

# Analyzing Disaster Preparedness at Personal and Community Level: Senior Citizens in Bangladesh

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**ABSTRACT:** This study's primary goal is to examine how prepared elderly individuals, their families, and community members are in BD households, as well as how related factors affect their readiness for unexpected disasters like earthquakes and fires. This study has followed mixed methodology: qualitative and quantitative. Household survey and In-depth personal interview, In-depth KII with semi structured questionnaire and observation methods have been applied for data collection. Study area is a village called Gangtiyara, which is located in Debidwar upazila under the district of Cumilla which falls in medium earthquake zone of Bangladesh part. The present study has revealed that 62.8% female are illiterate and overall, 23.3% have completed SSC or above and 72.6% have no present income. No elderly people are found who have profound preparedness knowledge against earthquake and fire and only 38.4% senior citizens have physical and mental ability to face these sudden disasters. The research also delineates that a number of criteria, including age, health, education, financial situation, and being the head of the household, have a significant influence on how prepared elderly people are for disasters. The result from chi square test indicates that good education qualification ( $\chi^2=14.511$ ), being head of the family ( $\chi^2=7.997$ ) and earning status ( $\chi^2=11.668$ ) have a medium to strong positive correlation with earthquake preparedness. Associate with the result of the binary logistic regression model indicates that individuals who have completed SSC or above are more likely to be prepared (S.E.= .747) for disaster-related emergency situations. Again, in the case of fire incident, chi square test reveals that age has medium to strong ( $\chi^2= 12.646$ ) positive correlation with fire hazard preparedness. A hopeful significant finding is social network which provide sense of security to elderly people in sudden disaster. The study also finds out a huge knowledge gap regarding to sudden disasters specially earthquake among family members and community people which condition make elderly people more vulnerable to earthquake and fire hazard. Another significant finding is the absence of proper meetings, seminar, training about earthquake and fire hazard. The elderly people, family members and community people have opinioned that practical and applicable elderly policy and mass spread of knowledge about disaster preparedness will enhance awareness among the elderly people, family members and community people which will help to reduce disaster risk of elderly people.

**Keywords:** Disaster Preparedness; Earthquake; Education; Fire Hazard; Health; Senior Citizens

## INTRODUCTION

Earthquakes were responsible for around 750,000 deaths worldwide between 1998 and 2017, accounting for more than half of all-natural disaster-related deaths. Over 125 million individuals were impacted by earthquakes (WHO, 2018). In 2023, 1,389,000 fires resulted in 3,670 civilian deaths and 13,350 injuries in USA (NFPA, 2024). The main disasters in Bangladesh are flood, cyclone, landslide, earthquake, fire, river bank erosion, drought etc. (Rahman et al., 2017). Tectonic framework as well as the presence of Indian and Eurasian plates are highly responsible for occurrence

of devastating earthquake in the past and recent times which have made awareness among general people and government (Islam et al., 2016). If the two plates close to the boarder of Bangladesh struck together, it could produce a megathrust earthquake with magnitude of 8.2 to 9.0 earthquake (Steckler et al., 2016). Besides, "Fire" is another arising man-made disaster in Bangladesh. According to Fire Service and Civil Defense, in 2023 about 27624 fire incidents occurred across the country. On the other hand, in 1996, there were 5376 fire incidents over the country which indicates a 413 percent increase over 27 years. (Financial Express, 2024).

Although older people are a variety group, many are especially vulnerable to disasters. Older adults, age 65 or older, are especially vulnerable during and after disasters (Malik et al., 2017; Bei et al., 2013). According to Bangladesh Journal of Bioethics

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(2016), in Bangladesh, sixty years is considered as the starting point of old age (Barikdar, 2016). Bangladesh Constitution mentioned elderly people of Bangladesh as “Senior Citizen”. According to Population and Housing Census, 2022 in Bangladesh, the number of aged 60 years or above population is over 15.3 million which is the 15.3% of total population. (The Daily Star, November 15, 2022). According to WHO 2024, by 2050, it will be 3.6 crore and constitute 22% of the total population (The Daily Star, March 24, 2024).

Levac, Toal-Sullivan, and O’Sullivan, 2012; Aldrich and Benson 2008 in Regina reported that older adults are more likely than others in a community to be socially isolated and have multiple chronic conditions, limitations in daily activities, declining capacity of vision and hearing, and physical and cognitive disabilities that hamper their ability to communicate about, prepare for, and respond to a natural disaster. In addition to physical and external factors, older adults express a variety of emotional and behavioral responses to disasters. Many are unwilling to evacuate even the most risk environments (McClelland, 2017).

In the case of financial factor, many elderly people live in poverty or have little financial reserves. These conditions make their everyday challenging and can be a bunker to take proper disaster preparation, evacuation, relocation, and recovery. Lack of transportations and reliable communication tools result in elders being left behind (Bethel et al.; 2013; Brunkard et al., 2005).

In Bangladesh, the elderly generally suffer from multiple health problems such as weakness, tooth problem, hearing impairment, vision impairment etc, which may demand long term psychosocial treatment, nursing care and hospitalization (Barikdar et al., 2016). The declining health and physical status of the older people, together with a competitive employment market that discriminates on age, reduces the chances of older people finding well-paying jobs as well as soaring prices of essential commodities make elderly people vulnerable to disasters (Alam et al., 2022).

Education is another significant factor of disaster preparedness. Seniors with low literacy and educational levels are more at risk because communications prior to, during, and after an emergency may be difficult to understand or completely missed (Powell et al. 2009). Elderly literacy rate, population 65+ years, both sexes

in Bangladesh was reported at 39.43 % (UNESCO, 2022). This low education status has made the elderly more vulnerable to disaster.

Social network plays another vigorous role in term of elderly people’s disaster preparedness. High social capital—such as strong social networks, high civic engagement, and high levels of trust among community members is essential for spreading information, which especially helps people get ready for natural disasters, according to social-capital theory (Kawachi & Berkman, 2003; Putnam, 2001). Prior research has demonstrated participation in social activities, improves a person’s ability to prepare for disasters (Reininger et al., 2013). Additionally, a person’s ability to find knowledge is influenced by strong support networks because information often spreads through casual talks among neighbours, relatives, and friends (Zakour & Gillespie, 2012). Additionally, prior research revealed that people with robust support systems believe that compared to people without such networks, they would be more resilient to calamity (Diekmann et al., 2007; Kawachi, Subramanian, & Kim, 2008; Rooney & White, 2007). So, these factors determinate the vulnerability of senior citizens in disasters.

On 8 October 2005, a strong earthquake with 7.6 on Richter scale hit northern Pakistan and the death toll was 73,276. Another research on earthquake on revealed that the death rate of people over 50 years was 24.2% within the survey area. Furthermore, more than 15,000 people died in the 2011 Great East Japan Earthquake, with 66.1% of them being 60 years of age or older (Okamoto et al., 2015). In the United Kingdom, the fire-related fatality rate per million is higher for men and older people. For men aged 65 to 79 the fatality rate was 10.6 per million population while the equivalent rate for women was 6.4 per million (Randall, 2017).

Bangladesh Disaster Related Statistics, 2015 also estimated the number of elderly people who had been injured in several disasters from 2009-14 and that was 5309 (16.13%). In North Bengal, a woman about 60 years old had died by mosquito net fire incident. (Daily Star, December 2019). This demonstrates how their needs and voices are not given enough consideration when it comes to disaster preparedness. Implementing more importance and efficient strategies to improve older adults’ disaster resilience is crucial as natural and man-made disasters grow more frequent and severe and Bangladesh’s population continues to age quickly.

The study is unique in that it focusses on senior citizens and is a crucial component of an inclusive disaster management strategy. Even though the number of elderly people is growing daily, we have very little research on them, particularly when it comes to “Disaster & Elderly People.” Many academics agree that senior persons are among the most vulnerable groups to climate change and disasters of all kinds. A few studies on “Health status, Nutrition status, Loneliness & Depression during pandemic, Quality life etc.” are carried out. The majority of studies on “elderly people’s preparedness for disasters” are conducted in coastal areas with relation to cyclones. Research on senior citizens’ preparedness for earthquake and fire hazards in Bangladeshi households is lacking. Additionally, the study will investigate perception and preparedness of elderly people as well as a number of variables that have a major impact on older individuals’ readiness for sudden disasters. Once more, academics have pointed out that our National Elderly Policy and National Plan for Disaster Management (NPDM) contain numerous flaws that have caused the elderly to fall behind in unexpected calamities like earthquakes and fire hazards. In order to assist policymakers in reconsidering and reforming the inclusive disaster management plan that prioritizes our older population, this study will also address these deficiencies and their effects. So, with these unique subject matters, it is expected that the present research will fill some portion of research gap of Bangladesh’s research.

## DATA AND METHODS

**Study Area:** The village of Gangtiyara, which is situated in the Cumilla district’s Debidwar Upazila, serves as the research’s study area. The community is roughly 3776 square kilometres, according to BBS (2011). About 1005 people reside in Gangtiyara village, which has 203 houses and a population density of 1537 per square kilometre. There are 458 males and 547 females. 10.3% of the village’s population is elderly. There are few reasons why the study area was chosen. Similarly, the community is located roughly 36 kilometres from Cumilla’s centre. Some of the roads are unpaved and narrow. The residents’ socioeconomic status ranges from poor to medium. There is just one government primary school and no secondary school. Higher secondary education is not offered by any college. This situation keeps the community far behind

in terms of quality education. There are also inadequate medical facilities here (the community clinic is roughly 3 km away). Numerous chronic illnesses afflict the elderly. Cumilla is located in the medium earthquake zone, according to the government of Bangladesh (Ali & Chowdhury, 2001). In addition, there have been more high-rise buildings in recent years. Since there hasn’t been a significant disaster yet and they lack experience, it’s critical to understand their level of preparedness for an unexpected earthquake. Once more, the majority of the village’s families utilize gas cylinders for cooking, and these cylinders are stored inside the main residence. This village has experienced a number of fire accidents throughout the years, notably cylinder blast.

**Data Collection:** The methodology of the research focuses on designs where there is a robust element of qualitative data collection as well as a sturdy element of quantitative data collection in the same research project. This design is entitled mixed methodology. The design is also referred to as Multi-Strategy (Johnson and Onwuegbuzie, 2004; Creswell & Creswell, 2003). To reach the research aim, surveys, in-depth interviews and observations were conducted as the research methods. For conducting the survey, we visited every household. The study applied the “Quota sampling method” for determining sample size. It applied quotas on age groups 60-100, gender, employment status, education and health condition of elderly people of the study area. It also recruited potential participants by following a snowball method through asking the relatives of that rural area. The total household number where elderly people live was 89. Using statistical methods at a 95 percent confidence level, with a margin of error of 5 percent and a response rate of 50 percent, the sample size 73 was calculated for the survey. The sample size was calculated by “Raosoft Sample Size Calculator” software ([www.raosoft.com](http://www.raosoft.com)). It has planned its survey strategy with “face to face interview” and “observation” methods. For conducting a face-to-face interview, it has followed a semi structured and open-ended questionnaire. A face to face-interview permits the assessment of different types of factors, and gives the potentiality of differentiating respondents on the basis of different causal issues (Hazel & Clark, 2013). For analyzing disaster preparedness of elderly people of rural households, 73 in depth interviews were conducted from elderly people. They were eagerly participated in interviews and expressed their valuable opinions. Associated with Key Informant Interviews (KII) were taken with another semi structured questionnaire from

family members and community people for analyzing their disaster preparedness. Eight (8) in-depth KII had been conducted among eight household members. Among the household members four members were male and four were female. Again, five (5) in depth KII were conducted among community people. They were former members, doctor, teacher, mosque preacher, and student. The KII were taken to understand the perception, preparedness and emergency plan regrading to elderly people and sudden disasters like earthquake and fire hazard.

For protecting ethical issues, researcher narrated further what research was about, its object and reason of interest in this topic, and assured each person that his or her anonymity would be protected. Each participant was asked if there was any problem to audiotape the interview. The research questions were organized using everyday language as well as local language was also used in some context during the interview. The scheme of this study was such that there was no more than subtle risk to subjects participating in the study. The respondents may have become exhausted or may have had some unsavory memories when answering the questions during the interviews. Precautions were taken to lessen the risk to the respondents and included emphasizing that respondents were free, that the respondents could discontinue the interview at any time, and that the participants could scamper or backtrack to answer any questions.

**Data Processing:** The data collected by survey was analyzed by SPSS software. Here, dependent variables are earthquake preparedness, fire hazard preparedness, resource preparedness. Independent variables are demographic characters (age, health status, economic status, head of family, education), social networks, meeting/seminar/training. Different statistical tests used for measuring data are such as like “Chi-Square test”, “Binary Logistic regression Model” etc. Qualitative analysis is done by thematic analysis. Secondary data were collected from Bangladesh Bureau of Statistics (BBS), yearly economic report, non-governmental official documents, books, journals, articles, web-based documents, daily newspaper etc.

## RESULTS

**Socio-Economic Conditions:** Aging between 60 and 100, to achieve the research goals of the study, a number of 73 elderly respondents were selected. The average age rate thus falls around 70.82. The number of female respondents

was relatively more than the male ones as counting 59%. However, 52% of the elderly people were living in a nuclear family. Almost half of the total respondents, for the result has unearthed, the highest proportion of the elderly people are illiterate. However, among the illiterate 62.8% are female. The rural area’s remoteness is the primary cause of the current situation. The socioeconomic situation fell behind due to the distance. It took several years for the benefits of science, such as electricity, to reach that region; as a result, the area was underdeveloped and had a high rate of early marriage.

There 9.6% of the elderly people have completed higher secondary education. Remarkably, it should be mentioned that our study has found no such woman who passed SSC (secondary school certificate) examination. According to the field survey, about 58.9% elderly people were housewife when 19.2% were service holder. Among the respondents 72.6% elderly people do the bare minimum at present time for their livelihood. Despite that, only 27.4% do so. The income sources comprise of job allowance, agriculture, business and service. Among them, 50% get their income from allowance. In terms of gender, only 10% female currently have any income source. Most of them receive their husband’s job retirement allowance. However, most of the respondents (75.3%) surprisingly do not have any idea about their family income. According to the respondents, who mentioned their family income, 12.3% respondent’s family income ranges between 5000-20000 tk. As our survey reveals, in most cases (80.8%) son, a male figure drags or pulls the responsibility of the family. There are three types of housing infrastructures found as such: kutcha (made of natural or alike materials), semi-pucca and building. Among them, 69.9% have kutcha houses which are made of mud, tin and wood. These types of house are more vulnerable to fire hazard. Most of the respondent’s (99%) house are connected with electricity. About 71.2% of them use both traditional fuel and cylinder gas for cooking purpose at their family. Moreover, among the elderly people, about 56% know how to use it. Those, who have cylinder gas keep the cylinder in their main house. However, 54.8% have their own mobile phone.

Senior citizens face different types of health problems. According to survey, 57.3% are suffering from eye disease, pain, blood pressure etc. other diseases. The study has found highest number of elderly people; the rate is 31.5%, whose monthly treatment cost is below than 1000 taka only. While only 11% of them bear

their own treatment cost on one hand, rest of them are dependent on their children on the other.

**Earthquake and Fire Hazard Perception and Response Plan of Elderly People**

**Perception on Earthquake:** When elderly people were asked about happening of earthquakes, many of them answered that it occurred suddenly. They were also asked whether they could feel it or not. Once during an earthquake, the water of a pond, canal and other waterbodies raised a few centimeter. Then the fish also

jumped up on the ground. They became surprised as well as a little afraid, too.

**Emergency Response Plan in Earthquake:** “Preparedness is commonly viewed as consisting of activities aimed at improving response activities and coping capabilities” (Sutton, 2006, p.3). No elderly people had found who had any emergency plan for sudden disaster like earthquake, fire hazard etc. (Al-Rousan et al., 2014). The study categorizes the emergency response plans of elderly people during earthquake below.

**Table 1:** Response to Earthquake

Response to Earthquake	Percentage	Response to Earthquake	Percentage
Pray to creator	64.4	Keep running	9.6
No knowledge about early response plan	33.3	I have no ability to do anything	5.5
Taking shelter in safe place	23.3	No idea about earthquake	4.1
Keep sitting	17.8		

Source: Field Survey, 2022

The present research investigates the activities that work as an emergency response to sudden earthquakes for elderly people. Two thirds of the surveyed people, about 64.4%, cite only religious practices, such as praying, as a prevention tactic. 33.3% bear no knowledge about possible early responses and 5.5% are incapable of carrying out any response activities, and require help from social networks. Some quotations are mentioned below-

“I will cry out to Allah, and if He grants me a chance, I will escape this place.”(65 years old woman).

“I will call upon Allah, for I cannot escape on my own. If someone rescues me, I shall live; if not, I will be buried beneath and die.” (90 years old paralyzed man).

“If an earthquake occurs suddenly, I will try to go outside with everyone in the house. If that’s not possible, I will take shelter under something strong.” (A Teacher, 72 years old).

**Table 2:** Chi-Square Test between Earthquake Preparedness and different Variables

Variable	Chi-Square Value ( $\chi^2$ )	Degrees of Freedom	p-value	Significance
Have education & earthquake preparedness	14.511	1	.000	Significant
Head of family & earthquake preparedness	7.997	1	.005	Significant
Income Status & earthquake preparedness	11.668	1	.001	Significant

**Relationship between Earthquake Preparedness and Education Level, Earning Status and Head of Family (Chi-Square Test)**

To strengthen the findings, the chi-square test for independence with  $\alpha = .05$  was used to assess whether

education, income status and head of family were related to earthquake preparedness. For education, the chi-square test was statistically significant, ( $\chi^2 = 14.51, p = .000$ ). It indicates that education has a positive relationship with earthquake preparedness. Phi ( $\phi$ ) coefficient of .47, indicating a medium to

large relationship between education and earthquake awareness according to the range. Again, chi-square test was also done for income status and head of the family with disaster preparedness. The chi-square test was statistically significant for income status and head of the family, ( $\chi^2 = 11.66, p=.001$ ), ( $\chi^2 = 7.99, p=.005$  respectively)). Both Phi ( $\phi$ ) coefficients of .40, indicating a medium to large relationship with earthquake awareness. The research also has found that though the large number of respondents were female, the awareness among female was not enough good. The

statistical test also has proved the above respondent's quotation. It is clear that physically good, educated elderly is more aware and confident about earthquake. Here, it should mention that, the study has explored some widow female participants who are head of their family because they get their husband's government retirement allowance and have more preparedness knowledge about disasters. They are mentally confident to early response in sudden disasters.

**Table 3:** Binary Logistic Regression Model Test Result

Variables	B	S.E.	Df	Sig.	OR	95% C.I. for EXP(B)	
						Lower	Upper
Have education	1.685	.747	1	.024	5.394	1.248	23.311
Head of family	-.499	1.164	1	.668	.607	.062	5.942
Income status	1.459	1.051	1	.165	4.301	.548	33.726
Constant	-1.641	.374	1	.000	.194		

### Binary Logistic Regression Model for Earthquake Preparedness

As shown in above table, only one of the independent variables made a unique statistically significant contribution to the model (have education qualification). The strongest predictor of reporting unawareness was uneducated, recording an odds ratio of 5.39. This indicated that respondents who had poor education qualification were over 5 times more likely to be unaware during sudden disaster like earthquake. It also indicates that education has both correlation and influence on earthquake awareness. The rest of the variables or factors, income status and head of family have correlation only with earthquake awareness

**Perception on Fire Hazard:** Nearly 23.3% of the elderly have said that at least one fire incident has occurred at their house. They possess a considerably good perception about fire hazards. They are aware that fire is a man-made disaster and that its source may be burning straw, wood etc. Similarly, they are aware that it can spread in a matter of minutes and cause significant damage.

### Emergency Response Plan in Fire Hazard

The research has noticed an enthusiasm among the

elderly people about adopting emergency response mechanisms in the case of fires, that is lacking when asked about earthquakes. According to a survey, more than half of the senior citizens respond to fires by shouting or exclaiming for help (they have no other response beyond this; as they become bewildered when faced with such danger and may try to pour water on to it). Other than this, 24.7% are also unable to do anything because of their physical disabilities and so require assistance when dealing with fire. All of the elderly people believe that they will get help from family, friends, neighbors etc. Some quotations are mentioned below-

"I will call for help, shout, attempt to extinguish the fire, and the neighbors will assist in putting it out." (63-year-old man.)

"I am a hunchbacked person. I cannot walk properly. I have hearing problems. If I see fire, I will scream. If someone comes and helps me out of the house, I might survive — otherwise, I will burn to ashes". (90 years old woman with physical disability)

"I will try to turn off the main switch, and if the fire is from the gas cylinder, I will try to put it out. I will try to move everyone to a safe place." (Retired service holder with secondary education)

**Table 4:** Response to Sudden Fire

Response to sudden fire	Percentage	Response to sudden fire	Percentage
Shout	58.9	Keep running	13.7
Try to pour water	58.9	Spread sand on current fire or use stick	11
Shut down main switch	38.4	Call fire service or rural electrification office	8.2
Pray to creator	26	I have not enough idea about it	8.2
I have nothing to do because of my illness	24.7	Cover cylinder with thick and wet cloth/sack	16.4

Source: Field Survey, 2022

### Relationship Between Fire Hazard Preparedness and Age (Chi-Square Test)

Pearson Chi Square test is applied on age variables to identify the correlation with fire hazard preparedness. The chi-square test ( $\alpha = .05$ ) was statistically significant, ( $\chi^2 = 12.75$ ,  $p = 12.65$ ), with Phi ( $\phi$ ) coefficient of .42,

indicating a medium relationship according to range. The health problems of elderly people are increasing as they are growing older and these problems impact on the awareness and preparedness of elderly people. In between 60-69 age range respondents' awareness is high in terms of fire hazard.

**Table 5:** Chi-Square Test between Fire Hazard Preparedness and Age

Variable	Chi-Square Value ( $\chi^2$ )	Degrees of Freedom	p-value	Significance
Age and fire hazard preparedness	12.646	2	.002	Significant

**Physical and Mental Ability of Respondents to Response in Disaster:** According to the opinion of elderly, the three categories are formed as of their ability to respond to a plan during a disaster. The question was

“What do you think about your ability (physical and mental) to respond in sudden disaster like earthquake and fire hazard?”. Their answer is categorized as like:

**Table 6:** Physical and Mental Ability of Respondents to Response in Disaster

Physical and mental ability of respondents to respond in sudden disaster	Percentage
<b>Good:</b> “I can”	38.4
<b>Medium:</b> “I can but I am confused about my condition”	28.7
<b>Poor:</b> “I cannot do anything”	32.9

Source: Field Survey, 2022

### Availability of Resource Preparedness and Attending on Disaster's Seminar

**Use of Preparedness Materials including Technology to Respond to an Emergency Situation:** No elderly people is found who has enough resource preparedness (money, medicine, food, water, torch light, emergency phone number etc.) for an emergency situation with

them. About 27% are identified who have torch light, medicine boxes which are kept near to their bed for emergency situations. This percentage belongs to these elderly people who are physically fit enough compare to age level and also educated or have income source and head of family or both. As mentioned above, 54.8% of elderly people have mobile phones. Among them 56.7% can only receive a phone and 43.3% can both

receive and make a call. Another alarming finding is about 99% elderly people's family have kept their cylinder gas container in their living house. Only one respondent's family has kept their cylinder gas container outside their house in a box. No respondent is found whose family have fire extinguisher. As they are residents of rural area, so they are not familiar with fire extinguisher.

**Attending Disaster Risk Programs/Seminars:** The present research has found no older adults in the households who had attended any meeting, seminar, training etc. on disasters. Because of being remote, small and undeveloped area, there was no such kind of activity happened around. There are 75.3% of elderly people who are eager to participate in training or seminars on disaster if they get any scope. According to the present survey, 79.5% elderly people think that there is a necessity to attend a seminar, training etc. on disasters. They also think these training and meetings can increase their confidence level during disasters and help to decrease risk. They also added that if elderly people know well about disaster preparedness, they could teach the younger people or children of the family. 20.5% respondents who are suffering different cognitive diseases and disturbed in their personal life think that there is no need to arrange any seminar, training etc. on disasters.

### **Emergency Response Plan of Family Members and Community People**

**Emergency Response Plan of Family Members to Earthquake and Fire Hazard:** Most of the family members have knowledge about earthquakes and fire hazard. Most of them have wished that they would try to move to a safer place like an open space with their family members. Some of them have also mentioned that they would try to go under the bed or table with their family members. There is also found lack of profound preparedness knowledge against earthquake. In the situation of fire hazard, all of them have said that they would try their best to move to a safer place with family members as well as they would try to control the fire incident by taking essential steps like pouring water, throwing sand etc. on fire and switching off the main switch of an electric supply. Though most of them are using cylinder gas at their home for cooking purposes, they do not know how to control fire from

cylinder gas. The family members also said that they are worried about elderly people in their family. No family members were found to have participated in any disaster training or discussion meeting. They explained that TV, newspapers are their source of knowledge. They are blaming their current location for their lack of preparedness.

“Our family members need to be aware. We will make the elderly and other members aware of disaster preparedness. We will try to take the elderly to a safe place.”(26-year-old family member)

**Emergency Response Plan of Community People to Earthquake and Fire Hazard:** Most of the community people have said that they would go to safer places but they did not mention anything specific like which places are safe for them during an earthquake. However, whatever the source is, they all know how to control a fire. But half of them have no adequate knowledge about the fire incidents from a cylinder gas. They said they would help elderly people conforming to their ability. Here is also same scenario of the absence of disaster related meeting, seminar etc. Their knowledge source is media communication.

### **DISCUSSION**

In sudden disasters, instant response is the most important. Early response helps to evacuate quickly. Response depends on physical and mental conditions (Hattori et al., 2021; Jogia et al., 2014; Amaratunga & O'Sullivan, 2006). The present study has revealed that elderly people are suffering from several chronic elder-age diseases aligns with other studies conducted by several researchers (Sara et al., 2024; Sarker et al., 2023). The study also delineates the elderly people who are physically vulnerable, dependent on others for movement as well as suffering from several chronic diseases are more vulnerable to sudden disasters (Eggert & Huss, 2017; O'Sullivan et al., 2012). Many elderly people become puzzled in danger. Besides, their physical condition is very limited and they have prepared their mentality like that they would do nothing. Mentally, they have accepted their defeat. Findings from Powell et al., 2009 also revealed similar results that because of the dependency on others, elderly people have negative attitudes about themselves which prevent them from asserting needs or seeking help. This research highlights both the fragility of treatment facilities in our society

and the health vulnerability of the elderly. It emphasizes providing elderly people with special care (both physical and mental) and maintaining an inclusive plan in National Plan for Disaster Management (NPDM) for their evacuation in light of their physical vulnerabilities.

The elderly people do not have enough preparedness knowledge about sudden disasters like earthquake and fire hazard (Bogdan et al. 2024; Al-Rousan et al. 2014). Most of the elderly people think they will pray to creator only in a sudden earthquake. A previous study by Alam (2016) in south-eastern part of Bangladesh found that almost cent percent of the people think the risk of earthquakes depends on Allah's (God) wish. Such a concept prevents them from being more aware of or keeping disaster plans for an emergency situation. Another research in Istanbul in 2011 by Tekeli-Yesil and his team has revealed that there are some factors affecting better knowledge and greater risk perception about earthquakes among elderly people. They should be made to understand that along with trusting in Allah, being cautious and prepared in this matter is beneficial for them.

The present study has analyzed that the elderly people with disability need help from social networks (Malak, 2020; Fernandez et al., 2002) and they believe that they will get it. In rural area these types of social support are seen ( Chruściel et al. 2018; Kang, 2003; Letvak, 2002). Previous research by Kim & Zakour, (2017) also reported that higher level of informal social support is related to increased levels of preparedness in disasters. Levac et al., 2012; Aldrich, 2012; Kaniasty & Norris, 2009; Rooney & White, 2007 also revealed that family, friends and neighbors often formed spontaneous support networks to resilience during and after disaster Though elderly people have knowledge gap about sudden disasters, but they have quite good perception regarding fire hazard comparing to earthquake. Good perception and extra willingness among the elderly people about saving themselves in sudden fire hazards indicates the familiarity of elderly people with fire and their previous experience. In term of earthquake, the older adults are not well familiar and have little experience regarding its severity because of its locational setting. Liao & Hu (2025) have also revealed that area of residency, disaster experience and poor perception contributes to variation in disaster preparedness.

For getting help, sending a signal to the social network

from the elderly people is most important. Because of physical impairments the elderly people cannot move or make delay to move in an emergency situation. But there were no elderly people who have resource preparedness for emergency situations though some of them keep torch light, medicine boxes for emergency situations (Murphy et al., 2009). Here, little number of elderly has capability of using mobile phone (Hattori et al., 2021). Similar findings from Aldrich & Benson, 2008; McGuire et al., 2007 also reported that it is hard for elderly to respond quickly and rightly to obtain help and evacuate during disasters. The study also reveals that people with good occupation history or present association with employment increase their financial security which helps them to take proper treatment and other essential steps and helps to keep essential kit to reduce disaster risk (Zhuang et al., 2021; Philips et al., 2005). A study in United States by Cox & Kim in 2018 revealed that the older adults in lower income status are less prepared in disasters. Again, financial security also helps to be head of family as well as participate in social activities. This study also explores that elderly people who are head of family and active in social activities are more aware about disaster preparedness compare to others (Hattori et al., 2020). Besides, there were some uneducated elderly females with earning status who are more aware of sudden disaster preparedness. It has been observed that the elderly people with earning status are happier and more confident about their life compared to others. We can therefore assume that earning status is a significant factor of disasters preparedness. The absence of resource readiness is a sign of both the elderly and their families' financial fragility as well as a lack of preparedness knowledge. Due to the lack of career opportunities for the elderly, many members of our society rely heavily on their families for financial support as they age. When it comes to women, the workplace is more limited (Birla, 2021; Harris et al., 2018; Barikdar et al., 2016). Chi square test has also proved that education qualification, earning status and being head of family have significant co-relationship with earthquake preparedness. Among these variables, education is not only correlation but also have an influence on earthquake preparedness. So, it can be said that good education level, earning status and being a head of a family imposes good earthquake preparedness (Kim & Zakour, 2017; Al- Rousan et al., 2014; Kim & Kang, 2010). A previous study in Japan by Shaw et al., 2004 also reported that education has an impact on

earthquake preparedness. Another study in Thailand Andaman Coast by Muttarak & Pothisiri in 2013 revealed that education has a positive relationship with taking preparedness measures in earthquake. It is also identified that gender is also a factor of less preparedness. Though the large number of respondents were female, the awareness among female was not enough or up to the mark. According to findings, women's restricted educational prospects and participation, early marriage, financial reliance on their husbands and children, lack of social engagement, and limited exposure to the outside world are the primary causes of their backwardness. Besides, Powell, et al. 2009 also figured out the same points found in Lebanon, Arch and British Columbia that women are at risk in disasters because of these same conditions.

In case of fire hazard preparedness, age has a significant relationship with preparedness. The health problems of elderly people are increasing with age (Martin, L. G. et al., 2010) and these problems impact on the disaster awareness and preparedness of elderly people. In between 60-69 age range respondents' awareness is high compared to unawareness to fire hazard. So, it indicates that age and fire hazard awareness are correlated (Liao & Hu, 2025; Connelly et al., 2021; Sri-On et al., 2019; UNISDR, 2012; Dissanaike & Rahimi, 2009).

In disaster risk reduction, family members and community people can play a vital role (Aldrich, 2012; Kaniasty & Norris, 2009) and elderly have faith in their help. Though most of the family members and community people have awareness about earthquake and fire hazard preparedness, they do not have profound knowledge about these. The knowledge gap because of unawareness and unwell being (poor to medium economic status) conditions may make a vulnerable situation for elderly as well as for society (Loke et al., 2011). Family members think that their elderly parents are more vulnerable to disaster and they have to give special care to lessen their disaster risk (Ngo, 2001). They said they would help elderly people by identifying and understanding their needs in disasters according to their ability (Gibson & Hayunga, 2006). The family members and community people realized and admitted that they should know properly about disaster preparedness, do practice and spread the knowledge among the society (Adhikari et al., 2016; Paton et al., 2001). In this situation, enriched disaster preparedness knowledge can reduce this vulnerability

of elderly people. But the present research has not found any respondents in the household and community who had attended any seminar, training etc. on disasters (Al-Rousan et al., 2014) because there was no such kind of activity in their locality or individual's workplace. Another previous research conducted by Alam, 2016 in the south-eastern part of Bangladesh also revealed that no risk reduction program was held for earthquake and tsunami and none of the respondents participated in risk reduction programs for disasters. This outcome makes it abundantly evident that our NPDM does not adequately account for the vulnerability of the elderly to disasters. Elderly people think that there is a necessity to attend a seminar, training etc. on disasters (Ao et al., 2021; Adiyoso & Kanegae, 2013; Khan, et al., 2001). Another alarming factor is that the elderly people who are suffering different cognitive diseases and disturbed in their personal life think that there is no need to arrange any seminar, training etc. on disasters (Zhu & Sun, 2017) and they are eagerly waiting for death. To overcome the situation, elderly people need to be provided with mental support. Zhu & Sun 2017 also suggested that elderly people should be encouraged to participate in disaster related programs local to national level to increase their visibility. Several researches by Amini and his team in 2021 in Iran and Subedi et al., 2020 in Nepal revealed that disaster related education program enhances awareness among the women and general people. Additionally, family members and community members must be included in the disaster awareness program.

#### ***Recommendations Based on Research Findings:***

After conducting the research there are some recommendations I would like to mention as follows:

Physical fitness, good health and financial solvency are vital need for avoiding disaster risk. This calls for the organization and more effective implementation of our 'Elderly Policy'. Every health centre should build the necessary measures, such as a geriatrics section with a psychological unit, to improve the mental and physical health of senior citizens. To improve their readiness, age-appropriate and rural catastrophe meetings, seminars, or training should be organized. Furthermore, it also needs to ensure educational opportunities for elderly. To enhance preparedness knowledge, authority can spread the preparedness knowledge among people through different visual media like disaster awareness posters, leaflets etc. The poster will highlight the dos

and don'ts in earthquakes and fire incidents and how to avoid risk. Disaster related short drama, documents can be presented in the rural area to aware elderly people and community people. Disaster emergency kits should be provided to elderly people and inspiring them mentally can be an important kit to live. Enhancing social networks and involving senior citizens in social activities can also help to lessen their vulnerability. Door to door service is required for disable elderly people. Community based volunteers need to be made for disaster risk reduction. Besides, it is also important to introduce elderly people to new technologies. For example, informing them about the use and precautions

of cylinder gas, electric and electronic device can be helpful to avoid any further disaster. Moreover, lessons on disaster preparedness and post-disaster preparedness for various disasters from primary to higher education level can be included in the education system so that students can learn about disasters from their early childhood and can spread their knowledge among their family member especially elderly ones. Arranging discussions, meetings and disaster management training associated with disasters for school, college and university going students also would be of great help for raising awareness among community people.

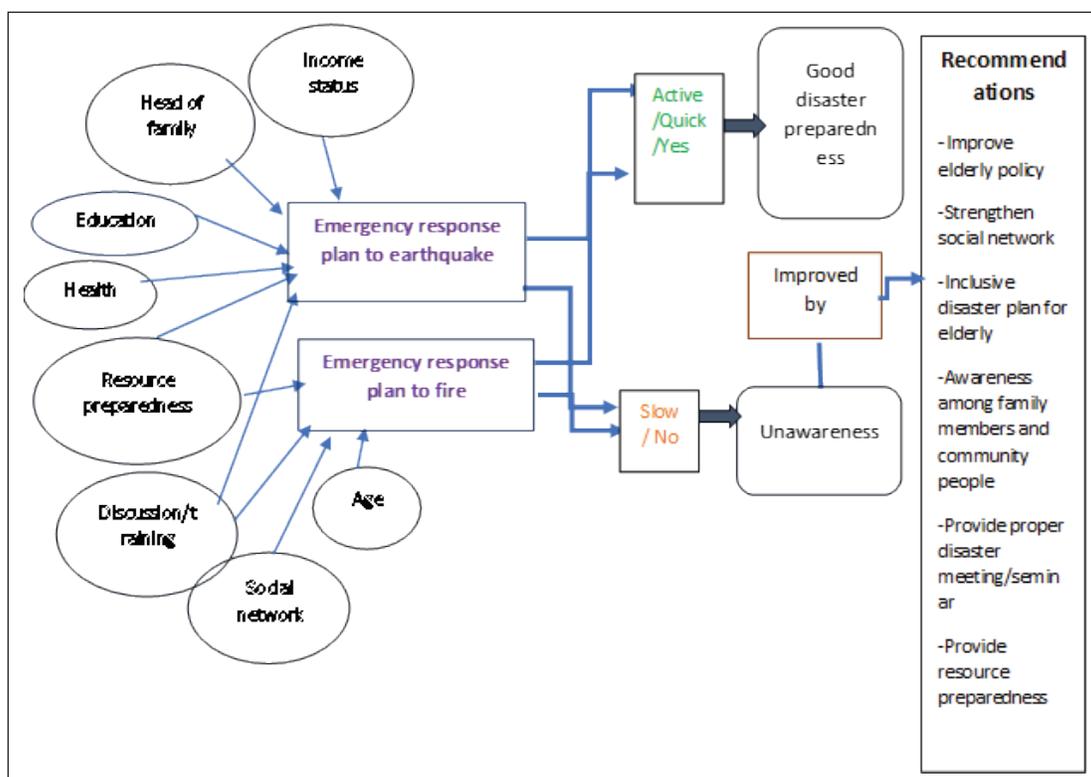


Figure 1: Visualization of Findings of the Study

## CONCLUSIONS

Bangladesh is trying to achieve the SDG goals within 2030. The study has also met 4 goals of SDG and they are “No Poverty” (G-1); “Zero Hunger” (G-2); “Good Health & Well Being” (G-3); “Quality Education” (G-4). The study has already revealed that elderly people are suffering in different chronic diseases. Because of family crisis and lack of income source, they are mostly unable to meet good treatment, take proper nutrients and lead a healthy-well being quality life. Besides,

goal 4 is about quality education and our most of the elderly are lag behind from quality education and tertiary education. So, to meet the goals within the timeframe the policy maker has to be more concern about these existing problems of our elderly people. As well as, there are many gaps in our National Plan for Disaster Management (NPDM) and Elderly Policy. Besides the policy mentioned for elderly people are not yet fully applied in all sectors practically. The National Plan for Disaster Management (NPDM) 2021-2025 has mentioned the word “the elderly” three times at the page

12 and 21 in the whole plan. There is a general holistic view about women, children, elderly and people with disabilities. Though a good portion of our population covers elderly people, there is no separate emergency plan about disaster risk reduction considering the elderly people. It is already proved that elderly people are more vulnerable to disaster because of aging, poor health condition. Education and income status have a vital impact on disaster preparedness of elderly people. Education helps to raise awareness among elderly people and increase their confidence and remove anxiety about disasters. Poor economic conditions will also accelerate vulnerable condition. Aged person with good economic status can take care of him/herself more appropriately comparing to a man of poor economic status. Good health (physical and mental) has a great influence on preparedness of disaster. So, we need more precise plan to enhance disaster awareness and preparedness of senior citizens of our country.

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