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Social Media as an Early Crisis Communication Channel: A Virtual Ethnography of a Community-Based Instagram Account During Flood and Landslide Disasters in the Gayo Highlands, Aceh

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Abstract

Background: With growing reliance on digital platforms during emergencies, social media increasingly functions as an early crisis communication channel, particularly during sudden-onset natural disasters like the floods and landslides in the Gayo Highlands, Aceh. Community-based accounts play a pivotal role in disseminating real-time information and shaping public understanding during the acute phase of a crisis.

Objective: This study explores how a local community Instagram account, @explore****, functions as an early crisis communication tool, examining its operational dynamics during the initial phase of the disaster.

Methodology: A qualitative approach rooted in virtual ethnography was adopted, analysing the production, distribution, and meaning-making of crisis communication. Data were gathered through passive participant observation, archival documentation of posts, and user interaction analysis conducted between 26 November and 31 December 2025.

Results: The findings revealed three key dimensions regarding how community-based communication strengthens social resilience and public trust. First, social media operated as a collective coordination space that significantly enhanced local situational awareness. Second, visual and textual narratives fostered digital solidarity while actively reflecting Gayo cultural identity. Third, digital spaces served as symbolic arenas that articulated local identity within a broader national context.

Conclusion: The study concludes that community-based social media platforms serve as both critical information channels and cultural-participatory spaces. During early crisis phases, they actively enhance collective resilience and build communicative legitimacy.

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Unique Contribution: This research theoretically extends the Social-Mediated Crisis Communication (SMCC) model by integrating local cultural and participatory dimensions into established frameworks. Practically, it provides actionable insights for disaster management agencies on how to integrate local digital networks into official early warning systems.

Key Recommendation: It is recommended that disaster management administrators formally partner with established community-based digital networks to streamline real-time communication during emergency situations. Furthermore, agencies should leverage local cultural narratives and digital solidarity spaces to cultivate public trust and enhance regional community resilience.

Keywords: Disaster communication; early crisis communicator; Gayo Highlands; flood disaster; virtual ethnography; social media; community resilience

Introduction

Disaster communication has become a key focus in crisis studies, particularly with the rise of social media as a real-time information hub. Natural disasters, once mediated mainly through institutional channels, are increasingly shaped by citizen-driven communication that influences how crises are experienced and responded to. In Indonesia, hydro-meteorological disasters like floods and landslides have grown in frequency and impact, affecting social, economic, and informational systems. The November 2025 flood and landslide in Sumatra exemplified this, as prolonged heavy rainfall caused river overflows, slope failures, and damage to critical infrastructure. The resulting isolation disrupted mobility and logistics, creating an information vacuum that limited the flow of accurate updates to the public (BNPB, 2025).

This situation is particularly critical in the Gayo Highlands, a mountainous region characterized by steep slopes, high rainfall intensity, and limited transportation infrastructure, making the area highly vulnerable to hydro-meteorological disasters such as floods and landslides. The geographical condition of dispersed settlements across mountainous terrain often results in physical isolation during disasters, increasing the community's dependence on digital communication for real-time information and coordination. Therefore, the environmental and geographical vulnerability of the Gayo Highlands reinforces the urgency of examining crisis communication practices in this region.

Instagram serves as a key medium for early crisis communication (Coombs, 2024; Gao et al., 2025). Unlike traditional media, community accounts provide faster, firsthand information with emotional impact. Instagram allows public sharing and real-time visual updates, unlike WhatsApp or Facebook. Yet, studies rarely examine local social media's role in Indonesia, focusing mostly on institutions. This gap calls for exploring how citizen-led platforms support coordination, empathy, and collective meaning, especially in vulnerable areas like the Gayo Highlands, where infrastructure limits official communication. Community accounts thus act as emergent crisis communicators within decentralised networks (Fathi & Fiedrich, 2022; Mirbabaie et al., 2020).

This study is grounded in disaster and crisis communication theories, which view disasters as socially mediated events shaped by communication, trust, and public interpretation. Within this

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framework, social media functions as a participatory infrastructure for collective sense-making and crisis response. The central research question is how Instagram operates as an early crisis communicator during the flood and landslide disaster in the Gayo Highlands, particularly in Aceh Tengah, Gayo Lues, and Bener Meriah. The study examines how information is produced, interpreted, and shared in the early phase of a disaster, and how these practices contribute to public awareness and collective response.

This research proposes that community-based social media accounts can generate situational awareness more rapidly than official channels, especially in geographically vulnerable and infrastructurally limited areas. Rather than testing statistical hypotheses, it develops an analytical proposition that community-driven digital communication complements, and sometimes precedes, institutional communication. The study also explores how the account manages credibility and mitigates misinformation during the chaotic early phase. By focusing on a local community account, it highlights the dynamics of digital participation and symbolic interaction in virtual spaces, contributing theoretically through virtual ethnography and practically by demonstrating the role of community-based social media as a complementary early crisis communication infrastructure.

Literature Review

Disaster communication theory views disasters as social events shaped by communication processes, media narratives, and public interpretation. Crisis communication aims to reduce uncertainty, build trust, and support decision-making during emergencies. These perspectives underpin Social-Mediated Crisis Communication (SMCC), which explains how digital media enable decentralised meaning-making during crises. Social media, in particular, enhances information access, situational awareness, and civic participation. Platforms such as Volunteer and Technical Social Media (VOST) and organisational accounts improve coordination and public trust (Fathi & Fiedrich, 2022; Lee et al., 2021), while crisis-affected individuals use digital networks to share and verify information. However, most research focuses on institutional or international contexts, leaving the role of grassroots, community-driven communication—especially in developing countries—underexplored, despite its potential to support local resilience and collaboration (Bonati et al., 2023).

This study addresses this gap by examining early-stage digital crisis communication led by local communities in disaster-prone areas, highlighting how cultural context, emotional expression, and credibility shape participatory communication. Integrating digital media research, crisis communication, and virtual ethnography, it analyses interaction patterns within a community-based Instagram network during a disaster. The study shows how local platforms function as early crisis communicators, connecting communities and institutions through rapid, collaborative, and emotionally engaged communication. By extending SMCC theory to include ritual communication and community resilience, the research demonstrates that social media operates as a collaborative space for meaning-making, coordination, and collective identity formation during disasters.

In recent years, short-video features such as Instagram Reels and Instagram Stories have transformed crisis communication into a more immediate, visual, and participatory practice.

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Studies indicate that social media functions as a real-time situational awareness system during disasters, enabling communities to share information, coordinate assistance, and inform the public and authorities in the early stages (Gopal et al., 2026; Gao et al., 2025). Short-video formats enhance engagement and emotional response through visual storytelling and real-time documentation (Coombs, 2024). Instagram Reels and Stories enable rapid visual narratives that disseminate information while building emotional connection and collective response (Gelgel et al., 2023). In disaster contexts, these multimodal features facilitate reporting, urgency expression, and assistance mobilisation, reflecting a shift toward multimodal, affective, and community-driven real-time crisis communication, particularly in geographically vulnerable regions where official information is often delayed.

Methodology

This study employs a qualitative approach using virtual ethnography to examine digital communication practices in online disaster contexts. Virtual ethnography extends classical ethnography into digital environments, enabling the analysis of symbolic and communicative behaviour within online communities. This approach was chosen because the disaster limited physical access to affected areas, making virtual observation a feasible and ethical method for examining how information and meanings circulated within the community's social media ecosystem.

This study is informed by the Social-Mediated Crisis Communication (SMCC) model and Networked Gatekeeping Theory, which explain how information flows, is filtered, and gains visibility in digital crisis environments. Within this framework, users, account administrators, and followers act as decentralised gatekeepers who shape the production, amplification, and validation of crisis information. Following Borkovich (2022), the methodological approach emphasises interpretive observation and symbolic meaning-making in digital environments.

The study uses both primary digital data and secondary sources. Primary data were collected from a community-based Instagram account that disseminated crisis information during the flood and landslide events in the Gayo Highlands (Aceh Tengah, Gayo Lues, and Bener Meriah) from November 26 to December 31, 2025. The dataset includes photos, videos, captions, timestamps, and user interactions. Secondary data from online news, government announcements, and verified institutional accounts were used for triangulation and contextualization. Following Beesley and Mount (2022), these digital traces are treated as ethnographic artefacts reflecting collective behaviour, emotional expression, and meaning-making in online crisis communication.

To ensure ethical compliance in digital research, all user data was anonymised and analysed at the collective level rather than the individual level. Usernames and identifiable information were not recorded, and no traceable direct quotations were used. The study employed passive observation only, without interacting with users or influencing online discussions. These procedures follow established ethical guidelines for virtual ethnography, particularly regarding privacy protection and non-intrusive observation in sensitive contexts such as disasters.

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Data were collected via passive observation, digital archiving, and ethnographic notes. Passive observation monitored online activities without intervention, ensuring ethical compliance. Web-archiving tools preserved content, while observation logs recorded media type, themes, engagement, and context. Data included informational posts (warnings, updates, aid coordination) and affective posts (empathy, solidarity, emotions). Ethnographic notes captured contextual and reflexive insights. This multimodal approach integrated textual, visual, and interactive data (Oechslen, Mao, & Repenning, 2025).

To ensure analytical rigor, data were selected based on the following criteria: posts published during the crisis period, disaster-related content, posts with at least 20 interactions, and geotagged or identifiable content from the Gayo Highlands. Promotional content, spam, hate speech, and unverifiable sources were excluded.

In addition to participant observation and digital documentation, this study examined visible engagement on Instagram, including likes, comments, shares, views, and the tone of user responses. These indicators served as ethnographic data to analyze public attention, emotional reactions, information verification, and participatory interaction, revealing how meaning and situational awareness were collectively constructed during the early disaster phase. Only data meeting the inclusion criteria were thematically coded and interpreted. The unit of analysis is crisis communication practices on the community-based Instagram account, encompassing multimedia posts and captions, user engagement, and recurring narrative themes. In virtual ethnography, the "subject" is understood as a relational network, making the account a collective phenomenon shaped by local identity, emotional expression, and civic participation.

Data were analysed using thematic, narrative, and visual analysis through methodological triangulation. All three analytical lenses were integrated through methodological triangulation to ensure interpretive validity. The analytical process followed the interactive model by Miles et al. (2014), which encompasses data reduction, data display, and conclusion drawing. This cyclical process enabled iterative reflection between data interpretation and contextual understanding.

By integrating thematic, narrative, and visual analyses, the research uncovers how digital communication mediated social understanding and collective action during the crisis. This methodological framework aligns with Bonati et al. (2023), emphasising the potential of community-led digital platforms to foster resilience, participation, and meaning reconstruction during disasters.

Results

This section presents findings from a virtual ethnography of the community-based Instagram account during the Gayo Highlands flood and landslide (Nov 26–Dec 31, 2025). Thematic, narrative, and visual analysis identified three main themes: (1) social media as a space for

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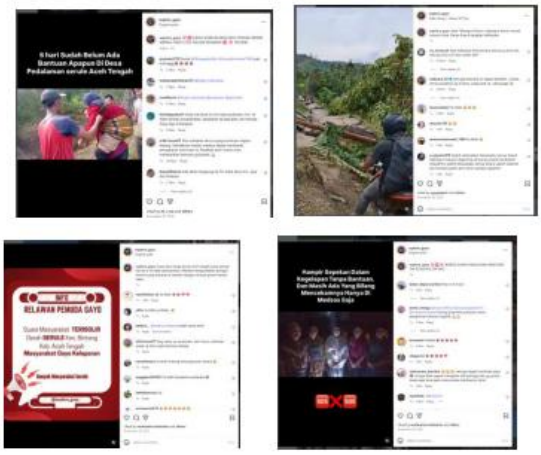
collective coordination, (2) digital empathy and solidarity, and (3) symbolic transformation of local space into a national public arena.

The first theme shows that the Instagram account acted as an early crisis communicator, linking residents, volunteers, and official agencies. About 43% of posts provided situational updates, including flood reports, accessibility, and safety instructions, illustrating rapid-response communication. Most posts combined text and visuals—maps, infographics, and short videos—enhancing public comprehension and engagement. For example, on November 28, 2025, a post reported that a landslide had blocked access to a rural area and included a call for volunteers and logistical support. Through the comment thread, users coordinated transportation and basic supplies, and a follow-up post confirmed that volunteers had reached the affected area. This case illustrates how Instagram functioned as a coordination hub that facilitated real-world community assistance.

Figure 1. The community-based account Instagram Posts During the Gayo Highlands Flood and Landslide (Nov–Dec 2025)



*Source: Screenshot documentation from the community-based Instagram account @explore****, collected by the author (2025).

The posts in Figure 1 illustrate how the community account functioned as an early crisis communicator by sharing real-time updates, documenting local recovery efforts, organising volunteer actions, and expressing digital empathy. These visuals reflect the shift from information sharing to emotional solidarity and collective coordination, showing how social media became a participatory space for crisis communication and community resilience.

Furthermore, user engagement patterns revealed that 62% of all comments appeared within two hours of a post being published, suggesting a *real-time response cycle* consistent with Mirbabaie et al. (2020) model of *social-mediated crisis communication*. This responsiveness demonstrates how citizen-driven media networks can function as decentralised systems for information verification and coordination when official communication channels are delayed or disrupted

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(Bubendorff et al., 2021). Visual posts depicting volunteers, children, or post-disaster landscapes generated the most interaction, often accompanied by captions combining religious expressions and local idioms such as *"kuat beu Gayo!"* (stay strong, Gayo).

This affective discourse reflects the intertwining of local cultural identity and emotional resilience. Similar to Bonati et al. (2023), who found that social media fosters *post-disaster social recovery* by reinforcing communal ties (Bonati et al., 2023), the @explore**** case shows that emotional expression online acts as a collective coping mechanism. In addition to empathy, users also organised digital solidarity actions, including donation drives, volunteer recruitment, and information sharing. This participatory activism parallels (Bonati et al., 2023) argument that technological mediation enables multi-stakeholder coordination during crises.

The third finding concerns the symbolic redefinition of local digital spaces. During the observation period, the followers grew from 71,000 to 96,200, indicating increased national attention. Content analysis revealed a transformation in the account's role from tourism promotion to public crisis representation. This *symbolic expansion* resonates with Giménez-Llort's (2021) study of viral video ethnography, which demonstrated how digital content can serve as an *emotional catharsis* across communities during collective stress (Giménez-Llort, 2021).

In the Gayo context, collaborations between the community-based Instagram account and institutional accounts such as @bpbd_**** and @****bencana.id formed an interconnected communication network that bridged local, regional, and national actors. This participatory model signifies a shift from top-down institutional communication to *networked citizen communication*, consistent with Snoussi's (2020) notion of social media as a *"lifeboat of communication"* during emergencies (Snoussi, 2020).

The analysis identified three temporal participation phases: Emergency phase (first 24 hours) dominated by warnings and real-time situational updates. Early recovery phase (days 2–7) – marked by empathetic narratives and calls for collective aid. Reflexive phase (weeks 3–5) – characterised by evaluative discourse and policy critique.

Table 1. Types of Content Posted by the Community-Based Instagram Account During the Disaster Period

Content Type	Description	Communication Function
Situational Updates	Flood reports, landslide locations, weather warnings, and affected areas	Early warning and situational awareness
Infrastructure Information	Road closures, bridge damage, accessibility updates	Mobility coordination and logistics planning
Victim and Evacuation Information	Information about affected residents, evacuation needs, and safe locations	Public awareness and emergency response
Donation and Aid Requests	Fundraising information, logistics needs, supply shortages	Resource mobilization
Volunteer Coordination	Calls for volunteers, transport assistance, and field coordination	Collective action and rescue support

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Empathy and Solidarity Posts	Prayers, encouragement, emotional messages	Emotional support and social solidarity
Recovery and Rehabilitation Updates	Cleaning activities, rebuilding, and community recovery	Post-disaster recovery communication
Reposts from Institutions	Information from BPBD, NGOs, government	Information verification and institutional linkage

Table 1 indicates that early posts were dominated by situational updates, infrastructure information, and urgent logistical needs, highlighting the account's role in real-time awareness and coordination. As the crisis evolved, content shifted toward donation, volunteer coordination, and emotional support, and later toward recovery and evaluation. This pattern reflects the account's dual function as an information hub and a platform for collective action and social solidarity.

This finding aligns with Bubendorff et al. (2021), showing how participation stabilises information flows. Additionally, 31.3% of posts involved tagging or reposting, indicating a decentralised communication structure and supporting Mustofa et al. (2022) on civic engagement in digital disaster discourse. Visual analysis revealed three dominant types of imagery: suffering, collective action, and recovery. The first type dominated during the initial days, portraying destruction and human distress. As the crisis evolved, visual themes shifted toward collective action documenting rescue efforts and volunteer work and eventually toward recovery, depicting environmental restoration and community rebuilding. These transitions align with Maier et al. (2019) argument that visual crisis communication often evolves from depictions of tragedy to symbols of recovery and collective memory (Maier, et al. 2019).

In the post-disaster phase, the role of local influencers and community account administrators became increasingly important in shaping resilience narratives. Through visual storytelling, captions, and the selection of recovery-related content, the administrators did not merely report events but also constructed narratives of hope, solidarity, and collective recovery. Posts showing rebuilding activities, volunteer collaboration, and the return of daily community life gradually shifted the communication tone from emergency response to resilience and recovery. In this sense, community administrators functioned as grassroots influencers who helped shape collective memory and public perception of the disaster, transforming digital communication into a space for emotional recovery, social cohesion, and ecological awareness.

In Gayo's case, visuals frequently featured *bendera (flag)*, *pakaian adat (local dress)*, and local language captions, underscoring the community's cultural identity and resilience. Such visual semiotics not only reflected the locality's emotional tone but also symbolised the cultural continuity that underpins social recovery.

Sentiment analysis of 5,421 public comments revealed that positive sentiments (support, empathy, prayer) accounted for 54.6%, followed by negative sentiments (criticism toward government response) at 28.9%, and neutral expressions at 16.5%. Moreover, comments directed at government-affiliated accounts tended to express more negative sentiment, while interactions with community accounts reflected predominantly positive emotions. This asymmetrical trust pattern

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highlights the public's greater confidence in peer-generated content than in institutional communication.

Figure 2. Digital Community Crisis Communication Model

Source: Developed by the author based on thematic, narrative, and visual analysis of digital ethnographic data (2025)

This conceptual model, illustrated in Figure 2, shows the cyclical and interactive nature of community-based crisis communication on social media. The inner Informational Layer represents the dissemination of situational updates and logistical data that establish initial awareness during a disaster. The middle Affective Layer captures emotional engagement expressions of empathy, solidarity, and local identity that transform information into shared meaning. The outer Coordinative Symbolic Layer reflects collective action and cultural representation, where communication becomes a vehicle for organising relief efforts and reaffirming community resilience. The bidirectional arrows between layers indicate dynamic feedback loops: information fuels emotion, emotion drives coordination, and coordination generates new symbolic narratives. Together, these layers form an evolving digital ecosystem in which crisis communication operates not as a linear flow of messages but as a process of collective meaning-making and identity reconstruction within the Gayo digital community.

In summary, the analysis identified that social media, particularly Instagram, through local community accounts fulfilled three primary crisis communication functions: (1) facilitating early situational awareness and information dissemination, (2) fostering emotional solidarity and empathy, and (3) transforming local cultural narratives into national representations of resilience. These findings demonstrate that social media platforms serve as both communicative and symbolic infrastructures that sustain collective understanding and response during disasters.

This study reaffirms social media's role as an early crisis communicator, particularly when physical infrastructures are disrupted. The Instagram account illustrates how community-based platforms function as decentralised systems supporting early warning, situational awareness, and collective coordination. Aligned with SMCC theory, the findings show that citizen-driven media

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become primary information agents in the early disaster phase, effectively complementing or even substituting official communication channels.

A comparison with BPBD social media posts during the same period shows that institutional accounts mainly shared formal reports and official instructions, while the community account provided faster on-site updates and logistical information during the first 24 hours. This suggests that community media excel in speed and situational reporting, while institutional communication provides verification and authority, indicating the need for more integrated communication between the two.

This study aimed to understand how social media functions as an early crisis communicator during the Gayo Highlands flood and landslide. Thematic findings—collective coordination, digital empathy, and symbolic transformation—show that disaster communication operates as a social process mediated by symbols, meanings, and interactions. Within the SMCC framework, @explore**** illustrates decentralised crisis authority, where legitimacy derives from peer credibility, local proximity, and participatory trust rather than institutional power, supporting Stewart's (2025) STREMII model of social listening and responsive engagement. Communication dynamics reveal a grassroots network integrating emotional engagement with informational accuracy. Visual storytelling and linguistic expressions of solidarity create a hybrid model combining rational updates with affective narratives, reinforcing public trust, as emphasised by Mirbabaie et al. (2020).

In the context of the Gayo Highlands, this hybrid communicative model is shaped by both technological affordances and cultural sensibilities. The use of local expressions such as *"kuat beu Gayo"* (stay strong, Gayo) illustrates how *vernacular digitality*, the blending of local language and online discourse, functions as a marker of collective resilience. This resonates with Schweinsberg et al. (2020) finding that crisis narratives often interweave cultural identity with emotional recovery, transforming communication into a form of symbolic healing.

Contrary to Snoussi (2020), who identified challenges in the reliability of citizen-generated content, the case of @explore**** suggests that *peer validation mechanisms* through comments, tagging, and content sharing can serve as organic fact-checking systems. This participatory verification process mirrors Bubendorff et al.(2021) findings on *collaborative information authenticity* in crisis environments. Furthermore, unlike the predominantly urban focus of prior research, this study contributes a rural and peripheral perspective by highlighting how geographically isolated communities adapt to technological infrastructures to sustain communication continuity.

Theoretically, this study contributes to the expansion of SMCC theory by incorporating two new dimensions: (a) the *cultural affective dimension*, which recognises that emotional expression and local identity are not peripheral but central to meaning-making in crisis communication; and (b) the *participatory network dimension*, which emphasises the co-production of crisis knowledge through horizontal information flows. By integrating these elements, the study refines the SMCC model into a more contextually grounded framework that acknowledges the role of *community resilience* and *digital solidarity*.

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Practically, these insights hold implications for disaster management agencies and policymakers. First, they underscore the necessity of integrating community-based digital actors into official crisis communication ecosystems. Local social media accounts such as @explore**** can function as early nodes in a distributed warning system, bridging the information gap between authorities and citizens. Second, training and collaboration initiatives could enhance the capacity of these community platforms in verification, risk framing, and multilingual dissemination essential components for accurate crisis communication in multiethnic regions like Aceh.

Figure 3. Digital Crisis Communication Ecosystem

Source: Developed by the author based on empirical findings and the Social-Mediated Crisis Communication (SMCC) framework (2025).

This model illustrates in Figure 3 the networked structure of crisis communication mediated by the community-based Instagram account during the flood and landslide disaster in the Gayo Highlands, Aceh. The diagram depicts five interconnected actors: citizens, volunteers, local authorities, national media, and the community media hub engaged in reciprocal information and emotional exchange. The ecosystem highlights how communication flows are decentralised, participatory, and culturally embedded, transforming local crisis narratives into collective digital action. It also demonstrates the hybrid role of social media as both an informational intermediary and an affective platform for solidarity and coordination, extending the *Social-Mediated Crisis Communication (SMCC)* framework into a community-centred context.

Despite its contributions, this study has limitations. Focusing on a single digital community restricts generalizability, and as a virtual ethnography, it relies on publicly available traces, missing private or closed-network communications. Data collection over five weeks may also overlook longer-term post-crisis dynamics, reflecting common challenges of representativeness in digital ethnography (Beesley & Mount, 2022).

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The findings suggest directions for future research, including comparative virtual ethnographies across regions, quantitative sentiment and network analyses to study information diffusion and emotional contagion, and integrating computational tools with qualitative insights to improve early crisis detection (Andersen et al., 2025). Practically, policymakers could foster partnerships between official agencies and local digital communities to develop adaptive, culturally resonant crisis communication frameworks. In conclusion, this study highlights that resilience in digital ecosystems is both social and cultural; the case of @explore**** shows that effective disaster communication relies not only on accurate information but also on shared meaning, emotional resonance, and collective enactment of care.

Conclusion

This study demonstrates that community-oriented social media, such as @explore****, act as vital early-stage crisis communicators during disasters. Using virtual ethnography, the research shows that digital communication not only disseminates information but also fosters collective understanding, empathy, and coordinated action. Key findings indicate that social media enables rapid group coordination, combines visual and textual content to build online solidarity, and transforms into symbolic spaces for expressing communal identity and social cohesion. Theoretically, the study extends the Social-Mediated Crisis Communication (SMCC) framework by integrating cultural and collaborative dimensions, illustrating how emotion and regional identity shape disaster response. Methodologically, it confirms virtual ethnography as effective for analysing online communication in remote or infrastructure-limited areas. Practically, these results highlight the importance of integrating community-led digital participants with formal disaster communication systems, enabling faster, verified, and reliable information flow. Overall, the research underscores that crisis communication transcends information sharing, involving relationship-building, collective meaning-making, and sustaining community resilience through shared narratives of perseverance and optimism.

Declaration

AI Use Statement: During the preparation of this work, the author used ChatGPT generative artificial intelligence (AI) for language editing and clarity improvement only. The AI tool did not contribute to data analysis, interpretation of results, or the development of scientific conclusions, and the author takes full responsibility for the content of this article.

Data Availability Statement: Data supporting the findings of this study are available from the corresponding author, Rudianto Rudianto, upon reasonable request.

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Conflict of Interest: The author states that they have no competing financial interests or personal relationships that could influence the work reported in this paper.

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Ethical Approval: This study was conducted in accordance with the ethical guidelines for internet research and Instagram's Terms of Use. Because the study analysed publicly available Instagram content using virtual ethnography and passive observation without accessing private data, interacting with users, or collecting personal identifiers, formal institutional ethical approval and informed consent were not required.

Author Contributions: Rudianto Rudianto designed the research, conducted data collection, analysed the data, and wrote the paper. The author has read and approved the final version.

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