



From Information to Empowerment: Refining Indonesia's Crisis and Risk Communication Model through Digital Literacy

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Abstract

Background: The COVID-19 pandemic revealed both the strengths and weaknesses of government crisis and risk communication in digitally connected yet socially diverse societies such as Indonesia. Although information dissemination was rapid, issues such as misinformation, declining public trust, and uneven levels of digital literacy limit the effectiveness of public engagement.

Aims: This study aims to examine digital literacy as a mediating factor between government information provision and citizen empowerment during Indonesia's pandemic response. It also seeks to refine an existing crisis and risk communication model in the context of national pandemic communication.

Method: A case study approach of central government communication was used involving analysis of regulations, public messaging, and digital engagement practices. The study integrates the Crisis and Emergency Risk Communication (CERC) framework and Situational Crisis Communication Theory (SCCT) to evaluate how transparency, participation, and inclusivity are embedded within crisis communication strategies.

Results: The findings indicate that digital literacy is not merely a technical competency but also a socio-political resource that shapes public trust, compliance, and societal resilience. The study reveals limitations of one-way communication and highlights the importance of participatory, trust-based, and digitally inclusive approaches.

Conclusions: The proposed model shifts government crisis communication from one-directional information dissemination toward participatory and digitally inclusive practices. Although the study focuses on Indonesia, it provides insights relevant to other contexts facing challenges of fragile public trust and uneven preparedness. The study contributes theoretically by extending CERC and SCCT with a literacy dimension and offers practical guidance for governments to strengthen resilience through digital literacy initiatives.

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INTRODUCTION

COVID-19 as a Health and Communication Crisis

Since its emergence in late 2019, COVID-19 has evolved into one of the most disruptive global crises of the 21st century. The World Health Organization (WHO) declared it a pandemic on March 11, 2020, after infections spread rapidly across borders and overwhelmed health systems worldwide (*World Health Organization*, 2023). By September 2022, more than 600 million confirmed cases and over 6 million deaths had been reported globally. Beyond its health implications, COVID-19 also represented a profound communication crisis, exposing how governments convey risk, build trust, and mobilize collective action under conditions of uncertainty.

Countries adopted diverse strategies shaped by their political, social, and economic contexts. Norway emphasized transparent and empathetic communication to maintain public trust (Christensen & Lægreid, 2020), while Australia adapted evidence-based policies to evolving challenges (Moloney & Moloney, 2020). Greece relied on rhetorical leadership to reinforce compliance (Aspriadis, 2021), and Rwanda deployed innovative technologies, such as drones and robots, to extend health messaging despite limited resources (N. Karim et al., 2021). Across Africa, fragile health systems were forced to improvise through service repurposing and isolation centers (Tessema et al., 2021), while in Oman, a unified leadership approach combined with community engagement proved critical (Al Khalili et al., 2021).

Within ASEAN, responses were similarly varied. Cambodia's swift containment and mass vaccination campaign benefited from strong political commitment and public cooperation (Chhim et al., 2023). Malaysia pursued active pandemic diplomacy and robust vaccination efforts, but its response was complicated by political instability and economic strain (A. Karim, 2023). These experiences underscore how effective crisis management requires not only medical capacity but also on credible communication, political stability, and international collaboration.

Globally, Risk Communication and Community Engagement (RCCE) emerged as a cornerstone of successful pandemic management, highlighting the central role of communication in shaping public trust, compliance, and resilience (Ihekweazu et al., 2022). COVID-19, therefore, should be understood as both a health and communication crisis, demanding integrated strategies that bridge science, governance, and public engagement.

The COVID-19 Pandemic Response in Indonesia

Indonesia's initial management of the COVID-19 pandemic revealed significant weaknesses in urgency, preparedness, and communication. While neighboring countries acted swiftly in early 2020, the Indonesian government initially downplayed the threat, framing the virus as a limited concern and prioritizing economic recovery. In February 2020, instead of introducing containment measures, the government announced a stimulus package of IDR 4.7 trillion to revive tourism, underscoring the gap between health risks and policy priorities (Bayu, 2020).

This lack of acknowledgement undermined public trust and international relations. For example, in February 2020, six Indonesians suspected of exposure traveled from Singapore to Batam. While Singapore raised concerns, Indonesian authorities issued conflicting statements, denying local infections and downplaying risks (Ikhsan, 2020; Radityo & Aliansyah, 2020). Such contradictions reflected the absence of a coherent crisis communication strategy.

A turning point came on March 2, 2020, when President Joko Widodo officially confirmed Indonesia's first cases. Shortly after, COVID-19 was declared a non-natural national disaster, and the government established the COVID-19 Response Acceleration Task Force. Policy measures escalated, beginning with large-scale social restrictions (PSBB) in April 2020, later evolving into micro-scale community activity restrictions (PPKM), and eventually tiered PPKM levels across regions (Nurita & Wibowo, 2022). These layered policies illustrated adaptive governance but also highlighted inconsistencies between central and local authorities, resulting in fragmented communication and uneven implementation (Nugroho & Syarief, 2021; Ridlo, 2022).

By September 2022, Indonesia had recorded more than 6.3 million confirmed cases and 157,770 deaths (Satuan Tugas Penanganan Covid-19, 2022). Despite early setbacks, the WHO commended Indonesia in June 2022 for high vaccination coverage and effective case control (Intan, 2022). However, the trajectory showed that COVID-19 was both a health and communication crisis: limited public understanding, inconsistent messaging, and weak policy coordination undermined responses, while clearer communication later helped restore credibility and mobilize compliance.

Given Indonesia's vast geography and diverse population, refining a crisis and risk communication model is vital for future preparedness. Indonesia's experience mirrors global challenges—delayed acknowledgment, fragmented communication, and difficulty translating science into accessible messages—but one factor stands out: digital literacy gaps. These amplified misinformation, fueled public confusion, and limited the impact of online campaigns. Strengthening digital literacy is therefore indispensable for effective crisis communication, offering lessons with global relevance.

Problem Statement: Trust Deficits, Misinformation, and Digital Literacy

Effective crisis and risk communication is central to managing public health emergencies. Governments must mitigate health risks while also navigating communication crises. In Indonesia, criticisms of the central government's handling often focused on delayed disclosures, inconsistent messaging, and limited transparency. Human Rights Watch (2020) noted failures in providing timely and adequate information early in the outbreak. Similarly, (Djalante et al., 2020) highlighted delays in critical updates, while others argued that shifting narratives weakened credibility and trust (Lusianawati, 2020; Shalihah & Hardiyanto, 2020; Siahaan, 2022).

Existing scholarship offers valuable insights but remains fragmented. Studies of communication during natural disasters such as forest fires (Arandas & Ling, 2020) and sectoral analyses of tourism or business during COVID-19 (Faustyna, 2020; Kartikawangi & Dahesihnsari, 2020) provided depth but lacked a systematic view of central government strategy. Analyses of government discourse (Alnizar & Manshur, 2022; Surahmat et al., 2021) and ministerial social media (Nova et al., 2021) remain partial. Local level studies explored misinformation on websites (Setiawana et al., 2021), citizen responses (Masduki et al., 2022), and leadership communication (Nurfadhilah et al., 2022). However, few targeted the central government's overarching approach.

Broader governance issues compounded these gaps. Mietzner (2020) links shortcomings to democratic backsliding, polarization, and populist anti-scientism that eroded trust in science-based messaging. Structural challenges in Indonesia's decentralized system—such as fiscal mismatches or “unfunded mandates” (Rodríguez-Pose & Vidal-Bover, 2023)—further fragmented coordination.

A critical limitation in prior research is insufficient attention to the intersection of digital literacy, misinformation, and trust. While Yudarwati et al. (2023) proposed a participatory risk communication model, most scholarship has not fully considered how citizens' digital competencies affect crisis outcomes. In Indonesia, digital literacy gaps exacerbated misinformation, polarized debates, and undermined trust in official guidance—key factors shaping the COVID-19 trajectory.

This study addresses these gaps by examining the central government's communication strategies, focusing on how trust, misinformation, and digital literacy interacted during the pandemic. By analyzing the response through the SCCT and the CERC model, this research provides a framework for understanding and improving communication in health emergencies.

Research Objectives

This study aims to refine Indonesia's crisis and risk communication model by integrating digital literacy as a core component, addressing challenges of misinformation, trust, and fragmented governance during the COVID-19 pandemic. Beyond Indonesian, it seeks to generate insights for other countries facing similar governance complexities and digital divides, contributing to global discourse on crisis communication.

Research Questions

1. How did the Indonesian central government communicate risks and manage public trust during the COVID-19 pandemic?

2. In what ways did gaps in digital literacy amplify misinformation and hinder the effectiveness of crisis communication?
3. How can integrating digital literacy into SCCT and CERC improve Indonesia's preparedness for future health crises?

Crisis and Risk Communication Frameworks

Overview of SCCT

SCCT is one of the most widely applied frameworks in crisis communication research (Coombs, 2007; Ndone & Park, 2022). Rooted in attribution theory, SCCT argues that public perceptions of responsibility determine the extent of reputational threat faced by an organization during a crisis. When stakeholders attribute high responsibility, the reputational damage and likelihood of negative behavioral responses increase (Coombs & Holladay, 2002). Conversely, a strong pre-crisis reputation or positive stakeholder relationships can act as a buffer, mitigating harm and fostering supportive behaviors (Ki & Brown, 2013; Kim & Yang, 2009).

The theory emphasizes matching communication strategies to the perceived level of responsibility and severity of the crisis. SCCT clusters responses into four main categories: denial, diminishment, rebuilding, and bolstering (Coombs, 2015). Denial strategies are suited to situations where the organization has little or no responsibility (e.g., misinformation crises). Diminishment strategies attempt to reduce perceptions of responsibility or harm, while rebuilding strategies—such as apology or compensation—are critical when responsibility is high. Bolstering strategies, including reminders of past good deeds or ingratiation, are typically used in combination with other approaches (Kwok et al., 2021).

Importantly, SCCT recognizes crisis management as a process spanning three stages: pre-crisis (signal detection, prevention, preparation), crisis event (recognition, response, containment), and post-crisis (evaluation, recovery, learning) (Coombs, 2019). Research has shown that crisis history, severity, and cultural or contextual factors shape how responsibility is attributed and how stakeholders interpret organizational responses (Claeys & Cauberghe, 2014; Su et al., 2021). These dynamics make SCCT both a strategic guide for practitioners and a robust theoretical foundation for examining crises across diverse contexts, including health emergencies like the COVID-19 pandemic.

While SCCT has been widely applied in Western contexts, its assumptions often require adaptation in Global South settings, where digital divides, cultural dynamics, and governance structures shape crisis responses. This sets the stage for the empirical sections, which demonstrate how Indonesia's literacy divides and governance structures complicate attribution and reputational outcomes during COVID-19. For instance, in Indonesia, decentralization and uneven digital literacy complicate the attribution of responsibility, as inconsistent messaging across government levels fosters confusion and distrust (Mietzner, 2020). Similarly, in India, health misinformation has spread rapidly in rural areas with limited internet literacy, highlighting the importance of tailoring strategies to diverse digital competencies (Abdul et al., 2021). In Brazil, political polarization amplified by social media further challenged the credibility of official communication during COVID-19 (Sampaio & Nóbrega, 2025). These cases suggest that while SCCT provides a valuable framework, integrating dimensions of digital literacy and socio-political context is crucial for its effective application in Global South crises.

Overview of CERC

CERC provides a comprehensive framework for managing communication during emergencies. It integrates principles of risk communication—traditionally associated with health campaigns to inform the public about behavioral risks—and crisis communication, which often focuses on reputation management (Reynolds & Seeger, 2007). Developed by the U.S. Centers for Disease Control and Prevention (CDC), CERC emphasizes that risks and crises unfold over time and require a continuous, adaptive communication process (Seeger, 2006).

CERC highlights the dual responsibility of communicators: to explain risks and benefits clearly and to guide public action during emergencies. This involves addressing uncertainty, correcting misperceptions, and providing reassurance to reduce anxiety and build trust (Reynolds & Seeger, 2014).

The model relies on scientific expertise but also stresses empathy, credibility, and respect as essential for maintaining cooperation and resilience.

According to the (Centers for Disease Control and Prevention U.S. Department of Health and Human Services, 2014), six core principles guide CERC practice:

- i) Be First – timeliness is critical, as the first source often becomes the most trusted.
- ii) Be Right – accuracy builds credibility, even when acknowledging uncertainty.
- iii) Be Credible – honesty and transparency are essential to sustain trust.
- iv) Express Empathy – recognizing suffering helps strengthen rapport.
- v) Promote Action – offering clear steps empowers communities and reduces panic.
- vi) Show Respect – respectful engagement fosters cooperation, particularly when people feel vulnerable.

CERC divides crisis communication into five phases, enabling communicators to anticipate evolving information needs (Reynolds & Seeger, 2007):

- a) Precrisis: monitor risks, educate the public, build alliances, and prepare messages.
- b) Initial Event: reduce uncertainty through rapid updates, empathy, and reassurance.
- c) Maintenance: provide ongoing updates, address misinformation, and reinforce self-efficacy.
- d) Resolution: explain recovery efforts, discuss lessons, and strengthen preparedness.
- e) Evaluation: assess the adequacy of communication and integrate findings into future planning.

This lifecycle approach underscores that crisis communication does not end with containment but extends into reflection and reform.

Although widely cited in policy and practice, CERC has received limited theoretical testing. A systematic review by Neville Miller et al. (2021) found that out of 4,471 publications screened, only one directly evaluated a specific principle of CERC. This suggests the model remains more practice-driven than theory-driven. Nonetheless, CERC offers a practical lens for analyzing communication in public health emergencies, where uncertainty, urgency, and emotional responses converge.

In this research, the CERC framework is applied to evaluate the Indonesian central government's communication during the COVID-19 pandemic. By examining how CERC principles and phases were enacted—or where gaps emerged—this study contributes both to empirical evidence for CERC and to refining crisis and risk communication models for contexts characterized by digital divides and complex governance.

While CERC provides a robust framework for structured crisis communication, its applicability in Global South contexts—such as Indonesia, India, and Brazil—requires careful adaptation. These countries share characteristics that can challenge conventional CERC implementation:

1. Digital Literacy and Access: Uneven internet penetration and limited digital literacy affect how populations receive, interpret, and act on risk messages. In Indonesia, rural communities often rely on WhatsApp or local networks, which can facilitate rapid spread of misinformation if official messages are delayed or unclear. Similar patterns are observed in India and Brazil, where digital divides amplify inequities in information access.
2. Governance Complexity: Decentralized and multi-tiered governance structures can create fragmented communication, with central and local authorities issuing overlapping or inconsistent messages. Indonesia's decentralized provinces, India's federal states, and Brazil's municipalities all experience challenges in coordinating timely, coherent communication across jurisdictions.
3. Trust Dynamics: Low institutional trust—shaped by political polarization, past crises, or corruption—modulates public responsiveness to official guidance. CERC's principles of "Be Credible" and "Express Empathy" are especially critical but may require culturally sensitive approaches to resonate in these contexts.

These limitations anticipate the patterns observed in Indonesia's COVID-19 response, where fragmented governance and uneven digital competencies undermined message consistency and public uptake.

Adapting CERC in these settings may involve combining digital literacy campaigns, localized messaging, and multi-channel dissemination strategies to ensure equitable access and enhance comprehension. Comparative insights suggest that incorporating context-specific interventions can strengthen CERC's effectiveness, ensuring that crisis communication not only reaches diverse populations but also fosters engagement and resilience.

These considerations highlight that effective crisis communication in contexts like Indonesia depends not only on structured frameworks such as CERC but also on the population's ability to access, interpret, and act on digital information. Understanding digital literacy—including technical, critical, and participatory competencies—becomes essential for designing messages that reach diverse audiences, counter misinformation, and foster trust and resilience. The following section explores these dimensions in detail, linking them directly to crisis communication effectiveness during the COVID-19 pandemic.

Digital Literacy in Crisis Communication

Digital literacy extends beyond technical skills of accessing online platforms; it also encompasses critical competencies in evaluating information, and participatory skills in engaging with digital dialogues. In the context of crisis communication, these dimensions are crucial in shaping how individuals interpret official messages, resist misinformation, and participate in collective responses. Without adequate digital literacy, citizens may either disengage from official communication channels or fall prey to misinformation, undermining public health measures and eroding trust. As the findings will show, these competencies decisively mediated whether Indonesian citizens complied with, resisted, or reinterpreted official guidance during the pandemic.

Global Insights on Digital Communication During COVID-19

The COVID-19 pandemic highlighted the central role of digital platforms in crisis and risk communication. Guidelines such as the WHO's Emergency Risk Communication Policy (World Health Organization, 2017) and the CDC's CERC Manual (Centers for Disease Control and Prevention U.S. Department of Health and Human Services, 2014) had already underscored the importance of social media in creating situational awareness, dispelling rumors, and facilitating rapid responses. Empirical studies reinforced these points. In the U.S., systematic shifts in online messaging strategies influenced dissemination effectiveness (Sutton et al., 2020), while governors adapted tone and style to maintain engagement (London & Matthews, 2022). Tagliacozzo et al. (2021) showed how agencies in Italy, Sweden, and the U.S. provided tailored, science-based communication to different groups, while Mexico saw a surge in social media engagement with government health agencies during early lockdowns (Sandoval-Almazan & Valle-Cruz, 2021). Across contexts, citizen engagement was shaped not just by content but by interactivity and emotional resonance; dialogic communication and emotionally charged posts drove higher participation (Q. Chen et al., 2020).

These cases underscore the significance of digital literacy: audiences with stronger critical and participatory skills were better able to process scientific information, discern misinformation, and engage constructively in digital dialogues. Conversely, jargon-heavy or inaccessible messaging (Shulman & Bullock, 2020) risked alienating those with lower digital literacy, thereby reducing compliance and trust.

Indonesia's Digital Landscape

In Indonesia, digital platforms—particularly Instagram—were widely used by local governments such as DKI Jakarta and Banten to communicate safety measures and policy updates during the pandemic (Nurfadhilah et al., 2022). However, these campaigns often prioritized institutional reputation over public welfare, limiting their effectiveness as participatory crisis communication tools. Setiawana et al. (2021) further revealed weaknesses in communication preparedness, coordination, and

the use of digital tools at the central government level, highlighting how fragmented approaches weakened crisis messaging. These challenges were compounded by uneven levels of digital literacy across Indonesia's diverse population, which amplified the circulation of misinformation and eroded public trust.

Taken together, the literature demonstrates that digital communication strategies during COVID-19 were only as effective as the public's capacity to critically engage with them. Globally, governments that combined timely, interactive, and emotionally resonant communication with citizen digital literacy support were more successful in building trust and resilience. Indonesia's experience mirrors these findings but also illustrates the risks of fragmented messaging and limited digital literacy capacity, which amplified misinformation and weakened public compliance. This highlights the urgent need to refine crisis and risk communication models by explicitly incorporating digital literacy as a foundation for trust, engagement, and resilience.

To better situate the role of digital literacy in shaping crisis communication outcomes, this study adopts a three-dimensional lens technical, critical, and participatory literacy. Each dimension plays a distinct role in enabling access, fostering trust, and sustaining engagement during health crises.

While the literature on digital literacy highlights its critical role in shaping trust, engagement, and resilience during crises, these dynamics are always embedded within specific national contexts. Understanding how technical, critical, and participatory dimensions of digital literacy play out requires situating them within broader socio-political and infrastructural realities. In Indonesia, where digital adoption is rapidly expanding but uneven, and where governance structures influence the flow of information, the challenges of digital literacy intersect directly with issues of access, trust, and political decentralization. The following section explores Indonesia's digital landscape to illustrate how these contextual factors condition the potential of digital literacy to strengthen—or undermine—crisis communication.

2.6 Toward an Integrated Model

While SCCT and CERC provide robust frameworks for understanding crisis and risk communication, both theories share an implicit assumption: that audiences are able to receive, interpret, and act upon information disseminated by institutions. In practice, this assumption often fails in contexts where digital literacy is unevenly distributed, where misinformation circulates widely, and where trust in institutions is fragile. To refine these frameworks for Indonesia's COVID-19 context, it is therefore necessary to integrate a digital literacy lens that addresses the gap between message delivery and public empowerment.

SCCT emphasizes how stakeholders attribute responsibility and how organizations must respond to protect reputations and maintain trust (Coombs, 2007). However, attribution processes are not uniform: citizens' judgments are mediated by their ability to critically evaluate information sources, cross-check facts, and resist manipulative framing. In low-literacy settings, attribution may rely more heavily on rumor, religious authority, or informal networks, thereby complicating the SCCT logic of response strategies. For example, during the COVID-19 pandemic, vaccine skepticism in Indonesia was not only a function of government missteps but also of the population's limited capacity to distinguish credible from misleading narratives (Ida et al., 2024; Sujarwoto et al., 2023). Integrating digital literacy into SCCT thus highlights that reputational management is contingent not only on organizational actions but also on public competencies in information processing.

CERC offers a temporal framework for how communication must evolve from pre-crisis preparedness to post-crisis recovery (Reynolds & Seeger, 2007). It underscores the importance of clarity, consistency, and empathy at each stage. Yet, as with SCCT, these principles presuppose audiences capable of interpreting and applying risk messages. When digital literacy is low, communication may fail even if messages adhere to CERC guidelines. For instance, early COVID-19 guidelines in Indonesia often reached citizens but were not fully actionable in many settings, due to limited comprehension or contextual mismatch (Handayani & Khoiriyah, 2022). Digital literacy therefore becomes a mediating factor that determines whether CERC principles translate into behavioral change and trust-building.

Combining SCCT and CERC with a digital literacy perspective creates a more holistic understanding of crisis communication. SCCT explains why trust deficits emerge when responsibility is misattributed or mishandled; CERC explains how communication should adapt across crisis stages; and digital literacy explains whether citizens can meaningfully engage with and act on communication. Together, these dimensions highlight that communication effectiveness is not simply a matter of “what” and “when” organizations say, but also of “how” publics are prepared to interpret and respond.

In Indonesia, where digital adoption is rapid but uneven, this integrated framework reveals why government communication struggled to build trust. SCCT points to institutional credibility challenges; CERC highlights inconsistent timing and coordination; and digital literacy underscores the public’s limited ability to resist misinformation. Civil society initiatives such as Mafindo’s fact-checking networks or UNICEF’s RCCE training partially filled this gap, showing that literacy-building can enable publics to become active co-creators of crisis responses rather than passive recipients of information.

This integration lays the foundation for the study’s contribution: a refined crisis and risk communication model for Indonesia that embeds digital literacy at its core. By positioning digital literacy not as an ancillary factor but as a structural condition that enables or constrains SCCT and CERC principles, the model offers both theoretical advancement and practical relevance. For theory, it bridges attribution, temporal communication, and audience capacity. For practice, it highlights the need for governments to pair information dissemination with sustained literacy-building initiatives. For policy, it suggests that resilience in future crises depends as much on empowering citizens as on managing organizational reputations.

Table 2. Integrating SCCT, CERC, and Digital Literacy

Framework	Contribution	Limitation	Role of Digital Literacy	Refined Contribution
SCCT(Coombs)	Explains attribution of responsibility, strategies for reputation repair, and trust management	Assumes publics can assess credibility and assign responsibility	Shapes how citizens evaluate responsibility and trust; low literacy → reliance on rumor, high literacy → critical evaluation	Reputation/trust outcomes depend on digital literacy capacity
CERC(Reynolds & Seeger)	Provides temporal stages (pre-crisis, initial, maintenance, recovery, evaluation) and principles (clarity, empathy, timeliness)	Assumes publics can interpret and act on risk messages	Determines whether messages are understood, contextualized, and actionable	Stage-specific communication succeeds/fails based on literacy levels
Integrated Model	Links responsibility (SCCT) + timing/messaging (CERC)	-	Embeds literacy as a mediating/enabling factor	A holistic model of crisis communication that accounts for trust, timing, and citizen empowerment

The empirical analysis in discussion section illustrates how this integrated model explains Indonesia’s COVID-19 communication trajectory more effectively than SCCT or CERC alone.

METHOD

This section outlines the methodological framework employed in the study. It begins with the research design, followed by a description of data collection methods. The subsequent section discusses analytical strategies used to interpret the data, with reference to the application of SCCT and the CERC framework. The section concludes with limitations and ethical considerations.

Research Design

This study adopts a case study approach, focusing on Indonesia's COVID-19 response. A case study design is appropriate for analyzing complex, context-dependent phenomena where multiple actors, institutions, and communication strategies interact (Yin, 2018). The COVID-19 pandemic provides a global test of public health communication systems, and Indonesia offers a particularly rich case given its archipelagic geography, socio-political diversity, decentralized governance, and uneven levels of digital literacy.

The research design combines qualitative and interpretive elements, reflecting the need to capture both the richness of communication practices and the structural dimensions of public trust, misinformation, and digital engagement. Semi-structured in-depth interviews were the primary method, allowing for in-depth exploration of meanings, narratives, and institutional practices. Documentary evidence, including policy documents and communication materials, provided complementary insights.

This design is explicitly theory-building, linking empirical findings to SCCT and CERC as interpretive lenses. By incorporating digital literacy into this framework, the study develops an Indonesia-specific model of crisis and risk communication.

Data Collection

Interviews

Semi-structured in-depth interviews were conducted with 12 elite informants involving policymakers, experts, and civil society actors involved in or observing Indonesia's COVID-19 crisis communication. These interviews illuminated the lived experience of communication, particularly around issues of trust deficits, misinformation, and adaptation of messages at local levels.

Participants were recruited through purposive sampling, ensuring representation across government agencies, academia, and grassroots organizations. This approach allowed for capturing both institutional perspectives and civic responses. Interviews continued until thematic saturation was reached, meaning no new significant insights were emerging from additional data.

Documentary and Policy Sources

To contextualize interview data, the study examined relevant documentary evidence, including:

- 1) Policy and regulatory mapping of government responses to COVID-19, particularly communication-related decrees and guidelines.
- 2) Official communication outputs, including press releases, public health campaigns, and social media content.

Data Analysis

The study employed a thematic analysis framework (Braun & Clarke, 2006), combining inductive and deductive approaches.

- 1) Inductive stage: initial open coding was conducted to allow themes to emerge organically from the interview and documentary data.
- 2) Deductive stage: emerging themes were then aligned with constructs from SCCT and CERC, ensuring theoretical grounding.

The analysis integrated findings with SCCT and CERC in two stages:

- 1) CERC alignment: communication practices were mapped against CERC's phases—pre-crisis, initial, maintenance, resolution, and evaluation.
- 2) SCCT integration: government responses were assessed in terms of responsibility attribution, reputational management, and corrective action.

Through this mapping, the study identified gaps and opportunities for refining an Indonesia-specific model of crisis communication. A particular focus was placed on digital literacy as a mediating factor shaping trust, compliance, and public engagement.

Limitations and Ethical Considerations

Several limitations must be acknowledged:

- 1) The single-country case study design limits the generalizability of findings, though the insights remain relevant for comparable Global South contexts.
- 2) Interview access was constrained by pandemic-related restrictions and logistical challenges, which may have influenced the breadth of perspectives captured.
- 3) The reliance on documentary and secondary sources for some aspects of policy mapping may have introduced gaps due to incomplete public access to data.

The study adhered to established ethical research protocols:

- 1) Informed consent was obtained from all interviewees.
- 2) Participants were assured of confidentiality and the right to withdraw at any stage.
- 3) Sensitive information—particularly criticisms of government policy—was anonymized to protect respondents from potential political or professional repercussions.
- 4) The study followed the principle of “do no harm”, ensuring interviews and data use did not expose participants to risk.

The methodological approach reflects the complexity of crisis and risk communication during the COVID-19 pandemic. By relying on qualitative interviews, the study captures multiple layers of Indonesia's communication landscape from the perspectives of policymakers, experts, and civil society actors. The integration of SCCT and CERC provides a strong theoretical foundation, while attention to digital literacy ensures responsiveness to the sociotechnical dynamics of the digital age. Despite acknowledged limitations, this design offers a robust framework for refining crisis communication models and generating insights with both scholarly and practical relevance.

Findings

This section presents the empirical findings, structured around the study's research questions. Results are organized thematically to reflect the progression from information dissemination to trust deficits (RQ1), from information delivery to citizen empowerment through digital literacy (RQ2), and the role of data, analytics, and public engagement in shaping crisis response (RQ3). These findings highlight both the opportunities and limitations of Indonesia's COVID-19 communication practices.

From Information Dissemination to Trust Deficits (RQ1)

RQ1 examines how Indonesia's crisis communication evolved from rapid message dissemination to the erosion of public trust. Although the government mobilized communication channels extensively, the absence of integration with digital literacy left citizens unable to critically process or adapt information. Four key themes emerged.

One-Way Communication and Limited Digital Empowerment

Government communication strategies were largely top-down and reactive, limiting their effectiveness. Participant G.2 observed delays and contradictions in early-stage messaging:

"People did not receive clear instructions in the early stages. Messages came late, and they were sometimes contradictory."

Similarly, Participant G.3 highlighted the mismatch between uniform messages and diverse local needs:

"Messages were not adapted to different community contexts. They were uniform and difficult to implement."

These accounts reinforce the perception that government communication prioritized dissemination over dialogue.

4.1.2 Gaps in Digital Literacy and Unequal Access

Digital divides further constrained engagement. Citizens in rural and low-income areas, with limited digital literacy, relied on intermediaries such as community leaders and volunteers to interpret government guidance. This dependency limited agency and contributed to uneven adoption of protective measures.

4.1.3 Misinformation, Media Framing, and Vulnerability to Hoaxes

Participants underscored that weak literacy and communication gaps created fertile ground for misinformation. Participant G.5 pointed to sensationalist reporting:

"News outlets sometimes prioritized drama over clarity, which made the situation worse. Hoaxes spread faster than corrections."

Misinformation on WhatsApp—often framed through religious or conspiratorial narratives—gained traction in the absence of trusted, clear messaging.

4.1.4 Trust Deficits and the Digital Divide

These weaknesses collectively eroded public trust. Inconsistent information fueled skepticism, while digital inequality left marginalized groups disproportionately vulnerable. Trust deficits thus became both a product and an amplifier of communication gaps.

4.2 From Information Delivery to Citizen Empowerment (RQ2)

RQ2 explores how communication practices can shift toward empowerment. Findings emphasize the role of digital literacy programs, media strategies, and civil society partnerships. While promising initiatives emerged, sustainability and inclusivity remained major challenges.

4.2.1 Promoting Digital Literacy Programs

Several initiatives sought to strengthen digital literacy. The *Siber Kreasi* movement, supported by the Ministry of Communication and Information, promoted awareness of misinformation. Participant N.3 explained that such efforts aimed to equip citizens with critical skills:

"Analytics exist. We already have standards for compiling anti-hoax messages... We use IT tools like the Yudhistira system, which serves as both a database and a tracker for alternative narratives."

The RCCE program, developed with UNICEF and Japelidi, provided training and mentoring for local facilitators. Participant G.2 described how the joint task force evolved into RCCE with diverse membership:

"There are representatives from the media, academia, and epidemiology experts."

He further emphasized its broad mobilization strategy:

"RCCE involves the development of many groups, including those based on religion, health, and digital platforms. For example, we mobilize students in Jogjakarta... to create content."

Civil society also played a critical role. Mafindo launched Jawara Internet Sehat and Tular Nalar, with Participant N.3 highlighting inclusive mentoring for the elderly:

"In Tular Nalar, we don't just stop at the education program. There is 1-3 months of mentoring for the elderly. We evaluate cognitive, affective, and behavioral changes."

Despite wide reach, participants noted that vulnerable groups—such as the elderly, people with disabilities, and rural residents—remained underserved:

"Government efforts, like disability-friendly digital features, still fall short in areas like noise reduction for the deaf or font contrast for low-vision users" (N.3).

4.2.2 Media and Digital Platforms in Crisis Communication

Traditional media outlets such as TVRI and RRI reached rural audiences, while digital platforms dominated among younger groups. Yet, Participant G.5 recalled structural limitations:

"Until June 2020 we did not create a public communication strategy... The government could only provide content through BNKP with TVRI and RRI. Private media required payment, and coverage followed their own commercial interests."

The Presidential Staff Office (KSP) used YouTube broadcasts featuring Dr. Reisa and engaged influencers. As Participant A.1 reflected:

"It is good that there are more popular spokespersons, such as Dr. Reisa Broto Asmoro. She can communicate well, but she does not have enough authority. When we use officials, they have authority but often cannot communicate well. When we use influencers, they communicate better but lack authority."

However, tensions persisted between authority and relatability: credible spokespeople enhanced trust but struggled to connect emotionally with everyday concerns. Social media campaigns targeted persistent hoaxes, including vaccine conspiracies and religious misinformation. Yet inconsistent government statements occasionally weakened these corrective efforts.

4.2.3 Civil Society and Fact-Checking Strategies

Fact-checking networks proved vital. Mafindo launched the *Turn Back Hoax* platform and mobilized volunteers to crowdsource reports. Participant N.3 described this role:

"We work closely with the government, which occasionally requests our assistance in debunking and clarifying hoaxes. The government is constrained because of the ASN code of ethics. So we help."

She explained how Mafindo systematized its approach:

"Debunking has a system, including finding original sources, categorizing deception, and promoting transparency."

Collaborations with AJI and AMSI integrated fact-checking into newsrooms. As N.3 noted:

"Mafindo also teaches cooperation with AJI and AMSI to educate journalists on fact checking and create a verification system."

Participants highlighted the value of “pre-bunking” and “infodemic training” to build resilience against misinformation.

4.2.4 Ethics, Risk, and Institutional Coordination

Fact-checking also carried risks, including harassment of volunteers. Participant N.3 recounted:

"Our fact checkers have been victims of doxing several times. Their KTP data, family cards were uploaded on Twitter and misused."

Mafindo responded by establishing an ethics council:

"We have an ethics council that guards and monitor us to ensure that our practices remain ethical and not detrimental. Practices like doxing... are strictly prohibited."

Partnerships with KPCPEN, UNICEF, and Japelidi demonstrated the value of multi-sector collaboration, though participants stressed limits. As N.1 summarized:

"We collaborate with the government. In public health, all programs will not succeed if they are done alone."

4.3 Data, Analytics, and Public Engagement (RQ3)

RQ3 examines how data and analytics shaped crisis communication. Findings show that fragmented systems and political sensitivities constrained effectiveness.

4.3.1 Strengthening Data Infrastructure and Monitoring

The government faced challenges in consolidating COVID-19 data across ministries and agencies. Early on, fragmented systems limited real-time monitoring. Participant G.1 explained the initial gap:

"At first, there was no integration between MoH data and BNPB. Each institution used different formats, and it slowed the decision-making process."

Efforts to integrate data accelerated with the development of PeduliLindungi and the Satu Data initiative, although disparities across provinces persisted. Participant G.2 emphasized the importance of integration:

"Data management is not only about collection, but also coordination across ministries. Without it, crisis communication becomes reactive."

Digital tools such as Yudhistira, mentioned by N.3, provided a basis for monitoring misinformation trends, showing how civil society actors also contributed to data infrastructure.

4.3.2 Vaccine Communication and Public Trust

Misinformation about vaccines required targeted communication strategies. Narratives questioning halal certification and safety dominated early discourse. Participant G.2 noted the need for authoritative framing:

"If religious leaders are not engaged, people will not trust the message. We need ulama and MUI to endorse the vaccines."

Similarly, Participant N.3 recalled cases of hesitancy among vulnerable groups:

"In rural areas, we found mothers refusing vaccines because of hoaxes they saw on WhatsApp. They said it would cause infertility. That was our challenge in Tular Nalar."

Government communication improved after MUI issued a halal ruling and public figures were shown getting vaccinated. Yet, as A.1 reflected:

"The challenge is sustainability. Once the spotlight is gone, misinformation returns."

4.3.3 Public Engagement and Two-Way Communication

Public communication strategies often remained one-way, with limited avenues for sustained dialogue. Participant N.2 highlighted this limitation:

"It's limited, should be sustainable. Public dialogue cannot be just during the peak of the crisis."

Civil society initiatives partially filled this gap by creating feedback loops. Mafindo's mentoring programs, for instance, tracked behavioral change among elderly participants, as N.3 described:

"We evaluate cognitive, affective, and behavioral changes. That's how we know if engagement is working."

Participant G.1 also stressed that engagement requires listening, not only disseminating:

"Communication is not just giving information. Communities must be heard, because they know local needs better."

4.3.4 Analytics and Evidence-based Messaging

The pandemic accelerated the use of analytics to track misinformation, sentiment, and compliance. Participant N.3 explained the tools used:

"Analytics exist. We already have standards for compiling anti-hoax messages... We use IT tools like the Yudhistira system, which serves as both a database and a tracker for alternative narratives."

These insights allowed RCCE actors to tailor messages for different demographics. As G.2 observed:

"For urban youth, short TikTok videos were effective. For rural communities, radio and religious sermons remained more impactful."

However, G.1 warned against overreliance on quantitative dashboards without contextual interpretation:

“Numbers alone don’t tell the story. If trust is low, even accurate data will not change behavior.”

Across RQ1–RQ3, findings reveal a paradox: information was widely disseminated but rarely transformed into empowerment. Citizens lacked the literacy and participatory channels needed to critically engage with messages. While civil society initiatives filled important gaps, weaknesses in government messaging, media coordination, and data management limited their impact. Building resilience requires reframing digital literacy as a core competency, supported by cross-sectoral collaboration, inclusive design, and transparent, data-driven practices. This synthesis directly feeds into discussion section, where these findings are interpreted through SCCT and CERC to construct an Indonesia-specific communication model.

Discussion

This section interprets the findings in light of established crisis communication frameworks and situates Indonesia’s experience within global contexts. By integrating SCCT and the CERC framework, the study refines an Indonesia-specific model that recognizes digital literacy as a mediating factor shaping the efficacy of risk communication. The discussion unfolds in three parts: first, an evaluation of how Indonesia’s practices align with or diverge from CERC and SCCT; second, an argument of digital literacy as the missing link between information dissemination and public empowerment; and third, implications for policy and theory.

Refining Indonesia’s Crisis Communication Model

Indonesia’s digital ecosystem provides both opportunities and challenges for crisis and risk communication. With over 210 million internet users in 2022—representing more than 77% of the population—the country has one of the fastest-growing online populations in the world (APJII, 2025). Social media platforms such as WhatsApp, Instagram, Facebook, and increasingly TikTok serve as the primary channels for news consumption and interpersonal communication. This high penetration rate makes digital platforms critical tools for public engagement during emergencies, yet it also exposes communities to an unprecedented volume of misinformation. Despite this growth, Indonesia continues to face a persistent digital divide, with uneven connectivity, affordability issues, literacy gaps between urban and rural areas. These disparities strongly influenced who could access reliable COVID-19 information and who remained vulnerable to rumors and disinformation.

These structural and cultural conditions directly shaped how Indonesia’s crisis communication unfolded. The country’s decentralized governance gave local authorities significant autonomy in crisis response, often producing fragmented messaging between the central and regional levels. Public trust in government, already volatile due to political polarization, perceptions of corruption, and past inconsistencies in risk communication (Mietzner, 2020), was further undermined by contradictory statements during the pandemic. In this context, digital platforms become more than just information channels; they emerged as contested spaces where citizens negotiated trust, expressed dissent, and mobilized collective action.

Against this backdrop, Indonesia’s COVID-19 communication revealed a persistent gap between message dissemination and public uptake. While authorities relied heavily on one-way messaging through official spokespersons, mass media, and digital platforms, citizen responses often reflected confusion, skepticism, or selective adoption. In SCCT terms, this weakened the government’s ability to position itself as a trustworthy crisis manager; in CERC terms, the transition from pre-crisis to initial response was hindered by fragmented messaging and the absence of pre-established trust. Mapping Indonesia’s response against CERC’s stages highlights these weaknesses: limited signal detection and preparation left communication reactive; early dissemination was rapid but not sufficiently contextualized; and inconsistent statements eroded credibility. Only during the resolution stage did messaging partially stabilize, though damage to trust had already constrained compliance.

The Indonesian experience thus underscores that technical dissemination alone does not suffice. Without mechanisms to embed messages into citizen practice, communication remains performative rather than transformative. This shortfall highlights the importance of citizen competencies—an issue developed further in the next section.

Digital Literacy as a Mediating Factor

A central contribution of this study is the recognition of digital literacy as a mediating layer between message delivery and citizen empowerment. The findings show that information circulated extensively but was not consistently translated into action, particularly in low-literacy contexts. Literacy determined whether citizens could evaluate sources, cross-check facts, and resist manipulative framing. Where literacy was low, misinformation flourished, and government narratives were met with suspicion.

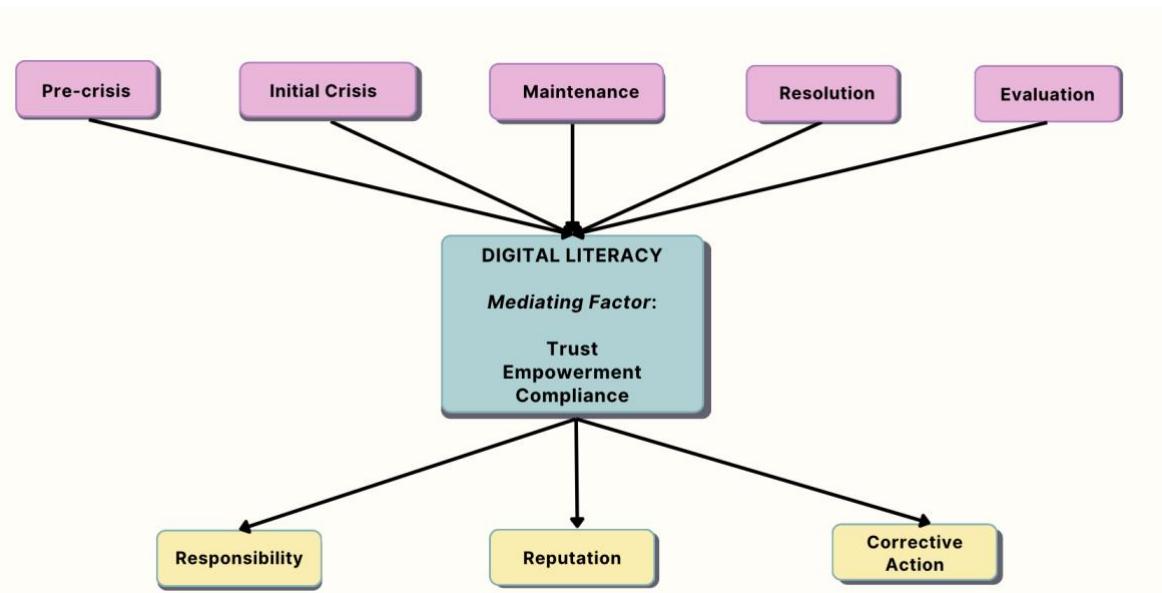
This reframing extends both SCCT and CERC. SCCT largely emphasizes organizational response strategies, while CERC highlights phases of crisis messaging. Neither, however, adequately accounts for the role of citizen competencies in filtering and applying information. By inserting digital literacy as an intervening mechanism, this study bridges that theoretical gap: risk communication is not merely about what is said and when, but also about citizens' capacity to interpret and enact guidance.

The mediating role of literacy is further illuminated by comparative cases. In Bangladesh, health communication during COVID-19 faltered where literacy gaps were pronounced, limiting compliance despite extensive government dissemination (Islam et al., 2025). In India, rapid digital expansion has been accompanied by persistent rural-urban divides and challenges in combating health misinformation (Abdul et al., 2021; Ganesan, 2022). Nigeria faced parallel struggles where uneven connectivity and low institutional trust complicate pandemic messaging (Ihekweazu et al., 2022). Brazil also illustrates how political polarization and social media reliance amplified misinformation during COVID-19 (Sampaio & Nóbrega, 2025). By contrast, Gulf states leveraged centralized authority and digital penetration to achieve compliance (Elhersh et al., 2024), while China relied on top-down enforcement (Guo et al., 2025) and South Korea built compliance through data transparency and participatory campaigns (Y. Chen et al., 2025). These cases demonstrate that digital literacy is not a universal remedy but operates within broader governance and cultural contexts. Indonesia thus occupies a middle ground: strong civil society innovation but weaker institutional uptake within formal crisis governance.

Policy and Theoretical Implications

Theoretically, the study advances crisis communication scholarship by positioning digital literacy as a mediating factor within SCCT and CERC. This reframing clarifies why extensive dissemination may fail to generate compliance: without literacy, messages remain inert signals rather than actionable knowledge. Incorporating literacy thus refines SCCT's focus on response strategies and enriches CERC's temporal stages by emphasizing citizen capacity at each phase.

For policy, three implications stand out. First, transparency in data provision is critical; trust depends not only on message consistency but also on the availability of reliable, contextualized information. Second, literacy initiatives should be embedded within crisis preparedness, equipping citizens to critically engage with digital content before crises occur. Third, participatory platforms can strengthen engagement, allowing citizens not only to receive but also to interrogate and contribute to crisis narratives. Together, these measures move beyond one-way dissemination toward a model of communication as co-production, where credibility and compliance emerge from interaction rather than imposition.

Figure 1. Crisis and Risk Communication Model for Indonesia's COVID-19 Response

As shown in Figure 1, the model underscores that digital literacy functions as the enabling layer through which trust, empowerment, and data integration are operationalized across the crisis cycle.

CONCLUSION

This study set out to examine Indonesia's crisis and risk communication during the COVID-19 pandemic, with particular attention to how information dissemination, digital literacy, and trust intersected in shaping public engagement. Drawing on insights from SCCT and the CERC framework, the analysis revealed both structural weaknesses and emergent opportunities in Indonesia's response. This section synthesizes the key findings, outlines the study's contributions to theory, practice, and policy, acknowledges its limitations, and identifies directions for future research.

The findings highlight a paradox in Indonesia's COVID-19 communication: information was widely disseminated, yet it failed to empower citizens. Government strategies emphasized one-way messaging, delivered primarily through official spokespersons, mass media, and digital platforms. While this approach aligned with CERC's emphasis on rapid dissemination during the initial crisis stage, it fell short of SCCT's expectation that communication should address stakeholder concerns and reputational accountability. Messages were often delayed, overly uniform, and insufficiently tailored to local realities, which exacerbated trust deficits.

Digital literacy emerged as a central mediating factor in shaping how citizens received and acted upon crisis information. Communities with limited literacy skills struggled to evaluate the credibility of information, leaving them vulnerable to misinformation, religiously framed narratives, and conspiracy theories. Civil society initiatives, such as Mafindo's fact-checking work and UNICEF-Japelidi's digital literacy programs, provided important counterweights through participatory and mentoring-based approaches. However, these initiatives remained fragmented, underfunded, and insufficiently embedded within formal crisis governance structures.

The study also found that the production and use of data shaped both communication strategies and levels of trust. Civil society platforms such as Lapor COVID-19 generated valuable crowd-sourced data, but discrepancies with official figures eroded credibility and created confusion. While social media monitoring and tools such as Google Trends offered some insights into public sentiment, they lacked predictive capacity. In the absence of transparent and interoperable systems, government communication remained reactive rather than anticipatory.

Comparative insights reinforced the global significance of digital literacy. Experiences from Bangladesh, the Gulf states, China, and South Korea underscored that low literacy weakens compliance

and trust, while robust, institutionalized literacy programs strengthen resilience. Indonesia occupies a middle ground, with strong innovation from civil society but weaker institutional uptake within state-led crisis management.

6.1 Limitations

Despite its contributions, this study has several limitations. First, the empirical focus on Indonesia constrains the generalizability of its findings. While comparative references were incorporated, they were used illustratively rather than grounded in primary fieldwork. Second, the study relied primarily on qualitative interviews. While providing rich insights, this approach did not capture quantitative dynamics of message reach, compliance, or sentiment shifts. Third, because the COVID-19 pandemic remains an evolving phenomenon, the perspectives gathered may reflect a particular temporal stage rather than long-term dynamics.

6.2 Recommendations

Future research could build on this study in several ways. First, comparative studies across countries would enable systematic analysis of how digital literacy mediates crisis communication across diverse political, cultural, and technological contexts. Contrasting democratic, semi-authoritarian, and authoritarian systems could reveal how different governance arrangements balance transparency, control, and citizen empowerment. Second, longitudinal research is needed to track how trust, compliance, and literacy evolve across multiple waves of a crisis—or across successive crises. This would shed light on whether digital literacy initiatives produce sustained improvements in resilience or whether their effects diminish over time. Third, mixed-methods approaches could enrich future scholarship by integrating survey-based measures of public trust, behavioral compliance, and digital practices with qualitative insights into meaning-making and institutional dynamics. Combining big data analytics (such as social media sentiment or mobility tracking) with ethnographic accounts would offer a more holistic understanding of crisis communication. This study demonstrates that crisis communication cannot be reduced to message dissemination; it must be understood as a co-produced process in which digital literacy, transparency, and inclusion determine whether information becomes resilience.

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