

## Assessment of Disaster Preparedness and Related Knowledge Among Senior High Students in Del Pilar National High School, Cabadbaran City, Agusan Del Norte, Philippines



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**ABSTRACT:** The Philippine Disaster Risk Reduction and Management (DRRM) are put into practice by the Department of Education (DepEd). It aimed to increase students' degree of resilience to natural disasters by integrating Disaster Risk Reduction Management (DRRM) into the curricula and other educational programs. This study was conducted to assess the disaster preparedness and related knowledge among Senior High School students of Del Pilar National High School in Cabadbaran City. A total of 120 respondents from Grades 11 and Grade 12 were subjected to the study. An adapted and modified survey questionnaire was utilized to collect the data. A five-point Likert scale was used to evaluate the responses. The results obtained high disaster preparedness (WM- 3.88) and disaster-related-knowledge indicators (WM- 3.53) with its verbal interpretation of Prepared. This indicates a helpful indicator that the students in the study area were equipped with disaster management. While a significant correlation  $P < 0.0001$  between age to disaster preparedness and related knowledge has been obtained. This indicates a strong relationship that age is an important factor in influencing disaster management. Further, results obtained from a high level of participants showed related knowledge, preparedness, and awareness of disasters associated with the use of effective, safe, and standardized methods. Employing the study emphasizes readiness, and resiliency while assessing the knowledge among the students in responding to the disaster. Thus, it presented information for students to improve and sustain their level of disaster preparedness to ensure safety on the school premises.

**KEYWORDS:** Disaster, awareness, public school, DepEd, DRRM

### I. INTRODUCTION

The Philippines is a disaster-prone country because of its geographical location (Mamon et al., 2017). Situated along the equatorial region identified as the Pacific Ring of Fire. It is an area about the edges of the Pacific Ocean where intense volcanic and regularly strong earthquakes. It is known to have 20 storms and typhoons each year and a high rate of susceptibility to storm surges, flooding, and strong winds (Llanto, 2011). As well as, the country is distinguished as vulnerable to natural hazards and reportedly ranked third out of 173 countries vulnerable to disaster risks (World Bank, 2014). These situations have called the interest of the national government to establish a law (RA No. 10121 of 2010, known as the National Disaster Risk Reduction Management Plan (NDRRM) that aims to mitigate the outcome of any disaster. It primarily aims to cover four important areas such as (1) Disaster Prevention and Mitigation; (2) Disaster Preparedness; (3) Disaster Response; and (4) Disaster Rehabilitation and Recovery (NDRRP, 2010). This law also provides a proactive method in focusing on disaster risks, wherein the people become presently prepared for the imminent risks and threats of natural disasters (Israel, 2016).

Since the country is categorically developing, these disasters have been known as issues that deter progress due to their long-term effects. To respond to the outcome of calamity disasters, the government and schools intend to do action about readiness to reduce the destruction. Establishing a more concrete management plan that constitutes prevention and action to carry out preparedness (Tan, 2019). Moreover, disaster is identified as a series of situations that disrupt and threaten lives and kill people and livelihoods. The causative factors are non-human and human, thus resulting in environmental damage, property loss, psychological impacts, and fatality (Pribadi et al., 2008). Relatively, preparedness is the activity undertaken to anticipate disasters and reduce the consequences through appropriate and effective actions (Vecaldo et al., 2020). It is important and shall be established in each community. Disaster preventive measures are one of the goals in schools by empowering students to recognize disaster warning signs and protocols undertaken to reduce the risk (Mathbor, 2007). Indeed, school is likely to be a source of information associated with natural disasters (typhoons and earthquakes) and fire that often occurs unexpectedly. Thus, the Department of Education (DepEd) includes the subject Disaster Risk Reduction Management (DRRM) in Senior High Schools to

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promote disaster readiness and preparedness among teachers, students, and parents. This strengthens the capacity of all individuals to practice and mitigate. Nonetheless, these are put into practice by the DepEd to increase students' degree of resilience to natural disasters by integrating Disaster Risk Reduction Management (DRRM) into the curricula and other educational programs. The organization implemented a drill for disaster-related activities such as fire and earthquakes to equip students ready to respond. It is also a mandate that each classroom is designed to be appropriate according to the requirement of a disaster risk management plan. Moreover, it is important to draw the basic concept of preparedness during an untoward situation to prevent casualties. Although fire and earthquake are unpredictable, students must cope with the status. Further, this study focuses on the basic responses to disasters both natural and anthropogenic. Thus, the present study measures preparedness, and related knowledge likewise to gather significant information on the level of disaster management among students in Del Pilar National High School, Cabadbaran City Agusan Del Norte.

### **II. RESEARCH OBJECTIVES**

This study aimed to assess the disaster preparedness and related knowledge among Senior High School Students of Del Pilar National High, Cabadbaran City, Agusan Del Norte, Philippines.

Specifically, it sought to answer the following questions:

1. What is the demographic profile of the respondents in terms of :

1.1 Age

1.2 Sex

1.3 Location/Address

2. What is the level of disaster preparedness among Senior High School Students at Del Pilar National High School?

3. What is the level of disaster-related knowledge among students in Senior High School Students at Del Pilar National High School?

4. Is there a significant correlation between the profile (Age) of the respondents and disaster-related knowledge and awareness?

### **III. LITERATURE REVIEW**

#### **Disasters**

It comprises and constitutes hazards such as floods, typhoons, and earthquakes- that can turn into deadly disasters if they occur in vulnerable areas inhabited by people, especially those with few defenses (Tulloch, 2010). Such catastrophic events are increasingly being recognized as catalysts for political action and policy change (Pelling and Dill 2006). Indeed, the increasing incidence and intensity of disasters in Asia intensify government responses from reactive to proactive as stated in high-risk countries like Indonesia and Vietnam (Gignoux and Menéndez, 2016).

#### **Socio-Economic Impacts of Disasters in the Philippines**

Natural disasters can have catastrophic impacts on the economy, society, and environment. The effect of damage goes to infrastructures, machinery, and, livestock which could obstruct economic activity. Human and social effects can rise, homelessness, disruption of communities, and loss of property compounded by death, disability, ill health, and mental trauma. The Philippines, location and topography are disaster-prone with high vulnerability to events such as volcanic eruptions, floods, and storm surges (NDRRMP, 2019). The risk of being hit by a natural disaster is not systematically unlike among developing and developed countries (Sawada and Takasaki, 2017). So far, the economic consequence varies: Low-income countries generally suffer disproportionately larger destructions related to their properties (Rentschler, 2013). This is partly because of the greater value of damaged assets in richer countries. Likewise, post-disaster losses are larger for cities in low- and middle-income countries than in high-income countries (Hallegatte et al., 2013).

#### **Social Vulnerability**

The Philippines' poverty rate is known through spatial and individual disparities; the poorest provinces are located in the southern part of the country (DRRPM, 2019). The poor, depending on their family, area, and gender, are impacted by several visible economic and natural shocks (fuel prices, varying rainfall, or natural hazards). While, education is defining issue of future income and economic status (Mina & Reyes, 2017). This is a significant factor given the evidence signifying that even small scales recurrent disasters, such as periodical flooding, can have harmful effects on education, especially for students from low-income backgrounds (Castonguay et al., 2016).

#### **Disaster Prevention and Mitigation**

Mitigation could be comprised in the term Prevention. Mitigation indicates to decrease in the danger of human and material impairment caused by the disaster. Prevention is to guarantee that human actions or natural phenomena do not result in disaster or emergency. Primary prevention is to reduce -avert- avoid the risk of the event occurring, by getting rid of the hazard or

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vulnerability (Castaños & Lomnitz, 2008). This provides action to mitigate the existing problem of natural catastrophes that eventually affects lives and properties.

## Disaster Preparedness

The concept of disaster preparedness encompasses measures aimed at enhancing life safety when a disaster occurs, such as protective actions during an earthquake, hazardous materials spill, or terrorist attack. It also includes actions designed to enhance the ability to undertake emergency actions to protect and contain disaster damage and disruption, as well as the ability to engage in post-disaster restoration and early recovery activities (Sutton & Tierney, 2006).

## IV. METHODOLOGY

### Respondents of the Study

The respondents of the study were composed of Senior High School students of Del Pilar National High School. A purposive sampling technique was to obtain 120 respondents from a total of 170 Senior High Schools student populations (HUMSS and GAS) of Del Pilar National High School, Cabadbaran City, Agusan Del Norte, Philippines.

### Research Instrument

A survey questionnaire was adopted by the researchers from the study of (Tuladhar et al., 2017). It was adopted based on investigating DRR knowledge. The respondents answered ten (10) questions that were categorized into two.

### Data Gathering Procedure

The researcher presented a letter to the School Head/Principal and the Senior High School adviser at Del Pilar National High School to ask permission to conduct a study. After this, the researcher allotted vigorous time, effort, and cooperation in disseminating the questionnaire to serve its intended respondents. After that, the researcher explained the purpose of the study to the selected respondents. The survey started when the students received the survey questionnaire. Each of the respondents was given enough time to answer the questions. Lastly, the questionnaires are gathered, check, tallied, interpreted, and analyzed.

### Statistical Treatment of the Data

The collected data was analyzed through percentages, weighted means, and Likert Scale are the statistical tools used by the researchers to examine and interpret the data.

#### 1. Percentage

The frequency of each response depended on how many respondents checked a given item. The demographic profile of the respondents was calculated using a percentage formula:

$$\text{Formula: } \frac{O}{O} = \frac{F}{N} \times 100$$

$$\text{Slovin's Formula: } N=n / (1+ Ne^2)$$

Where:

n = sample size

N= population size

E= margin of error

Solve for n:

$$n= 120/ (1+170(0.05)^2) \\ = 119\sim 120$$

#### 2. Average Weighted Mean

Since it is less likely to contain errors, the mean is most frequently used in central tendency calculations. The tabulated data were handled using frequency distribution, percentage, and weighted mean.

#### 3. Likert Scale

The responses of respondents to a certain topic or statement were measured using Likert items. The interval of frequency classification in this study is determined using the Likert scale.

**Table 1. Mean of Range and Verbal Interpretation**

Rating Scale	Weighted Mean	Verbal Interpretation
5	4.50-5.00	Extremely Prepared
4	3.50-4.49	Prepared

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3	2.50-3.49	Somewhat Prepared
2	1.50-2.49	Not prepared
1	1.00-1.49	No knowledge

**V. RESULTS AND DISCUSSION**

A total of one hundred twenty senior high school students from Del Pilar National High School responded to the study (Table 2). Among the respondents, there were 54% (n=65) aged between 16-17 years old and observed to be the foremost aged among the students. Also, 30% (n=36) were aged between 18-19 years old, 12% (n=14) were aged 20 years old, and above 4% (n=5) were aged 14-15 years old. While 58% (n=70) were females, and 42% (n=50) are males. As observed females have a higher number of respondents when compared to males. In terms of respondents' location/address, 36% (n=43) of the respondents are located in Brgy. Del Pilar, 25% (n=30) is located in Sitio Pirada, and 14% (n=17) are located at Brgy. Bayabas, 15% (n=18) are located at Brgy. Marapot and 10% (n=12) are located at Brgy. Katugasan respectively. It was also observed that most of the respondents were located in Brgy. Del Pilar as the data presented.

Further, a significant correlation  $P < 0.0001$  between age to disaster preparedness and related knowledge has been obtained. This indicates a strong relationship that age is an important factor in influencing disaster management. This finding could be inferred that there was a significant difference when assessing the age of the respondents towards disasters. An important correlation is established between the age of the students and their awareness level. A previous study showed that students aged 15 years are more knowledgeable about disaster preparedness (Tuladhar et al., 2014). However, young students are the most vulnerable aspect of the community when a natural or man-made disaster occurs (Lapada et al., 2022). This supports the present data that age is important and must be included in assessing the preparedness related to the disaster. This is also linked to the idea that age can be associated to be more cautious and perceptive to disaster risk. Moreover, study shows that sex has been connected with quickly responding to disaster preparedness. This is supported by the study (O'Neill et al., 2016), that females tend to express better concerns and worry more than men in times of disaster. However, it was opposed that no substantial evidence that gender-based difference was found concerning the respondents' disaster knowledge, awareness, preparedness, and disaster risk discernment (Tuladhar et al, 2015). Further, as the outcome of the amendments of the National Disaster Management Plan in 2008, Local Disaster Management Plan takes part in various requirements of men and women and both views in shelter management. The revision has also stipulated the growing appointment positions of women in shelter management (APEC, 2009).

**Table 2. Demographic Profile of 120 Respondents from Senior High School Students (Grades 11 & 12) in Del Pilar National High School, Cabadbaran City, Agusan Del Norte, Philippines.**

<b>Demographic Profile</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Age</b>		
14-15 years old*	5	4
16-17 years old*	65	54
18-19 years old*	36	30
20 years old and above*	14	12
<b>Sex</b>		
Female	70	58
Male	50	42
<b>Location/Address</b>		
Brgy. Del Pilar	43	36
Brgy. Pirada	30	25
Brgy. Marapot	18	15
Brgy. Bayabas	17	14
Brgy. Katugasan	12	10

Note: \*  $P < 0.05$

Nevertheless, the previous work of Vintura and Madrigal, 2020 found that females, students in public schools in Antique (Grade 10) are more aware of disaster preparedness than males. The present study is supported that most of the respondents were females and thus obtaining the highest percentage of participants while associating the high level of disaster knowledge. Also, the study included the location/address of each of the respondents, known that Brgy Del Pilar was recorded as the highest of the respondents implying that more households are situated in the area. Determining the location of the participants is also important to assess their safety. Further, environmental degradation, urbanization, marginalized, high population density, and lack of preparation for

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disasters combine with other man-induced and natural disasters. The combined risks from these factors are experienced more by the poor communities within the developing country (Kusumarasi et al., 2010). Whereas awareness and preparedness are two important components to able to manage risk potential.

Table 3 shows the level of disaster preparedness with weighted mean and the equivalent verbal interpretation among Senior High School students of Del Pilar National High School. Among the five indicators evaluated, indicator 1, 2, and, 3 respectively has the highest (WM= 4.0) with the equivalent verbal interpretation of Prepared. Based on the results survey indicator no. 1 has the highest weighted mean indicating the importance of sharing knowledge and experience of disaster, which is likely seen as a critical component of disaster preparedness. While survey indicator no. 2 has the highest weighted mean since the respondents recognize the importance of socialization, communication, and collaboration in disaster preparedness. By acknowledging the importance of making conversations about disasters with family members, neighbors, relatives, friends, and colleagues, are more likely to take the necessary steps to prepare themselves and their communities for emergencies. Meanwhile, survey indicator no. 3 results indicate that the respondents have had positive experiences with government assistance in the past, which has predisposed their awareness of government support. It has influenced their insight into the government's readiness to provide aid. Followed by survey indicator No.4 has an average (WM= 3.89) with the equivalent verbal interpretation of Prepared. Conversely, survey indicator No. 5 has the lowest average (WM=3.61) with the equivalent to the verbal interpretation of Prepared. This signifies that the majority of the respondents have a high level of awareness about disaster reduction and management.

**Table 3. Weighted Mean of Disaster Preparedness and the Equivalent Verbal Interpretation among Senior High School Students in Del Pilar National High School, Cabadbaran City, Agusan Del Norte, Philippines.**

Survey Indicators	5 SA	4 A	3 D	2 SD	1 NK	Total	WM	Verbal Interpretation
1. I know the significance of sharing knowledge and experiences of disaster.	38	53	18	8	3	120	4.0*	Prepared
2. I recognize the importance of making conversations about disasters with family members, neighbors, relatives, friends, and colleagues.	39	60	11	5	5	120	4.0*	Prepared
3. I know the government is ready to assist with a disaster.	36	59	15	5	5	120	4.0*	Prepared
4. I am confident that reconstruction activities can be implemented after a disaster.	28	55	26	4	7	120	3.82*	Prepared
5. I gain enough knowledge about disasters from experts who work or conduct activities for disaster reduction and management	17	68	16	10	9	120	3.61*	Prepared
<b>Average</b>							<b>3.88*</b>	<b>Prepared</b>

**Note:** SA= Strongly Agree; A= Agree; D= Disagree; SD=Strongly Disagree; NK=No Knowledge; (\*) = P<0.05

The result supported by the study (Mamon et al., 2017) is that Grade 11 students understood some disaster preparedness, concepts and ideas, and are prepared, adapted, and aware of the risks inflicted by these natural hazards. Also, the Department of Education provides technical training such as fire and earthquake drills to be able the students to be ready and prepared for disasters. The advantage of preparing the school secure from any disasters could help as an accessible place for the people vulnerable to risk to participate in the implementation of training and capacity-building for mitigating earthquake disasters to ensure that the children are safe in school against the harsh impact of the subsequent earthquakes (Olores et al., 2023). Indeed, knowledge, skills, and values are honed by the schools as it plays a vital role in society and is considered the second home. When emergencies happened, schools are the most affected with substantial damage and severe panic among the students. (Lapada et al., 2022). Thus, communication and awareness campaigns of DRR are necessary to be implemented by developing educational materials and strategic planning (Asharose et al., 2015).

Furthermore, the Department of Education in the Philippines (DepEd) incorporates the Philippine DRRM Act of 2010, to initiate Disaster Risk Reduction Management in the school curriculum and other educational programs, and to intensify the level of resilience of students to natural disasters. It is right and important to evaluate the capability of students on DRR to make sure that the senior high school education of the K to 12 curricula is substantial on the culture of safety and resilience toward disaster risks (Bernardo, 2020). Several plans have been established for preparedness and disaster mitigation associated with disasters, however, there are limited studies for the determination of disaster awareness in communities, especially educational institutions. (Horan et. al., 2010). In relation, the local government unit (LGU) is the frontrunner in disaster risk reduction and management as authorized by the Local Government Code of 1991. The LGU needs to have the autonomy to act firmly and deliver proactive

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decisions suitable for their constituents' situation reinforced by the national government (Col, 2007). In addition, the grounding of disaster preparedness, access to health security, information sources, and emergency evacuation centers specifically in the island communities are more important in assessing disaster preparedness (Campanero and Egargo 2017).

Additionally, realizing and further evaluating the school's disaster preparedness strategies is a significant action to reduce the effect of a disaster (Miasco, 2017). Similarly, authorities' neglect is an important issue in why schools fail to answer sufficiently throughout difficult times (Alexander, 2015). Besides, the government ought to forefront disaster risk reduction management to aid school administrators have their locations safe and secure (Nderitu, 2009). The collaboration of the national government with local government as well as with the various schools would help to educate disaster preparedness and related knowledge among the students. Thus, introducing DRRM drills to students and teachers and giving services and equipment for disaster drills is a major assistance that the government can offer to schools within the country (Kelly, 2010 & Villanueva & Villanueva, 2017).

**Table 4. Weighted Mean of Disaster-Related Knowledge and the equivalent Verbal Interpretation among Senior High School Students in Del Pilar National High School, Cabadbaran City, Agusan Del Norte, Philippines.**

Survey Indicators	(5) SA	(4) A	(3) D	(2) SD	(1) NK	Total	WM	Verbal Interpretation
1. I know when a disaster will happen.	18	42	37	9	14	120	3.34	Somewhat Prepared
2. I know there is no prevention for the occurrence of a disaster.	18	35	49	7	11	120	3.37	Somewhat Prepared
3. I have been a participant in a disaster risk education seminar and training.	25	39	19	5	12	100	3.5	Prepared
4. I know already that disaster can cause damage that will harm anyone.	46	37	16	10	9	120	3.79	Prepared
5. I know the specific actions to do to inform others by disseminating the information about disaster-related knowledge.	26	61	11	13	9	120	3.68	Prepared
<b>Average</b>							3.53	Prepared

**Note:** SA= Strongly Agree; A= Agree; D= Disagree; SD=Strongly Disagree; NK=No Knowledge; (\*) = P<0.05

Table 4 shows the level of disaster-related knowledge among Senior High School students of Del Pilar National High School. Among the five indicators evaluated, survey indicator no. 4 found to have the highest weighted mean (WM= 3.79) with the verbal interpretation of Prepared. This indicates that respondents have a high level of knowledge regarding potential harm caused by disasters. Since the effects of disasters are often visible and tangible, people may have personal experiences or have witnessed the impact of disasters. It makes it easier for them to understand the potential harm and damage caused by disasters. Followed by, survey indicator no. 5 which has a (WM= 3.68) with its equivalent verbal interpretation Prepared. Additionally, survey indicator no.3 has a (WM=3.5) equivalent to the verbal interpretation of Prepared. Moreover, survey indicator no.2 has an average (WM =3.37), and survey indicator no.1 (WM =3.34) both with the verbal interpretation of Somewhat Prepared. In which the respondent's level of related knowledge is low when it comes to a disaster. It might be because of the lack of awareness, uncertainty, different perceptions, and limited access to information that the respondents do not have access to reliable sources of information, such as early warning systems. After all, they do not predict the disaster accurately and thus resulted in a lower weighted mean based on the gathered data.

The results supported by the study of Mamon et al., 2017 that the data they gathered shows a high level of disaster-related knowledge among Grade 11 students. Responses in all cases of disaster-related knowledge are significantly different. Out of 120 respondents, 33.33% understood when a disaster will take place, followed by 30.00% who find it unclear on this DRR issue. The majority of respondents (42.50%) have no clear knowledge of the idea that there is no prevention for the occurrence of disasters. There is also a higher percentage of students (35.00%) who understood the importance of participating in a disaster risk education seminar and training, followed by 20.83%, and 20.00% of Grade 11 students who have no clear idea and find it confusing on this important issue. The above discussions, it implies the overall average weighted mean regarding disaster-related knowledge is 3.53

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that equivalent to the verbal interpretation of Prepared which serves that the level of related knowledge of the respondents is prepared and this will certainly help the disaster preparedness to decrease the danger of the human and material impairment caused by the disaster. Further, this could be improved by implementing the awareness of disaster preparedness-related knowledge. Lastly, this can be completed by providing a drill of how the school is being utilized as the right venue for getting information on how to avoid and mitigate earthquake and fire disasters (Tan, 2019).

Nonetheless, the obtained data from the study would be the basis of disaster management among the senior high school students of Del Pilar National High School. Relatively this information highlights creating a localized intervention that intensifies and develops enough support to protect against disaster potential risk. The acquired statistics do not guarantee the promptness of each individual to escape from danger. Hence man-made disaster is unpredictable though they could be prohibited with sufficient preventive measures. On the same note, natural disasters are predictable (typhoons) while an earthquake is unpredictable however, the impact of these disasters can be reduced as long as preparedness, awareness, and related knowledge are practiced among the students since they are the most affected in the school community.

### VI. CONCLUSION

The level of disaster preparedness of the respondents based on the results was Prepared. It has a positive significant impact on the degree of disaster preparedness and related knowledge among Senior High School students of Del Pilar National High School. Even while the majority of respondents asserted to be familiar with, knowledgeable about, and prepared for disasters, the survey's results showed that some respondents were not. Most of the respondents agreed that becoming knowledgeable helps them be better prepared for disasters. But somehow, relying solely on knowledge when it comes to disaster preparedness is insufficient due to a lack of basic survival skills, lack of access to resources and support systems, as well as lack of training and education on disaster preparedness, and are not adequately prepared to respond to emergencies. Thus, even though the majority of respondents claimed to be aware and confident about many aspects of vulnerability to disaster still exists. Overall, the findings of a study on the assessment of disaster preparedness among Senior High School students of Del Pilar National High School can provide valuable insights into the current level of knowledge and preparedness among students and highlight areas where improvements can be made to ensure that students are better equipped to respond to emergencies.

### RECOMMENDATIONS

1. Students will be given an activity, advocacy program, and enhancing DRR simulation program to develop the level of disaster preparedness.
2. A post-assessment should be done at the end of the academic year. If the school implements and applies the full intervention program, it will benefit from applying disaster preparedness and reducing the risk of disaster.
3. National Disaster Risk Reduction and Management Council (NDRRMC) officials may work together to design new policies and programs that would support the complete application of disaster preparedness among schools and stakeholders.

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