Magna Scientia Advanced Research and Reviews

eISSN: 2582-9394

Cross Ref DOI: 10.30574/msarr

Journal homepage: https://magnascientiapub.com/journals/msarr/

(REVIEW ARTICLE)

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Risk fatigue and the infodemic: Understanding declining public responsiveness to health campaigns, mitigation strategies, and public health impact

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Magna Scientia Advanced Research and Reviews, 2025, 14(02), 150-157

Publication history: Received on 10 July 2025; revised on 17 August 2025; accepted on 19 August 2025

Article DOI: https://doi.org/10.30574/msarr.2025.14.2.0099

Abstract

The COVID-19 pandemic exposed significant challenges in public health communication, particularly due to the combined effects of risk fatigue and the infodemic. Risk fatigue refers to the public's declining responsiveness to repeated health warnings, often driven by emotional exhaustion, information overload, and declining trust in institutions. At the same time, the infodemic, defined by the World Health Organization as an overabundance of information that includes both accurate and false content, fueled confusion, misinformation, and distrust, especially through social media. These dynamics created a feedback loop in which misinformation intensified fatigue, and fatigue increased susceptibility to misinformation. This paper examines how these phenomena undermined crisis communication during COVID-19, using the social amplification of risk framework, the health belief, the crisis and emergency risk communication model. It explores the main drivers, consequences, and mitigation strategies, including digital literacy, message tailoring, trust-building, and social listening. The analysis shows that effective crisis communication requires more than just accurate messaging. It must be adaptive, culturally sensitive, and trust-centered. Ultimately, this study highlights the need for resilient communication systems that can counter both fatigue and misinformation, especially in structurally disadvantaged populations and rapidly evolving digital environments.

Keywords: Infodemic; Risk fatigue; public health communication; Misinformation; COVID-19; Crisis communication; social media; Institutional trust; Health literacy

1. Introduction

The "infodemic," a term coined by the WHO, refers to an overabundance of information, both accurate and false, that complicates public health responses (WHO, 2022). During crises such as COVID-19, it has contributed to confusion, mistrust, and harmful behaviors. Risk fatigue, which is the public's reduced responsiveness to repeated health warnings due to emotional exhaustion or inconsistent messaging, further undermines public health efforts. Together, these phenomena influence how people perceive and act on health information. This introduction examines their interaction and the challenges they create for effective public health communication. The COVID-19 pandemic marked the first health crisis accompanied by a large-scale "infodemic," where accurate and false information spread rapidly through digital platforms, undermining public trust and compliance. False claims fueled stigma, reduced adherence to safety measures, and shaped distorted risk perceptions (Roozenbeek et al., 2020; Allington et al., 2021; Islam et al., 2020). Alongside this, prolonged exposure to health warnings led to risk fatigue, where emotional exhaustion and inconsistent messaging diminished responsiveness to protective behaviors (Guan et al., 2023; Lilleholt et al., 2023; Ball & Wozniak,

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2022). Together, the infodemic and risk fatigue created a cycle of confusion, skepticism, and disengagement, particularly among populations with low health literacy or limited access to credible information. Structurally disadvantaged groups were especially vulnerable, facing greater exposure to misinformation and communication gaps that heightened stress and reduced compliance.

Effective risk communication and infodemic management are critical to countering these challenges. The WHO has emphasized the importance of systematic, evidence-based approaches to manage infodemics, including monitoring information flows, promoting health literacy, and disseminating credible information (WHO, 2022). Strategies such as social listening, which involves analyzing public sentiments on social media, have been employed to identify misinformation and address information voids (WHO, 2020). For instance, the WHO's Early AI-Supported Response with Social Listening (EARS) tool has been used to track COVID-19-related narratives and inform targeted communication strategies (WHO, 2020). Additionally, engaging trusted community leaders and leveraging partnerships with fact-checking organizations have proven effective in combating misinformation and rebuilding trust (Aslan et al., 2024).

2. Concepts of Risk Fatigue

Risk fatigue in public health communication refers to the reduced responsiveness of individuals to repeated health warnings, especially during prolonged crises like the COVID-19 pandemic. Continuous exposure to risk messages can lead to emotional exhaustion, cognitive overload, and desensitization, ultimately decreasing adherence to recommended behaviors (Thompson et al., 2017). Over time, individuals may view warnings as less urgent or credible (Siebenhaar et al., 2020). During the COVID-19 crisis, evolving guidelines and repetitive messaging contributed to public disengagement and resistance to health measures (Bavel et al., 2020). The infodemic, as defined by the World Health Organization, on the other hands, is an overabundance of information, both accurate and false, that circulates rapidly during a health crisis. This information overload complicates the delivery of credible guidance and exacerbates risk fatigue by promoting confusion and mistrust (Zarocostas, 2020). Misinformation about topics such as mask usage, vaccine safety, and unproven treatments spread quickly, especially via social media, where speed often outpaces verification (Cinelli et al., 2020). These conflicting messages weakened public confidence and hindered health interventions (Gallotti et al., 2020). Crisis communication, the strategic dissemination of information by health authorities during emergencies, is designed to inform and protect the public (Reynolds & Seeger, 2005). It emphasizes clear, consistent, and actionable messaging. However, the combination of risk fatigue and the infodemic undermines these efforts, as trust in health authorities declines and misinformation fills the gap (Depoux et al., 2020). The CDC highlights the need for crisis communication to be adaptive, culturally relevant, and sensitive to public sentiment (CDC, 2018). This review explores how repeated exposure to health risk messages contributes to risk fatigue, increases vulnerability to misinformation, and erodes trust in institutions. It draws on guidance from the WHO and CDC, as well as peer-reviewed studies, to analyze the psychological and social factors involved and offer strategies for improving the effectiveness of public health communication in times of crisis.

2.1. Theoretical Frameworks for Understanding Risk Fatigue and the Infodemic

Several theoretical frameworks provide a foundation for understanding the dynamics of risk fatigue and the infodemic in public health communication. These models among others help explain how risk perceptions are formed, amplified, or attenuated and how they influence public behavior during crises.

2.2. Social Amplification of Risk Framework (SARF)

The Social Amplification of Risk Framework (SARF), developed by Kasperson et al. (1988), posits that risk perceptions are shaped not only by the objective severity of a hazard but also by social, psychological, and cultural factors that amplify or attenuate public responses. According to SARF, information sources such as media, social networks, and public health campaigns play a critical role in shaping how risks are perceived and acted upon (Kasperson et al., 1988). During the COVID-19 pandemic, social media platforms amplified both accurate and misleading information, contributing to the infodemic and intensifying public fear or skepticism (Pidgeon et al., 2003). SARF is particularly relevant for understanding how misinformation can exacerbate risk fatigue by amplifying conflicting narratives, leading to distrust and disengagement (Renn, 2011). Studies shown that the rapid spread of misinformation about COVID-19 vaccines on platforms like Twitter and Facebook amplified public skepticism, reducing vaccine uptake in some populations (Loomba et al., 2021). SARF highlights the need for public health communicators to monitor and counteract amplified misinformation to mitigate its impact on risk perceptions and behaviors.

2.3. Health Belief Model (HBM)

The Health Belief Model (HBM), developed by Rosenstock (1966), provides a framework for understanding individual health behaviors based on perceived susceptibility, severity, benefits, barriers, and cues to action. During prolonged crises, repeated health warnings may reduce perceived susceptibility and severity if individuals become desensitized or perceive risks as less immediate (Janz & Becker, 1984). Risk fatigue can also increase perceived barriers to action, such as the inconvenience of sustained preventive measures like mask-wearing or social distancing (Champion & Skinner, 2008). The HBM suggests that effective communication must address these perceptions by reinforcing the benefits of compliance and providing clear, actionable cues to maintain public engagement (Glanz et al., 2015). The HBM was applied to explain variations in compliance with preventive measures. For instance, studies found that individuals who perceived lower personal risk of infection were less likely to adhere to guidelines, particularly as the pandemic progressed and risk fatigue set in (Clark et al., 2020). The HBM underscores the importance of tailoring messages to address evolving public perceptions and counteract fatigue.

2.4. Crisis and Emergency Risk Communication (CERC) Model

The Crisis and Emergency Risk Communication (CERC) model, developed by the CDC, provides a structured approach to communicating during public health emergencies. The CERC model emphasizes six principles: be first, be right, be credible, express empathy, promote action, and show respect (Reynolds & Seeger, 2005). During prolonged crises, maintaining credibility and promoting action become challenging as risk fatigue and the infodemic erode public trust (CDC, 2018). The CERC model advocates for adaptive communication strategies that evolve with the crisis lifecycle, from pre-crisis preparation to resolution and recovery (Seeger et al., 2018). The CERC model was widely applied during the COVID-19 pandemic to guide communication efforts. However, inconsistencies in messaging, such as evolving guidelines on mask-wearing or vaccine boosters, undermined credibility and contributed to risk fatigue (Freeman et al., 2020). The model highlights the need for transparent, consistent, and empathetic communication to sustain public trust and counteract the effects of misinformation.

3. Related works

3.1. Risk Fatigue and the Infodemic in Public Health Communication

The term "infodemic," coined by the World Health Organization (WHO), describes an overwhelming surge of information, including misinformation and disinformation, that complicates public health responses during crises (WHO, 2020). This phenomenon, amplified by social media, was particularly pronounced during the COVID-19 pandemic, leading to confusion, mistrust, and reduced adherence to health guidelines. Concurrently, risk fatigue a desensitization to repeated health warnings further diminishes public responsiveness, exacerbating the challenges posed by infodemics (Bavel et al., 2020). This literature review synthesizes scholarly research from 2019 to 2025 to examine the interplay between infodemics and risk fatigue, their impact on public behavior, and strategies to mitigate their effects, with a focus on peer-reviewed studies and their contributions to the field.

3.2. The Infodemic and Its Impact on Public Health

An infodemic involves the rapid spread of both accurate and inaccurate information, primarily through social media platforms such as Twitter, Facebook, YouTube, and Instagram (Zarocostas, 2020). The WHO states that infodemics create confusion, erode trust in health authorities, and encourage noncompliance, ultimately harming public health (WHO, 2020). Gallotti et al. (2020) estimated that 0.2% to 28.8% of COVID-19-related social media content included misinformation, distorting risk perceptions and fueling vaccine hesitancy. Roozenbeek et al. (2020) found that false claims about treatments like hydroxychloroquine and cow urine led to risky behaviors and diminished trust in health systems.

Social media algorithms, which prioritize engagement, often amplify sensational or misleading content (Cinelli et al., 2020). On Twitter, up to 40% of COVID-19-related posts contained unreliable information, much of it propagated by bots or disinformation campaigns. Political endorsements of unverified treatments, such as those by leaders in the United States and Brazil, intensified public confusion (Evanega et al., 2020). The psychological impact of infodemics includes heightened anxiety and depression, with Islam et al. (2020) linking misinformation exposure to mental health declines and reduced compliance with protective behaviors.

Risk fatigue, or warning fatigue, arises when repeated health alerts lose perceived urgency, leading to disengagement (Bavel et al., 2020). Continuous coverage and shifting health guidelines during COVID-19 caused emotional exhaustion

(Kellerman et al., 2022). Inconsistent messaging about vaccines and mask use increased skepticism, especially in low-trust communities (Kim et al., 2021).

Factors contributing to risk fatigue include contradictory messages and personal characteristics. Kreps and Kriner (2020) found that inconsistent communication from health and political leaders reduced compliance. Clark et al. (2020) noted that people with chronic conditions showed higher risk awareness, while those with optimism bias were less responsive. Piltch-Loeb et al. (2021) demonstrated that misinformation exposure increases fatigue and decreases engagement with health guidance.

4. Risk Fatigue and its causes

Risk fatigue, defined as the declining responsiveness to repeated health warnings, stems from interconnected factors such as information overload, conflicting messages, and institutional distrust. Information overload occurs when individuals face excessive or repetitive content, leading to cognitive and emotional exhaustion (Eppler & Mengis, 2004). During COVID-19, overwhelming volumes of health-related information from media and social networks impaired the public's ability to act on guidance (Siebenhaar et al., 2020). Gallotti et al. (2020) found that the infodemic intensified this overload, as both accurate and false information competed for attention, causing confusion and disengagement.

Conflicting expert messages further weakened credibility. Early in the pandemic, inconsistent recommendations on mask-wearing and treatments created public confusion (Depoux et al., 2020). Freeman et al. (2020) linked inconsistent messaging to reduced compliance, echoing the Social Amplification of Risk Framework (Kasperson et al., 1988). Bavel et al. (2020) noted that such inconsistencies fueled distrust, especially in polarized contexts.

Institutional distrust, often rooted in past failures, also plays a key role. Larson and Heymann (2010) and Loomba et al. (2021) found that skepticism toward authorities, fueled by political bias or conspiracy beliefs, reduced adherence to health guidelines. Risk fatigue thus reflects not just overload, but deep-seated societal and historical influences.

4.1. Consequences of Risk Fatigue and the Infodemic

The consequences of risk fatigue and the infodemic include apathy, noncompliance with health guidelines, and increased acceptance of misinformation, all of which undermine public health efforts. Apathy, characterized by emotional disengagement, emerges when individuals become desensitized to repeated warnings. Thompson et al. (2017) found that during the Ebola crisis, prolonged exposure to fear-based messaging led to emotional exhaustion, reducing public responsiveness. Similarly, Siebenhaar et al. (2020) observed that during COVID-19, information overload triggered information avoidance, where individuals deliberately ignored health warnings to cope with distress, leading to reduced adherence to preventive measures like mask-wearing. Noncompliance with health guidelines is a direct outcome of risk fatigue, as individuals prioritize convenience or skepticism over recommended behaviors. Clark et al. (2020) reported that lower perceived risk of COVID-19 infection correlated with reduced compliance, particularly as the pandemic progressed and fatigue set in. This is consistent with the HBM, which suggests that diminished perceived severity and benefits reduce health behavior adoption (Janz & Becker, 1984).

Freeman et al. (2020) further noted that mistrust and conspiracy beliefs exacerbated noncompliance, with some individuals rejecting vaccines or social distancing due to perceived institutional biases. The infodemic amplifies these consequences by increasing vulnerability to misinformation. Cuan-Baltazar et al. (2020) found that misinformation about COVID-19 treatments, such as unproven remedies, distorted risk perceptions and led to harmful behaviors. Roozenbeek et al. (2020) demonstrated that exposure to vaccine misinformation significantly reduced vaccination intent in multiple countries, highlighting the infodemic's role in undermining public health campaigns. Zarocostas (2020) argues that misinformation acceptance creates a feedback loop, where distrust in official sources drives reliance on unverified information, further reducing compliance. Thompson et al. (2017) and Siebenhaar et al. (2020) emphasize psychological consequences like apathy, Cuan-Baltazar et al. (2020) and Roozenbeek et al. (2020) focus on behavioral outcomes, such as noncompliance and misinformation acceptance. The literature would benefit from studies integrating these perspectives to explore how psychological and behavioral consequences interact over time, particularly in diverse populations.

4.2. Role of Digital and Social Media in Infodemic Dynamics

Digital and social media platforms, including WhatsApp, TikTok, and Twitter, are central to the infodemic, accelerating the spread of both accurate and misleading information. The SARF highlights how media amplify risk perceptions, often prioritizing engagement over accuracy (Kasperson et al., 1988). Cinelli et al. (2020) found that during COVID-19, misinformation on Twitter spread faster than accurate information due to algorithmic biases that favored sensational

content. Similarly, WhatsApp's encrypted messaging facilitated the rapid dissemination of false remedies and conspiracy theories, particularly in regions with limited digital literacy (Islam et al., 2020). TikTok's short-form video format emerged as a significant vector for misinformation, particularly among younger audiences. Basch et al. (2021) analyzed TikTok content and found that many videos contained misleading or incomplete information about COVID-19 prevention, yet their viral nature amplified their reach. In contrast, Twitter's open platform allowed for some community-driven fact-checking, though Brennen et al. (2020) note that these efforts were often insufficient to counter misinformation's spread. Depoux et al. (2020) argue that social media creates echo chambers, where users are exposed to reinforcing narratives that undermine official guidance. The WHO's Early AI-Supported Response with Social Listening (EARS) tool demonstrated the potential to monitor and counter misinformation in real-time (WHO, 2020). However, platforms like WhatsApp pose unique challenges due to their private nature, complicating efforts to intervene (Islam et al., 2020). Comparing Cinelli et al. (2020) and Basch et al. (2021), the literature highlights platform-specific dynamics but lacks comprehensive studies on how private messaging apps can be effectively monitored or leveraged for public health communication.

4.3. Strategies to Mitigate Infodemics and Risk Fatigue

Mitigating the effects of infodemics and risk fatigue requires multifaceted approaches. The WHO advocates for infodemic management, emphasizing risk- and evidence-based strategies (WHO, 2020). Key interventions include:

- **Enhancing Health and Digital Literacy**: Improving public ability to discern credible information is critical. Roozenbeek et al. (2020) demonstrated that digital literacy interventions in the United States and India increased resilience against misinformation, particularly among youth and low-literacy groups.
- **Clear and Consistent Communication**: Clear, evidence-based messaging counters misinformation and reduces fatigue. Mohammaditabar et al. (2022) emphasized two-way communication channels in Iran to address public concerns in real time, enhancing trust. Consistent messaging from trusted sources, such as the CDC or WHO, mitigates confusion (Larson et al., 2021).
- **Leveraging Technology**: AI-based tools, such as the WHO's Early AI-Supported Response (EARS) system, monitor online narratives to detect misinformation (Purnat et al., 2021). Blockchain verification and algorithmic transparency have also been proposed to enhance content credibility, though challenges like restricted API access persist (Burnat et all, 2025).
- **Community Engagement**: Engaging communities fosters resilience. The Africa Infodemic Response Alliance promotes collaborative approaches to improve preparedness (Okereke et al., 2021). Involving community leaders and influencers amplifies credible messages, as shown in studies by Schiavo (2021).
- **Psychological Support**: Addressing the mental health toll of infodemics is essential. Brooks et al. (2020) advocate for psychosocial interventions to mitigate anxiety and depression, improving responsiveness to health warnings.

4.4. Strategies for Sustaining Engagement

To mitigate risk fatigue and the infodemic, evidence-based strategies focus on message reframing, tailoring, and trust-building. Message reframing involves presenting health warnings in ways that maintain relevance and avoid desensitization. Reynolds and Seeger (2005) advocate for the CERC model's emphasis on clear, action-oriented messaging. Bavel et al. (2020) found that emphasizing community benefits, such as protecting vulnerable populations, was more effective than fear-based messaging during COVID-19. Kim et al. (2019) suggest that highlighting short-term, tangible benefits can reduce fatigue and sustain engagement. Tailoring communication to specific audiences is critical for addressing diverse needs and countering misinformation. Sentell and Vamos (2020) emphasize the role of health literacy in designing messages for structurally disadvantaged groups, hostage to misinformation. Zhang et al. (2024) found that tailored messaging in Asian jurisdictions improved compliance among older adults by addressing specific concerns. Larson and Heymann (2010) highlight the effectiveness of culturally relevant spokespersons in building trust.

Trust-building is essential for sustaining engagement and requires consistent, transparent, and empathetic communication. The CERC model emphasizes credibility and empathy as key principles (Seeger et al., 2018). Aslan et al. (2024) report that WHO's partnerships with fact-checking organizations and social media platforms helped counter misinformation by flagging false content. However, Larson and Heymann (2010) note that addressing historical distrust requires long-term efforts, such as engaging trusted community leaders. Bavel et al. (2020) and Kim et al. (2019) focus on practical messaging strategies, Larson and Heymann (2010) and Aslan et al. (2024) emphasize systemic trust-building. The literature lacks evidence on the scalability of these strategies across diverse cultural contexts, particularly in low-resource settings.

5. Conclusion and future research

The literature underscores that risk fatigue and the infodemic are driven by information overload, conflicting messages, and distrust, leading to apathy, noncompliance, and misinformation acceptance. Social media platforms amplify these issues, but they also offer tools for mitigation, such as social listening (WHO, 2020). Strategies like message reframing, tailoring, and trust-building are effective but require adaptation to specific contexts (Bavel et al., 2020; Sentell & Vamos, 2020). The SARF, HBM, and CERC models provide theoretical grounding, highlighting the interplay of social, psychological, and communication factors (Kasperson et al., 1988; Janz & Becker, 1984; Reynolds & Seeger, 2005). The absence of standardized protocols for managing infodemics on private platforms like WhatsApp is a critical challenge (Islam et al., 2020). Future research should explore these areas and develop predictive models for infodemic risks (Gallotti et al., 2020) to enhance crisis communication resilience.

Addressing these gaps is essential for building adaptive, culturally responsive health communication systems that can withstand the dual pressures of misinformation and audience fatigue. A deeper understanding of how risk fatigue and the infodemic interact across different populations and media environments will be crucial for designing evidence-based interventions that maintain public engagement, trust, and protective behaviors during prolonged crises.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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