

# Public Awareness and Perception of Earthquake Hazard: A Case Study in Herat Province

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**Abstract**—Natural disasters, notably earthquakes, remain a global concern due to their unpredictable and devastating nature. Afghanistan, strategically located at the intersection of tectonic plates, faces a persistent seismic threat heightened by its geological diversity. Despite historical perceptions of Herat Province as less prone to seismic activity, October 2023 observed an extraordinary wave of seismic events, four consecutive earthquakes, each registering a magnitude of 6.3, resulting in substantial devastation with 1,482 fatalities and 2,100 injuries. Mitigating the impact of disasters and minimizing both spiritual and material losses are predominantly achievable through the education of every individual within a society. This research, employing a rigorous mixed-methods approach, aimed to thoroughly examine and address gaps in public awareness and perception of earthquake hazards in Herat. A questionnaire, featuring 21 questions, was distributed to 835 participants across strategically selected districts. It encompassed both closed-ended questions, with two-choice and multiple-choice formats, and open-ended questions that encouraged participants to express their opinions. And the result of which were analyzed through SPSS version 24. The results revealed concerning disparities: 89.46% were unaware of earthquake hazards, 81.2% lacked confidence in the country's earthquake preparedness, and a significant portion (68.02%) had never experienced an earthquake. The study suggests government-led workshops to enhance community resilience, emphasizing stringent building compliance with seismic codes. It highlights the imperative for government intervention in disseminating accurate earthquake preparedness information, addressing the prevalence of misinformation on social media platforms, particularly Telegram channels.

**Keywords**— Chaman Fult, Hri Rud Fault, Herat city, Natural disaster, SPSS.

## I. INTRODUCTION

Natural disasters, characterized by their unpredictability and destructive potential, have long been a concern for communities worldwide. Among these disasters, earthquakes stand out for their sudden and devastating impact on both lives and property [1]. The seismic events that lead to earthquakes are a result of the dynamic forces within the Earth's crust, and

their consequences are often felt across vast geographical regions [1]. The impact of earthquakes extends far beyond the initial ground shaking. Secondary effects such as tsunamis, landslides, and aftershocks can compound the devastation [1]. The aftermath often includes damage to buildings, infrastructure, and, tragically, loss of human life. Earthquakes are inherently unpredictable, making them a unique challenge for disaster preparedness and response [3]. In the past two decades, out of 1.35 million individuals who succumbed to natural disasters, more than half lost their lives in earthquakes, with the remaining fatalities attributed to hazards related to climate and weather [6].

Afghanistan, a nation at the crossroads of tectonic plates, grapples with the constant threat of earthquakes due to its geographical positioning. Certain parts of Afghanistan are located within a tectonically stable region, whereas others are surrounded by active plate boundaries, leading to deformation, faults, and seismic activities [4]. Afghanistan is susceptible to earthquakes due to the presence of four major faults within its borders. These include the Chaman Fault, Hari Rud Fault, Central Badakhshan Fault, and Darwarz Fault [4]. These faults have played a crucial role in generating notable earthquakes in Afghanistan over the past few decades. The deadliest among them occurred in Takhar in 1998, with Herat ranking fourth in the observed seismic activity [1].

Historically considered less prone to seismic activity due to its proximity to the purportedly inactive Hari Rud Fault, Herat, located in the western part of Afghanistan, faced a seismic challenge in October 2023. A succession of four significant earthquakes, each registering a magnitude of 6.3 and accompanied by subsequent aftershocks, rattled Herat Province [2]. These seismic events, attributed to thrust faulting, resulted in devastating consequences, as documented by the US Geological Survey [4]. The World Health Organization reported grim statistics, indicating 1,482 fatalities, 2,100 injuries, and the displacement of 43,400 individuals, highlighting the severity of the situation [2]. It is

crucial to note that prior to these events, Herat residents were largely unfamiliar with earthquake preparedness and response strategies. This area has infrequently experienced earthquakes in recent decades [4].

The sudden activation of the Hari Rud Fault caught many off guard, leading to a lack of knowledge on how to react in the aftermath of the earthquakes. Casualties occurred not only during the initial seismic events but also due to a lack of awareness regarding aftershocks. The significance of public knowledge in mitigating the impact of earthquakes is underscored by observations of individuals navigating damaged structures without recognizing the imminent danger. This emphasizes the vital role that awareness and preparedness play in ensuring the safety of communities during seismic events. Additionally, during the earthquake, people were observed shouting and swiftly evacuating their houses, indicating an instinctive response to the perceived threat. These behavioral patterns further emphasize the immediate need for comprehensive public education initiatives to enhance understanding and preparedness, ultimately minimizing the potential risks and casualties associated with seismic activities.

Mitigating the impact of disasters and minimizing both spiritual and material losses are predominantly achievable through the education of every individual within a society [7]. It is widely acknowledged that high-quality education plays a crucial role in achieving success in the battle against disasters [8]. People who have autonomous access to earthquake information are generally better prepared. Furthermore, individuals who perceive a higher risk of earthquakes and are more sensitive to this risk are typically more prepared for such events. It is evident that a positive correlation exists between knowledge and awareness of earthquakes and the level of disaster preparedness among residents residing in rural areas prone to earthquakes [5].

The motive of this study is October 2023 earthquake of Herat and seeks to address the gaps in public awareness, literature and perception of earthquakes in Herat following the seismic events. By disseminating nearly thousand questionnaire forms throughout the city, this research endeavors to assess the depth of knowledge within the population concerning seismic risks and to comprehend their perceptions of the recent earthquakes. Given the absence of prior research in Herat city, this study holds significant importance as it addresses a critical gap in the existing literature, providing a pioneering exploration of seismic awareness and perception within this specific geographical context. By analyzing the responses, this study aspires to contribute valuable insights that can inform future initiatives for enhancing public awareness, preparedness, and response strategies in regions unexpectedly susceptible to seismic activities, such as Herat.

## II. LITERATURE REVIEW

Exploring earthquake awareness and preparedness has been a primary focus in regions with established seismic histories. However, a notable research gap exists concerning the Herat province, where no studies have been conducted to

date. To address this deficiency in the literature review section, we turn to three comprehensive research studies that serve as the foundation for our investigation.

### *Society-Based Earthquake Disaster Mitigation in Kabul City, Afghanistan*

Naseri and Kang (2017) conducted a study titled "A Primary Assessment of Society-Based Earthquake Disaster Mitigation in Kabul City, Afghanistan," aiming to evaluate the state of disaster prevention education and the knowledge level of high school students in Kabul [10]. Employing a questionnaire-based survey, the researchers randomly selected 10 high schools, encompassing both private and public institutions, in the 13th district of Kabul. The survey, conducted in August 2015, involved 324 participants from the 10th grade. To ensure a representative sample, a simple random sampling technique was utilized. The questionnaire focused on six key research questions, addressing students' experiences with earthquakes, the existence of earthquake-related subjects or programs in schools, information received on earthquake preparedness, students' reactions during earthquakes, discussions with families about earthquake disasters, and the presence of earthquake preparedness plans or drills in schools. The survey was conducted on-site, with a brief pre-description given to students, and the data collection process took approximately 25 minutes.

The study exposed significant deficiencies in earthquake disaster education and preparedness among high school students in Kabul. A substantial portion of the surveyed students lacked essential knowledge about earthquake mitigation, with 243 participants (75%) having experienced an earthquake, while 80 (25%) had not. Despite the high incidence of students encountering earthquakes, their understanding of disaster preparedness and mitigation was limited. Regarding the existence of earthquake-related subjects or programs in schools, 115 participants (36%) acknowledged their presence, while 208 (64%) claimed their absence. Furthermore, the majority of students, 174 (54%), reported not receiving any information on earthquake disaster preparedness at school. While 151 participants (47%) claimed to know what to do and where to go during an earthquake to stay safe, 172 (53%) did not possess this basic knowledge. Regarding discussions with their families about disaster education, 227 students (70%) affirmed engaging in such conversations, while 96 (30%) expressed reluctance. Alarming, only 84 participants (27.4%) indicated the existence of an earthquake preparedness plan at their school, with a significant majority, 223 (72.6%), asserting the absence of such a plan. These findings underscored a critical need for immediate and comprehensive improvements in disaster education within the educational system to enhance students' awareness and preparedness for earthquake disasters.

### *Earthquake awareness among resident of Istanbul*

This study was conducted by Tekeli and others titled "Earthquake Awareness and Perception of Risk Among the Residents of Istanbul," drawing data from a survey conducted in 2007 [11]. The study focused on two districts in Istanbul,

Bakırköy and Beykoz. A field survey was carried out in May and June 2007, interviewing a total of 1,123 people. The survey employed a stratification process, categorizing sub-districts based on socioeconomic levels (SEL), assessed through information on residents' economic status and housing costs. After stratification, households were randomly selected using a two-stage cluster sampling technique.

The results of Tekeli's study revealed insights into earthquake awareness and risk perception among the residents of Istanbul. In terms of earthquake awareness, 58% of respondents provided scientific explanations for what an earthquake is, while 18% attributed earthquakes to religious explanations, and 14% offered mixed explanations. Regarding knowledge about mitigation and preparedness measures, 18% of respondents spontaneously mentioned at least two of the nine measures, with the most frequently cited measure being compliance with building codes (67%), while the least mentioned was having a fire extinguisher (3%). and 42.5% said that their building was tested for construction quality and will withstand the earthquake. Concerning behavior during an earthquake, 55% followed information from booklets, and 3% admitted not knowing what to do. The majority of respondents in both districts (70% in Bakırköy and 69% in Beykoz) expressed greater concern about other threats in daily life than earthquakes. The media, particularly television (89%) and newspapers/magazines (48%), were the primary sources of information for respondents. Regarding the structure 42.5% said that their building is tested and will withstand earthquake.

#### *Sulka-Gandaki Municipality Study, Nepal:*

This study was performed by Ashalata W Devi, and Dibya Sharma titled Awareness on earthquake preparedness: A key to safe life [9]. The study targeted 300 adults aged 20 years and above in Sulka-Gandaki Municipality, Ward no-2, Dulegauda-Tanahu District, Nepal, during May 2015. The research employed a demographic Proforma, a Knowledge questionnaire on earthquake, and a Practice questionnaire on earthquake preparedness as tools. Data collection involved a semi-structured questionnaire administered through interviews conducted door-to-door. The questionnaire included questions related to earthquake preparedness practices categorized as Before the earthquake, during the earthquake, and after the earthquake.

The results of the study revealed significant gaps in earthquake preparedness practices among the participants. Before an earthquake, the majority (84.3%) had not prepared an emergency supply kit, and 54.7% stored breakable, harmful chemicals, and flammable objects in lowermost shelves. Approximately 77% did not consult engineers before constructing houses/buildings, and 87% had not conducted geological studies prior to construction. While 67.7% had discussed natural disasters at home, 54.3% lacked information about earthquake occurrences from the government, and a staggering 93.7% did not have earthquake insurance for their homes. Regarding knowledge about earthquakes, 58% of adults demonstrated adequate knowledge, while 42% had inadequate knowledge.

During an earthquake, participants exhibited varied practices. While 68.3% were not calm during the earthquake, 85% evacuated immediately from their houses. Additionally, 61% did not stay where they were, 84.7% opened doors for exit, and 86.3% stayed away from glass and windows. Notably, 95.7% did not know the emergency contact number despite earthquakes being prevalent in Nepal.

In the aftermath of an earthquake, 91.7% of participants moved to an open area, 75.7% stayed away from trees, power lines, posts, and buildings. For those driving during an earthquake, 63% stopped and got out of moving vehicles, and 75.7% pulled over and stayed inside the vehicle until the shaking stopped. After the earthquake, 75% helped those around them, 75.7% checked for injuries and provided first aid, and 97.3% turned on radio and TV for emergency instructions.

While the three aforementioned studies explored the perceptions and knowledge of individuals regarding earthquake hazards, a notable distinction sets our research apart. Unlike these studies, which did not conduct surveys during actual earthquake events, our research strategically unfolded during the heightened period of seismic activity. This timing was intentional to capture the immediacy and heightened awareness that individuals experience when confronted with an earthquake, offering a unique perspective that goes beyond retrospective responses. Additionally, a significant divergence lies in the demographic characteristics of our study area in Herat. Unlike the participants in the previous studies who had experienced earthquakes before, a considerable portion of our respondents had never encountered such an event. This divergence allows for an exploration of perceptions and responses in a context where seismic events are unfamiliar. Furthermore, our study location, characterized by predominantly brick and mud structures, stands in contrast to the concrete structures prevalent in the areas studied by others. This difference in building materials introduces a nuanced dimension, as brick and mud structures are known to be more susceptible to earthquake damage. Therefore, our research not only fills a temporal gap by conducting surveys during seismic events but also ventures into unique geographical and demographic contexts, providing valuable insights into earthquake preparedness and perceptions under distinctive conditions.

### III. METHODOLOGY

This research employed a mixed-method approach to comprehensively investigate awareness and perception of devastating earthquake of October 2023 on the population of Herat province. The primary data collection instrument was a carefully crafted questionnaire consisting of 21 questions, all reviewed and approved by the Unisfere and Mirab Organizations board. The questionnaire encompassed both closed-ended questions, with two-choice and multiple-choice formats, and open-ended questions that encouraged participants to express their opinions. The questionnaire required approximately 7 to 10 minutes for completion.

The survey targeted a total of 835 participants. The diverse sample included both male and female participants from

various districts of Herat province, focusing on districts 15, 9, 4, 8, 6, 11, and 2, which were randomly selected from the 15 districts affected by the earthquake. The participants were exclusively above grade 10 in order to ensure a certain level of educational background.

Notably, the distribution of the questionnaire forms strategically coincided with a period when individuals were residing in tents due to the aftermath of the earthquake. This intentional timing ensures that respondents' minds were acutely attuned to the realities of seismic events, providing a unique opportunity to capture their insights and experiences during a heightened state of earthquake awareness and preparedness. This approach enhances the reliability and relevance of the data collected, offering a nuanced understanding of the community's perspectives in the immediate aftermath of seismic activity. In instances of strong aftershocks, a one-day delay in the publication of forms was implemented to prioritize the safety and well-being of the participants. Post data collection, a preliminary manual analysis was conducted, and subsequently, the remaining data were input into SPSS version 24 for further statistical analysis. The analyzes was carried out in three phase, first for all female, second for all male and third the combination of them. This mixed-method approach allows for a nuanced exploration of both quantitative trends and qualitative insights, providing a comprehensive understanding of the earthquake's impact on the surveyed population.

IV. RESULTS

Based on responses from 835 participants. The demographic distribution reveals that 444 participants were female, while 391 were male. Educational backgrounds varied, with 498 participants having a high school education, 294 holding bachelor's degrees, 35 with master's degrees, and 8 with doctorates (Table.1 and 2).

TABLE 1. Show the number of male and female participant in the study

Gender	Frequency	%
Male	391	46.83%
Female	444	53.17%
Total	835	10.00%

TABLE 2. Show the degree vs number of participant in the study

Participant	%	Frequency
High School	59.64%	498
Bachelor's	35.21%	294
Master's	4.19%	35
Dotorate	0.96%	8

Experiences and Awareness:

- A notable 68.02% of participants had never experienced an earthquake, while 31.98% reported having experienced one.

- Alarmingly, 89.46% of participants were not aware of the earthquake hazard in Herat City before the October 2023 earthquake.

Experience of Earthquake

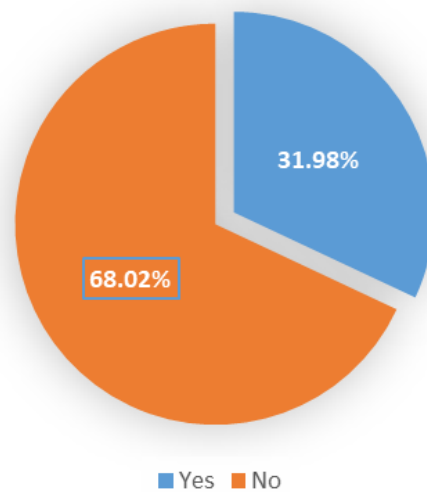


Figure 1. Show the experience of people of earthquake before October earthquakes

Awareness of Earthquake Hazard

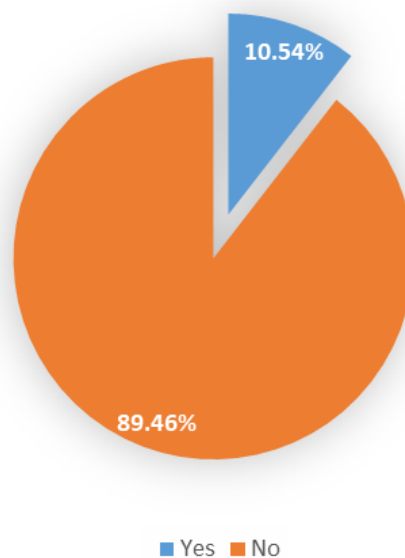


Figure 2. Show Awareness of people from earthquake hazard and how to react against it

Perceptions of Preparedness:

- A substantial 81.2% of participants expressed the view that the country is not adequately prepared for earthquakes. Only 6.47% were neutral, and 12.34% believed the country is ready.

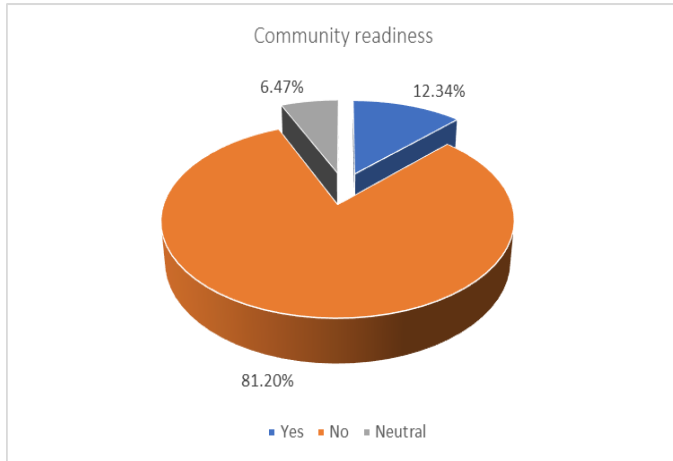


Figure 3. Show the response to question if your community is ready for coming earthquake

**Emergency Preparedness and Response:**

- Regarding earthquake preparedness measures, 50.42% stated that they had never even thought about creating emergency exits or exit routes during an earthquake.
- A striking 94.49% had never participated in earthquake-related workshops.
- The majority (91.62%) believed that the buildings in their area were not strong enough to withstand earthquakes, prompting them to immediately run outside.

**Information Dissemination:**

- Disturbingly, 47.54% of participants reported not receiving information about earthquake preparedness or response from official government or other sources after the 2023 earthquake.

**Emergency Response Actions:**

- Table 2 illustrates that 75.41% of responders did not prepare an emergency supply kit during the earthquake, and 73.68% immediately went outside when an earthquake occurred.
- Regarding behavior during earthquakes, 36% reported screaming and frightening others, while 64% claimed to manage others and stay calm.

TABLE 3. Show the participant’s response to some question we asked

Characteristics of practice	Yes	No
Preparation of emergency supply kit	24.59%	75.41%
Go outside if there is earthquake immediately	73.68%	26.32%
Screaming and frightening others	36%	64%
Managing and calming others	64%	36%
Being aware of aftershock	70.5%	29.50%
Knew what number to call in an emergency	21.40%	78.60%

**Knowledge and Concerns:**

- A diverse range of responses was recorded for participants' evaluation of their knowledge of earthquakes, with 35.93% stating average, 23.35% low, 15.69% very low, 17.49% good, and 7.54% excellent.
- Concerns about the possibility of another earthquake varied, with 21.68% extremely concerned, 55.69% very concerned, 11.98% average concern, 7.07% low concern, and 3.59% not concerned at all. In their responses to the open-ended question, numerous participants conveyed a sense of bewilderment, describing the situation as markedly unusual. Many emphasized that the October 7 earthquake, widely perceived as the primary seismic event, was followed by subsequent earthquakes of similar magnitude, creating a heightened sense of apprehension. Concerns were voiced regarding the possibility that these subsequent earthquakes might represent foreshocks, dissuading individuals from venturing outdoors for fear of additional seismic activity. As a consequence of this sustained anxiety, a noteworthy pattern emerged, with a substantial portion of Herat's residents choosing to remain outside their homes for nearly a month.

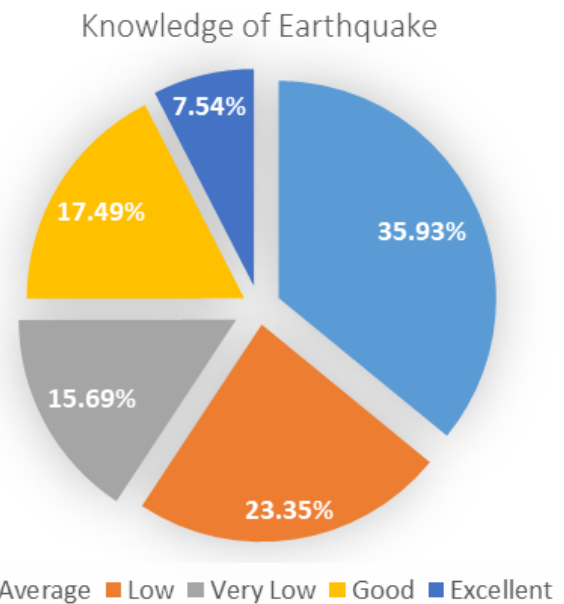


Figure 4. Show the level of knowledge of participant about earthquake preparedness and response

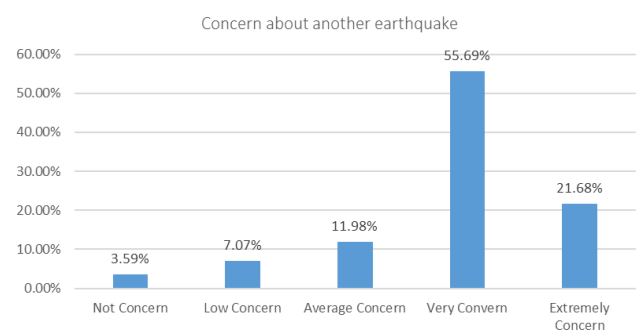


Figure 5. Show concern of people of possibility of another earthquake

**Impact and Evaluation:**

- In assessing the impact of earthquakes, 51.62% perceived very significant damage, 29.22% considerable damage, 13.29% average damage, 4.91% slight damage, and 0.96% negligible damage. In response to the open-ended question regarding the earthquake's impact, participants voiced concerns about the structural integrity of concrete houses. The prevailing sentiment was one of uncertainty, with many reporting visible cracks in their concrete dwellings. The ambiguity surrounding the safety of these structures heightened anxiety among residents, as they grappled with the question of potential danger posed by the compromised buildings. Furthermore, reports from those who ventured to Zinda Jan, the epicenter of the earthquake, revealed a stark reality. Almost all buildings constructed with brick and mud in close proximity to the epicenter suffered were completely damaged. These eyewitness accounts, particularly from individuals involved in the recovery efforts, underscore the devastating impact of the earthquake on vulnerable structures. The widespread destruction in areas nearest to the epicenter serves as a poignant reminder of the devastating damage that this earthquake left.
- The sources of information varied, with 66.23% relying on social media, 16.05% on familiar individuals, 14.61% on news media, and 3.11% on official government media.

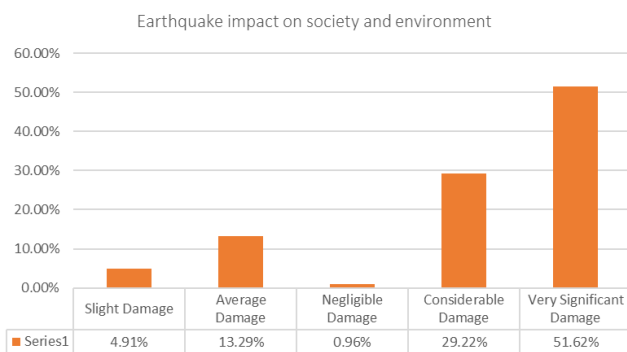


Figure 6. Show participant's response to the damage of October earthquake to building and environment Herat

**Evaluation of Government Performance:**

- A significant portion (56.53%) of participants perceived the performance of the government and other organizations as poor during the earthquake, with 1.2% rating it excellent, 11.02% good, 17.72% average, and 13.53% neutral.
- In response to the open-ended question, a significant consensus among participants indicated widespread dissatisfaction with the government's performance, particularly in providing assistance to the affected population. A prevailing sentiment emerged, characterizing the government's efforts as notably inadequate in aiding the populace during critical times. Regarding the inquiry about well water, a substantial 57.49% of respondents reported that the water in their wells remained non-potable for an extended period. This

predicament stemmed from the seismic activity during the earthquake, which resulted in a discernible alteration of the water's color in numerous wells. Consequently, the affected individuals encountered considerable challenges in sourcing clean water, often compelled to transport containers over significant distances to access open areas with potable water sources. The enduring unavailability of well water intensified the burden on the community, further underscoring the pressing need for improved disaster response measures and water infrastructure resilience.

Additionally, respondents underscored a substantial challenge related to restroom facilities, further accentuating the difficulties of remaining outdoors. Many participants expressed the hardship of returning home to use the restroom due to the persistent fear of aftershocks. Notably, respondents lamented the absence of government initiatives to provide temporary restroom facilities during such crises. The absence of designated restroom facilities led to a situation where individuals felt compelled to relieve themselves in open spaces, including cultivated grounds. This widespread practice not only posed a significant inconvenience for the affected community but also had severe environmental repercussions in the immediate surroundings. The lack of a structured plan for addressing this basic necessity further emphasized the critical gaps in disaster management and highlighted the urgent need for comprehensive strategies to ensure the well-being of the populace in the aftermath of seismic events.

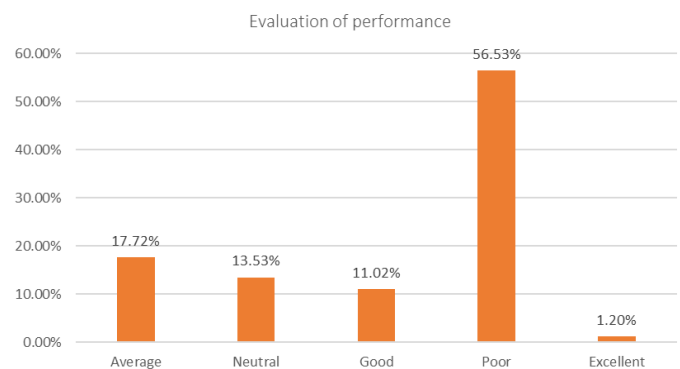


Figure 7. Show the performance of government and organization in the October earthquake of Herat

**Suggestions for Enhancing Community Response:**

- Respondents suggested various measures for enhancing community response, including building earthquake-proof structures (37.96%), improving coordination between government and community (24.91%), increasing earthquake knowledge through workshops (17.72%), and increasing information dissemination (16.17%). A small percentage (3.23%) remained neutral on these suggestions.

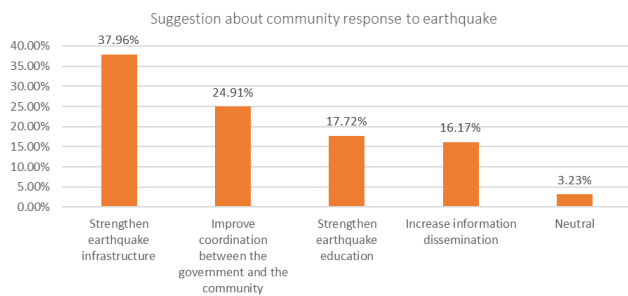


Figure 8. Show participant's suggestion about how government can respond to the future earthquake

## V. DISCUSSION

The study reveals that a significant segment of the participants, accounting for 68.02%, indicated that they had never encountered an earthquake, a factor that undeniably influenced people's reactions during seismic events. The initial earthquake prompted loud screams from a majority, and interestingly, some individuals were uncertain whether what they were experiencing was, indeed, an earthquake. This contrasts with the findings of Naseri's study in Kabul, an earthquake-prone area, where approximately 25% reported not having experienced earthquakes. Furthermore, a staggering 89.46% expressed unawareness of the earthquake hazard in Herat before the pivotal event in October 2023. This stark revelation aligns with the study conducted in Kabul by Naseri and Kang, where deficiencies in earthquake disaster education were evident among high school students. The parallels suggest a broader need for comprehensive educational initiatives, not only in Herat but also across Afghanistan.

Nearly half of the participants, totaling 47.54%, revealed that they had not received information about earthquakes after the seismic events, suggesting a potential gap in the government's communication efforts. This echoes similarities with Naseri's study in Kabul, where 54% reported a lack of information from the government, and aligns with the findings in Nepal's Sulk-Gandaki study, where 53.4% of respondents similarly expressed not receiving earthquake-related information from governmental sources. Only 17.59% and 7.54% of participants claimed their knowledge of earthquakes to be good and excellent, respectively. This notably low level of knowledge is identified as a significant factor contributing to the high mortality rate following the main earthquake, as evidenced by numerous individuals seen running amid mud-made buildings during the seismic event. This starkly contrasts with the findings in Nepal, where 58% of respondents were reported to possess adequate knowledge of earthquakes. The role of media as a predominant source of information is a common thread across studies. In Herat, 66.23% relied on social media for earthquake information, while in Istanbul, television and newspapers played a pivotal role for 89% of respondents. This consistent pattern underscores the significance of leveraging media channels for effective communication during seismic events. The pressing need for enhanced building resilience emerges as a shared concern in both the current study and the research conducted in Istanbul. In Herat, a striking 91.62% of respondents expressed a lack of

confidence in the strength of their buildings to withstand earthquakes, leading to widespread immediate evacuation. This highlights a significant factor contributing to people's reluctance to stay at home during seismic events, driven by uncertainty about the structural integrity of their residences. In contrast, participants in Istanbul exhibited a greater awareness of specific mitigation measures, with 67% emphasizing compliance with building codes and 42.5% said that their building was tested for construction quality and will withstand the earthquake. This underscores the importance of resilient infrastructure in earthquake-prone areas and suggests that heightened awareness in Istanbul might contribute to a more informed populace regarding the structural soundness of their buildings. A notable 75.41% of participants admitted to not preparing emergency supply kits, signifying a potential lack of readiness for seismic events. In comparison, respondents in Nepal reported an even higher percentage at 84.3%. Additionally, a significant 73.68% disclosed the practice of immediately fleeing outdoors when an earthquake occurs. This high percentage raises concerns about increased casualties due to falling objects and suggests a prevalent fear among individuals that their buildings might not withstand earthquakes. This fear may contribute to the fact that many participants had never experienced an earthquake before, contrasting with the lower percentage of 39% in Nepal, where earthquake exposure appears to be more common. A striking 95.7% of respondents in Nepal expressed uncertainty about which number to call in case of an emergency. In contrast, in Herat, a slightly lower but still substantial percentage of 78.6% of participants reported not knowing the appropriate emergency contact number. This highlights a widespread lack of awareness about emergency response protocols in both regions, albeit to varying degrees.

## VI. CONCLUSION

The study's key takeaway is the evident lack of public knowledge regarding earthquake hazards and the subsequent uncertainty in how to respond during seismic events. It underscores the imperative for government intervention to equip citizens with essential information on earthquake preparedness. The prevalent use of social media, particularly Telegram channels known for disseminating misinformation, emerges as a concerning trend, potentially causing distress and prompting unwarranted evacuations. Therefore, a call is made to halt the reliance on such platforms for earthquake-related information.

To address the knowledge gap and promote community resilience, the study advocates for government-led workshops. These educational initiatives would serve to raise awareness about earthquake hazards, impart necessary skills for effective response, and dispel misconceptions perpetuated by unreliable sources. Additionally, the study highlights a critical issue concerning building compliance with seismic codes. Urgent and stringent measures are recommended to ensure that construction adheres to established standards, mitigating the risk of structural failures during earthquakes.

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#### DEDICATION

To my dearest parents,  
Your unwavering support and endless encouragement have been the guiding lights throughout my academic journey. This paper is dedicated to you, the pillars of my strength. Reference

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#### Authors contribution:

Arif Alkozay played a pivotal role in overseeing and coordinating the publication process, managing the work of other researchers during questionnaire form publication. He was responsible for creating the questionnaire, ensuring its validity, analyzing the questionnaire data using SPSS software, and writing the entire paper. Abulfazl Usefi, Khalid Ahmad, Mahnaz Salehi, Zia Gul Amin, Tayeba Rahmani, and Farishta Ayoubi actively participated in both the publication and manually examining the questionnaire forms. Their collective efforts were crucial to the successful completion of this research. Selena Homayouni and Marwa Alko helped in publication of the questionnaire forms during the tremor.