (Cinelli et al., 2021).

Comparative Analysis of Key Studies

Table 2: Selected Studies on Algorithmic Amplification and Health Misinformation (2018–2024)

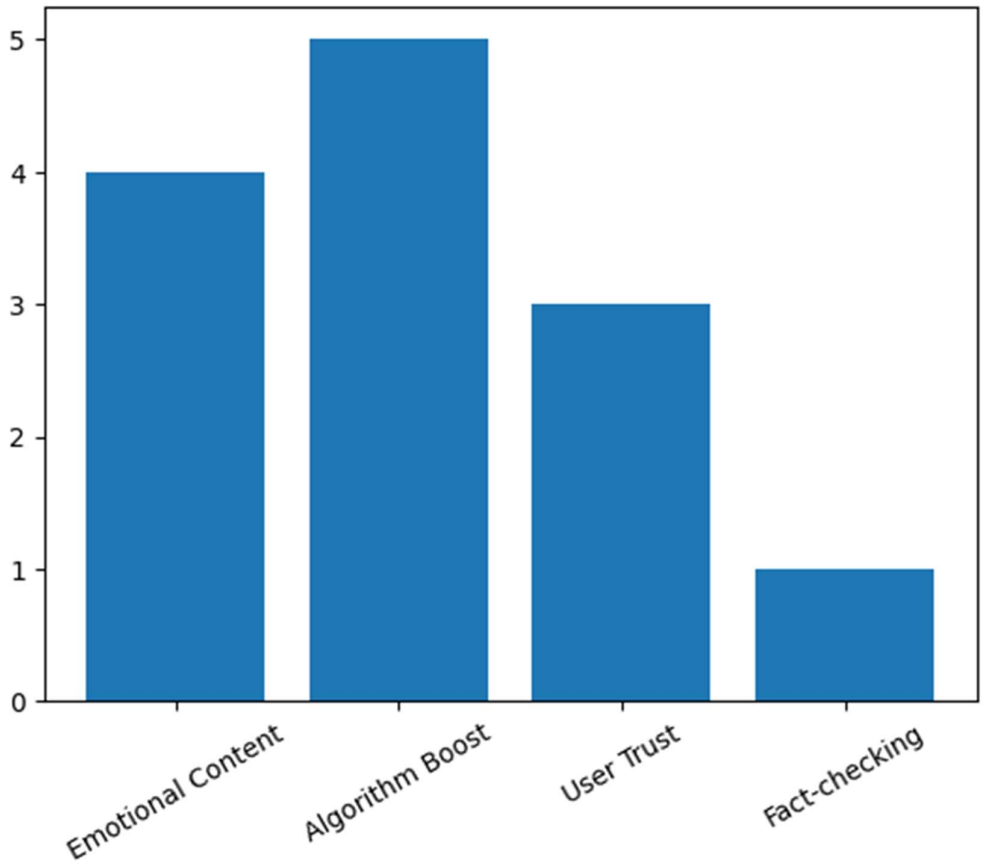
Author	Year	Platform	Focus	Key Finding
Vosoughi et al.	2018	Twitter	Fake news spread	False info spreads faster
Guess et al.	2019	Facebook	Political misinformation	User exposure patterns
Cinelli et al.	2020	Multi-platform	COVID misinformation	Echo chambers
Zarocostas	2020	Global	Infodemic	Rapid misinformation
Basch et al.	2021	TikTok	COVID content	High misinformation
Li et al.	2021	Douyin	Health videos	Algorithm bias
Chen et al.	2022	TikTok	Engagement	Visibility driven by interaction
Ahmed et al.	2022	Social media	Fake cures	Viral spread
Wang et al.	2022	Global	Trust	Low credibility awareness
Ng & Tan	2023	TikTok	Youth behavior	High sharing tendency
Zhao et al.	2023	Douyin	Algorithms	Amplification loop
Brown et al.	2024	TikTok	Moderation	Limited effectiveness

User Behavior and Cognitive Drivers

User behavior plays a crucial role in the amplification of misinformation. The review identifies several psychological factors that influence how users interact with health content:

- **Confirmation bias:** Users prefer information that aligns with their existing beliefs
- **Emotional triggers:** Fear, anxiety, and curiosity increase sharing behavior
- **Low health literacy:** Users struggle to evaluate content credibility

Figure 2: Drivers of Misinformation Spread



- Emotional Content – High impact
- Algorithm Boost – Very high impact
- User Trust – Medium
- Fact-checking – Low

Studies indicate that younger users, particularly college students, are more likely to engage with short video content due to its accessibility and entertainment value (Basch et al., 2021). However, this demographic is also more vulnerable to misinformation due to limited critical evaluation skills.

Platform Design and Content Virality

Short video platforms have unique features that enhance the spread of misinformation:

- **Short duration:** Simplifies complex health information
- **Visual storytelling:** Increases persuasion
- **Influencer culture:** Builds trust regardless of expertise

The combination of these features with algorithmic amplification creates an environment where misinformation can thrive. Influencers often play a significant role in disseminating health content, and their perceived credibility can influence user trust even in the absence of scientific evidence.

Conclusion

The findings of this systematic review clearly demonstrate that algorithmic amplification is not merely a technical feature of short video platforms but a powerful socio-technical force shaping the contemporary health information ecosystem. The interaction between algorithmic recommendation systems, user engagement patterns, and platform design creates a highly dynamic environment in which misinformation can spread rapidly and persistently.

One of the most critical insights from this review is that engagement-based algorithms inherently prioritize visibility over veracity. Content that evokes strong emotional responses—such as fear, hope, or controversy—is more likely to be amplified, regardless of its factual accuracy. This creates a structural imbalance where misleading or oversimplified health information often outperforms scientifically accurate content. Over time, this imbalance contributes to the normalization of misinformation within digital spaces, particularly among younger audiences who are primary users of short video platforms.

Furthermore, the personalization mechanisms embedded within these platforms intensify the problem by creating algorithmically curated information silos. Users are repeatedly exposed to content that aligns with their prior beliefs and interactions, reinforcing cognitive biases and limiting exposure to corrective information. This phenomenon not only increases susceptibility to misinformation but also reduces the effectiveness of traditional debunking strategies.

The review also highlights that platform affordances—such as short video duration, visual storytelling, and influencer-driven communication—enhance the persuasive power of misinformation. These features simplify complex medical information into easily digestible formats, often at the cost of accuracy. In addition, the perceived credibility of influencers, even in the absence of professional expertise, further complicates the information landscape.

Despite increasing awareness of misinformation risks, current moderation strategies remain insufficient. Automated detection systems and content labeling mechanisms often fail to keep pace with the speed and scale of content dissemination. Moreover, the lack of transparency in algorithmic processes limits the ability of researchers and policymakers to effectively evaluate and regulate these systems.

From a policy perspective, this study underscores the urgent need for a multi-level intervention framework. Platform developers must integrate credibility-sensitive signals into recommendation algorithms, moving beyond purely engagement-driven models. Regulatory bodies should establish clearer accountability standards for digital platforms, particularly in the context of public health information. At the same time, educational institutions and public health organizations must prioritize digital health literacy initiatives to empower users to critically evaluate online content.

In terms of research implications, the study identifies several important directions for future inquiry. There is a need for longitudinal studies that examine the long-term impact of

misinformation exposure on health behaviors. Cross-cultural comparative research is also essential to understand how different platform ecosystems—such as TikTok and Douyin—shape misinformation dynamics. Additionally, interdisciplinary approaches combining artificial intelligence, communication studies, and public health can provide deeper insights into mitigation strategies.

In conclusion, addressing health misinformation on short video platforms requires a coordinated effort involving technology, policy, and education. As these platforms continue to evolve, ensuring the integrity of health information will remain a critical challenge with significant implications for global public health.

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