



Reconnoitering NGOs strategies to strengthen disaster risk communication (DRC) in Pakistan: A conventional content analysis approach

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ABSTRACT

Risk communication is crucial since individuals need to understand how they are at risk and what proper steps to deal with flood events. Sharing information with the public opens the door for two-way communication about risks, wherein you learn about people's perspectives and work together to find ways to mitigate the risks. Beyond government scope, relief organizations play a big part in advising individuals about the likelihood of catastrophic events as they possess the commonalities that define community engagement. In numerous accounts of devastating events, the failure of risk management groups to coordinate their efforts and the public's mistrust of relief agencies are highlighted. One possible explanation for this skepticism could be relief organizations' failures in communicating risks. In addition, individuals' lack of skills and experience with catastrophes has left rural residents unprepared, which is why relief agencies need to raise their efforts or measures to communicate with people about possible risks. If these measures are uncovered, it could improve public communication and provide information for formulating recommendations to prevent fatalities. This study identifies the strategies used by relief organizations in enhancing disaster risk communication across four severely affected districts in Khyber Pakhtunkhwa, Pakistan. The qualitative research used semi-structured interviews with 50 participants from relief organizations, local institutions, and affected households. We employed qualitative content analysis and NVivo software to analyze the data. The findings of this study highlighted some significant strategies that relief organizations adopted in this line of work: the administration of educational and information transmission, managing obstacles in communication, and managing inter-organizational communications. The findings validate the potential for relief organizations to become change agents, facilitate communication between the public

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and relief organizations, and ultimately strengthen community resilience and reduce disaster risks as part of local responses.

1. Introduction

Disasters are unpredictable events that disrupt regular social functioning, often resulting in numerous fatalities and extensive property and environmental damage [1]. There is a growing concern that the number of natural catastrophes threatening human life will continue to rise. Massive catastrophes kill and injure thousands of people yearly, wiping billions of dollars in GDP [2]. The repercussions of catastrophic events vary from country-to-country exclusivity to the extent of social and economic resilience. In industrialized nations, financial losses from extreme events have been recorded higher than in emerging economies. At the same time, the reality is very different for estimates of human fatalities and injuries [3]. Disasters occur most frequently in low-income countries. Disasters pose a significant threat to the impoverished in developing countries, which can wipe out years of progress and ruin people's wealth. This requires comprehension of disasters' specific risks and potential outcomes [4].

Pakistan has been hit hard by a wide range of disasters in the past few decades (such as earthquakes, floods, landslides, cyclones, drought, etc.). Yet, hydro-meteorological disasters are becoming more common and severe. Pakistan is regularly affected by natural hazards; among them, floods are common and extremely lethal. The Indus River basin's overflowing levees have significantly damaged human lives, crops, farmland, and infrastructure [5]. Floods have been a recurring problem in Pakistan for a long time. Over the past two decades, the country has experienced several disastrous floods, with the most severe in 2010. This calamity was the largest flood the country had ever faced up to that point, and it affected 24 million individuals. The flooding also destroyed more than two million hectares of crops and caused the country's economy to suffer a loss of \$10 billion [6–12]. However, the floods of 2022 in Pakistan have overtaken those of 2010, which were previously thought to be the worst natural calamity in the country's history¹ as the past two months have been a period of devastation, with most of the households losing their homes and villages submerged in flood waters. The 2022 floods have resulted in 1,717 fatalities, including 639 children, and left 12,867 people injured. Approximately 2.1 million people have lost their homes without food or water. In addition, 436 bridges, 13,115 roads, and over 2 million houses have been damaged, and over 1.1 million livestock animals have perished. The floods have also impacted healthcare, with over 2,000 health facilities affected and limited access to medical supplies and healthcare workers. The floods have led to spreading diseases, such as diarrhoea, malaria, acute respiratory infections, skin and eye infections, and typhoid, affecting tens of thousands of people.² Pakistan experiences flooding primarily due to the monsoon rain pattern in the lower Indus River basin and the melting of glaciers in the higher, upstream mountain regions that feed into the Indus River. The country's geographical location makes it susceptible to these phenomena, which occur during the monsoon season from July to September and can result in heavy rain and overflowing rivers [13]. As a result of these shifting phenomena, Pakistan has shifted from a relief-based to a proactive approach, endorsing DRR in policy, planning, and institutional framework.

The persistent flooding that has plagued Pakistan throughout the decades has necessitated the development of sophisticated measures for reducing flood risk. The purpose of flood risk reduction in Pakistan is to minimize the negative impacts of floods on people, property, and infrastructure and to reduce the likelihood of future flood events. This is achieved through structural and non-structural strategies, such as improving early warning systems, reinforcing flood protection structures, relocating communities to safer areas, and promoting better land use and planning practices [6]. The non-structural approaches have become an essential part of flood risk reduction policies in Pakistan. They are cost-effectiveness (Non-structural measures are often less expensive than building large infrastructure projects, making them a more cost-effective way of reducing risk) and community involvement (non-structural measures often involve the participation of local communities, helping to increase community resilience and ownership of disaster risk reduction (DRR) activities), flexible (non-structural measures can be implemented quickly and adapted to changing circumstances, making them a flexible way of reducing disaster risk) and sustainable (non-structural measures, such as DRR education and training, can have a long-lasting impact, making them a sustainable way of reducing disaster risk) [14]. Risk communication is crucial at every level of the DRR preparation process since it is one of the managerial and non-structural tools that can lessen the effects of disasters and build community resilience [15].

1.1. Theoretical underpinning of risk communication

Risk communication is an integral component of Disaster Risk Management (DRM) [16]. It refers to exchanging information and opinions among individuals, groups, and institutions involved in risk assessment, risk reduction, and risk management. Effective risk communication is crucial for reducing the impact of disasters and ensuring that response and recovery efforts are effective [17]. It involves sharing information on the nature and extent of the disaster risk and the steps that can be taken to reduce the risk of harm. Institutions that deal with hazards must have a comprehensive strategy to identify, assess, and manage potential risks [18]. This strategy should also include a clear and effective communication plan that involves all stakeholders, including the public, government agencies, and other organizations involved in hazard management. Effective risk communication can help institutions to achieve

¹ <https://thediplomaticinsight.com/wwf-reports-differences-between-2010-and-2022-floods/#>

² <https://reliefweb.int/report/pakistan/pakistan-monsoon-floods-2022-islamic-relief-pakistan-12-october-2022>.

several objectives [19]. It can increase public awareness of hazards and their associated risks, which can help people make informed decisions about their safety. It can also facilitate the adoption of appropriate risk management measures by individuals and organizations, thereby reducing the overall risk of harm. Moreover, risk communication can build trust and credibility between institutions and the public, which is essential for effective hazard management [20]. It can create a dialogue between institutions and affected communities, which can help to identify and address concerns and facilitate the development of effective hazard management strategies.

Risk communication requires active engagement from all stakeholders, including government agencies, NGOs, communities, and the media. This helps to ensure that all perspectives are considered and that the most appropriate strategies are developed to address disaster risks [21]. Due to its two-way nature, risk communication differs from traditional forms of top-down communication, where information flows from a central authority to the public. Instead, risk communication is a participatory process where information flows in both directions, from the public to decision-makers and from decision-makers to the public [22]. This two-way approach is essential for several reasons. First, it helps to ensure that the perspectives of different stakeholders are taken into account and that the most appropriate strategies are developed to address disaster risks. Second, it helps to build trust and understanding between different groups, which is crucial for effective disaster response and recovery efforts. Finally, the two-way nature of risk communication helps ensure that the right information is communicated to the right people at the right time. This is important for reducing the impact of disasters and ensuring that communities are better prepared and able to respond effectively [23,24].

Risk communication is a continuous process at all organizational levels, within and between organizations. Given the increasing significance of communication in today's world, organizations must effectively communicate risk information internally and externally. This involves ongoing communication between different departments within and between organizations and between organizations and individuals. For example, effective risk communication between different departments within an organization can help ensure that all relevant information is considered when developing strategies to address disaster risks. Similarly, effective communication between organizations can help ensure that response and recovery efforts are well coordinated and resources are used effectively. Effective risk communication between organizations and individuals is crucial for building group trust and understanding. This helps to ensure that communities are better prepared, able to respond to disasters, and aware of the steps they can take to reduce the risk of harm. Effective risk communication is crucial for ensuring that communities know the nature and extent of the disaster risks they face and the steps they can take to reduce them. Suppose risk information is not communicated effectively, or communities cannot access accurate and up-to-date information. In that case, they may be unable to take the appropriate steps to reduce the risk of harm. In addition, ineffective risk communication can lead to misunderstandings and confusion during crisis management efforts [25]. For example, if response and recovery efforts are not well coordinated, resources may be wasted, and duplicated efforts may occur. This can result in longer response times, increased costs, and greater community damage. Furthermore, suppose communities are not well informed about the risks they face. In that case, they may not trust the authorities responsible for responding to disasters and may not cooperate with response and recovery efforts. This can further increase the impact of disasters and make recovery more difficult [25].

Failure to effectively communicate risks can indeed lead to wasted time and money during crisis management at the community level [23]. Residents may not always be able to participate in two-way communication during emergencies. In these cases, a one-way communication strategy may be necessary to prevent the spread of false information. Accurate and up-to-date information must be communicated to communities quickly in an emergency. If false information is spread, it can cause confusion, fear, and panic and delay response and recovery efforts. For example, if false information is spread about the location of a disaster, emergency responders may be sent to the wrong area, and valuable resources may be wasted. Similarly, if false information is spread about the nature of the disaster, communities may be unable to take the appropriate steps to reduce the risk of harm. In these cases, a one-way communication strategy, communicating information from a central authority to the public, can help eliminate the possibility of spreading false information. This can ensure that communities can access accurate and up-to-date information and respond effectively to emergencies. However, it is important to note that even in emergencies, striving for effective two-way communication where possible [26,27]. This helps ensure that communities better understand their risks and can participate in response and recovery efforts [28,29].

Disregarding risk communication and information management by relief organizations during disasters can cause several problems. Some of these problems have been reported in various studies [25,30]. For example, access to credible and accurate information reduces uncertainty, anxiety, and fear among affected communities in disasters and emergencies. The inability to provide credible information can spread rumors, misinformation, and other false information, creating confusion and undermining the effectiveness of relief efforts [30]. On the other hand, credible and accurate information can help to dispel illusions and rumors. It can provide communities with a clearer understanding of the situation, which can help to reduce their anxiety and fear. Moreover, credible and accessible information is critical for enabling affected communities to make informed decisions about protecting themselves and their families. By providing them with information about the risks they face and the steps they can take to reduce them, relief organizations can empower communities to be more proactive in responding to disasters and emergencies. Therefore, it is crucial for relief organizations to prioritize providing credible and accessible information and to take steps to ensure that information is communicated effectively to affected communities. This can include the use of clear and simple language, the use of multiple channels of communication, and the engagement of local media and community leaders to help convey information. By doing so, relief organizations can help to build trust, reduce uncertainty and fear, and ensure that communities are better equipped to respond to disasters and emergencies [30].

To avoid the problems associated with poor risk communication and information management during disasters, relief organizations must have purposeful and effective strategies [31,32]. For instance, Gesser-Edelsburg et al. [32] highlighted inter-organizational information exchange (sharing information between organizations involved in the response effort to a disaster or emergency. Effective inter-organizational information exchange helps ensure that information is accurate, consistent, and disseminated promptly. It

also helps to avoid confusion and overlap in response efforts), trust maintenance (trust is a critical factor in disasters and emergencies, as it affects how people perceive and respond to information); individual empowerment (refers to providing people with the information and resources they need to take appropriate actions during a disaster or emergency), uncertainty (in disaster and emergencies, it is common to have uncertainty about the extent of the impacts and the timing of the response); stakeholder engagement (refers to the process of engaging with key stakeholders, such as local communities, business owners, and emergency responders, to gather information and provide information).

Furthermore, disaster-affected organizations often use strategies that include; managing competitive messages (this involves ensuring that all communication from different organizations involved in the response effort is consistent and aligned), conducting training campaigns (help to educate the public about what to expect during a disaster or emergency, and how to respond appropriately); and developing and setting up messages about probabilistic information (refers to information that is uncertain and subject to change) to effectively communicate with the public during a disaster or emergency [33]. Despite this, the vast majority of research and approaches pertaining to risk communication center on making people more aware of and instructing about the hazard risk [34,35]. However, this teaching has not always resulted in a shift in people's behavior and attitudes, and as a result, society as a whole has not been made more prepared [36]. To address this issue, relief organizations and related stakeholders must adopt various risk communication initiatives or strategies. Even though several studies have offered various ways to alter people's behavior in times of disaster [34], these do not appear to be adequate, and more thorough studies in this field are needed, meanwhile, relief organizations may employ various strategies [36]. Despite the importance of effective communication in disaster response, there is limited research in Pakistan on the strategies relief organizations employ to increase public communication in disasters. Relief organizations must continue to develop and implement strategies that effectively reach and engage with the public. This will ensure the safety of communities, support disaster response efforts, and improve the overall response to disasters. Thus, this study aimed to examine and understand the strategies relief organizations use to enhance disaster risk communication in Khyber Pakhtunkhwa districts that disasters have impacted. Relief organizations and government agencies could use the study findings to enhance their communication efforts during future disasters and better prepare communities for the impacts of a disaster.

2. Material and methods

2.1. Study area description

Pakistan is home to approximately 210 million people and covers an area of roughly 881,913 square kilometers (Fig. 1). The population of Pakistan is comprised of various ethnic and racial groups, resulting in a diverse cultural and geographic landscape. While this diversity can be a positive attribute, it also makes the country more susceptible to natural disasters due to the range of coping mechanisms and preparedness levels across different regions and communities [6]. Pakistan has experienced numerous devastating floods recently, impacting vulnerable populations in all four provinces. Since independence in 1947, Pakistan has suffered from approximately 16 major floods, causing economic damages of around Rs 386 billion (US\$). Factors contributing to these disasters include human intervention in rivers, the continuous melting of the Himalayan and Siachen glaciers due to rising temperatures, unplanned development, and deforestation. Rainfall has also played a significant role in causing the floods in the country.

Khyber Pakhtunkhwa is one of the four provinces of Pakistan, located in the northwestern part of the country. The province has a population of over 35 million people, and the majority of the population is engaged in agriculture and small-scale industry. The literacy rate in the province is around 53%.³ Khyber Pakhtunkhwa is in a mountainous region known for its rugged terrain, with many areas located at high elevations. The province is also prone to natural disasters such as floods, landslides, and earthquakes. The Indus River runs through the province; many major cities and towns are along its banks. Floods have significantly impacted Khyber Pakhtunkhwa recently, with the province experiencing devastating floods in 2010, 2015, and 2019. However, the 2022 flood in Khyber Pakhtunkhwa province was even more severe than the 2010 floods regarding the number of people affected. Seventeen districts in Khyber Pakhtunkhwa province were hit by the 2022 flood disaster, affecting approximately 4350490 people. As a result, 306 individuals were killed, 369 were injured, and 91463 homes were damaged; of these, 37525 were fully damaged (FD), and 53938 were partially damaged (PD).⁴ The government of Pakistan and various international aid organizations have worked to provide relief and assistance to those affected by the floods. Still, the impacts have been long-lasting and have significantly impacted the province's socioeconomic well-being.

2.2. Study setting, participants' selection, and data collection

Even though disaster relief organizations are in regular contact with those impacted by an event, there is a dearth of descriptive data on the strategies these organizations employ when reaching out to those in need. It was decided by the principal investigator (first author) to carry out a qualitative content analysis of the perspectives of disaster relief professionals, relief workers, and other individuals who were physically present during a disaster and witnessed firsthand how relief organizations engaged with those who had been impacted. The qualitative content analysis could characterize the phenomenon using simple stories. Content analysis is a way to

³ https://kp.gov.pk/page_type/message/page/welcome#:~:text=The%20Population%20of%20the%20province,of%20the%20province%20is%2053%25.

⁴ <https://reliefweb.int/report/pakistan/detail-needs-assessment-flood-emergency-kp-25th-sep-2022.>

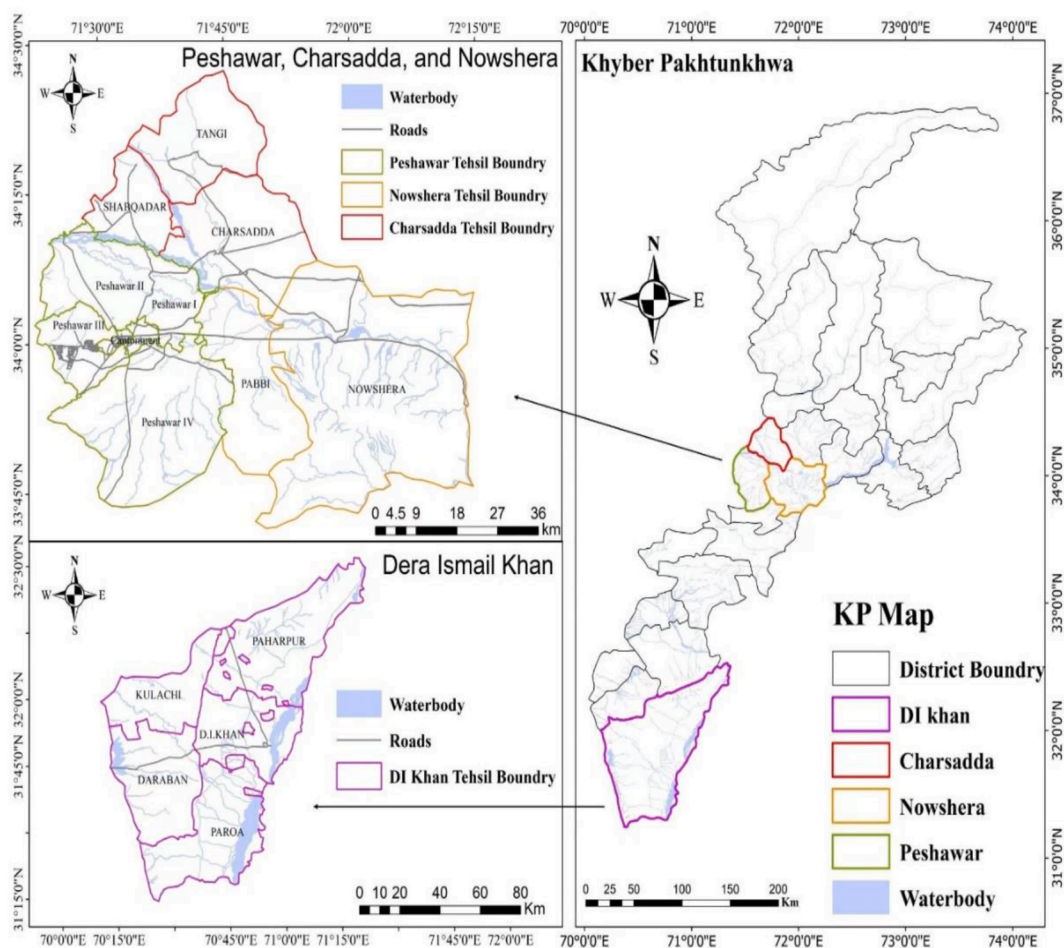


Fig. 1. Sample study districts in Khyber Pakhtunkhwa Province, Pakistan.

look at qualitative and quantitative data and can be used inductively or deductively [37]. This qualitative research was carried out between July 2021 and September 2021 across four severely affected districts of Khyber Pakhtunkhwa; Peshawar, Charsadda, Nowshera, and Dera Ismail Khan (D.I.Khan). These districts are vulnerable to flooding due to their location along major rivers, including the Kabul River, Swat River, Indus River, and tributaries. The region is prone to heavy monsoon rains, which can cause flash floods and landslides, damaging infrastructure, homes, and agriculture. In addition to natural factors, human activities such as deforestation, encroachment of river banks, and uncontrolled urbanization have also increased the region's vulnerability to flooding. These activities have disrupted the natural flow of water, reducing the capacity of rivers to carry excess water and causing them to overflow their banks during heavy rains [31].

To acquire our data, we used a purposive sampling technique. To begin with, as the study continued, participants who had firsthand knowledge of the research subject were purposefully chosen. Participants with particular knowledge were asked to participate in the study to consider each person's distinctive perspectives [38,39]. The lead author performed all of the in-depth semi-structured interviews. A total of 50 participants (Table 1) were interviewed using semi-structured interviews (30 participants from 10 NGOs with a plethora of experience in communicating catastrophic risk in addition to 20 participants from the local institutions and affected household heads affected by different catastrophic events). The decision to include 50 participants for interviews in a study is based on various factors, including the research question, the study's research design, the depth of information needed, and the resources available. As a first step in conducting interviews and building relationships with the participants, one overarching question was posed to all participants: Think about the calamities you have seen or been through; when a catastrophic event occurs, how do relief organizations get the word out to the public? At this point in the conversation, the substantive questions began, how did the public receive their news? For what purpose did you employ certain strategies? During the interview, the interviewer also asked follow-up questions in response to the participant's answers to the broad question and the important questions mentioned earlier. Additionally, the questions who, when, why, and how and the directive supplementing your explanation with an illustration were used extensively to saturate the data and the notion. This procedure was repeated until all available data had been used. It took almost five months to accomplish this.

Table 1
Relief organizations and characteristics of the key informants^a

S.No	Relief organizations	Gender	Designation	Age	Education	Experience	KI
1	NGO-1	Male	Program Manager	35	16 years	15 years	P1
	NGO-1	Male	Team Leader	37	16 years	10 years	P2
	NGO-1	Female	Field Officer	29	16 years	7 years	P3
2	NGO-2	Male	Program Manager	45	18 years	20 years	P4
	NGO-2	Male	Team Leader	41	16 years	11 years	P5
	NGO-2	Male	Coordinator	37	16 years	7 years	P6
3	NGO-3	Male	Manager	39	16 years	10 years	P7
	NGO-3	Female	Team Leader	41	18 years	9 years	P8
	NGO-3	Female	Field Officer	38	18 years	7 years	P9
4	NGO-4	Male	Team Leader	34	18 years	5 years	P10
	NGO-4	Male	Field officer	33	18 years	9 years	P11
	NGO-4	Male	Coordinator	36	16 years	13 years	P12
5	NGO-5	Male	Senior Field officer	36	18 years	5 years	P13
	NGO-5	Male	Field officer	38	16 years	5 years	P14
	NGO-5	Male	Team Leader	37	16 years	5 years	P15
6	NGO-6	Female	Field officer	33	16 years	5 years	P16
	NGO-6	Female	Field officer	37	16 years	5 years	P17
	NGO-6	Male	Program Manager	44	16 years	10 years	P18
7	NGO-7	Male	Program Manager	49	16 years	16 years	P19
	NGO-7	Male	Field Coordinator	44	16 years	14 years	P20
	NGO-7	Male	Team Leader	31	16 years	12 years	P21
8	NGO-8	Male	Team Leader	38	16 years	11 years	P22
	NGO-8	Male	Field officer	25	16 years	9 years	P23
	NGO-8	Female	Field officer	27	18 years	4 years	P24
9	NGO-9	Male	Field officer	33	14 years	7 years	P25
	NGO-9	Female	Field officer	31	14 years	4 years	P26
	NGO-9	Male	Field Coordinator	39	18 years	8 years	P27
10	NGO-10	Male	Field officer	30	14 years	3 years	P28
	NGO-10	Male	Program Manager	44	18 years	12 years	P29
	NGO-10	Female	Field officer	41	18 years	10 years	P30
11	HHPWR	Male	Retired Teacher	48	16 years	12 years	P31
	PDMA Official	Male	Assistant Director	39	18 years	11 years	P32
	PDMA Official	Female	Deputy Director	41	16 years	9 years	P33
	HHPWR	Male	Retired Govt officer	61	16 years	30 years	P34
	Health Department	Female	Early Childhood Education Specialist	39	18 years	8 years	P35
	Health Department	Female	Child Psychologist	33	18 years	5 years	P36
	Social welfare department	Male	Assistant Director	37	16 years	8 years	P37
	HHCHD-8	Female	Social worker	33	16 years	6 years	P38
	HHCHD-9	Male	Social worker	44	10 years	11 years	P39
	HHCHD-10	Female	Retired Teacher	61	14 years	22 years	P40
	HHNOW-11	Male	Community leader	71	5 years	40 years	P41
HHNOW-12	Male	Community leader	61	8 years	21 years	P42	
HHNOW-13	Female	Widow	54	2 years	11 years	P43	
HHNOW-14	Male	Community elder	59	0 years	17 years	P44	
HHNOW-15	Female	Social worker	43	10 years	7 years	P45	
HHDIK-16	Male	Community elder	53	5 years	13 years	P46	
HHDIK-17	Male	Retired Officer MET	61	14 years	25 years	P47	
HHDIK-18	Female	Widow	54	0 years	9 years	P48	
HHDIK-19	Male	Social worker	44	10 years	11 years	P49	
HHDIK-20	Female	Widow	44	0 years	11 years	P50	

2.3. Data analysis

In qualitative studies, data analysis starts at the same time as data collection (Fig. 2). We adopted qualitative content analysis techniques to accomplish this goal [40,41]. When the interviews were finished, the transcripts were heard multiple times before being typed out in Microsoft Office. Multiple passes were made over the interview transcripts to ensure the accuracy and comprehension of the data. The next step involved a line-by-line analysis of the data. The participants' accounts of crisis communication were broken down into "discrete units," and labels were applied to the phrases, sentences, or paragraphs that best captured the salient points. The words provided by the participants were used in the primary coding process, and the resulting codes were further categorized according to their commonalities and differences. Such an inductive strategy persisted until the final categories and subcategories surfaced. NVivo software was utilized to organize the data for the initial coding phase of the qualitative data analysis. The remaining stages of the qualitative content analysis process were performed manually.

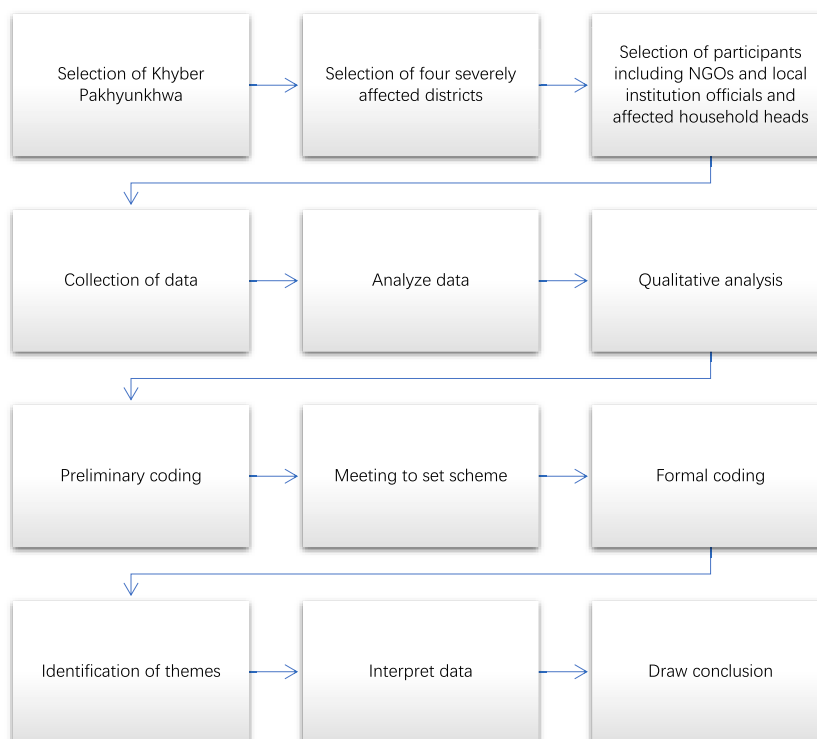


Fig. 2. Graphic representation of the methodology.

2.4. Ethical statement

This research was conducted with the respondents' consent according to approval guidelines of the ethical review committee, Faculty of Public Administration, Department of Sociology, Hohai University, Nanjing 210098, China (HHU-PS-21-2805).

3. Findings and discussion

Organizations' ability to work jointly in the face of disasters depends on effective coordination between different departments of disaster-related organizations and international agencies [42,43]. However, failure to properly share information and coordinate efforts can lead to duplicative efforts that waste resources and drive-up expenses. To prevent this from happening, relief organizations have investigated several solutions across the disaster risk management cycle. These solutions have helped set the course of action for several processes and reduce the room for confusion. Few research efforts have focused on how relief organizations can better communicate various risks to the public. The current research is the first of its kind undertaken in Pakistan. The results of this research demonstrate the most significant strategies adopted by relief organizations in this line of work (as determined by the respondents' first-hand information), which include 1) administration of educational and information transmission, 2) managing obstacles in communication, and 3) management of inter-organizational communications.

3.1. Theme-1: administration of educational and information transmission

Effective handling of information is crucial for natural hazard mitigation and disaster-relief efforts. Stakeholders involved in these efforts include government agencies, emergency responders, community organizations, and individual citizens. Each group has a vital role to play in disaster preparedness, response, and recovery and requires access to timely and accurate information to fulfill its responsibilities. Effective information handling in disaster situations includes clear communication channels; reliable data sources; real-time data monitoring; effective information sharing; and adequate training and resources. By ensuring these factors are in place, stakeholders can work together to mitigate the impact of natural disasters and provide adequate relief and recovery efforts to affected communities. Information sharing is crucial in responding to and helping people affected by catastrophic events. Timely and accurate information can help individuals and communities make informed decisions about protecting themselves, finding resources, and accessing critical services. Disasters can happen suddenly and without warning, making it challenging to prepare and respond effectively. Additionally, disasters can vary in scale and impact, further complicating response efforts. For example, floods have caused significant damage and displacement in many areas of Pakistan, causing loss of life, displacement, and damage to property and infrastructure [6,13,44,45]. The impact can be particularly severe in developing countries with limited resources and infrastructure,

making it difficult to respond effectively and provide relief to those affected. Floods and other catastrophic events can highlight the need for improved communication and information-sharing efforts [46].

The study findings demonstrate that education-focused strategies and open information sharing are essential for effective catastrophe preparedness (Fig. 3). When relief organizations prioritize education and information sharing, they can help communities prepare for disasters by providing them with the knowledge and resources they need to respond effectively in times of crisis. The survey respondents discussed their experiences with how relief organizations could perhaps educate and train the general population about the catastrophic event. Categorizing the perspectives on catastrophe preparedness into subcategories, such as helping with the educational mechanism, various educational approaches or strategies, and unified information, can be helpful in identifying specific areas for action and improvement.

Helping with the educational mechanism (Fig. 3) is essential to educational and information transmission. Most relief organization participants emphasized that adopting various educational approaches is essential in improving catastrophe preparedness efforts. By using different educational approaches, it is possible to provide individuals with the knowledge and skills they need to make informed decisions during times of crisis. The interviewees noted that relief organizations were using different ways to educate people about disasters depending on the time and place. Using different channels and mediums to reach a wider audience is important in adopting various educational approaches to improve catastrophe preparedness. For example, they used ambient ad campaigns, which involved placing advertising messages in non-traditional locations or situations, such as public spaces, transit systems, or on products themselves. Ambient ad campaigns can raise awareness and disseminate disaster preparedness information to a wider audience. A 35-year-old male participant (the program manager for NGO-1) with 15 years of experience working for various relief organizations said,

“Slightly earlier on, we began ambient ad campaigns and put up educational, promotional materials in rural communities. Most of the messages centered on the importance of clean drinking water and garbage disposal. Consequently, raising awareness prevented people from experiencing specific issues (P-1).

A 41-year-old male participant (the team leader for NGO-1) with nine years of experience working for various relief organizations commented in reference to the media’s role in this process;

“The media substantially supported us in covering the flood and transmitting educational information and are more likely to change the actions of those populations immediately affected by natural catastrophes. Broadcast and print media were still the best ways to get information to disaster-prone communities, particularly those without internet access. The mainstream media helped emergency responders and people living in disaster zones during catastrophic events to obtain the most useful information. By verifying crisis information quickly, the media managed to help decrease the likelihood that other parts of the sociotechnical system would be affected. Media also helped people “learn from disasters” by discovering what caused them and how to be better prepared for similar events. The way the media framed disasters suggested who was to blame and how the most prominent stakeholders should react (P-7).”

In addition, a female participant from NGO-10, who has worked in the field for ten years for several relief organizations, remarked that how the media portrays a crisis can significantly impact how people react to it. The media has the power to shape public perception and understanding of a crisis, and how the media covers a crisis can influence how people perceive the severity of the situation, how they respond to it, and what actions they take. If the media portrays a crisis in an alarmist or sensationalistic manner, it can cause panic and anxiety among the public, leading to disorganized and ineffective responses to the crisis. On the other hand, if the media downplays the severity of the crisis, it can lead to complacency and a lack of preparedness among the public.

“This was evidenced by the reactions of certain inhabitants to the media’s portrayal of the super flood that hit on July 26, 2010, leaving behind roughly 20% of the land it reportedly flooded. In response to media reports claiming the provincial government’s report on the situation, homeowners began barricading themselves inside their residences and armed themselves. Some residents disobeyed evacuation orders because they were concerned about their possessions being looted, a fear fueled by media reports of such looting occurring elsewhere. The media’s wild guesses about the disaster’s effects also significantly affected how resources were dispersed in the aftermath. Authorities were blamed for shifting their attention away from rescuing lives during the 2010 megafloods and toward monitoring illegal conduct after reading news reports that focused mostly on looting (e.g., a looting frame) and anarchy. Such ‘disaster misconceptions’ spread by the media could alter the behavior and demands of impacted communities, which can slow the response and recovery efforts (P-30).”

A female participant from NGO-10 further stated that several strategies can be used to favor risk communication in potential affected communities, particularly in situations where obstacles in communication are present and fake news and misinformation are widespread. Some of these strategies include building trust, which can be done by involving the communities in the decision-making

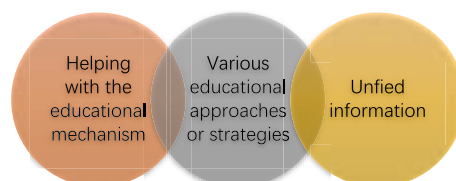


Fig. 3. Administration of educational and information transmission.

process, providing accurate information, and being transparent in communication, tailoring communication to the specific needs of the affected communities. It should be in a language that they understand, and the message should be delivered in a culturally appropriate way; using multiple channels, such as social media, radio, TV, and community meetings, can help to reach a broader audience and ensure that everyone hears the message; providing context around the risk and the potential impact can help people understand the severity of the situation and make informed decisions; and engaging with local Leaders such as community leaders, religious leaders, and other influential figures, can help to disseminate information and build trust with the affected communities. In addition to these strategies, it is also essential to address the role of fake news and misinformation in risk communication. This can be done by Monitoring social media as it can help to identify misinformation and fake news. Once identified, efforts should be made to correct the misinformation; providing accurate information and correcting misinformation is critical in preventing the spread of fake news; collaborating with local media outlets can help to disseminate accurate information and fake counter news; and educating the public about the risks of fake news and misinformation and providing them with the tools to identify and verify accurate information can help to prevent the spread of fake news.

Fig. 3 emphasizes the second sub-theme, which consists of various instructional approaches applied by relief organizations. The results showed that the relief organizations in the study employed various methods to disseminate information to the public. These strategies were selected considering the target audience's literacy and motivation levels. A 41-year-old female participant (the team leader for NGO-3) with nine years of experience working for various relief organizations commented in reference to the dispersion of relevant information;

“People devastated by the 2010 megafloods in Khyber Pakhtunkhwa, Pakistan, resided in tents next to their homes and were given health education primarily through personal interactions. We sent out teams to canvas shelters to identify at-risk populations and educate them on better protecting themselves from infectious diseases and improving their diet and lifestyle.”

Practical education is essential for ensuring that individuals can apply the knowledge they have acquired in a real-world setting. By providing practical education, relief organizations can help individuals to retain the knowledge and skills they have acquired over time and to use them effectively in the face of adversity.⁵ Practical education can also help individuals feel more confident and empowered to take action in a disaster, leading to more effective responses and better outcomes for those affected. A 61-year-old female participant (retired primary school teacher from Nowshera District) with twenty-two years of teaching experience commented in reference to the importance of practical education;

“Recently, a non-governmental relief organization came to our school to demonstrate first aid and Cardiopulmonary resuscitation (CPR) until I decided to go for a stroll. I realized my daughter was unresponsive and not breathing for a split second. What I had acquired in those lessons came flooding back to me: what to do in unconsciousness; I had executed all that I had learned to my child, and she had been spared from unconsciousness (P50).”

The third sub-theme was Integrated or unified information (Fig. 3), which refers to having accessible and standardized data on natural disasters, their likely outcomes, the potential scale of damages, and the steps that can be taken to help those who have been affected. It enables individuals to understand the fate of their loved ones so they can better prepare for the future and assist their fellow people. The study findings revealed that the majority of the sampled participants believed that considering the inconsistencies in information dissemination among relief organizations and the pragmatic lack of an authoritative source for such information, relief organizations employed various techniques to provide comprehensive and accurate information. The study findings further indicated that respondents acknowledged that a unified and coordinated effort across relief organizations was necessary to provide the community with precise and timely information. A 33-year-old female participant (social worker from Charsadda district) with six years of social work experience commented;

Radio, television networks, smartphone applications, and social media sites were among the many channels used to disseminate the public's warnings and information to prepare for the flood (P38).”

Another participant from the Dera Ismail Khan district, a retired officer from the metrology department with over 25 years of experience, remarked that different information strategies might be needed depending on people's circumstances and preferences.

“We may alter our strategy for disseminating information in response to what we learn from the needs expressed in cyberspace or the viewpoints voiced there, as well as what we learn from the media and our cyberspace monitoring (P47).”

Media outlets provide real-time, in-depth coverage of breaking news and natural disasters, educating the public and serving as de facto spokespersons for the population. As a result of what the participants have seen, relief organizations were increasingly using the media to spread their message. A 39-year-old male participant (Assistant Director from Provincial Disaster Management Authority (PDMA)) with eleven years of professional/social work experience commented;

“At the height of the 2010 megafloods, every news organization sent representatives, and TV and online news outlets provided rapid coverage of the disaster. Every incident was recorded in real-time, so nothing was missed (P32).”

⁵ <https://www.linkedin.com/pulse/what-practical-education-all-claire-mandimika/>.

3.2. Theme 2: managing obstacles in communication

It is essential to have open channels of communication. Nonetheless, there are several obstacles in the way of communication.⁶ The individuals who participated in the study showed that one of the trickiest ways for a relief organization to communicate with its target audience entails eliminating obstacles in communication. Building trust (Fig. 4) is an essential and challenging strategy for non-governmental organizations (NGOs) to effectively communicate and engage with the communities they serve. Trust is a two-way process that requires consistent and transparent communication, active listening, and a commitment to following through on promises. When NGOs build community trust, they can create a safe and supportive environment for people to share their concerns, provide feedback, and actively participate in decision-making. This two-way dialogue helps NGOs to understand better the unique needs and challenges of the community, which can inform the design and delivery of more effective programs and services. To build trust, NGOs should be transparent about their goals, strategies, and limitations and openly acknowledge mistakes or failures. They should also prioritize the active involvement of community members in the planning, implementation, and evaluation of programs and demonstrate a genuine commitment to long-term partnerships and collaboration. NGOs should also be aware of the assumptions that people may have about aid agencies and work to address those assumptions through effective communication and outreach. This can include engaging with local leaders and organizations, using culturally appropriate messaging and channels of communication, and providing opportunities for feedback and input from the community.

A 38-year-old male participant (the team leader for NGO-3) with eleven years of professional experience working for various relief organizations commented in reference to the problems and needs of the local inhabitants;

“With "daily trips to the flood-affected districts and visits to shelters" and "intimate interaction with the residents," we were able to "become conscious of the issues and the requirements of individuals and anticipate their needs to the best of our ability. For instance, In 2010, floodwaters hit districts in Khyber Pakhtunkhwa (KPK) province out of the blue, and then, even more unexpectedly, the water level quickly rose to the tops of buildings. Numerous communities were washed away. Due to the unfortunate event, our organization donated 1500 shawls to the 1500 women in the impacted Villages (P22).

A 31-year-old female participant (the field officer for NGO-9) with four years of professional experience working for various relief organizations commented;

With the help of other local organizations, we provided 5,000 hygiene kits to 500 households in the Charsadda district that the floods had impacted on October 10, 2010. This greatly improved the quality of life for those displaced by the flood disaster. The packages included: 2 moisturizing soaps, two toothbrushes, two toothbrush tubes, 1-foot cleanser, one nail clipper, ten gauze pads (Plastic Handel), one bar of soap, one towel, one bottle of Medicam shampoo, one tube of Vaseline, one box of powder for freshness, one bottle of Dettol, and one bottle of baby lotion (P26)

Another 44-year-old male participant (field coordinator for NGO-7) with fourteen years of professional experience working for various relief organizations commented;

“Our organization, together with the help of an international NGO, supplied 7,000 Meals Ready to Eat packages to the most affected flood households of the Nowshera and Charsadda Districts during the 2010 megaflood (P20).”

The respondents also noted that establishing proper communication channels with all stakeholders is critical for building trust and ensuring that people believe that relief organizations are on their side. Effective communication is a powerful tool that can help create a shared understanding of the challenges and opportunities facing a community and can help to build relationships based on mutual respect and trust. When relief organizations take the time to actively engage with stakeholders, including community members, local leaders, and government officials, they can better understand the local context and the unique needs and challenges of the community. This information can inform the design and delivery of more effective and sustainable programs and services. Furthermore, engaging with stakeholders is critical to demonstrating a relief organization's commitment to transparency, accountability, and partnership. This can help build trust and credibility with the community and establish relief organizations as trusted allies to address humanitarian challenges. A 61-year-old male retired government officer from Peshawar district (with over 30 years of professional experience within government setup) commented;

“Multiple visits were made by health officials who conducted checkups and provided necessary medications to those who had requested them. They conversed with people, reassured them, and offered psychosocial support. Because of the floods around two weeks later, women and children were understandably frightened and needed reassurance, so they spoke to and guided them (P34).

The respondent also said that recent floods, which can cause significant damage and loss of life, can have significant psychological impacts on children and adults. Experiencing a natural disaster can be traumatic, leading to various mental health issues, including anxiety, depression, post-traumatic stress disorder (PTSD), and grief. Natural disasters can significantly impact the psychological well-being of children, who may be particularly vulnerable to the effects of these events. Children may experience fear, anxiety, confusion, and a sense of helplessness during and after natural disasters, especially if they witness or experience traumatic events, such as the loss

⁶ <https://www.easymanagementnotes.com/barriers-to-effective-communication-in-an-organization/>.

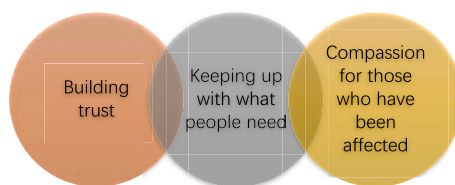


Fig. 4. Managing obstacles in communication.

of homes or loved ones, injury, or displacement. These experiences can have long-term effects on a child's emotional and cognitive development, affecting their overall mental health and well-being. Children may not have the same coping skills and support networks as adults, making it more difficult to process and cope with the traumatic event.

Natural disasters can have a significant impact on the psychological well-being of adults. Adults may experience a wide range of emotional and psychological responses to natural disasters, including anxiety and depression—natural disasters can lead to feelings of sadness, hopelessness, and anxiety. These feelings can be prolonged and affect daily functioning, leading to clinical depression and anxiety disorders; and grief and loss: adults may experience the loss of loved ones, homes, and personal belongings, leading to feelings of grief, sadness, and loss. In addition to the psychological impacts of natural disasters, adults may struggle with the practical challenges of rebuilding their lives and communities, leading to ongoing stress and psychological distress. Rebuilding after a natural disaster can be a long and difficult process involving financial, logistical, and emotional challenges. Adults may have to deal with issues such as finding temporary housing, repairing or rebuilding damaged homes, navigating insurance claims, and finding new employment. These challenges can be overwhelming and lead to ongoing stress and anxiety. Additionally, adults may also face the loss of social networks, community infrastructure, and other sources of support, which can further contribute to psychological distress and a sense of isolation. To address these challenges, adults need to seek out practical support. They may also benefit from joining support groups or connecting with other community members who have experienced similar challenges. By working together and supporting one another, adults can help to rebuild their communities and promote psychological resilience in the aftermath of a natural disaster.

A 33-year-old female child psychologist from the health department (with five years of professional experience within government setup) commented;

“Children’s mental and physical well-being and their capacity to survive after the disaster are highly dependent on the availability of emotional and psychological assistance for the group. A child’s physical and emotional well-being was emphasized, and she cited a stable home as crucial. Children are particularly vulnerable to the psychological effects of traumatic events like natural catastrophes since they lack the life experience to cope with the unpredictable risk posed by flooding. Living with the unpredictability of flood hazards may cause them to feel uncomfortable and cause them to lose their feeling of security, which can lead to worry and tension in a stressful circumstance like a natural catastrophe. As of this moment, parents are urged to maintain an upbeat line of communication with their children at all times, informing them of the measures being taken to ensure their safety and assuring them that numerous people are working to aid in the community’s recovery from the disaster (P36).

In addition, keeping an eye on the media can be an important way for relief groups to connect with people affected by natural disasters and to become aware of their needs and requirements. In the aftermath of a natural disaster, the media can provide important information about the extent of the damage, the needs of affected communities, and the relief efforts underway. This can help relief groups better understand the situation on the ground and identify where their resources and support are most needed. A 37-year-old male Assistant Director Social welfare department commented;

“Maybe I’m free from most obligations, but I still spend half an hour each night going through the news. Some of the media I ingest undergoes a preliminary inspection on my part. I tune in to several news stations to keep up with the latest events. I guess the media will be harsh on our programs (P37).”

Empathy and compassion (Fig. 4) are essential for building strong interpersonal and social connections and for fostering a sense of community and collective responsibility. When individuals and communities can empathize with and show compassion for others, they are better able to understand and address their needs, and to work together towards common goals [47]. Empathy and compassion can play a critical role in supporting affected individuals and communities in the aftermath of a natural disaster. By showing empathy and compassion towards those who have been impacted by a natural disaster, individuals and communities can help to alleviate emotional distress and promote healing and recovery. Empathy and compassion can also help to build bridges between different communities and groups, promoting social cohesion and collective responsibility. By recognizing and valuing the experiences and perspectives of others, individuals and communities can work together towards common goals and support each other through difficult times. People fundamentally desires them in their personal and professional relationships [48]. Esteem refers to the recognition and respect that individuals receive from others, and it plays an essential role in shaping how people feel about themselves and their place in the world [49,50]. In personal relationships, esteem is often expressed through love, affection, and support from family and friends. When individuals feel valued and respected by those close to them, they are more likely to feel secure and confident in their relationships and to develop positive self-esteem [51,52]. In professional relationships, esteem is often expressed through recognition and reward for achievements and contributions. When individuals feel valued and respected in their professional roles,

they are more likely to be motivated and engaged in their work and to feel a sense of satisfaction and accomplishment [49].

The study findings show that respecting catastrophe victims is an important aspect of effective relief efforts, particularly during the response stage. When relief agencies prioritize the needs and well-being of affected individuals and communities, they can better provide effective and targeted support and foster trust and cooperation with the public. The participants felt that it is important for aid groups to follow the cultural norms and beliefs of the locals when creating disaster preparedness communications. By doing so, aid groups can help ensure that their messages are received and understood by the local population and that people can make informed decisions about preparing for and responding to disasters. Cultural norms and beliefs play a significant role in shaping how people perceive and respond to disaster risks. By taking into account the cultural context of the local population, aid groups can tailor their communications to better resonate with the target audience and provide relevant and actionable information that is more likely to be acted upon. In addition, by following cultural norms and beliefs, aid groups can help to build trust and credibility with the local population. When people feel that their cultural values and beliefs are respected and reflected in the aid group's messaging, they are more likely to view the aid group as a legitimate and trustworthy source of information and support.

A 37-year-old male participant from NGO-5 (Team leader) with five years of professional humanitarian experience toured some of the local flood-affected areas and met with some community residents for various project-related activities and remarked;

"I had a conversation with a local. He said that God was aware of the event's goodness before it took place, but if that were the case, we wouldn't have to deal with any more floods. Without passing judgment on his faith, I informed him that God must have thought it was best that this occurred to us so that we might learn to lean on each other and pull through tough times. After we conversed, I realized that he would consider my points at least. He also pledged, "we will do everything you say" (P15).

In addition, relief organizations can play a crucial role in easing the hardships of people affected by disasters by demonstrating empathy, listening to genuine concerns, and trying to fulfill their requirements. Relief organizations can build trust and establish a sense of connection and shared responsibility with the public by demonstrating empathy towards disaster-affected individuals and communities. This can help to create a more positive and supportive environment and may encourage people to engage more fully in the relief and recovery process. Listening to genuine concerns is also critical in building effective relief efforts. By actively seeking out and responding to the concerns and needs of disaster-affected individuals and communities, relief organizations can tailor their efforts to better address the specific challenges and issues the local population faces. This can help to create more targeted and effective relief efforts and may improve the overall success and impact of the relief effort. A male participant aged 44 from the area of Charsadda, who has done social volunteer work for the previous 11 years, said;

"The morning following the 2010 megaflood, I noticed that workers from a relief organization had come to our town to set up a shelter for those who had lost their homes. I inquired if I could take some tents for my family and was directed to a large shelter stocked with necessities. We were served courteously; however, having family demographics and supplies delivered directly to the tents would have been helpful. People assist them out since they know they aren't genuine beggars but rather folks who have lost everything and are now dependent on the charity of others (P39)."

Additionally, the study results showed that it is commendable that specific relief organizations are making concerted efforts to ensure that aid workers treat beneficiaries with dignity. However, as you mentioned, individual participants' experiences may vary. Respondents' views and experiences revealed one of the significant challenges in responding to disasters is meeting the diverse and often complex needs of affected populations. These needs range from food, water, and shelter to medical care, emotional support, and financial assistance. To address these challenges, it is essential to have a comprehensive and detailed disaster response plan that considers the needs of the affected populations.

A 71-year-old male participant (community leader) from district Nowshera said;

They never listened to us (relief organizations), and whenever we asked for something, they said "no," even if they thought it was for the best. Boots and shovels were among the supplies that arrived in a convoy of assistance vehicles, but these were not distributed to the people who needed them. What good might they do if I don't know they're essential for the flood? (P41)"

3.3. Theme-3: management of inter-organizational communications

Inter-organizational communication is a broad term for the study of many different types of entities (e.g., collaboration, coalitions, joint ventures, etc.) and organizational behavior (e.g., networking, exchanging information, and developing new knowledge are all examples of organizing acts) [53]. Due to the breadth of disaster-related operations, coordination is one of DRM's most pressing

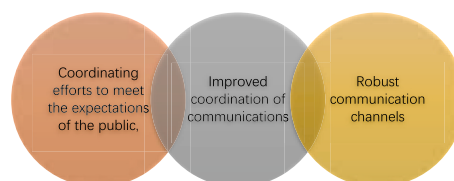


Fig. 5. Management of inter-organizational communications.

concerns and obstacles [54,55]. The goal of disaster management is to lessen the impact of disasters on society, which can only be achieved through collaboration and coordination amongst relevant agencies. The risk-effective communication can be enhanced through cooperation and coordination across various organizations. In this regard, relief organizations have used several strategies to achieve it, including coordinating efforts to meet the public's expectations, improved communications coordination, and robust communication channels (Fig. 5).

The study's findings showed that relief organizations used several strategies to coordinate their efforts and address the needs of affected populations in times of crisis. These strategies may include needs assessment (conducting a needs assessment is a critical first step in responding to a crisis. Relief organizations identified the specific needs of the affected populations, such as food, shelter, medical care, and emotional support. This information can be gathered through surveys, interviews, and other data collection methods); notification of public needs (it is important to notify the public about the available resources and services to meet their needs. This can be done through public announcements, social media, and other communication channels); and satisfying local needs (relief organizations must work to satisfy the local needs of the affected populations. This may involve providing necessities, such as food and water, and ensuring that the affected people have access to medical care, emotional support, and financial assistance).

Furthermore, organizations' initiatives to determine what individuals need and enhance cooperation with other relief organizations to meet those requirements are known as coordination. Drawing from the opinion of most of the participants in this study, determining people's information requirements during a crisis requires a unified recognition of the individual needs of the affected populations. It is important to understand that each individual or group may have unique and specific information needs based on their circumstances, experiences, and background. A unified recognition of information needs can help avoid the dispersed information collected by multiple entities. Various organizations may gather information about the affected populations' needs in a crisis. If these efforts are not coordinated, there is a risk that information may be duplicated or dispersed, leading to confusion and inefficiencies in the response. By adopting a unified approach to identifying and addressing information needs, relief organizations can work together to ensure that information is collected and shared in a coordinated and efficient manner. This can help to minimize duplication of efforts and ensure that the information gathered is comprehensive and accurate. A male participant from NGO-7 (Field coordinator), who worked for the previous 14 years with different local and international relief organizations, said;

"Field coordinators from numerous relief organizations convened to work collaboratively, but each organization operated independently. After the floods subsided, they were able to pinpoint at-risk populations by consulting health records and other sources of data (P20)

The results also showed that most respondents agreed that it is common for relief organizations to face resource constraints during a crisis. The demands on relief organizations can be overwhelming, and it is often difficult for a single organization to meet all the needs of the affected populations. In such situations, relief organizations may need the support of other organizations and individuals to help them address the needs of the affected populations. Relief organizations can work together to share resources, expertise, and knowledge to maximize the impact of their interventions. This can involve collaborating with other relief organizations, local authorities, and community groups to coordinate their efforts and ensure that the needs of the affected populations are met. Communicating their intentions to the public through various forms of media is an important aspect of the work of relief organizations during a crisis. By making their intentions known, relief organizations can increase transparency and build trust with the affected populations, often in vulnerable and uncertain situations. A male participant from NGO-6 (Program Manager), who worked for the previous ten years with different local and international relief organizations, said;

"We were constantly communicating with the media; I even appeared on the local television to deliver important announcements. We broadcasted to the flood-affected areas, "We've checked, and individuals do need these goods, and if you would like to help, make sure to send these to people," letting them know what was needed and how to support those who had been impacted by the disaster (P18).

Before a disaster strikes, relief organizations often meet to plan and coordinate their efforts to ensure an effective response. This planning process involved identifying the roles and responsibilities of each organization, as well as the resources and expertise they can bring to the response. It also involved identifying potential challenges or barriers to effective coordination and developing strategies to overcome them. Expert participants identified that information exchange between relief organizations is crucial for boosting communication between aid agencies during a disaster. Sharing information can help to avoid duplication of efforts and resources, identify gaps in the response, and ensure that the response is coordinated and effective. However, information exchange between relief organizations is often only undertaken on a relatively small scale due to various factors such as resource constraints, technical limitations, and logistical challenges. As a result, there is often a lack of communication and coordination between aid agencies, leading to inefficiencies and gaps in the response.

To improve information exchange between relief organizations, several strategies were employed. These include: establishing information sharing protocols-relief organizations can work together to establish protocols for sharing information, including the types of information to be shared, the frequency of sharing, and the channels for sharing; Using technology-Technology can be used to facilitate information exchange between relief organizations, including the use of online platforms, databases, and communication tools such as social media, email, and messaging apps; Creating networks and partnerships-relief organizations can form networks and partnerships to facilitate information exchange, including formal and informal networks, regional and international partnerships, and partnerships between different types of organizations (e.g., governmental and non-governmental organizations); and building capacity-Relief organizations can invest in building their capacity for information management and sharing, including developing standard operating procedures, training staff on information management and sharing, and investing in information management and

sharing systems.

However, humanitarian organizations exchanged information unofficially due to lacking a unified plan at the highest possible tier. When there is no clear plan or framework for information sharing, relief organizations may rely on informal or ad-hoc methods, such as phone calls, emails, or meetings. This can lead to inconsistencies in the shared information, duplication of efforts, and gaps in the response. To avoid these issues, relief organizations established a clear and coordinated information-sharing plan. This plan included the types of information to be shared, the frequency of sharing, and the channels for sharing. It also identified the roles and responsibilities of each organization in the information-sharing process.

4. Discussion

This study has found that participants relied heavily on administering educational and information transmission to disseminate knowledge and information. Disaster planners and policymakers recognize the critical role that education and awareness play in DRM initiatives. Education and awareness programs can help promote an understanding of the risks and hazards that communities may face during a disaster and can provide important guidance on preparing for and responding to these events [56,57]. For emergency preparedness workers, education and awareness programs can help build skills and knowledge for effective disaster response, including incident management, communication, and coordination. Education and awareness programs can help promote individual and community preparedness, improve understanding of early warning systems, and increase awareness of potential risks and hazards for people living in disaster-prone areas.

Effective disaster preparedness and response requires high technical expertise, planning, and coordination among emergency workers and other stakeholders [58]. Emergency workers, including first responders and disaster relief personnel, require specialized training in various areas such as search and rescue, first aid, disaster risk assessment, and logistics management, among others. This training equips them with the skills and knowledge to respond effectively to a disaster and provide critical assistance to affected communities [59]. Effective planning is also critical to disaster preparedness and response. This involves developing emergency response plans that outline roles and responsibilities, identify potential hazards and risks, and establish protocols for communication and coordination among stakeholders. Planning also includes ensuring that emergency supplies and resources are readily available and that infrastructure is in place to support effective response efforts [60]. Coordination among stakeholders is also essential for effective disaster preparedness and response. This includes collaboration among government agencies, non-governmental organizations, community groups, and private sector partners to ensure that response efforts are well-coordinated and resources are efficiently deployed [58].

Relief organizations often explore multiple public education strategies when developing outreach and education campaigns. When designing education and awareness programs, organizations typically consider factors such as the target audience, the desired goals of the program, time constraints, and available resources [61]. Furthermore, other research has shown that relief organizations use various media [62,63] and school-based strategies [64] to educate citizens about disaster preparedness and response. Media-based education strategies include mass media campaigns, social media, and other online platforms to disseminate information and reach a broad audience. These campaigns may use a variety of formats, including videos, infographics, and interactive tools, to engage and inform the public. Media-based strategies may also include partnerships with local media outlets to ensure critical information reaches those most in need. School-based education strategies are another common approach used by relief organizations. These strategies provide disaster preparedness and response training to students, teachers, and school administrators. This can include educational materials, classroom presentations, and training sessions that teach students and educators about risk reduction, emergency preparedness, and response. While many nations have launched catastrophe risk reduction educational initiatives, there is still a long way to go before they fully effectively reach their intended audience and promote emergency preparedness and DRR initiatives throughout society [65,66].

Educational and information transmission administration is integrated information on catastrophic events; somehow, this notion is underlined, and the other research findings demonstrate its importance in disaster response and community preparedness. For example, Granell et al. [67] and Guo et al. [68] show that spreading reliable and organized information enhances emergency preparedness. Sharing them on social media with precise details about the current scenario can assist in managing and controlling catastrophes. People must have access to timely, accurate, and trustworthy information, and this can be achieved through the rapid evolution of communication technologies and the efficient dissemination of information [69]. The researchers also looked at various models for the dissemination of disaster-related information. Using the information entropy method, Shan et al. [70] proposed a methodology for transmitting urgent essential information in crises that could enhance disaster prediction and response. In conjunction with the mainstream media, social networks can share information and enlighten people to communicate effectively [71].

The participants' most effective strategy for resolving communication obstacles and facilitating interactions between relief organizations and individuals was cultivating trusting connections between the two groups. Trust in humanitarian organizations has been a primary driver of risk aversion in prior studies [72,73]. Numerous researches demonstrate a lack of mutual trust between people and managers, making it difficult for disaster managers to earn the general population's trust [74]. Therefore, managers employ many strategies to deal with this issue. Putting one's trust in others is a good way to earn respect. To maintain people's trust, public officials should trust the public [75]. People have more confidence in an organization if they can count on them to follow through on their commitments. Moreover, relief managers who break their word generate a climate of mistrust and discourage constructive communication. Morgan and Hunt [76] found a direct link between truth and commitment. The current research contributes to the existing literature on communication obstacle management by revealing the importance of effectively managing people's needs. Evidence from the study participants indicates that in a disaster, most respondents plan to visit hospitals for care that is not immediately

life-threatening. Managers must ensure that individuals can access non-emergency medical treatment by directing them to the proper facilities and personnel during a catastrophe. Therefore, disaster managers must consider public needs and concerns [77].

Additionally, Lam et al. [78] found that people have high expectations of relief organizations during and after a disaster, particularly regarding basic needs such as evacuation, temporary relocation, and shelter. In many cases, relief organizations are the primary source of support for people affected by a disaster. They are often expected to provide a range of services to help people cope with the aftermath of the event. However, meeting these expectations can be challenging for relief organizations, particularly after a large-scale disaster. Relief organizations often have limited resources and work in a complex, dynamic, and constantly changing environment. They must balance competing priorities and make difficult decisions about allocating resources and supporting those who need it most. The present research also found that respecting those impacted can be a significant enabling factor in developing positive relationships between the relief organization and people. Research undertaken by Samadipour et al. [52] found that human dignity is a fundamental right everyone has and one of the most significant aspects of how individuals and organizations interact. This research indicates that individuals ought to believe that rules and laws are in place to safeguard their dignity. Thus, when managers adopt this strategy, they become more committed to their relationships with the public [79]. Yet other studies have found that ordinary people view the strategy used by relief organizations to distribute aid to others very differently. People's expectations of how disaster relief agencies treat them can vary widely; some want to be treated with dignity and respect, while others care only that their necessities are satisfied [80]. However, to strengthen the bond between relief organizations and people, it is critical to value the thoughts, feelings, and beliefs of others. So, by maintaining their human dignity, we could gain the public's trust.

Effective management of communications between multiple relief organizations is crucial to ensuring an effective disaster response and promoting collaboration among different stakeholders. Coordinating relief efforts in the aftermath of a catastrophe can be a complex and challenging task [25], especially when multiple relief organizations are involved. While these organizations all have the shared goal of meeting the needs of survivors [81], they may have different priorities, resources, and methods of delivering aid. When multiple organizations are involved in relief efforts, it can be difficult to establish clear lines of communication and coordination. Sometimes, there may be a lack of leadership or coordination structures to guide relief efforts [82,83]. Several organizations have indicated strategies that relief organizations can use to improve inter-organizational communication and foster coordination in disaster response and recovery efforts [82]. The previous research has demonstrated that offering and developing required skills (relief organizations can work to ensure that their staff has the necessary skills and training to communicate and collaborate with other organizations effectively) effectively, exchanging resources and information (sharing resources and information, to avoid duplication of efforts and ensure that resources are used effectively), and giving heed to public involvement (involve local communities in the disaster response and recovery efforts. This can help to ensure that the needs and priorities of affected communities are heard and addressed, and that relief efforts are culturally appropriate and responsive to the specific needs of the affected population) these are all important factors in improving inter-organizational communication and fostering coordination in disaster response and recovery efforts [31].

Several organizations have improved their methods for obtaining information to communicate better during a disaster, even though none is expected. The inability of people and relief organizations to communicate with one another during a crisis can indeed be due to the breakdown or absence of communication technology. Disasters can cause damage to communication infrastructure, such as cell towers, telephone lines, and internet connections, making it difficult or impossible for people and organizations to communicate with each other. However, other factors can also contribute to breakdowns in communication during a crisis. These can include overload on communication systems [84] (during a disaster, there can be a surge in communication as people try to contact loved ones or seek information about the situation. This can overwhelm communication systems and make it difficult for important messages to get through); Language barriers [85] (In some cases, language barriers can make it difficult for relief organizations to communicate with affected communities or for individuals to access critical information); Lack of communication protocols [86] (without clear communication protocols, relief organizations and individuals may not know who to contact or what information to share in the event of a disaster); and Cultural differences [87] (cultural differences can also impact communication during a crisis, as different communities may have different norms and expectations for communication and may interpret messages differently). The government is important in improving communication with individuals and relief organizations during a crisis. The government can use its resources and authority to help facilitate communication and ensure people can access the latest communication technology [88]. Shklovski et al. [89] found that people use all the different communication channels and information at their disposal, consistent with the current study's findings.

5. Conclusion and policy implications

People have always been able to handle challenging situations, like catastrophic events, on their own or with the help of close relatives. This way of dealing with a disaster looks different depending on the type and length of the catastrophic event. Khyber Pakhtunkhwa, Pakistan, is prone to frequent and widespread flooding, which has a negative effect on the region's rural areas, its residents, and the economy. Communities are often the first and most severely affected by catastrophes, so any actions and countermeasures must benefit them. At this point, risk communication is essential since communities need knowledge regarding how they are at risk, and they must recognize who is sending information to undertake the appropriate measures. By sharing information with the local communities, risk communication evolves into a two-way conversation in which individuals share information, learn how others see risk and work together to find ways to mitigate it. In addition to the government, relief organizations can significantly warn the public about potential disasters. They share the commonalities that serve as a foundation for community involvement. They are efficient in enacting community change in concert with common goals. Despite being connected to the people, the government has

acknowledged and praised their community-based activities due to their size and visibility. With this acknowledgment, they could more easily integrate risk-reduction programs and reach more people who stand to benefit from them. Hence, the communities would benefit from the risk communication approach relief organizations adopt, and the response actions will become more community-driven.

Based on participants' insights, this research highlights various strategies through which relief organizations have enhanced communication with one another and the public. These strategies improve risk communication, guarantee efficient use of resources, and prevent losses. The results of this research demonstrate the most significant strategy adopted by relief organizations in this line of work (as determined by the respondents' first-hand information) included 1) administration of educational and information transmission, 2) managing obstacles in communication, and 3) management of inter-organizational communications. Implementing strategies for risk communication can help emergency managers and planners develop efficient plans that make the best use of available resources. Also, provide individuals with access to trustworthy information and lessen the impact of catastrophes. Following our research findings, there is a lack of planned and comprehensive initiatives to strengthen risk communication and interactions between individuals and relief organizations. This research's key themes and sub-themes can be utilized as a guide to enable emergency managers and policymakers to establish a detailed plan to strengthen risk communication.

Additionally, this study found relief organizations had a lesser role in the risk communication approach. Still, it is possible that organizations and individuals can forge a more robust and reliable connection if those who are affected by the risk are included in the risk-management process. In light of this, it is suggested that relief organizations consider employing this strategy for risk communication. It is uncertain the extent to which these strategies would successfully alter people's behavior and whether or not relief organizations would be ready to respond quickly enough in the event of a catastrophe. This is why it is essential to evaluate different methods of influencing people's behavior and enhancing communication in times of emergency.

5.1. Study limitations and directions for future research

The current research on NGOs' strategies to increase disaster risk communication in Pakistan is not immune to the pitfalls plaguing other research types. This research has some limitations-The study is limited in its generalizability because it only looked at four different locations. This is because the results may not apply throughout different regions of Pakistan or nations with vastly dissimilar economic, political, and cultural settings. Furthermore, limiting the current study to four districts may have also impacted the sample size, potentially impacting the statistical significance and undermining its ability to derive important insights. A relatively limited number of women took part due to cultural norms could reduce the reliability of the sample and the generalizability of the results. It can be challenging to recruit and involve women in research projects due to cultural norms limiting women's access to participation in society. Also, women may have more specific communication needs, interests, and access to information than males, so the low female participation may potentially impact the accuracy and efficacy of the strategies in the context of disaster risk communication. Thus, it is crucial to recognize the cultural and societal barriers that hinder women from participating in research and develop strategies for overcoming these barriers, such as collaborating with local groups or community leaders who can help access women participants. Reasons for NGOs' reluctance to get involved range from a lack of time, funding, or interest to worries about privacy, ethics, and potential bias. Therefore, it is essential for researchers to consider and solve these worries and obstacles and to collaborate closely with the NGOs to establish trust and set up effective lines of communication. Making sure the research results are spread in a manner that is beneficial and relevant to the NGOs and the wider community may involve offering benefits or incentives for participation, attempting to address concerns regarding privacy and ethical issues, and making sure the research is conducted in a safe and secure environment.

Lastly, security concerns were cited as a potential limitation of the research. This is because places plagued by political unrest, armed conflict, or other security concerns are more likely to be the sites of natural disasters, making it difficult for researchers to gain access and gather data there. Fieldwork, data collection, and community engagement can be hampered or even rendered impossible under such conditions. In addition, security concerns may endanger the well-being of both researchers and participants. For example, it could be challenging to protect the participants' privacy and anonymity, or to safeguard the researchers' safety, due to security concerns that arise during data gathering. Thus, it is crucial for researchers to be aware of the potential influence of security issues on the design and implementation of the study and to take measures to mitigate such risks. There are several steps that must be taken to guarantee the safety of the researchers and the participants in a study, including forming partnerships with local organizations or community leaders who have a better understanding of the security situation, providing adequate training and education to all participants, and implementing appropriate measures.

Future research on the strategies used by NGOs to improve disaster risk communication in the region could focus on the following areas: including finding the gaps in current disaster risk communication strategies, evaluating the effectiveness, building the capacity of local communities, exploring the use of technology for disaster risk communication, and developing partnerships and collaborations. This can help identify successful collaboration models and areas for improvement.

Author contribution statement

Ashfaq Ahmad Shah: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Ayat Ullah; George T Mumdimu: Analyzed and interpreted the data.

Nasir Abbas Khan; Abid Khan: Performed the experiments.

Chong Xu: Contributed reagents, materials, analysis tools or data.

Data availability statement

Data will be made available on request.

Additional information

No additional information is available for this paper.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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