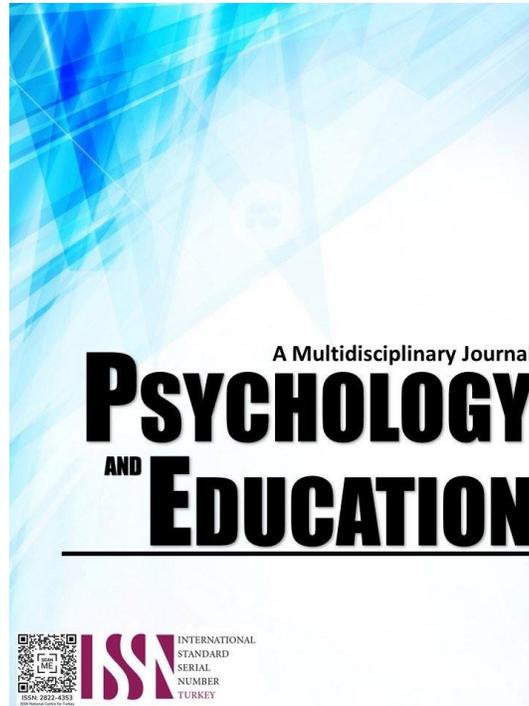


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Earthquake Preparedness of People in Rural Community: A Basis for Disaster Risk Mitigation Intervention

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Abstract

Being part of the seismically active "Pacific Ring of Fire," earthquakes in the Philippines have ever been occurring. Many studies have been conducted assessing the earthquake preparedness of the people, yet there needs to be more studies among rural communities. This research study aims to fill in the gaps as it assesses the earthquake preparedness of people living in rural communities, particularly in Ipil-Cuneg, Bayombong, Nueva Vizcaya. The study utilized a mixed method of qualitative and quantitative methodology. A survey questionnaire was used to assess the earthquake preparedness of the respondents in terms of awareness and practices among the 187 sample size. With the use of inferential and statistical treatments, it was found that the respondents are very aware and prepared about the necessities regarding earthquake preparedness. However, it is analyzed that earthquake preparedness has very low to no relationship to the residents' demographic profiles. The respondents' awareness and practices are also found to have a very high positive correlation. The respondents' actions are based on what they know and are aware of. Moreover, the respondents deem that awareness and practices are essential in preparation for earthquake occurrences to know what they should do during the event. These findings can be used to establish disaster risk mitigation interventions for the barangay in order for the people to strengthen their knowledge and practices about earthquake preparedness. It is recommended that authorities should initiate programs that would shape the community to be efficient in times of disaster.

Keywords: *earthquake preparedness, earthquake awareness, earthquake practices, earthquake, disaster*

Introduction

Throughout the years, studies regarding earthquake preparedness have been widespread. However, even with this extensive research, some places in the country still need to be studied. Primarily, researchers conduct studies in highly dense or populated areas. Although disaster losses frequently occur in rural and agricultural areas, a majority of the existing disaster research has focused on urban areas and coasts, often overlooking rural populations and communities (Cutter et al., 2016; Tierney, 2013). Furthermore, most of the research studies that have taken place in rural communities have focused on environmental or technological disasters, such as mining-related incidents, and not on more frequently occurring events, such as disaster losses from flooding (Scott et al., 2012). Especially in the locality of Nueva Vizcaya, only countable research regarding disaster preparedness is available.

With the frequent occurrence of earthquakes in this current time, there is a rise in concern about how people are acting toward such happenings. Particularly in areas located in remote locations, there is a need to assess their earthquake preparedness given that they are far from the central town. In a research brief by Weber (2020) from the United Nations Office for Disaster Risk Reduction (UNDRR, 2020), first, in many regions, rural populations suffer more than urban centers because they typically wait longer for rescuers to arrive and often experience more building collapse than in the cities. Second, the number of casualties following an earthquake is often underestimated in rural areas partly because of infrastructure and communications damage. This slows rescue groups from sending personnel and equipment. For any rescue effort, time is critical. According to the Occupational Safety and Health Administration (OSHA, n.d), an earthquake is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the Earth's surface. This shaking can cause damage to buildings, bridges, disrupt gas, electric, and phone service triggering landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis).

The Philippines is prone to natural disasters and is located on the seismically active "Pacific Ring of Fire," a band of volcanoes and fault lines that arc around the edge of the Pacific Ocean, causing frequent earthquakes (Funakoshi, 2022). The Philippines is ranked third in the 2018 World Risk Index of most disaster-prone worldwide. The country experiences 100 to 150 earthquakes yearly, according to the Philippine Institute of Volcanology and Seismology (PHIVOLS). Every year, the country experiences almost all disasters, such as typhoons, earthquakes, and volcanic eruptions (United Nations Population Fund Philippines [UNFPA], 2019). The Philippine Seismic Network records an average of twenty earthquakes per day. The country has experienced numerous damaging earthquakes and tsunami events over the past years. While earthquakes can occur anywhere, rural communities are often more vulnerable due to their remote locations and limited access to resources.

Nueva Vizcaya is one of the provinces in Northern Luzon that is highly prone to earthquakes due to its location near the Digidig Fault Line, which is part of the Philippine Fault System. When an earthquake occurs in a populated area, it can cause deaths and injuries as well as extensive property damage. Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls or floors, flying glass, and falling objects as a result of the ground shaking or people trying to move more than a few feet during the shaking. Much of the damage in earthquakes is predictable and preventable (OSHA, n.d).

Consequently, occurrences of earthquakes are inevitable and should be taken into consideration by the community. Flooding, coastal erosion, the drowning of people, and damage to properties are just some of the effects earthquakes can bring us (Philippines Institute of Volcanology and Seismology [PHIVOLCS], n. d). For rural communities, however, building resilience is problematic for several reasons. Smaller tax bases can cause financial constraints, the limited population can affect the way state and local mitigation and recovery funds are distributed, and training opportunities and equipment for disaster response might also be lacking. Reduced access to technology can prevent communication before, during, and after disasters. These obstacles can create significant difficulties in designing and implementing hazard mitigation plans and practices (Kapucu & Rivera, 2020).

On July 18, 2022, a 7.0-magnitude earthquake struck the mountainous province of Abra at 8.43 a.m. local time, triggering landslides and the collapse of structures (United Nations Office for the Coordination of Humanitarian Affairs [OCHA], 2022). Also, on July 27, 2019, magnitudes 5.4, 5.9, and 5.8 hit Itbayat, Batanes. Reportedly, there were 9 people dead (National Disaster Risk Reduction Management Council Situational Report No. 11), houses that sustained major damage and damaged/ collapsed were mostly Ivatan houses which are classified as Unreinforced Masonry (URM) or Unreinforced Stone (URS) houses, and others experienced minor damages to their houses. Earthquakes can destroy rural households' assets and livelihood in seconds and increase their vulnerability to poverty. Investigating rural residents' intentions to cope with disaster impacts is important for disaster managers and policy-makers in designing more relevant prevention and mitigation strategies (Yu et al., 2019).

The most effective way to combat catastrophes to take precautions beforehand to reduce the losses that may result from disasters (Ulaş Kadioğlu & Uncu, 2018). In an earthquake disaster, Jaime (2020) and Kusumastuti et al. (2021) discovered that those who have participated in an earthquake evacuation drill in advance and mastered evacuation routes and emergency safety procedures are more likely to survive. In a landslide disaster, Xu et al. (2018) showed that people who engage in disaster preparation behaviors, including learning disaster prevention knowledge, stocking emergency food, participating in government-organized training, strengthening houses, purchasing insurance, etc., can be less negatively affected.

The purpose of assessments in the initial phase of a disaster is to provide information that can guide our emergency services in activities such as search and rescue missions, pinpoint the location and nature of secondary threats, provide information about the status of facilities needed to treat or support the survivors and provide information about the access to stricken communities (Skavdal, 2003). Moreover, a basis for interventions can be attained in conducting this study. Particularly in terms of providing information and advice to members of their communities about how to adequately prepare for natural disasters.

Several factors strongly influence disaster preparedness, including knowledge of disaster risks and disaster management (Khairilmizal et al., 2016). Preparedness activities should be based on knowledge of the potential impacts of disaster hazards on health and safety (Sutton & Tierney, 2006). Lack of knowledge and readiness can affect poor performance when providing disaster management (Putra & Matyusuki, 2019).

Preparedness for Earthquake

According to OSHA (n.d), preparedness includes planning for an earthquake before it occurs, equipping workers with information and emergency supply kits, training, and implementing preparedness plans.

Individual emergency preparedness behaviors are associated with attitudes, training/exercise, self-efficacy, knowledge, and risk perception (Ning et al., 2021). The same study analyzed that attitudes impact preparedness behaviors most, followed by training/exercise and self-efficacy. Awareness and risk perception are indirectly linked with preparedness behaviors. This suggests that individual emergency preparedness can be improved through changing attitudes and training/exercise plays an important role in enhancing preparedness behaviors both directly and indirectly (through improving self-efficacy, attitudes, and knowledge).

Awareness on Earthquake

The level of knowledge of disaster risks, the causes of disasters, and the potential collective or individual responses to exposure and vulnerability to hazards are referred to as disaster awareness. As Shen (2009) stated, awareness is decreased when the provision of appropriate information is minimal or when memories of past experiences or events are diminished. Awareness can generally be uplifted through efforts that are centered on local issues, contain simple solutions to reduce risk, and are repeated on a regular basis (Poortinga et al., 2011).

Awareness and preparedness towards disasters vary depending on the characteristics of individuals within the community and the characteristics of communities across space (Gerdan, 2014). For instance, Gerdan (2014) suggested that there is a direct link between education or sensitization and awareness. Using the educational levels of respondents, it was found that higher levels of education contributed to producing positive awareness. In addition to this, the Regional Office for the Arab States of the United Nations Office for Disaster Risk Reduction (USAID, 2011) has indicated that depending on the type of community, access to information may vary depending on the social grouping, therefore one's awareness of disaster risks. These groups may include gender, ethnic grouping, and social status. Lastly, the International Federation of Red Cross and Red Crescent Societies (IFRC, 2011) suggests that most people become disaster-aware based on their personal experiences with disaster events over time.

The link between preparedness and awareness is well understood (Gerdan, 2014; Sinclair & Pegram, 2003), and as suggested by Gerdan

(2014: p.159): “It is possible to increase the capacity to cope with the disasters by raising the awareness of all components, all individuals and communities in line with this common cause.”

Practices on Earthquake

Disaster drills and practices have been proven to mitigate the risk of various health morbidities and mortalities during a disaster. Moreover, if such drills and practices are focused to meet the local needs of people then these are more likely to have a higher impact. Similarly, intervention focusing only on providing information related to hazard or risk has not been proven to enhance the practice of disaster preparedness. However, interventions when aggregated with training and two-way interactions among participants and the interventionist have shown some better results. Identifying and providing training to the leaders who could disseminate the relevant information to their local community is also one of the possible ways in increasing the preparedness level of individuals.

By increasing the level of practices against natural disasters, societies can be ready against earthquakes with all their institutions before the earthquake happens (Demirci & Yıldırım, 2015). Knowing how to act during and after an earthquake is necessary to reduce potential damage. The most effective way to struggle against disasters is to take precautions before disasters to reduce the losses that may result from disasters (Ulaş Kadioğlu & Uncu, 2018).

Research into urban resilience has dwarfed our understanding of disaster resilience in rural places (Cutter, 2016). Consequently, this study assessed the awareness and practices of the locals in a rural area in determining the level of their earthquake preparedness. Evaluating the local's knowledge and practices on earthquake preparedness in a rural area enabled the study to determine the community's general knowledge on earthquake preparedness and whether it is sufficient or needs improvements. It was determined which areas concerning earthquake preparedness require further attention with the assistance of the locals. Moreover, the assessment on those two aspects resulted to the formulation of method that will help the locals in terms of disaster wherever they may be situated.

Research Questions

This study aims to assess the earthquake preparedness of people in a rural community. Hence, the research sought to answer the questions as follows:

1. What is the level of earthquake preparedness of the respondents on the following aspects:
 - 1.1. awareness; and
 - 1.2. practices?
2. Is there a significant difference in the earthquake preparedness of the respondents in terms of awareness when compared according to their:
 - 2.1. sex;
 - 2.2. age group;
 - 2.3. socio-economic status;
 - 2.4. marital status;
 - 2.5. educational attainment;
 - 2.6. working condition; and
 - 2.7. residential type?
3. Is there a significant difference in the earthquake preparedness of the respondents in terms of practices when compared according to their:
 - 3.1. sex;
 - 3.2. age group;
 - 3.3. socio-economic status;
 - 3.4. marital status;
 - 3.5. educational attainment;
 - 3.6. working condition; and
 - 3.7. residential type?
4. Is there a significant relationship between the respondent's awareness and practices?
5. What is the importance of awareness and practices in preparation for earthquake occurrences?

Methodology

Research Design

This study utilized a mixed method that included both qualitative and quantitative methods. A descriptive- comparative- correlational was used in the quantitative section of the study. A descriptive approach was utilized to determine the level of awareness and practices on earthquake preparedness of people living in a rural community. A comparative method was used to verify the significant difference in awareness and practices on earthquake preparedness when classified according to the demographic profiles of the respondents. The correlational method was used to verify the relationship between the respondents' awareness and practices with regard to earthquake preparedness.

Apart from that, qualitative responses using open-ended questions were collected to further understand the respondents' perception of the importance of having awareness and practices in preparing for earthquake occurrence.

Participants

The respondents of this study are the residents of Ipil-Cuneg. The respondents are only limited to people aged 18 years and above who were selected through convenient sampling because of the availability of the time that researchers gathered data. The Raosoft sample size calculator by Raosoft incorporation was used to identify the number of respondents residing in the rural community of Ipil-Cuneg. With 541 respondents determined by the 2020 census and the considered 360 people who were 18 years and above as of 2023, the recommended sample size of the study by Raosoft is 187 with a confidence level of 95% and a 5% margin of error. The questionnaires were given and handled by the barangay officials and distributed to the students of Ipil-Cuneg Elementary School answered by their family members that are 18 years old and above.

Table 1. *Demographic Profiles of the Respondents*

Demographics	Frequency	%
Sex		
Male	77	41.2
Female	110	58.8
Age Group		
18 -25	55	29.4
26-35	63	33.7
36-45	47	25.1
46+	22	11.8
Socioeconomic Status		
less than P12,082	174	93.0
P 12,082 – P 24,168	2	1.1
P 24,164 – P 48,328	7	3.7
P 48,328 – P 84,575	1	.5
P 84,574 – P 144,984	2	1.1
P 144,984 – P 261,640	1	.5
Marital Status		
Single	77	41.2
Married	102	54.5
Separated	3	1.6
Widowed	5	2.7
Educational Attainment		
Primary School	10	5.3
Elementary School	60	32.1
High School	92	49.2
College	24	12.8
Others: (TESDA)	1	.5
Working Condition		
Self-employed	27	14.4
Public employee	11	5.9
Unemployed	145	77.5
Private employee	4	2.1
Residential Type		
Single story	186	99.5
Two story	1	.5
Total	187	100

Table 1 shows the demographic profiles of the respondents. As can be seen, most of the respondents were female, followed by males. The ages of the respondents were fairly distributed, yet 26-35 is the age group that garnered the highest distribution. Moreover, the majority of the respondents' socioeconomic status was less than P 12,082. On the other hand, the respondents were mainly married but few are separated and widowed. Almost half of the sample size were high school graduates and most of the respondents were unemployed. In addition, respondents were living in a single-story residence and only an individual is in a two-story residence

Instruments

The questionnaire survey that was used in this study was adapted from the study

of Yayla and Şahinöz (2020) entitled Preparedness for Earthquake: Knowledge and Behavior (See Appendix A). Questions from the anchor study were modified to achieve the study's objective and aim. This study's questionnaire was translated into Iloco statements in order to provide an option for the respondents in case the respondents may not understand the English statements. The questionnaire

consists of three sections. The first part mainly comprises the profile of the respondents, including their name (optional), sex, age, marital status, socio-economic status, educational attainment, working conditions, and residential type. The second part includes the main body of the questionnaire. The survey respondents were asked two sets of close-ended questions about their awareness and practices towards disaster preparedness. The first section will assess the respondent's Earthquake Awareness, consisting of 23 items. The indicators are designed using a four-point Likert scale in the following levels: (4) Strongly agree, (3) Agree, (2) Disagree, (1) Strongly disagree. The second section will assess the Earthquake Practices which consists of 23 items. The indicators are designed using a four-point Likert scale on four levels: (4) Always, (3) Sometimes, (2) Rarely, (1) Never. Moreover, the third part comprises an open-ended question that asks about the importance of awareness and practices in preparing for earthquake occurrences. Overall, the questionnaire was checked and validated by the language coordinator. It underwent pilot testing to check the reliability of the questionnaire.

Table 2. *Result of Reliability Test*

	<i>Cronbach's Alpha</i>	<i>Cronbach's Alpha Based on Standardized Items</i>	<i>N of items</i>
Awareness	.940		23
Practices	.844		23

Procedure

The study's data-gathering procedure began with creating the research survey questionnaire. The adapted questionnaire from the study of Yayla & Sahinoz (2020) was modified and altered by the researchers to suit the significance and the target respondents of the study. Finalization was made by examining whether grammatical, spelling, translation and punctuation errors were present in the questionnaire to avoid further confusion and misinterpretation with the respondents. Then, the prepared questionnaire undergone a validity and reliability check. After the approval of the questionnaire that will be utilized in this study, the questionnaire was then reproduced into hard copies and distributed physically to the respondents in Ipil-Cuneg. The survey was done face-to-face, and within the constraints of the COVID-19 pandemic, we also followed safety protocols. This was followed by the collection and tabulation of data provided by the participants. Furthermore, descriptive and correlational statistics were used to analyze and interpret the data and information gathered from the survey. To complete the investigation, the researchers presented conclusions and suggestions that are intended to inform the readers about the findings and results found in the study.

Data Analysis

To analyze the gathered data, descriptive and inferential statistics were utilized through IBM's Statistical Package for the Social Sciences (SPSS). Specifically, the following statistical treatments were used:

Frequency count and percentage distribution were used to present the demographic profiles of the respondents namely; sex, age group, socio-economic status, marital status, educational attainment, working condition, and residential type.

To describe the level of earthquake preparedness of people living in a rural community, a 4-point Likert scale was utilized in the questionnaire and was interpreted using mean and standard deviation. The table below was used to interpret the analyzed data.

Table 3. *Likert Scale Interpretation of Awareness on Earthquake Preparedness*

<i>Mean Range</i>	<i>Qualitative Description</i>	<i>Interpretation</i>
3.50 – 4.00	Strongly Agree	Very Aware
2.50 – 3.49	Agree	Aware
1.50 – 2.49	Disagree	Unaware
1.00 – 1.49	Strongly Disagree	Very Unaware

Table 4. *Likert Scale Interpretation of Practices on Earthquake Preparedness*

<i>Mean Range</i>	<i>Qualitative Description</i>	<i>Interpretation</i>
3.50 – 4.00	Always	Very Prepared
2.50 – 3.49	Sometimes	Prepared
1.50 – 2.49	Rarely	Unprepared
1.00 – 1.49	Never	Very Unprepared

T-test for independent samples was used to identify the significant difference in the level of earthquake preparedness among the respondents in terms of sex.

One-way ANOVA was used to compare the level of earthquake preparedness of respondents in terms of age, marital status, socio-economic status, educational attainment, working conditions, and residential type.

In assessing the significant relationship between the respondent's awareness and practices, Pearson's r correlation was utilized.

The latter part of the questionnaire is an open-ended question. The responses collected from this qualitative method were to assess the perception of the people on what is the importance of awareness and practices in preparation for earthquake occurrences. In analyzing

the open-ended question, thematic analysis will be used.

Results and Discussion

This section presents the analysis, interpretation, and discussion of the data gathered from the questionnaires floated to assess the earthquake preparedness of people living in a rural community. Both the data gathered in the quantitative and qualitative parts of the questionnaire are listed in the following tables:

Section 1. Level of Earthquake Preparedness of the Respondents

Table 5. *Level of Awareness on Earthquake Preparedness*

<i>Awareness Statements</i>	<i>Mean</i>	<i>SD</i>	<i>Interpretation</i>
I need to get a running lamp or flashlight.	3.775	.418	Very Aware
I need to get a aid kit.	3.764	.438	Very Aware
It is necessary to be careful that the items containing water do not stand on electrical appliances.	3.652	.477	Very Aware
It is necessary to buy an alternative cooking source	3.412	.592	Aware
It is necessary to take the essential medicines necessary for use in diseases and allergies.	3.620	.498	Very Aware
It is necessary to ensure that heavy object stand on the ground.	3.588	.504	Very Aware
I need to get canned food for emergency use.	3.626	.485	Very Aware
After a major earthquake, it is necessary separate enough tools to make minor repairs at home.	3.513	.532	Very Aware
I need to get a radio with a running batter.	3.567	.548	Very Aware
We need to make a new arrangement in our cupboards so that heavy object are at ground level.	3.471	.589	Aware
We need to store water to survive.	3.508	.571	Very Aware
It is necessary to consider the possibility of a major earthquake when buying, renting, or building the house we live in.	3.476	.599	Aware
You need to fasten the combi or hot water tank.	3.208	.819	Aware
We need to take measures to increases the earthquake resistance of the of the building we live in or to reduce the possibility of collapse in major earthquake.	3.615	.499	Very aware
After the earthquake, it is necessary to determine a meeting point for everyone.	3.599	.543	Very aware
Excess toilet paper should be stored to meet our toilet needs in emergencies.	3.347	.719	Aware
It is necessary to take measures to strengthen the chimney of the building or house we live in to reduce the possibility of a collapse in major earthquake.	3.540	.589	Very aware
We need to take measures to reinforce our roof or reduce the likelihood of collapse in major earthquake.	3.802	2.927	Very aware
You need to take some precautions in your workplace.	3.546	.550	Very aware
I need to get a working fire extinguisher.	3.213	.884	Aware
We need to attach safety locks to our cup boards.	3.433	.639	Aware
The cupboards must be fixed to the wall.	3.439	.696	Aware
In our house, it is necessary to secure movable items such as computers and television.	3.537	.503	Very aware
Total	3.537	.382	Very aware

*Legend: SD= Standard Deviation

Awareness: 3.50 – 4.00 = very aware ; 2.50 – 3.49 = aware ; 1.50 – 2.49 = unaware ; 1.00 – 1.49 = very unaware

Table 5 provides the descriptive statistics on the respondents' level of awareness of earthquake preparedness. As indicated in the table, the highest mean ($M = 3.775$; $SD = .418$) suggests that the respondents fall into the category of "very aware" in terms of awareness in earthquake preparedness.

This indicates that they possess a comprehensive understanding of the necessary precautions and actions to take, in the event of an earthquake. They are likely to be well-informed about earthquake safety measures, such as creating an emergency kit, developing an evacuation plan, and staying updated on earthquake-related information. With their high level of awareness, they are well-prepared to respond effectively and protect themselves and others during disasters. On the other hand, the lowest mean ($M=3.207$; $SD=.819$) falls into the "aware" category. While this group still demonstrates a reasonable level of awareness, there may be some areas where their knowledge and preparedness for earthquakes could be improved. They may benefit from further education and resources to enhance their understanding of earthquake safety measures and response strategies.

Overall, it is evident that the respondents have a commendable level of awareness when it comes to earthquake preparedness, with its overall mean score ($M=3.537$; $SD=.382$) suggesting that the respondents are "very aware". The fact that the majority of participants scored above average signifies a significant level of awareness and understanding in this critical area. This high level of awareness empowers the respondents and the community to take proactive measures, such as creating emergency plans and securing their surroundings, to mitigate potential risks associated with earthquakes. This is supported by the study conducted by Demirci and Yıldırım (2015), being aware of the earthquake requires having the right information to create this awareness, as well as having the right attitudes to determine how to act against the earthquake.



Table 6. *Level of Practices on Earthquake Preparedness*

<i>Preparedness Statements</i>	<i>Mean</i>	<i>SD</i>	<i>Interpretation</i>
I have a flashlight prepared.	3.808	.422	Very Prepared
I have prepared a first aid kit.	3.722	.506	Very Prepared
I have ensured that object which contain water have been stored on top of electrical equipment.	3.626	.604	Very Prepared
I can access an alternative cooking source.	3.374	.613	Prepared
I have a supply of essential medicine for illness and allergies.	3.529	.561	Very Prepared
I have ensured that heavy object are stored on the floor.	3.578	.527	Very Prepared
I have a supply of canned food that could be used in an emergency.	3.609	.541	Very Prepared
I have enough tools to make minor repairs to the house following a major earthquake.	3.487	.580	Prepared
I have a working battery radio.	3.550	.606	Very Prepared
I have arrange the cupboards to store heavy object at ground level.	3.508	.589	Very Prepared
I have stored water for survival.	3.470	.598	Prepared
I consider the risk of a significant earthquake when deciding to live in the house that I do now.	3.454	.641	Prepared
I have fastened the combi or hot water tank.	3.198	.822	Prepared
I have either strengthen my house to increase its earthquake resistance or satisfied myself that I will probably not fall into significant earthquake	3.546	.520	Very Prepared
After an earthquake, everyone knows a gathering location that will be used to meet up with family members.	3.567	.548	Very Prepared
I have put aside spare plastic bags and toilet paper for use as an emergency toilet.	3.316	.727	Prepared
I have either strengthen my chimney or satisfies myself that I will not fall into a significant earthquake.	3.492	.617	Prepared
I have ensured that my roof will probably not collapse in a major earthquake.	3.631	.516	Very Prepared
I have taken safety precautions in my workplace.	3.160	.931	Prepared
I have working fire extinguisher	3.160	.930	Prepared
I have attached safety locks to the cupboards	3.412	.636	Prepared
I have fixed the cupboards and other furniture to the wall.	3.369	.724	Prepared
I have secured movable object in my home.	3.615	.386	Very Prepared
Total	3.499	.386	Prepared

*Legend: SD= Standard Deviation

Awareness: 3.50 – 4.00 = very prepared; 2.50 – 3.49 = prepared; 1.50 – 2.49 = unprepared; 1.00 – 1.49 = very unprepared

Table 6 shows the level of practices of the respondents towards earthquake. As can be seen in the table, the respondents’ level of practices on earthquake preparedness with the highest mean score (M=3.808; SD=.422) indicates that the respondents are “Highly Prepared” in an event of an earthquake. This suggests that the respondents have taken proactive steps to ensure their safety in case of an earthquake. On the other hand, the lowest mean score (M=3.160; SD=.931) indicates that the respondents are prepared. This suggests that while they may have demonstrated some safety precautions and mitigation capabilities, there is still a need for the respondents to enhance their practices in terms of the respondents’ practice preparedness efforts. Overall, it signifies that the respondents, as a whole, are “Prepared” (M=3.499; SD=.382) for potential earthquake situations. Continued efforts should be made to assist respondents with a lower level of practice earthquake preparedness in improving their preparedness levels, while also maintaining and enhancing the preparedness practices among those who are already “Highly Prepared”. It is based on residents’ subjective consciousness to study their disaster prevention and mitigation capabilities said by Jones et al. (2017)

Differences on the level of earthquake preparedness of the respondents in terms of awareness when grouped according to their demographic profiles

Table 7. *Difference in the level of earthquake awareness when grouped according to sex*

	<i>Sex</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>
Awareness	Male	76	3.555	.358	185	.838ns	.403
	Female	111	3.510	.362			

*Legend: p<0.05, ns – no significance

Awareness: 3.50 – 4.00 = very aware ; 2.50 – 3.49 = aware ; 1.50 – 2.49 = unaware ; 1.00 – 1.49 = very unaware

Table 7 shows the difference in the earthquake preparedness of the respondents in terms of awareness when compared according to their sex. Based on the means of the data, males (M=3.555) have higher awareness compared to female respondents (M=3.510). These analyzed means indicate that both sexes are very aware of what to do in line with earthquake preparedness. An independent sample t-test was conducted and revealed that there is no significant difference in the earthquake preparedness (t=.838*; p=.403) of the respondents when grouped according to sex. This indicates that one’s awareness is not affected by their sex. The findings of the present

study is inline with that of Montillano (2018). His study found that there was no significant difference in the level of earthquake awareness between male and female school personnel. This suggests that both males and females have similar levels of knowledge about earthquakes and earthquake preparedness.

Table 8. *Difference in the level of earthquake awareness when grouped according to age group*

Factor	Group	N	Mean	SD	F-value	p-value
Age Group	18-25	55	3.633	.303	4.825*	.003
	26-35	64	3.459	.361		
	36-45	46	3.585	.367		
	46+	22	3.350	.386		

* $p < 0.05$; A= there is a significant difference; B= there is no significant difference
Awareness: 3.50 – 4.00 = very aware ; 2.50 – 3.49 = aware ; 1.50 – 2.49 = unaware ; 1.00 – 1.49 = very unaware

Table 8 presents the difference in the level of awareness towards earthquake preparedness of the respondents when compared according to their age group. As can be seen on the table above, there shows a significant difference in the level of awareness of the respondents when grouped according to their age group as it garnered a p-value of .003. Referring to the table, it can be implied that people ages 18-25 have a higher level of earthquake awareness than the rest of the group. This may mean that younger ones possess more knowledge regarding to earthquake preparedness. There might be activities of people that can be highly affected by age. Just like in the study of Gonzales and Klower (2020), their study on disaster resilience in the Philippines acknowledges that age can be a complex factor in disaster awareness and preparedness. They added that younger generations might benefit from easier access to information and technology.

Moreover, Punzalan and Peña (2019) on their study of Earthquake preparedness and risk perception among students and faculty members of the University of the Philippines Diliman, found that younger participants (18-24 years old) generally scored higher on earthquake knowledge and preparedness measures compared to older age groups. However, other factors like disaster experience and educational attainment also played a significant role.

Yet, the study of Montillano (2018) shows no significant difference in the level of earthquake awareness when compared to people's ages. It should be taken into consideration that there are number of factors that may contribute to this age difference in terms of earthquake awareness.

Table 9. *Difference in the level of earthquake awareness when grouped according to socioeconomic status*

Factor	Socioeconomic Status	N	Mean	SD	F-value	p-value
Socioeconomic Status	Less than P12 082	173	3.529	.360	1.221 ^{ns}	.301
	P12 082 – P 24 164	3	3.261	.452		
	P 24 164 – P 48 328	7	3.602	.310		
	P 48 328 – P 84 574	1	4.000	–		
	P 84 574 – P 144 984	2	3.196	.215		
	P 144 984 – P 241 640	1	3.826	–		

*Legend: $p < 0.05$, ns – no significance
Awareness: 3.50 – 4.00 = very aware ; 2.50 – 3.49 = aware ; 1.50 – 2.49 = unaware ; 1.00 – 1.49 = very unaware

Table 9 shows the difference in the level of awareness among the respondents when grouped according to their socioeconomic status. As illustrated in the table, there is no significant difference ($p = .301$) on the level of awareness when compared to socioeconomic status. This can be implied that people have the same level of awareness on earthquake preparedness regardless of their status in life. Moreover, it can be said that knowledge and information is spread out to people of all economic status. This implication can be supported by the study of Ghayat et al. (2018). Their study was conducted in Iran, a country with a high risk of earthquake and it was found that there was also no significant difference in earthquake awareness between people of different socioeconomic status.

Table 10. *Difference in the level of earthquake awareness when grouped according to marital status*

Factor	Group	N	Mean	SD	F-value	p-value
Marital Status	Single	77	3.594	.332	1.499 ^{ns}	.216
	Married	102	3.485	.374		
	Separated	3	3.450	.320		
	Widowed	5	3.444	.445		

*Legend: $p < 0.05$, ns – no significance
Awareness: 3.50 – 4.00 = very aware ; 2.50 – 3.49 = aware ; 1.50 – 2.49 = unaware ; 1.00 – 1.49 = very unaware

Table 10 presents the difference in the level of earthquake awareness of the respondents when grouped according to their marital status. As stated in the table, there is no significant difference in the respondents' level of earthquake preparedness ($F = 1.499$; $p > 0.05$) when their marital statuses are taken into consideration. This suggests that being married or single, separated, or widowed does not seem to have a direct influence on the respondents' readiness for earthquakes. The respondents' readiness for earthquakes may be influenced

by a combination of various personal factors, regardless of their marital status. Factors like personal beliefs and values, level of awareness, access to information, prior experiences, and motivation could all contribute to earthquake preparedness. Marital status alone may not be the sole determinant of one's readiness for earthquake occurrences. Similarly, in the studies of Montillano (2018) and Ghayat et al. (2018), the level of earthquake awareness of their respondents had no significant difference between married and unmarried school personnel and households.

Table 11. *Difference in the level of earthquake awareness when grouped according to educational attainment*

Factor	Group	N	Mean	SD	F-value	p-value
Educational Attainment	Primary School	10	3.561	.185	1.228 ^{ns}	.301
	Elementary School	60	3.456	.362		
	High School	92	3.576	.373		
	College	24	3.525	.345		
	Others	1	3.217	-		

*Legend: $p < 0.05$, ns – no significance

Awareness: 3.50 – 4.00 = very aware ; 2.50 – 3.49 = aware ; 1.50 – 2.49 = unaware ; 1.00 – 1.49 = very unaware

Table 11 shows the tabulated result of the difference in the level of earthquake awareness of respondents when grouped according to educational attainment. As can be observed, there is no significant difference in the level of awareness of earthquake preparedness ($p > .301$) among the respondents when compared according to their educational attainment. This suggests that earthquake preparedness efforts need to reach a wider audience beyond formal education. By tailoring awareness programs to different educational backgrounds, it can ensure that everyone, regardless of their level of education, has access to important information and resources for effective earthquake preparedness.

This result is contrary to the finding of the study by Arif (2018) which is conducted in Quetta, Pakistan, a city with a high risk of earthquakes. The study found that secondary school students with higher levels of education had higher levels of earthquake awareness. This suggests that people with higher levels of education have more knowledge about earthquakes and earthquake preparedness.

However, the study of Montillano (2018) also states that there is no significant difference in the level of earthquake awareness across respondents' educational attainment. Meaning to say, people have a relative level of earthquake awareness regardless of educational background. Despite differences in findings, it can be implied that educational attainments affect one's level of earthquake awareness depending on their location.

Table 12. *Difference in the level of earthquake awareness when grouped according to working conditions*

Factor	Group	N	Mean	SD	F-value	p-value
Working Conditions	Self-employed	27	3.588	.322	.700 ^{ns}	.553
	Public employee	12	3.438	.390		
	Unemployed	144	3.521	.367		
	Private Employee	4	3.663	.249		

*Legend: $p < 0.05$, ns – no significance

Awareness: 3.50 – 4.00 = very aware ; 2.50 – 3.49 = aware ; 1.50 – 2.49 = unaware ; 1.00 – 1.49 = very unaware

Table 12 presents the difference in the level of earthquake awareness among the respondents when grouped according to their working conditions. As can be seen, there is no significant difference ($p = .553$) between the two variables. It can be implied that the residents in Ipil-Cuneg have similar levels of earthquake awareness regardless of their working conditions: Self-employed, unemployed, private employee, and public employee. In a study by Evasco et al. (2022), it was found that there was no significant difference in earthquake awareness between people with different working conditions. However, the study did not specifically assess earthquake awareness among people with different types of jobs. However, the study did find that education level was a significant predictor of earthquake awareness.

Table 13. *Difference in the level of earthquake awareness when grouped according to residential type*

Factor	Group	N	Mean	SD	F-value	p-value
Residential Type	Single story	186	3.526	.359	1.735 ^{ns}	.189
	Two story	1	4.000	-		

*Legend: $p < 0.05$, ns – no significance

Awareness: 3.50 – 4.00 = very aware ; 2.50 – 3.49 = aware ; 1.50 – 2.49 = unaware ; 1.00 – 1.49 = very unaware

Table 13 shows the difference in the level of earthquake awareness of the respondents when compared according to residential type. As shown, there is no significant difference ($p = .189$) between the two mentioned variables. This can be interpreted that the resident's level of awareness is not greatly affected by their residential type. Parallel to this is the study of Evasco et al. (2022) which found that there was no significant difference in earthquake awareness between people living in different types of residences (e.g., houses, apartments, condominiums). This suggests that people living in different types of residences have similar levels of knowledge about earthquakes and earthquake preparedness.

Differences on the level of earthquake preparedness of the respondents in terms of practices when grouped according to their demographic profile

Table 14. *Difference in the level of earthquake practices when grouped according to sex*

Factor	Group	N	Mean	SD	df	t	p
Sex	Male	76	3.515	.395	185	.479 ^{ns}	.633
	Female	111	3.487	.382			

*Legend: $p < 0.05$; ns = no significance

Practices: 3.50 – 4.00 = highly prepared ; 2.50 – 3.49 = prepared ; 1.50 – 2.49 = unprepared ; 1.00 – 1.49 = very unprepared

Table 14 presents the difference on the level of earthquake practices among the respondents when grouped according to sex. Male respondents garnered a mean of 3.515 and 3.487 among female respondents which can be interpreted as highly prepared and prepared, respectively. Though there is a visible difference between the sexes, it is not considered a significant difference ($p = .633$). Thus, the level of earthquake practices among the residents is not highly affected by their sexes.

A study that supports this is conducted by Cruz et al. (2018). Suggesting that the level of earthquake preparedness practices of people does not have a significant difference when compared according to their sex in the Philippines.

Table 15. *Difference in the level of earthquake practices when grouped according to age group*

Factor	Group	N	Mean	SD	F-value	p-value
Age Group	18-25	55	3.586	.384	3.273*	.022
	26-35	64	3.405	.375		
	36-45	46	3.570	.394		
	46+	22	3.403	.347		

*Legend: $p < 0.05$; ns = no significance

Practices: 3.50 – 4.00 = highly prepared ; 2.50 – 3.49 = prepared ; 1.50 – 2.49 = unprepared ; 1.00 – 1.49 = very unprepared

Table 15 presents the difference in the level of earthquake practices among the respondents when grouped according to age group. On the table presented, there show a significant difference ($p = .022$) in the level of earthquake practices of the respondents when compared according to age group. Along with this result is an implication that younger individuals are more exposed to earthquake practices in comparison to other age groups. Some factors brought by age may contribute to this difference strength and capability.

In the study of Punongbayan and Gonzales (2017) focusing on Typhoon Yolanda response, noted that younger volunteers played a crucial role in community mobilization and disaster response efforts, suggesting potential differences in engagement and action-oriented preparedness across age groups. Additionally, Gonzales and Pulong (2019) found that Individuals aged 18-34 were more likely to have emergency kits and participate in drills than those aged 55 and above.

Table 16. *Difference in the level of earthquake practices when grouped according to socioeconomic status*

Factor	Group	N	Mean	SD	F-value	p-value
Socioeconomic Status	Less than P12 082	173	3.501	.380	1.996 ^{ns}	.081
	P12 082 – P 24 164	3	3.261	.452		
	P 24 164 – P 48 328	7	3.603	.310		
	P 48 328 – P 84 574	1	4.000	–		
	P 84 574 – P 144 984	2	2.848	.707		
	P 144 984 – P 241 640	1	3.826	–		

*Legend: $p < 0.05$; ns = no significance

Practices: 3.50 – 4.00 = highly prepared ; 2.50 – 3.49 = prepared ; 1.50 – 2.49 = unprepared ; 1.00 – 1.49 = very unprepared

Table 16 presents the level of earthquake practices of the respondents when grouped according to their socioeconomic status. As can be seen, there is no significant difference between the two variables. It can be said that status in life does not highly affect one's practices on earthquake preparedness. However, an inconsistency may be observed as some studies found that low-income earners are less likely to develop a family earthquake plan or store food and water (Cruz et al., 2018). Even so, it is important to note that this is just one study, and more research is needed to confirm whether there is a consistent relationship between socioeconomic status and earthquake preparedness.

Table 17. *Difference in the level of earthquake practices when grouped according to marital status*

Factor	Group	N	Mean	SD	F-value	p-value
Marital Status	Single	77	3.528	.395	.430 ^{ns}	.732
	Married	102	3.485	.383		
	Separated	3	3.333	.214		
	Widowed	5	3.426	.445		

*Legend: $p < 0.05$; ns – no significance

Practices: 3.50 – 4.00 = highly prepared ; 2.50 – 3.49 = prepared ; 1.50 – 2.49 = unprepared ; 1.00 – 1.49 = very unprepared

Table 17 represents the level of earthquake practices among the respondents when grouped according to marital status. As observed, there is no significant difference ($p = .166$) on the level of earthquake practices of the respondents when compared according to their marital status. The implication is that people have relative levels on earthquake practices regardless of their marital status. On a similar note, a study by Montillano (2018) found that there was no significant difference in earthquake preparedness practices between male and female school personnel of different marital statuses.

Table 18. *Difference in the level of earthquake practices when grouped according to educational attainment*

Factor	Group	N	Mean	SD	F-value	p-value
Educational Attainment	Primary School	10	3.526	.237	1.641 ^{ns}	.166
	Elementary School	60	3.399	.383		
	High School	92	3.561	.373		
	College	24	3.496	.467		
	Others	1	3.435	-		

*Legend: $p < 0.05$; ns – no significance

Practices: 3.50 – 4.00 = highly prepared ; 2.50 – 3.49 = prepared ; 1.50 – 2.49 = unprepared ; 1.00 – 1.49 = very unprepared

Table 18 shows the difference in the level of earthquake practices of the respondents when compared according to educational attainment. The result show no significant difference on the level of earthquake practices despite different educational backgrounds. This can be implied that educational attainment do not dictate how prepared is a person when it comes to earthquake preparedness. Similar finding was found in the study of Cruz et al. (2018). Earthquake practices of people is not highly affected by their educational attainment in the Philippines.

Table 19. *Difference in the level of earthquake practices when grouped according to working condition*

Factor	Group	N	Mean	SD	F-value	p-value
Working Conditions	Self-employed	27	3.639	.336	2.261 ^{ns}	.083
	Public employee	12	3.344	.386		
	Unemployed	144	3.480	.392		
	Private Employee	4	3.674	.250		

*Legend: $p < 0.05$; ns – no significance

Practices: 3.50 – 4.00 = highly prepared ; 2.50 – 3.49 = prepared ; 1.50 – 2.49 = unprepared ; 1.00 – 1.49 = very unprepared

Table 19 presents the difference in the level of earthquake practices of the respondents when grouped according to working condition. As shown, the p-value shows no significant difference ($p = .083$) between the two mentioned variables. Meaning to say, working conditions are not a serious dictator of the respondents' practices on earthquake preparedness. Although, social capital and risk perception play a more significant role in earthquake preparedness than individual characteristics like employment status said by Horiuchi and Shaw (2017). Moreover, Kovacs and Ajami (2018) found no significant association between employment status and preparedness levels, but other factors like income, age, and awareness significantly influenced preparedness actions.

Table 20. *Difference in the level of earthquake practices when grouped according to residential type*

Factor	Group	N	Mean	SD	F-value	p-value
Residential Type	Single story	186	3.496	.386	1.700 ^{ns}	.194
	Two story	1	4.000	-		

*Legend: $p < 0.05$; ns – no significance

Practices: 3.50 – 4.00 = highly prepared ; 2.50 – 3.49 = prepared ; 1.50 – 2.49 = unprepared ; 1.00 – 1.49 = very unprepared

Table 20 shows the level of earthquake practices of the respondents when compared according to their residential type. As observed in the table above, the p-value is .194 and shows no significant difference. It can be implied that their residential type is not an indicator of their level of earthquake practices. So, regardless of house type; single storey, two storey or more, people's level of earthquake practices can be on similar levels.

Relating this on the study of Kuhnert et. al (2016), they found that while housing type influenced some preparedness elements (e.g., emergency kit ownership), it wasn't the primary factor. Knowledge, risk perception, and mitigation experience played a more significant

role.

Correlation of the respondents' awareness and practices

Table 21. *Correlation of Awareness and Practices*

Variable	N	M	SD	I
Awareness	187	3.537	.382	-
Practices	187	3.499	.386	.826**

***Correlation is significant at the 0.01 level (2-tailed)*

Table 21 shows the relationship between the respondent's level of awareness and practices. As shown, there is a very high positive correlation between the two variables having a Pearson r of 0.826. It can be implied that an individual's earthquake practices are highly affected by their awareness of earthquake preparedness. Meaning to say, what they practice is based on what they know. In contrast, if they do not know about something, they also will not practice it as they do not know its application. The study of Alsaati al. (2020) supports this implication. It was analyzed that there was a positive and significant correlation between awareness and practice of sustainable behaviors among university students. This suggests that students who are more aware of sustainable behaviors are more likely to practice them.

Thematic Analysis

Table 22. *Thematic analysis of the importance of awareness and practices in preparation for earthquake occurrences*

Statements	Example Quote	Frequency, n (%)
Be prepared mentally and emotionally	“Dapat malaman nating lahat ang kahalagahan ng paghahanda sa lindol para malaman natin ang ating gagawin kapag andiyan na Ang sakuna makilahok sa earthquake drill kapag may nagpapaaral saatin.”	100 (53.48)
	“Dapat ammo nu adda dumteng nga sakuna tapno makapagsagana tayo tapno dumteng tu ti sakuna ket nakasagana tayo.”	
	“Mailisi tayo iti peggad nu ammo tayo ti aramiden tayo nu adda ti gingined.”	
Ensure safety and prevent casualties	“Rumbeng lang nga ammuwen tayo iti kinapateg ti panakammo ken panagsagsagana dagiti pasamak ti gingined ta napateg ti biag tayo.”	83 (44.39)
	“Para makaiwas sa anumang disgrasya”	
	“Napateg para iti biag tayo nu maamuan tayo nu Anya ti aramiden nu adda gingined ken nu malpas iti gingined”	
Prepare the necessities	“Always prepare a medicine kit, food and water at flashlight para kung sakaling may brownout, may gagamitin.”	25 (13.37)
	“Para walang masaktan o masugata sa loob ng Isang tahanan maghanda lagi ng medicine kit at mga pagkain na ready to eat kung sakaling may earthquake.”	
	“Magimpkae ng mga pagkain.”	
Total		208 (100)

Table 22 shows the thematic analysis of the respondent's answers to the open-ended question of what is the importance of awareness and practices in preparation for earthquake occurrences. As presented in the table, most of the respondents hold the importance of awareness and practices for them to be ready in case of earthquake happenings. Moreover, some also consider awareness and practices for them to ensure the safety of their household and prepare necessary materials in preparation for earthquake occurrences.

From that result, it can be implied that residents value awareness and practices in preparation for earthquake occurrences for them to be ready. Being ready results in ensuring the safety of the family. Moreover, awareness and practices on earthquake preparedness enable them to know what necessities should be readied in preparation for the unexpected occurrences.

In the study of Chang et al. (2020), it was found that disaster awareness and preparedness in the Philippines were positively associated with household resilience. This suggests that being aware of and prepared for disasters can help people to bounce back from them more quickly.

Conclusion

Considering that the Philippines is in an area with many earthquakes called the 'Pacific Ring of Fire', the country often experiences earthquakes unexpectedly. Hence, it is important for everyone to be prepared to protect their tangible possessions. In connection, there has not been enough research on how well people in rural areas are prepared for earthquakes. Thus, this study aimed to fill in those

gaps by assessing how prepared people are in Ipil-Cuneg, Bayombong Nueva Vizcaya, a remote place in the province. The study made use of a survey questionnaire to gather the data and achieve the objectives of the study.

Using different statistical and inferential statistics in analyzing the gathered data, it was found that the respondents demonstrated a high level of awareness in their earthquake preparedness which implies that they possess a lot of knowledge on how to ensure safety during an earthquake. Moreover, they have fairly high level of practices yet, continued efforts should be undertaken to further improve the practical application of what they are aware of.

Furthermore, it was also found in this study that there were no significant differences in earthquake preparedness based on various factors such as sex, socio-economic status, marital status, educational attainment, working conditions, and residential type. However, there was a significant difference in earthquake preparedness based on age group.

On the other hand, a significant relationship between awareness and practices was found. This implies that individuals who have a higher level of awareness about earthquake preparedness are more likely to engage in practices related to earthquake safety.

Lastly, the study's result indicated that the residents of Ipil-Cuneg place a high importance on awareness and practices for earthquake preparedness. They deemed that the two variables are important for them to be ready of earthquake occurrences.

Based on the research results and findings, these were the recommendations formulated in the study:

1. The researchers recommend to the school administration to collaborate with the barangay officials of Ipil-Cuneg on conducting seminars and trainings about DRRM (Disaster Risk Reduction and Management) to further develop their knowledge, skills, and resiliency towards disaster especially on earthquakes. These programs and seminars should include topics such as the effects of earthquakes and the hazards that are associated with it, the importance of first aid kits, and also emergency planning and response.
2. To the Local Government Unit of Bayombong, Nueva Vizcaya, the researchers recommend that they should allocate sufficient funds and resources for DRRM projects such as the establishment of evacuation centers, reorganization of BDRRMC (Barangay Disaster Risk Reduction Management Council), and provide transportation utilities such as ambulance.
3. The researchers would like to encourage the residents of Ipil-Cuneg to cooperate with the barangay officials, school administration, and government by participating to its programs, seminars, and projects about DRRM to increase their knowledge and skills on how to prepare, manage, and recover on earthquake or any other disasters. These can help inform the residents of Ipil-Cuneg on how to take proactive measures on earthquake or other disasters; and
4. The researchers of this study suggest that future researchers should conduct a study about technology literacy of the residents living in a rural area such as Ipil-Cuneg and their access to technology or communication devices that can facilitate earthquake preparedness and emergency response. Moreover, it is recommended that future researchers should conduct similar study to other locales. Ideally, to other rural communities or the entire Bayombong to assess the whole locality and improve every barangay's disaster risk management. Furthermore, the researchers suggest conducting the study with a larger sample size and experimenting with other research design. Particularly, a phenomenological approach in the qualitative part to know more and investigate the individual's lived experiences and formulate more practical solutions to their issues experienced to produce more conclusive and reliable data.

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