

## RESEARCH ARTICLE

# Prioritizing Factors in Social Media Crisis Communication for Resilience Enhancement Using Analytical Hierarchy Process

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**ABSTRACT** In today's era dominated by social media, crisis communication has become increasingly complex in the evolving landscape of crisis management, shaped by globalization and technological advancements. The pivotal role of social media in facilitating information seeking and sharing during crises underscores the need to identify factors that enhance resilience in crisis communication. As a result, the study presented herein delves into the intricate interplay between information-seeking, information-sharing, and social media usage factors, examining their influence on resilience within the context of crisis management. Utilizing the Analytical Hierarchy Process (AHP), the research creates a comprehensive hierarchical model of these factors and elucidates their priorities through expert pair-wise comparisons. The results reveal that information-seeking factors dominate the ranking, highlighting the paramount importance of understanding how individuals seek and engage with information during crises. Specifically, the findings suggest that factors such as media choice, crisis type, and trust play pivotal roles in resilience building during crisis situations. In the realm of information sharing, the study underscores the significance of factors like sentiment, authority, and relevance in shaping the resonance and effectiveness of shared content. Moreover, the analysis unveils the outcomes of social media usage factors, spotlighting elements such as media exposure, uncertainty, and involvement, and showcasing their role in driving individuals' engagement with crisis-related content on social platforms. By leveraging the AHP methodology, this research unravels the priorities of factors that underpin the efficacy of Social Media Crisis Communication (SMCC). Accordingly, it underscores the potential of AHP as an invaluable tool for navigating the intricate landscape of SMCC literature, offering fresh perspectives and empirical insights. Embracing the prioritized factors unveiled in this analysis, crisis managers and communicators can tailor their strategies to better align with the dynamics of social media and enhance resilience-building efforts in an ever-evolving crisis landscape.

**INDEX TERMS** Social media, crisis communication, AHP, resilience, information seeking, information sharing.

## I. INTRODUCTION

In an age characterized by rapid globalization, interconnectivity, and technological advancement, crisis management

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has evolved into a complex and multifaceted challenge [1], [2], [3]. Organizations and individuals alike are confronted with a myriad of crises, ranging from natural disasters and pandemics to cyberattacks and political unrest. The ability to effectively respond to and recover from such crises has become a paramount concern, prompting the exploration of

how social media could be used and the identification of various factors that can enhance resilience in crisis management [4], [5], [6], [7], [8], [9], [10]. The modern landscape of crisis response and management is fundamentally shaped by the way information flows, is accessed, and is disseminated as illustrated in the crisis communication matrix [11]. With the advent of digital technology and the ubiquity of social media platforms, the dynamics of crisis communication have experienced a profound transformation [5], [12], [13], [14].

The role of information cannot be overstated in the context of crisis management [1], [15], [16], [17], [18]. Effective decision-making, rapid response, and resource allocation depend heavily on the quality, quantity, and timeliness of information available to stakeholders. Information seeking, the proactive act of seeking out relevant data and insights during a crisis, is often a critical initial step in the crisis management process [19], [20], [21]. Simultaneously, information sharing, the act of disseminating pertinent information to relevant parties, is crucial for coordinated and collaborative responses. Social media platforms, with their real-time communication capabilities, have introduced new dimensions to information seeking and sharing during crises. These platforms serve as critical channels for the rapid dissemination of information, enabling individuals and organizations to connect, communicate, and mobilize like never before [11], [22], [23].

As a result, this study embarks on an exploration of social media practices and their collective impact on the resilience desire of crisis management. The overarching objective of this paper is to investigate the interplay between these three pivotal elements: information seeking, information sharing, and social media usage, and how they collectively influence the resilience desire within the realm of crisis management. To achieve this, this study employs the Analytical Hierarchical Process (AHP), a robust decision-making framework that enables the quantification and prioritization of complex factors and their relationships [24], [25], [26], [27]. By examining the nuanced connections between information behaviors and social media utilization within the context of crisis management, this research aims to contribute valuable insights that can inform strategies for enhancing resilience in the face of crises.

Accordingly, the significance of this study lies not only in its potential to augment our understanding of crisis management but also in its practical implications for individuals, organizations, and policymakers striving to build more resilient systems in an increasingly uncertain world. In the subsequent sections, Section II delves into the existing literature on resilience problems in social media crisis communication, provides insights into the current research problem, discusses the research gap underpinning this study, and elucidates the research focus. Section III discussed the research methodology, Section IV presented the study's result and discussion, Section V discussed research contributions and implications, and Section VI concluded the study.

## II. RESILIENCE IN SOCIAL MEDIA CRISIS COMMUNICATION

Numerous scholars have provided evidence of the application and efficacy of technology in crisis management and communication [9], [23], [28], highlighting the significance of technological advancement. Among various technological tools, social media has emerged as a particularly effective means of communication, catering to both formal and informal channels during and after a crisis [20]. However, the primary concern for individuals facing a crisis lies in the process of recovery, which necessitates resilience. Consequently, existing researchers focus on conducting investigations to explore how social media aids individuals in their recovery from crises, as well as identifying the specific social media activities and dimensions that contribute to expediting this ability of people to recover effectively and efficiently [5], [19], [20]. Therefore, in order to understand the context of existing studies pertaining to resilience building in crisis management and communication literature, the proceeding sections discuss the related works, classifications of factors, research gap analysis, and research focus.

### A. RELATED WORKS

The existing studies encompass a wide range of research efforts aimed at understanding the dynamics of social media usage during crisis scenarios. Ref. [29] conducted surveys and regression analysis to delve into information-seeking behavior amidst health emergencies on the Internet. Ref. [8] utilized surveys, factor analysis, and analysis of variance (ANOVA) to investigate information-seeking and sharing behaviors across popular social media platforms such as Facebook, Twitter, Instagram, and YouTube during emergencies. Ref. [30] explored behaviors on WeChat, employing theories like Theory of Planned Behavior (TPB) and Uses and Gratification Theory (UGT) and examining information-seeking, entertainment, and status-seeking. Ref. [21] focused on health emergencies, using the Crisis Information Seeking and Sharing (CISS) theory to probe information-seeking and sharing on platforms like Twitter, Instagram, Pinterest, and Snapchat. In addition, Ref. [9] studied individuals' perceptions of social media during crises on Facebook, Twitter, and Instagram, employing surveys and statistical tests. Ref. [31] investigated social media use intention on WeChat, considering theories like UGT, Task-Technology Fit (TTF), and Media Dependency Theory (MDT), and behaviors including information seeking, sharing, and communication. Moreover, Ref. [19] delved into resilience during the Covid-19 crisis, utilizing surveys and Structural Equation Modeling (SEM) to understand crisis response and social media interactions across various platforms. A related study by Ref. [32] further examined resilience during Covid-19 using surveys, regression, and process macro analysis, focusing on crisis response and social media interactions.

Furthermore, Ref. [33] delved into information-sharing behavior on Facebook during Covid-19, considering factors

like entertainment and status seeking with the aid of TPB and UGT. Ref. [34] explored risk information exposure and preventive behavior during Middle East Respiratory Syndrome (MERS) disease outbreaks on various platforms, applying the Appraisal Tendency Framework (ATF). Ref. [35] studied information-sharing behaviors on WeChat during health emergencies, incorporating theories such as TPB, UGT, and Social Cognitive Theory (SCT) while considering factors like status seeking and social support. In addition, Ref. [10] focused on Covid-19, investigating crisis communication behaviors in a general context and considering factors like risk culture and strict censorship. A related study by Ref. [20] examined resilience during flooding through surveys and Structural Equation modeling-Artificial Neural Network (SEM-ANN), exploring various crisis response and social media interaction behaviors. Collectively, these existing studies provide a comprehensive perspective on the multifaceted aspects of research on social media behavior during crises, incorporating diverse theories, methodologies, social media platforms, and crisis scenarios, thus contributing significantly to our understanding of this complex field.

## B. CLASSIFICATION OF FACTORS

The behavioral theories examined in prior researches on crisis communication through social media have explored a range of crisis management aspects, giving particular attention to diverse outcome measures. These outcomes encompass activities like seeking information, sharing information, demonstrating resilience, expressing intentions related to social media usage, and addressing various other concerns such as seeking social support, discussing negative experiences, perceiving risks, taking protective actions, addressing post-rebuttal rumors, considering rebuttal messages, indicating donation intentions, engaging on social media, forming perceptions of social media among citizens, and expressing intentions related to sharing neutral information. The synthesis of the literature and the outcomes explored in prior studies are presented in Table 1. The literature finding has identified factors and the categorization under the theoretical framework is further refined based on the outcome measures examined in the existing research. Specifically, these factors have been categorized into components related to seeking information, sharing information, demonstrating resilience, and expressing intentions regarding social media, among other factors. The organization of these factors aligns with the AHP framework, as discussed and presented in Section III.

## C. RESEARCH GAP ANALYSIS

The existing literature (Table 1) provides an overview of various studies related to social media and crisis communication. It summarizes the theoretical frameworks, research methods, critical components examined, outcome variables, social media platforms, and crisis scenarios under investigation. Firstly, the analysis of existing literature shows that there is a lack of comprehensive studies on how social media

usage correlates with public resilience during times of crisis, particularly integrating key functions of social media such as information sharing and seeking. This crucial aspect has not been adequately addressed, as highlighted by existing studies [7], [19], [20], [21], [36]. To bridge this research gap, it is essential to investigate how social media platforms are instrumental in aiding individuals in their recovery process following a crisis. By studying the relationship between social media usage and public resilience, researchers can gain valuable insights into the mechanisms that contribute to a faster and more effective recovery. Additionally, it is crucial to identify the specific dimensions of these variables on social media platforms that have the most positive impact on individuals' ability to bounce back from a crisis. By delving into these unexplored areas, scholars can enhance existing understanding of the potential of social media in crisis management and recovery. Such knowledge can inform the development of strategies and guidelines for crisis responders and individuals affected by crises, ultimately improving overall resilience and facilitating a smoother recovery process.

Secondly, the existing literature shows that different studies have employed a wide range of theoretical frameworks, such as the TPB, UGT, SCT, and more [19], [21], [30], [31], [32], [33], [34], [35]. While these frameworks offer valuable insights, they also introduce variability in the way factors are conceptualized and measured. As a result, it becomes evident why research adopting the AHP is needed in this field. The AHP can provide a systematic way to synthesize these diverse theoretical perspectives and establish a unified framework for understanding the relative importance of various factors. Moreover, the methods employed in these studies include surveys, SEM, descriptive analyses, regression analysis, and factor analysis [8], [9], [10], [19], [20], [21], [29], [30], [31], [32], [33], [34], [35]. AHP can complement these methods by offering a structured approach to prioritize and weight the importance of different factors consistently, irrespective of the data collection or analysis technique. In addition, this study observed that the outcome variables in these existing studies range from information-seeking and sharing behaviors to resilience, social media interaction, and crisis response. AHP can help researchers establish a clear hierarchy of these outcome variables and their relationships, shedding light on which factors have the most significant impact on desired outcomes.

In addition, the existing literature examines various social media platforms (e.g., Facebook, Twitter, WeChat) and crisis scenarios (e.g., health emergencies, general crises, Covid-19). Since AHP used expert as target participant [24], [25], [26], [27], [37], [38]. Expert experience and knowledge can help facilitate cross-platform and cross-scenario research findings by providing a standardized method for assessing the importance of factors under the umbrella of social media crisis communication. Similarly, many studies consider complex correlations between multiple factors, making it challenging to discern the individual contributions of each

TABLE 1. Summary of existing studies.

SN	Ref.	Theory	Methods	Critical component	Outcome Variable	Social media platform	Crisis scenario
1	[29]		Survey, descriptive, regression analysis	Information seeking	Information seeking behaviour	Internet	Health emergencies
2	[8]		Survey, descriptive, factor analysis, ANOVA	Searching information, information sharing	Citizens attitudes social resilience	Facebook, Twitter, Instagram, YouTube	Emergencies
3	[30]	TPB, UGT, theory of prosocial behavior	Survey,	Information seeking, entertainment, socializing, habit, status seeking, reciprocity	Information sharing behavior	WeChat	General
4	[21]	CISS	Survey, descriptive, factor analysis	Information seeking, information sharing	Scale development	Twitter, Instagram, pinterest, snapchat	Health emergencies
5	[9]		Survey, descriptive, Chi-Square, Kruskal-Wallis	Information sharing	Citizens perception of social media	Facebook, Twitter, Instagram	Emergencies
6	[31]	UGT, TTF, and MDT	Survey, SEM-ANN	Information seeking, information sharing, communication, solitary play, mobility, and task features	Social media use intention	Wechat	Emergencies
7	[19]	SMCCR	Survey, SEM	Crisis, crisis response, social media interaction	Resilience	General	Covid-19
8	[32]	SMCCR	Survey, regression and process macro	Crisis, crisis response, social media interaction	Resilience	General	Covid-19
9	[33]	TPB and UGT	Survey, SEM	Information seeking, entertainment, socializing, status seeking	Information sharing behavior	Facebook	Covid-19
10	[34]	Appraisal Tendency Framework (ATF)	Survey, descriptive, bivariate correlation analyses, SEM in R	Risk information exposure	Preventive behaviour	Blogs, Facebook, Twitter or YouTube	MERS disease out-breaks
11	[35]	TPB, UGT, SCT	Survey, SEM	status seeking, social interaction, and norm of reciprocity, social support, critical mass, entertainment, information needs	information sharing behavior	WeChat	Health emergencies
12	[10]		Survey	risk culture, strict censorship	Crisis communication behaviours	General	Covid-19
13	[20]	SMCCR	Survey, SEM-ANN,	Crisis, crisis response, social media interaction, information seeking, information sharing	Resilience	General	Flooding

variable. AHP’s ability to break down complex problems into hierarchies of criteria and sub-criteria [24], [25], [26], [39], [40] can offer clarity in understanding the relative significance of each factor and their relationships, as depicted in Figure 3. Moreover, AHP is not just a theoretical framework; it is a practical decision-making tool that allows for quantitative assessments of the importance of various factors [24], [26], [39], [40], making it highly applicable to real-world crisis management and communication strategies. This practical utility is particularly valuable in a field where effective crisis response and communication are of utmost importance [16], [41], [42], [43], [44], [45]. Therefore, while the existing literature provides valuable insights into the relationship between social media and crisis communication, adopting the AHP can enhance the field by offering a structured, systematic, and quantitative approach to understanding the relative importance of various factors [24], [26], [39], [40]. Accordingly, AHP can help researchers, practitioners, and policymakers make informed decisions regarding crisis management and communication strategies, leading to more effective responses in an ever-evolving digital landscape.

**D. RESEARCH FOCUS**

The rapid dissemination of information via digital platforms and the dynamics of crisis communication have evolved

significantly. Social media, in particular, has emerged as a vital tool in crisis management, facilitating real-time information sharing, community engagement, and resource mobilization [9], [22], [23], [46], [47]. However, despite its widespread adoption, there is a noticeable dearth of comprehensive research that systematically examines the intricate relationship between various factors influencing resilience in social media crisis communication [5], [8], [19], [36]. As a result, this study utilized AHP, a multi-criteria decision-making (MCDM) approach, as the cornerstone of our research methodology. The AHP is a well-established and versatile decision-making framework, often employed in diverse fields ranging from business and engineering to environmental management and healthcare [18], [24], [25], [26], [48], [49], [50]. Its utility in the context of social media crisis communication literature is particularly novel and promising. By applying AHP, we seek to provide a structured and quantitative assessment of the multifaceted factors that underpin resilience-building efforts in the digital realm during crises.

Accordingly, through the application of AHP, this study systematically evaluates and prioritizes SMCC factors, taking into account their relative importance and interdependencies. This analytical approach offers a robust and data-driven means to assess the intricate web of variables [25]

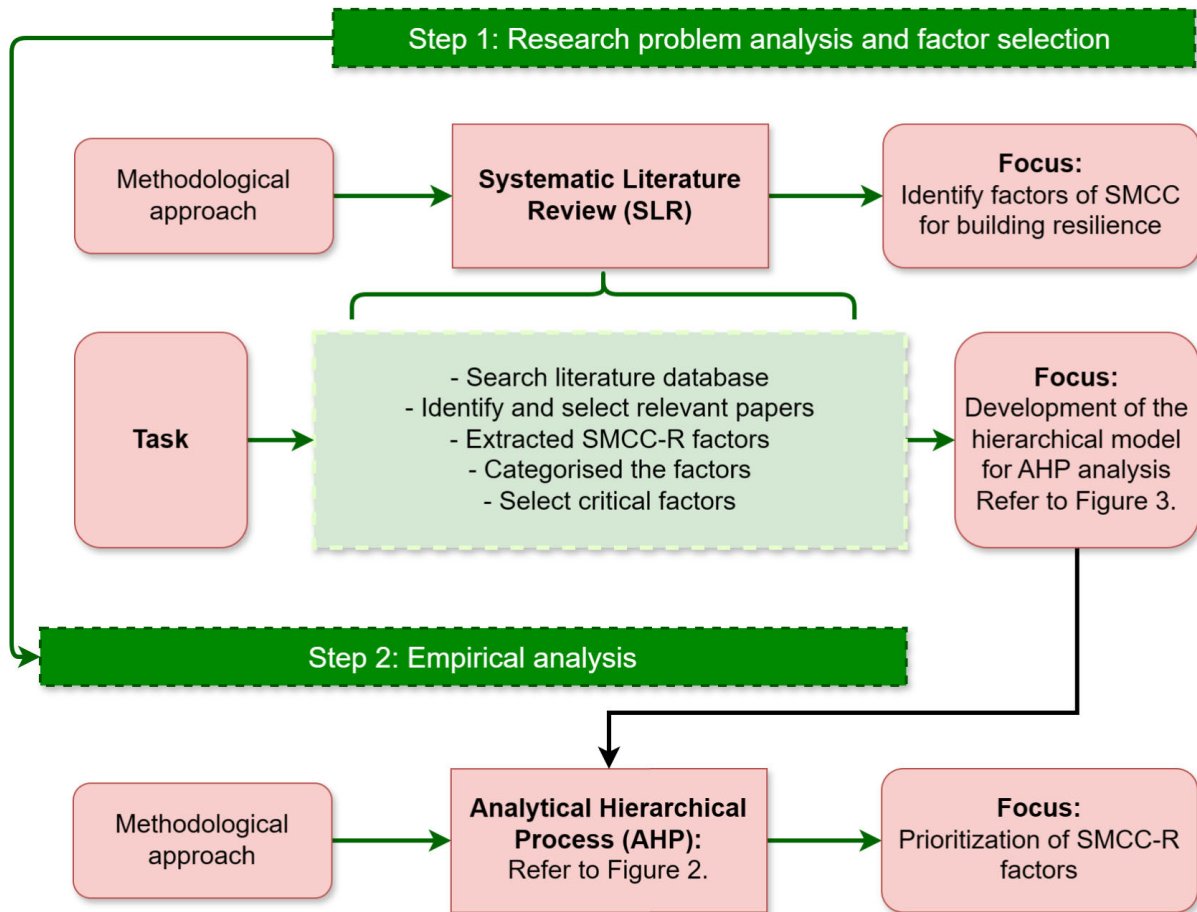


FIGURE 1. Research methodology.

that influence resilience, encompassing information-seeking behaviors, information-sharing practices, and social media usage patterns. By quantifying the significance of each factor, the study aims to provide a clear understanding of their respective roles and contributions to the broader goal of enhancing resilience in social media crisis communication. Moreover, the utilization of AHP enables this study to offer valuable insights for decision-makers in crisis management, policy development, and organizational planning. As the digital landscape continues to evolve, the findings of this study can inform the development of more effective strategies and frameworks for harnessing social media’s potential in crisis response and recovery. Hence, by bridging the gap between theory and practice, this research seeks to contribute not only to the academic discourse surrounding crisis communication but also to the practical tools available for navigating the complex terrain of crisis management in the digital age. Hence, Figure 1 shows the typical research framework adopted for this study.

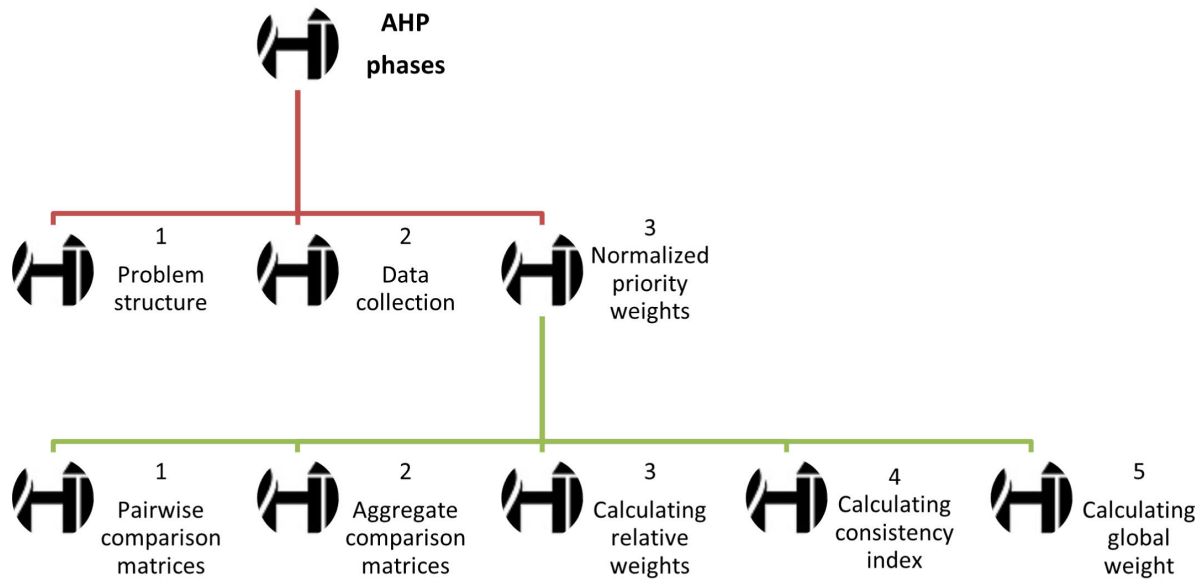
### III. METHODOLOGY

The AHP is a widely employed technique in MCDM literature, primarily utilized for situations involving a

multitude of criteria or factors, to address intricate MCDM challenges [24], [25], [26], [27], [39], [40]. The AHP methodology essentially dissects an MCDM problem into a minimum of three hierarchical levels, encompassing the objectives, criteria, and decision alternatives [26], [39], [40]. Within this framework, the AHP constructs a hierarchical model, assesses the relative priorities of the criteria, conducts comparisons among the available decision alternatives for each criterion, and ultimately establishes a ranking of these alternatives [26], [39], [40], [51]. To determine the ranking of criteria or factors, the AHP relies on expert pair-wise comparisons, where judgments are expressed as “how much more one element dominates another with respect to a specific attribute,” as elucidated by [39]. Accordingly, this study systematically follows the existing approach to perform the AHP conducted in this study [27], [48], [52]. The AHP follows several phases, as depicted in Figure 2.

#### A. PROBLEM STRUCTURE AND HIERARCHY PROCESS MODEL DEVELOPMENT

The first phase of the AHP approach focuses on constructing a coherent hierarchy for the research problem into the AHP model, which consists of the objective, criteria or factors,



**FIGURE 2.** Phases of AHP Approach.

sub-criteria or sub-factors, and alternatives. The primary objective of this research is to assign priorities to the elements that influence resilience building in social media crisis communication and management. Positioned at the top of the hierarchical structure is the research's main objective. At Level 2, the main factors or categories of factors are delineated, and at Level 3, the sub-factors that hold the potential to influence expert decisions regarding resilience building in technology-mediated crisis communication are detailed. As illustrated in Figure 3, the structure of the AHP problem for this study is presented. It's important to note that the AHP model in this study does not include alternative options because the primary goal is to prioritize these components. However, the factors that receive the highest rankings will be subjected to empirical testing through the use of a SEM. This subsequent phase will help further validate and explore the significance of the most influential factors identified through the AHP process for the social media crisis communication for building a public resilience model.

### **B. DEVELOPING THE AHP QUESTIONNAIRE AND DATA COLLECTION**

The pairwise comparison method involves presenting respondents with a set of two criteria and asking them to assess the relative preference and importance of these criteria [39]. In this study, respondents were provided with matrices for pairwise comparisons. The sample comparison matrix questionnaire for information seeking factors is presented in the Appendix (Figure 6). Accordingly, the pairwise questionnaire matrix is also created for the category comparison, as well as information sharing and social media usage factors. The

questionnaire encompassed all the factors and sub-factors pertinent to the study, which was administered to the panel of experts. To meet the research objectives effectively, the questionnaire is designed in the form of matrices. These matrices contained eight sub-factors, as well as the main factors at the top of the questionnaire. After finalizing the criteria, the questionnaire was distributed to the respondents via email for their input and assessment. This method allowed us to systematically gather the expert opinions needed to assess the importance and relationships between these factors and sub-factors in the context of social media crisis communication.

Accordingly, the input is gathered from academics and industry experts in information systems and crisis communication discipline. These experts provide data through pair-wise comparisons of various aspects and sub-factors related to SMCC. To assign relative scores to these pair-wise comparisons among the different factors, the nine-point scale introduced is employed [39], as depicted in Figure 5. It's worth noting that the AHP is not a statistical methodology, and as such, it doesn't necessitate a statistically significant sample size [53], [54]. Unlike conventional statistical analyses where large sample sizes are often recommended, the AHP operates on a different principle. In AHP, the unit of analysis is the decisions made, rather than the individuals making those decisions. Therefore, a representative sample is not required [55]. In many AHP studies, researchers have successfully employed small sample sizes, a departure from the typical requirement of large sample sizes in traditional surveys and statistical analyses. One reason for this difference is that the AHP is typically used to gather input from individuals who possess

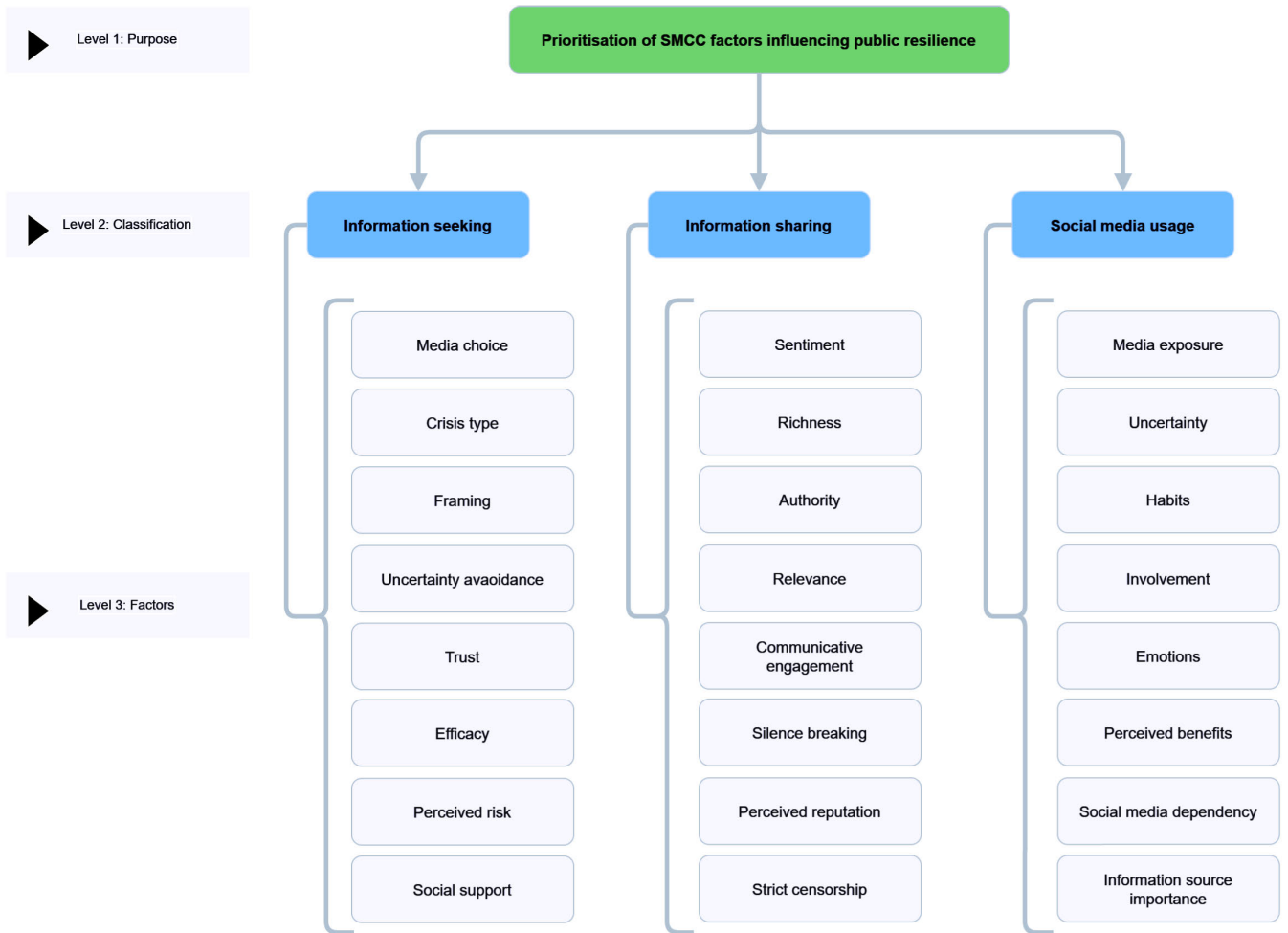


FIGURE 3. AHP framework for SMCC-R.

specialized knowledge about the subject under investigation. These experts are well-informed and capable of providing meaningful insights and comparisons, rendering a large sample size unnecessary [37]. Consequently, in the context of AHP, the focus is on the expertise and knowledge of the participants rather than the number of participants, making it a suitable approach for gathering input on complex topics such as crisis communication on social media.

Moreover, more than 40 experts were reached out, hailing from diverse institutions and industry backgrounds. These experts were approached to contribute their invaluable insights regarding the significance of various factors influencing the SMCC resilience model. Each of these experts boasted an extensive experience portfolio, with no less than five years of expertise in various domains (refer to Appendix, Table 7 for the breakdown of the expert demography). During the administration of the questionnaire, detailed explanations of each variable and sub-factor were provided to ensure that the respondents had a comprehensive understanding of the concepts under consideration. Accordingly, the study collected and documented 14 responses in MS Excel, as presented in Appendix, Table 7. Unfortunately, the

analysis discerned that three of these responses exhibited inconsistencies, as explained in section III-C4. Consequently, these three responses were deemed unsuitable for inclusion, leaving the study with a total of 11 valid responses that form the basis of the findings presented in this study. These responses are a critical component of the research, as they represent the informed perspectives of experts regarding the SMCC resilience model.

**C. COMPUTATION OF NORMALIZED PRIORITY WEIGHTS**

The study delves into the analytical process used to transform the raw pairwise comparison data into meaningful and interpretable priority weights. This crucial step involves converting expert judgments into a quantifiable form that will serve as the foundation for subsequent analyses. Here, the detailed methodology employed to ensure that the final priority weights accurately reflect the relative importance of criteria and sub-criteria in this study on SMCC and resilience are discussed. Accordingly, the preceding section discussed the steps employed to determine the normalized weights of the SMCC and resilience variables.

Information seeking category	Media choice	Crisis type	Framing	Uncertainty avoidance	Trust	Efficacy	Perceived risk	Social support
Media choice	1	1/8	1/5	6	9	8	1/9	1/2
Crisis type	8	1	2	4	8	1/8	1/8	1/8
Framing	5	1/2	1	1/7	9	9	9	9
Uncertainty avoidance	1/6	1/4	7	1	9	8	1/7	7
Trust	1/9	1/8	1/9	1/9	1	5	5	2
Efficacy	1/8	8	1/9	1/8	1/5	1	5	5
Perceived risk	9	8	1/9	7	1/5	1/5	1	9
Social support	2	8	1/9	1/7	1/2	1/5	1/9	1

FIGURE 4. Typical example of the pairwise comparison matrix for information seeking category.

Intensity of importance	Defination
1	Equal importance
3	Moderate importance
5	Strong importance
7	Very strong importance
9	Extremely strong importance
2,4,6,8	Intermediate values (Reaching compromise values between 1,3,5,7,9)

FIGURE 5. Relative Importance Scale of the AHP.

1) BUILDING PAIR-WISE COMPARISON MATRICES OF THE FACTORS

The pair-wise comparisons serve as a pivotal step in determining the relative significance of factors, a process introduced by [39] and [40] and further elucidated by [56]. During these comparisons, judgments are derived and expressed as integers, signifying the preference of one factor over another. If the judgment indicates that the  $x_{th}$  factor holds greater importance than the  $y_{th}$  factor, the integer is positioned in the  $x_{th}$  row and  $y_{th}$  column of the comparison matrix. Simultaneously, the reciprocal of this integer is entered in the  $y_{th}$  row and  $x_{th}$  column of the matrix. In cases where the factors under comparison are deemed equal in importance, a value of one is assigned to both locations in the matrix.

Consequently, each comparison matrix, denoted as  $M = [M_{xy}]$ , emerges as a square matrix of order  $n$ , where  $n$  represents the number of factors compared, and it contains reciprocated elements, as illustrated in Equation 1. This process lays the groundwork for the subsequent computation of normalized priority weights.

$$M_{xy} = \frac{1}{M_{yx}}; x, y = 1, 2, 3 \dots n \tag{1}$$

2) CONSTRUCTING AGGREGATE COMPARISON MATRICES OF THE FACTORS

To consolidate the judgments for each element within the comparison matrix, we employ the geometric mean method, which involves aggregating the responses collected from all



experts who participated in the pair-wise comparisons of various factors and sub-factors. This method helps in arriving at a consensus assessment. The aggregated comparison matrix, denoted as  $A = [A_{xy}]$ , is created for a specific characteristic. Here, each element  $A_{xy}$  represents the geometric mean of judgments provided by  $N$  decision makers. This calculation is illustrated in Equation 2. In this equation,  $N$  represents the number of experts participating in the assessments, and  $M_{xy}$  represents the individual judgments provided by each expert for the respective factor or sub-factor being compared. This aggregation process aids in deriving a more comprehensive and collective perspective regarding the relative importance of these elements in the context of SMCC and resilience study.

$$a_{xy} = \left( \prod_{x=1}^n M_{xy} \right)^{1/N} \quad (2)$$

### 3) CALCULATING PRIORITIES OR RELATIVE WEIGHTS OF THE FACTORS

To determine the priority for each category (main factor) and sub-factor by using the AHP method, a normalized matrix is created, denoted as  $N$ . This matrix is derived from the corresponding comparison matrix  $A$  and is constructed as follows, as depicted in Equation 3:  $N$  represents the normalized matrix for the category or sub-factor,  $N_{xy}$  signifies the element at the  $x_{th}$  row and  $y_{th}$  column of the normalized matrix  $N$ ,  $A_{xy}$  stands for the corresponding element in the comparison matrix  $A$ , and  $n$  represents the total number of factors or sub-factors being considered. Accordingly, this normalization process standardizes the data within the matrix, making it suitable for the subsequent calculation of priority weights. The normalized matrix  $N$  allows this study to quantitatively assess the relative importance of each category and sub-factor in the context of SMCC and resilience study.

$$N = [n_x], \text{ where } n_{xy} = \frac{a_{xy}}{\sum_{x=1}^n a_{xy}} \quad (3)$$

Furthermore, to obtain the priority weights for each factor, the study calculated the average of the elements within each row of the normalized matrix  $N$ . This process results in a priority vector denoted as  $W = [w_x]$ , which is a column matrix of order  $n \times 1$ , as illustrated in Equation 4. Accordingly,  $W$  represents the priority vector, where each element  $w_x$  corresponds to the priority weight of a specific factor. Thus,  $w_x$  signifies the priority weight for the  $x_{th}$  factor, and  $n$  represents the total number of factors being considered. Remarkably, the priority vector  $W$  provides a clear quantitative representation of the relative importance of each factor within the study. This enables this study to rank and prioritize these factors based on the collective assessments of the experts involved in the pair-wise comparisons and normalization process.

$$w_x = \frac{\sum_{y=1}^n n_{xy}}{n} \quad (4)$$

### 4) VALIDATING THE RESULT OF ALL THE COMPARISON MATRIX THROUGH CONSISTENCY TEST

Given the inherent variability in human responses to questions, it is crucial to assess the consistency of the comparison matrices to validate the predicted priority vectors. The consistency ratio (CR) serves as the measurement index for evaluating pair-wise comparisons. If the CR is found to be less than or equal to 0.10 ( $CR \leq 0.10$ ), it indicates an acceptable level of consistency within the comparison matrix  $A$ . In such cases, the ranking results can be deemed reliable and accepted, as per the threshold recommended by [39].

However, if the CR exceeds the threshold of 0.10 ( $CR > 0.10$ ), it signifies that the ranking results are not acceptable due to inconsistency issue. In such instances, the decision maker should revisit the evaluation process, as recommended by [26] and [48]. Ensuring consistency in the comparison matrices is essential for obtaining robust and dependable priority vectors. Accordingly, the matrix  $A$  is considered consistent if it meets the following conditions, as illustrated in Equation 5. These conditions help guarantee the reliability of the prioritization results:  $A$  represents the comparison matrix and  $W$  is the priority vector. These conditions ensure that the priority vector is valid and consistent representation of the relative importance of factors in the context of the SMCC-R study.

$$AW = nW \quad (5)$$

Moreover, the issue presented in Equation 4 is essentially an eigenvalue problem. In this context, the principal eigenvalue, denoted as  $\lambda_{max}$ , should be greater than or equal to  $n$ , as established by [39]. A key measure of consistency is that the larger  $\lambda_{max}W$  is, the closer it should be to  $n$ . This relationship ensures that the matrix  $A$  is more consistent, as the principal eigenvalue becomes closer in magnitude to the number of factors,  $n$ . Hence, to assess the consistency of CR related to a comparison matrix  $A$ , the following steps are typically performed in this study:

- Step 1: Calculating the principal Eigenvalue ( $\lambda_{max}$ ) by using Equation 6:

$$AW = \lambda_{max}W \quad (6)$$

- Step 2: Calculate the CI, where CI is the consistency index given by Equation 7:

$$CI = \frac{\lambda_{max} - n}{n - 1} \quad (7)$$

- Step 3: Determine the RI, where RI is the random index. Notably, the RI is a predefined value that depends on the order of the matrix ( $n$ ). It is typically obtained from a reference table based on the matrix order. Thus, the different number of criteria ( $n$ ) corresponds to different values of RI, as presented in Appendix, Table 8.

- Step 4: Calculating CR by using Equation 8:

$$CR = \frac{CI}{RI} \quad (8)$$

- Step 5: Check if CR is acceptable: If the CR is less than or equal to 0.10 ( $CR \leq 0.10$ ), it indicates that the amount of inconsistency in the comparison matrix A is acceptable, and the ranking results can be considered reliable.

#### 5) CALCULATING GLOBAL WEIGHTS OF ALL FACTORS

Equation 4 is employed to calculate the local weights for both the main factors and sub-factors related to the SMCC resilience model. These local weights provide insights into the relative importance of factors and sub-factors within their respective categories. For the main factors (categories), their global weights are identical to their local weights. In other words, the local weights directly represent the global weights for the main categories. However, when it comes to sub-factors, the global weights are determined differently. The global weights for sub-factors are calculated using Equation 9. This implies that the importance of sub-factors within their parent category is assessed concerning the overall priorities of all factors and sub-factors in the study. This approach allows for a comprehensive evaluation of the significance of sub-factors in the broader context of crisis communication and management.

$$GWSF = LWSF * GWCMF \quad (9)$$

Indeed, in Equation 9: GWSF stands for the global weight of the sub-factors, LWSF represents the local weight of the sub-factors, and GWCMF signifies the global weight of the corresponding main factor (category).

## IV. RESULTS AND DISCUSSION

In the analysis of the data obtained for this study, Microsoft Excel 2016 (MS EXCEL) was utilized. The responses provided by experts during the pair-wise comparisons of various factors and sub-factors were aggregated using the geometric mean approach, as defined in Equation 4. The findings and outcomes of this analysis are summarized in Tables 2, Table 3, Table 4, and Table 5, which include the comparison matrices, weights, and CR for all the categories within the hierarchical model. These values were obtained by following the methodology steps explained in the preceding sections. It is noteworthy that the results indicate that all CR values obtained during the analysis are smaller than the predefined threshold value of 0.10. This outcome signifies that the comparison matrices exhibit a degree of consistency, and the calculated weights or priorities are deemed acceptable and reliable. The consistency of the matrices is a crucial validation, reinforcing the trustworthiness of the prioritization results for the factors and sub-factors in the context of social media crisis communication and management.

Firstly, based on the results obtained from Table 2, it is evident that among the three primary categories, “information seeking” holds the highest weight, which is calculated as 0.38. This signifies that information seeking is the most influential factor within the context of social media crisis communication for building resilience. The result is

followed by “information sharing” with a weight of 0.25, indicating its intermediate level of importance. Lastly, “social media usage” carries a weight of 0.20, making it the third primary category in terms of significance. These weightings provide valuable insights into the relative priorities of these categories within the broader framework of the SMCC and resilience model.

The sub-factor analysis for the “information seeking” category provides deeper insights into the factors that influence resilience-building in the context of crisis management. The weighted analysis of sub-factors of information seeking is shown in Table 3. According to the result obtained, media choice (weight = 0.1626) is judged to be the most relevant and important sub-factor for information seeking, followed by crisis type (weight = 0.1290), uncertainty avoidance (weight = 0.1004), framing (weight = 0.0967), trust (weight = 0.0957), efficacy (weight = 0.0882), perceived risk (weight = 0.0753), and social support (weight = 0.0571). The respondent’s concerns on media choice show that the choice of social media platforms for crisis communication is crucial. The calculated values of  $\lambda_{max}$  (8.0831), CI (0.011875), and CR (0.008422 < 0.10) suggest that the consistency of the comparison matrices used in the analysis is acceptable, affirming the reliability of the ranking results. These sub-factor rankings provide a nuanced understanding of the factors that underpin information-seeking behavior during crises. Crisis managers can use this information to tailor their communication strategies and platforms, taking into account the relative importance of each sub-factor in fostering resilience within their target audience.

The sub-factor analysis within the “information sharing” category sheds light on the factors that hold particular significance in the context of social media crisis communication, as presented in Table 4. The respondents view sub-factor rankings and their associated weights which comprise sentiment (weight = 0.161), richness (weight = 0.111), authority (weight = 0.105), relevance (weight = 0.094), communicative engagements (weight = 0.092), silence breaking (weight = 0.082), perceived reputation (weight = 0.073), and strict censorship (weight = 0.078). The respondents consider these factors such as sentiment, richness, and authority to be more significant in social media crisis communication. The calculated values of  $\lambda_{max}$  (8.089), CI (0.012743), and CR (0.009038 < 0.10) indicate that the consistency of the comparison matrices used in the analysis is acceptable, affirming the reliability of the ranking results. These sub-factor rankings provide valuable insights into the nuanced aspects of information sharing during crises. Crisis communicators can use this information to tailor their content and strategies, focusing on factors like sentiment, authority, and relevance to maximize the effectiveness of their crisis communication efforts.

The sub-factor analysis within the “social media usage” category provides valuable insights into the factors that play a significant role in the context of social media

TABLE 2. Result for main factors.

	Information seeking	Information sharing	Social media usage	Weight	Consistency test
Information seeking	0.40	0.39	0.37	0.3886	$\lambda_{max} = 3.0075$ ; CI = 0.003730248; RI = 0.58; CR = 0.006431462 < 0.10
Information sharing	0.24	0.23	0.29	0.2542	
Social media usage	0.23	0.18	0.22	0.2085	

TABLE 3. Result for information seeking.

	Media choice	Crisis type	Framing	Uncertainty avoidance	Trust	Efficacy	Perceived risk	Social support	Weights	Consistency test
Media choice	0.18	0.18	0.17	0.11	0.16	0.17	0.18	0.16	0.1626	$\lambda_{max} = 8.0831$
Crisis type	0.12	0.12	0.15	0.14	0.13	0.12	0.14	0.12	0.1290	
Framing	0.09	0.07	0.08	0.12	0.11	0.10	0.11	0.10	0.0967	
Uncertainty avoidance	0.14	0.07	0.06	0.09	0.11	0.10	0.11	0.12	0.1004	CI = 0.011875
Trust	0.11	0.08	0.07	0.08	0.09	0.11	0.11	0.12	0.0957	
Efficacy	0.10	0.09	0.07	0.08	0.07	0.09	0.11	0.10	0.0882	RI = 1.41
Perceived risk	0.08	0.07	0.06	0.06	0.07	0.06	0.08	0.12	0.0753	CR = 0.008422 < 0.10
Social support	0.07	0.07	0.05	0.05	0.05	0.06	0.04	0.07	0.0571	

TABLE 4. Result for information sharing.

	Sentiment	Richness	Authority	Relevance	Communication engagements	Silence breaking	Perceived reputation	Strict censorship	Weights	Consistency test
Sentiment	0.18	0.20	0.14	0.14	0.15	0.17	0.17	0.12	0.161	$\lambda_{max} = 8.089$
Richness	0.10	0.12	0.11	0.13	0.13	0.12	0.10	0.09	0.111	
Authority	0.10	0.09	0.08	0.12	0.12	0.13	0.12	0.07	0.105	
Relevance	0.11	0.08	0.06	0.09	0.12	0.12	0.10	0.08	0.094	CI = 0.012743
Communicative engagements	0.11	0.08	0.06	0.07	0.09	0.14	0.10	0.07	0.092	
Silence breaking	0.09	0.09	0.06	0.07	0.06	0.09	0.13	0.07	0.082	RI = 1.41
Perceived reputation	0.08	0.10	0.05	0.07	0.07	0.06	0.08	0.07	0.073	
Strict censorship	0.10	0.09	0.07	0.07	0.08	0.08	0.07	0.07	0.078	

crisis communication. The sub-factor rankings and their associated weights include media exposure (weight = 0.141), uncertainty (weight = 0.123), involvement (weight = 0.103), habits (weight = 0.097), emotions (weight = 0.089), perceived benefits (weight = 0.088), media dependency (weight = 0.082), and information source importance (weight = 0.066), as presented in Table 5. The calculated values of  $\lambda_{max}$  (8.044), CI (0.006299), and CR (0.004467 < 0.10) indicate that the consistency of the comparison matrices used in the analysis is acceptable, affirming the reliability of the ranking results. These sub-factor rankings offer insights into the multifaceted nature of social media usage during crises. Crisis communicators can use this information to tailor their strategies and content, considering factors like media

exposure, uncertainty, and emotional responses to effectively engage with their audience during crises.

The global weights and rankings of the 24 sub-factors from the three key categories (information seeking, information sharing, and social media usage) impacting SMCC resilience building are shown in Table 6, which presents the global ranking of various factors for social media crisis communication with regards to resilience building. Each factor is assigned a global weight, and they are ranked based on their importance within the context of the study. The top ten (10) most significant factors are discussed accordingly. Specifically, media choice (rank 1, global weight = 0.06320), under the information-seeking category, is the highest-ranked factor in this analysis. This suggests that the choice of media platforms

TABLE 5. Result for social media usage.

	Media exposure	Uncertainty	Habits	Involvement	Emotions	Perceived benefits	Media dependency	Information source importance	Weights	Consistency test
Media exposure	0.18	0.14	0.12	0.12	0.15	0.12	0.14	0.15	0.141	$\lambda_{max} = 8.044$ CI = 0.006299 RI = 1.41 CR = 0.004467 < 0.10
Uncertainty	0.15	0.12	0.13	0.11	0.10	0.12	0.13	0.13	0.123	
Habits	0.12	0.08	0.08	0.11	0.10	0.09	0.10	0.09	0.097	
Involvement	0.13	0.09	0.06	0.09	0.14	0.11	0.09	0.11	0.103	
Emotions	0.11	0.11	0.07	0.06	0.09	0.10	0.09	0.07	0.089	
Perceived benefits	0.13	0.09	0.08	0.06	0.08	0.09	0.10	0.07	0.088	
Media dependency	0.10	0.07	0.07	0.08	0.08	0.07	0.08	0.10	0.082	
Information source importance	0.08	0.06	0.06	0.05	0.08	0.08	0.05	0.07	0.066	

or channels for crisis communication holds the most significant influence on resilience building in social media crisis communication. Organizations and crisis managers need to make informed decisions regarding the selection of media channels to effectively communicate during crises. Secondly, crisis type (rank 2, global weight = 0.05012), under the information-seeking category, is the second-ranked factor, indicating that the nature or type of crisis being addressed is of substantial importance. Different crisis types may require tailored communication strategies, and understanding this ranking helps prioritize crisis management efforts according to the crisis types. Thirdly, sentiment (rank 3, global weight = 0.04084), under the information sharing category, follows as the third-ranked factor. Monitoring and managing public sentiment during a crisis can significantly impact resilience. Maintaining a positive sentiment or effectively addressing a negative sentiment is crucial for crisis communication.

Furthermore, uncertainty avoidance (rank 4, global weight = 0.03900), which belongs to information seeking category, ranks fourth. This factor underscores the importance of addressing uncertainty and ambiguity during crises, which can impact public perception and resilience. Framing (rank 5, global weight = 0.03759), under the information seeking category, takes the fifth position. This shows that how information is framed or presented to the public can influence their understanding and reactions during a crisis. Hence, effective framing is crucial for resilience-building efforts. Similarly, trust (rank 6, global weight = 0.03720), also from the information-seeking category, is ranked sixth. This indicates that trust is a fundamental element in crisis communication and establishing and maintaining trust with the audience is essential for resilience. Additionally, efficacy (rank 7, global weight = 0.03428), under the information-seeking category, is the seventh-ranked factor. This suggests that people’s perception of their ability to take action and make a difference during a crisis plays

a significant role in resilience. Media exposure (rank 8, global weight = 0.02945), the only factor from the social media usage category, ranks eighth. This indicates that the extent to which individuals are exposed to crisis-related media content can influence their resilience and reactions. Moreover, perceived risk (rank 9, global weight = 0.02928, from the information-seeking category, is the ninth-ranked factor. People’s perception of the risks associated with a crisis can impact their resilience behaviors. Finally, richness (rank 10, Global Weight 0.02817), the second factor from the information sharing category, rounds out the top ten factors. This indicates that the richness in communication refers to the depth and completeness of information shared during a crisis. Comprehensive and detailed information can enhance resilience. The study noted that the information seeking category (7 factors) dominated the top ten factors, while information sharing category (2 factors), and the social media usage category (1 factor). These rankings provide valuable insights into the factors that should be prioritized in crisis communication strategies aimed at building resilience. These findings highlight the multifaceted nature of crisis management and underscore the importance of considering various factors in decision-making processes.

Moreover, the dominance of information-seeking factors in the top ten factors is indeed noteworthy and provides valuable insights into the priorities within the context of social media crisis communication and resilience building. The fact that seven out of the top ten factors are from the “information seeking” category underscores the critical role that information-seeking behaviors play in crisis management and resilience. People’s desire to seek information and their information-seeking strategies significantly influence their ability to respond effectively during crises. However, while information-seeking factors dominate, it’s essential to recognize that factors from the “information sharing” and “social media usage” categories also hold importance within

**TABLE 6. Global rank of all the factors for social media crisis communication for resilience building.**

Factors	Category	Global Weight	Rank
Media choice	ISE	0.06320	1
Crisis type	ISE	0.05012	2
Sentiment	ISH	0.04084	3
Uncertainty avoidance	ISE	0.03900	4
Framing	ISE	0.03759	5
Trust	ISE	0.03720	6
Efficacy	ISE	0.03428	7
Media exposure	SMU	0.02945	8
Perceived risk	ISE	0.02928	9
Richness	ISH	0.02817	10
Authority	ISH	0.02671	11
Uncertainty	SMU	0.02560	12
Relevance	ISH	0.02394	13
Communicative engagements	ISH	0.02340	14
Social support	ISE	0.02217	15
Involvement	SMU	0.02144	16
Silence breaking	ISH	0.02078	17
Habits	SMU	0.02026	18
Strict censorship	ISH	0.01994	19
Perceived reputation	ISH	0.01863	20
Emotions	SMU	0.01847	21
Perceived benefits	SMU	0.01834	22
Media dependency	SMU	0.01709	23
Information source importance	SMU	0.01368	24

**Note:** ISE- information seeking; ISH- information sharing; and SMU- social media usage

the top ten. This suggests a balanced approach to crisis communication, considering not only how information is sought but also how it is shared and the role of social media platforms. Hence, the findings reinforce the complexity of crisis communication and the need for a holistic approach that takes into account various facets of how individuals interact with information on social media platforms during crises. This understanding can inform more effective and targeted crisis communication efforts aimed at building resilience within communities and organizations.

## V. CONTRIBUTION AND IMPLICATIONS

In this section, the unique and significant contributions of the study is elucidated, which brings to the field of crisis management and its intersection with information dynamics. Interestingly, the investigation delves into the intricate interplay between key factors, namely, information seeking, information sharing, and social media usage, within the context of crisis management. By leveraging the AHP approach, this study meticulously assesses and prioritize the relative importance of these factors, shedding light on their roles in shaping resilience desires during crisis situations. Hence, the proceeding sections outline the distinctive contributions and implications that this study offers, as well as limitations and future directions.

### A. THEORETICAL CONTRIBUTIONS

The study makes several theoretical contributions to the field of crisis management and related academic disciplines. For instance, the study bridges the gap between information dynamics and resilience theory within the context of crisis management. It provides a nuanced understanding of how

information-seeking, information-sharing, and social media usage contribute to building and maintaining resilience during crises. This integration enriches the theoretical foundations of both domains from existing studies perspectives [19], [20], [21], [36]. In addition, the study offers a conceptual framework for crisis communication research that considers the interplay between information-seeking, information-sharing, and social media usage. This framework can serve as a valuable theoretical foundation for future studies in crisis communication. Similarly, the theoretical contributions may extend beyond crisis management to encompass information science, communication studies, and decision science. The study fosters cross-disciplinary dialogue and collaboration, encouraging scholars from diverse fields to explore the multifaceted nature of crisis resilience.

Similarly, by examining three distinct but interconnected categories (information-seeking, information-sharing, and social media usage) of building resilience, the study takes a multidimensional approach to crisis management research. This approach acknowledges the complexity of information flow during crises and underscores the importance of considering multiple facets for a comprehensive understanding. Moreover, the application of AHP to assess the relative importance of sub-factors represents a methodological innovation. This quantitative approach adds rigor to the field of crisis management research, allowing for a systematic and structured analysis of the significance of each factor. Likewise, by applying AHP to crisis management, the study demonstrates the practical utility of this decision-making methodology in a real-world context. This has the potential to inspire further research on the application of AHP to other aspects of crisis management and emergency response. Remarkably, the study prioritizes information-seeking, information-sharing, and social media usage factors based on their influence on resilience desires. This prioritization contributes to a hierarchy of factors that can inform future research, policymaking, and crisis management strategies.

### B. PRACTICAL IMPLICATIONS

The study offers valuable practical implications for various stakeholders involved in crisis management and related domains. The practical implications of this study extend across the spectrum of crisis management, offering actionable insights for organizations, government agencies, policymakers, and researchers. By recognizing the pivotal role of information dynamics in crisis resilience, stakeholders can make informed decisions, allocate resources judiciously, and develop strategies that enhance people's capacity to withstand and recover from crises effectively. For instance, the findings yield actionable insights for crisis managers and decision-makers by identifying the factors with the most significant influence on resilience desires. This offers guidance on choices of resource allocation and strategic planning to enhance crisis preparedness and response. Specifically, understanding the relative importance of factors such as social media choice, crisis type, etc. can guide

organizations in allocating resources more effectively to improve crisis preparedness. This includes investments in technology, training, and personnel. Moreover, insights from the study can inform the development of crisis communication strategies that emphasize the most influential factors, helping organizations communicate more efficiently and comprehensively during crises. Also, crisis managers can use the findings to make real-time decisions during crises. Recognizing the significance of information-seeking and sharing can lead to quicker and more informed responses. In addition, the study identified media choice as the most significant factor, thus, understanding the role of social media can aid organizations in harnessing its power for crisis communication, monitoring public sentiment, and responding to emerging issues effectively.

Furthermore, Organizations can focus on strengthening the identified critical factors to enhance resilience during and after crises. This may involve training employees in effective information-seeking behaviors or creating and identifying platforms for seamless information sharing. Continuous learning and adaptation based on prioritized factors such as crisis type can help crisis management organizations evolve their crisis management strategies over time, improving overall public resilience. Government agencies and Non-Governmental Organization (NGO) can allocate budgets more efficiently by prioritizing investments in information-related technologies and infrastructure based on the study's findings. Departments such as human resource management can benefit from insights obtained from this study into the importance of information-seeking and sharing, enabling the recruitment and training of personnel with the right skills for crisis management. Additionally, policy-makers can use the study to develop or refine regulatory frameworks that facilitate information flow and sharing during crises while ensuring data security and privacy. Public awareness campaigns can be designed to educate individuals on the importance of responsible information-seeking and sharing during crises. Finally, the study introduces AHP as a valuable methodology for assessing the relative importance of factors in crisis management. This methodological innovation can inspire further research and refinement in the field.

### C. LIMITATIONS AND FUTURE WORK

The study is not without limitations which are discussed to provide insight for future researchers in their future work. These limitations and other aspect of the methodology encourage an open gap for future curiosity. Accordingly, the study's findings may have context-generality issues, as they are not based on the specific crisis scenarios and participant demographics not considered. Focusing on a specific crisis, social media apps, or demography may require further research. Thus, extending this research to encompass a wider range of cultural and regional contexts could reveal variations in the importance of information dynamics in building resilience during and after the crisis. This would enhance

the generalizability of findings. Similarly, the methodology employed in this study (AHP) relies on expert judgments, which can be subjective. As a result, comparing the effectiveness of AHP with other decision-making methodologies in crisis management could shed light on the strengths and weaknesses of different approaches. Moreover, while the study focused on three primary categories (information seeking, information sharing, and social media usage), other potentially relevant factors influencing resilience in crisis management may have been omitted. Furthermore, employing additional methods such as SEM can be used to examine the relationships between the variables. Additionally, social media platforms and usage patterns evolve rapidly and therefore the study's findings may not capture the full scope of changes in social media dynamics that occur over time. Hence, developing dynamic models that consider the evolving nature of information dynamics and their influence on resilience over time would offer a more realistic representation of crisis scenarios. Consequently, while this study represents a significant contribution to the understanding of information-seeking, information-sharing, and social media usage factors and their influence on resilience building, it also highlights avenues for further research to address the limitations and advance the field.

### VI. CONCLUSION

In the era of rapid information dissemination and the ubiquitous presence of social media, understanding the dynamics of information seeking, information sharing, and social media usage in the context of crisis management is paramount. This study set out to unravel the intricate relationship between these factors and their influence on the resilience desire of crisis management, employing the AHP as a systematic and quantitative tool for prioritization. The findings have unveiled critical insights into the relative importance of information dynamics within crisis management scenarios. According to the findings, information seeking emerged as the foremost factor, bearing the greatest weight in shaping resilience desires. It is closely followed by information sharing, emphasizing the significance of collaborative knowledge exchange during crises. Social media usage, while influential, occupies a slightly lower priority but remains a vital channel for crisis communication and response. Specifically, the top factors from the global ranking analysis indicate media choice (ISE), crisis type (ISE), sentiment (ISH), uncertainty avoidance (ISE), framing (ISE), trust (ISE), efficacy (ISE), media exposure (SMU), perceived risk (ISE), and richness (ISH). These factors were dominated by information seeking category to demonstrate their significance analytically. Accordingly, the dominance of information-seeking factors in the hierarchy emphasizes the paramount importance of understanding and addressing individuals' behaviors and preferences in seeking and engaging with crisis-related information.

The theoretical contributions of this study extend to the integration of information seeking, sharing, and social

TABLE 7. Respondent profile.

SN	Affiliation	Specialization	Highest Qualification	Experience	Date returned
1	Assistant Professor, College of Computer Science and Information Technology, Dammam University, KSA	Explainable AI, Deep Learning, Data Mining, Artificial Intelligence, Big Data.	PhD	19	07-May-2023
2	Associate Professor at University of Islamabad.	Hybrid Intelligent Systems, DSP, Adaptive Communication, Soft computing.	PhD	15	14-May-2023
3	Senior Lecturer, computer science department, Taraba state university Nigeria.	Information system and crisis informatics.	PhD	8	04-June-2023
4	Faculty of Science and Environment, Memorial University of Newfoundland.	Environmental systems engineering and management	MSc.	5	29-May-2023
5	Assistant Professor, Computer Engineering Dept., King Fahd University of Petroleum and Minerals.	Computer vision, Intelligent transportation systems, IoT.	PhD	12	02-June-2023
6	Assistant Professor, Chemical Engineering, KFUPM, Saudi Arabia.	Petroleum fuels, machine learning, and pyrolysis combustion	PhD	5	08-June-2023
7	Assistant Professor, Computer Science Dept., Effat University, Saudi Arabia.	Information Security, Smartphone Security Malware Analysis.	PhD	10	11-July-2023
8	Data Analytics Consultant, Resultant, Indianapolis, Indiana.	Information Security, Applied Cryptography, Secure Systems	PhD	6	14-July-2023
9	Procurement & Logistics Manager, The International Academy – Amman.	Software engineering, Global virtual team GVT, Entrepreneurship strategic management	MSc.	25	20-July-2023
10	Lecturer, Federal College of Education, Katsina, Nigeria.	Internet of Things, Smart Cities, Artificial Intelligent and Machine Learning	PhD	13	22-July-2023
11	Data Analyst in the Jordanian Duty Free Shops (JDFS).	Information systems	PhD	15	24-July-2023
12	Head of IS Department in The Jordanian Duty Free Shops (JDFS)	Information systems	PhD	18	25-July-2023
13	Lecturer, School of Aerospace Engineering, Universiti Sains Malaysia	Machine Learning, Artificial Intelligence, High Performance Computing, Image Processing and computer vision, and applied Science	PhD	5	03-August-2023
14	Professor, Dept. of Mechanical Engineering, IIUM, Kuala Lumpur, Malaysia	Stability derivatives for wing, active & passive control of base pressure and supersonic jets and drag reduction techniques.	PhD	40	03-August-2023

TABLE 8. Predefined value of the random index (RI).

N	1	2	3	4	5	6	7	8	9	10	11	12	13
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.58	1.56

media usage dynamics and resilience theory, offering a multidimensional perspective on crisis communication and management. Accordingly, the study has demonstrated the practical utility of AHP in assessing the relative importance of factors in a real-world crisis context, fostering cross-disciplinary insights, and laying the groundwork for future research methodologies. Practically, the study holds substantial implications for crisis managers, policymakers, and organizations tasked with safeguarding their communities and stakeholders during times of adversity. Therefore, by recognizing the pivotal role of information-seeking and sharing, informed decision-making during crises can be accelerated. Moreover, optimizing social media usage as a crisis communication tool can enhance public engagement and support. However, it is imperative to acknowledge the

study’s limitations, including its context-specific nature and reliance on expert judgments. Future research endeavors should explore cross-cultural variations, and experimental designs to further enrich the current understanding of social media crisis communication for building resilience in crisis management scenarios.

Conclusively, as crises continue to evolve in complexity and frequency, the lessons gathered from this study underscore the importance of information in bolstering resilience desires. By prioritizing information seeking, sharing, and social media usage factors, this study paves the way for more resilient and responsive crisis management practices that can navigate the challenges of social media and crisis dynamics. In addition, the priorities of factors revealed in this study underpin the efficacy of SMCC, which offers

**Comparison among the information seeking factors**

How important are the following social media based crisis communication factors in comparison?

Information seeking category	Media choice	Crisis type	Framing	Uncertainty avoidance	Trust	Efficacy	Perceived risk	Social support
Media choice								
Crisis type								
Framing								
Uncertainty avoidance								
Trust								
Efficacy								
Perceived risk								
Social support								

**FIGURE 6.** Typical questionnaire for pairwise comparison.

valuable insights for crisis managers and communicators to tailor their approaches and enhance resilience-building efforts. Furthermore, the study highlights the potential of AHP as a powerful tool for navigating the complexities of SMCC literature and offers a roadmap for future research in this area. Ultimately, embracing the findings of this analysis can empower stakeholders to navigate the ever-evolving landscape of crisis communication and leverage social media effectively to mitigate the impacts of crises.

**APPENDIX**

Refer to Table 7 for the respondent profile, Table 8 for the Saaty’s [39], [40] predefined random index, and Figure 6.

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