



RESEARCH ARTICLE

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Disaster Preparedness and Sensitivity Level among Higher Education Institution Students

Lilybeth Musong Matunhay

Davao de Oro State College Poblacion, Compostela, Davao de Oro, Philippines.

*Corresponding author: lilybeth.matunhay@ddosc.edu.ph

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Abstract

Disaster preparedness is an important factor that plays a major role in diminishing the casualties in case of any disasters. In the Philippines, Davao Region also frequently experiences various disasters due to geological, morphological, and climate characteristics. Earthquakes, flooding, and landslides are the premise fields of these disasters. Furthermore, devastating earthquakes and floods that are seen as a result of global climate change shaved to significant loss of both life and property in the region. It is imperative to increase the knowledge and attitude of people regarding natural and man-made disasters in order to make them able to cope with their adverse effects. In this paper, an attempt has been made to access the knowledge, attitudes, and practices of college students in the region. Results revealed the need to highlight the need for disaster safety education among students. Descriptive statistics are used in the analysis and evaluation of the data. By revealing the level of awareness at the higher education level, the result of the study could be a potential basis for disaster mitigation education intervention that includes relevant topics on disaster preparedness and resiliency. Results revealed that an information source repertoire has to be strengthened and reconsidered to meet information insufficiencies and explore more structural factors to address the gap as it is evident in the result that the students who have taken disaster training are reported to have more positive opinions compared to those who have none.

Keywords: disaster preparedness; sensitivity level; higher education institutions; HEI students

Introduction

Disaster preparedness is an important factor that plays a major role in diminishing the casualties in case of any disasters (Rohith et al., 745-753). People have been exposed to a variety of disasters in the time period of the past to the present (Ozkazanc and Yuksela, 2015). Disasters like floods, earthquakes, fires, typhoons and the like pose a serious threat to people (Matunhay, 2018). In this context, disaster education, which includes education on disaster risks, mitigation, and preparedness strategies, is one approach to reducing the negative consequences of disasters (Bhat, et al., 2017).

The Asia Pacific region is the most disaster-prone and most disaster-affected in the world (Smith, 2003). In terms of disaster risk, the Philippines ranked third among all of the countries with the highest risks worldwide according to the World Risk Report 2018, with an index value of 25.14% (UNDRR, 2019). More than 20 typhoons take place every year in the Philippines, five of which are typically destructive, taking a toll on not only infrastructure but also human life (Parks, 2021). Also, as the islands are located within the "Ring of Fire" between the Eurasian and Pacific tectonic plates, earthquakes and volcanoes are posing serious risks to the safety of the populace, and flooding, landslides, droughts, and tsunamis further contribute to the exposure to natural hazards (CFE-DM, 2018). The country's vulnerability to natural hazards alone costs the Philippine government an average of 15 billion pesos annually (Maminta, 2019). However, in 2017, the expenditure value of the government on disaster risk reduction in the Philippines amounted to approximately 20.6 billion Philippine pesos making the government's risk reduction expenditure valued highest in 2013, the same year typhoon Haiyan occurred in the country



(Statista, 2022). Consequently, over the years, there has been a growing interest in introducing a broader concept of disaster preparedness and resilience. The Philippines has been proactively focusing on disaster risk management because its geographical location suggests that natural hazards may occur at any time (Matunhay, 2018).

In Mindanao specifically, which has long weathered conflict and calamity, (Philippines, 2020) effects of disasters are very tremendous, it can be loss of lives, loss of access, and the loss of services. However, rapid progress in the level of regional development contradicts certain land use policies and has focused primarily on socio-economic sectors, at times failing to recognize DRR concerns (CFE-DM, 2018). It has been further noted that one of the key gaps is the limited amount of attention and resources devoted to DRR research. There are also very few learning institutions devoted to DRR and CR, and the research outputs of these institutions are not sufficiently used by the concerned agencies and the public in general (OCD-NDRRMC, 2015; Pailoplee, 2016). A greater emphasis on efforts to put on disaster education is a critical part of any disaster risk reduction plan, which aims at raising public awareness of disaster prevention and reduction by offering appropriate education programs to the public and in different school settings (Tan et al., 2016). On the other hand, research on disaster preparedness among university students has suggested that they are more vulnerable to disasters compared to the general public and are overlooked in preparedness efforts (Tanner and Doberstein, 2015). It has been noted that disasters have damaged universities' critical infrastructure and forced them to be closed for a more extended period (Patel et al., 2022) and university students tend to delineate their incompetence from lack of prior experience with regional natural hazards, shortages of emergency preparedness kits in an actual scenario (Cariaga, 2020), due to the transient nature of their residency in the community, and lower levels of self-responsibility (Hasan et al., 2021).

As such, in as much as higher education institutions (HEIs) are expected to effectively respond to the current and dynamic construction of labor markets, they are likewise expected to build an environment with continuous updates of knowledge and education in order to contribute to disaster management. Apparently, the increased independence that comes with being in college also comes with more responsibility, especially when it comes to emergency preparedness (Dynes, 2019). Education in this regard is an important way to improve disaster preparedness among university students, and disaster preparedness needs to be explored more. Specifically, we do not know how much disaster knowledge students already have and what knowledge and skills students need to learn. It is in this context that this study is being mapped out in determining disaster preparedness index and sensitivity level among students in the seven (7) SUCs in the Davao Region as the basis for program complementation among higher education institutions. This study is unique with respect to the other works in the past, mainly because, a reliable and valid scale was utilized for the assessment of preparedness towards natural disasters as a whole and also, captured the effect of psychological and socioeconomic factors.

Research Objectives

This study aimed to determine the Disaster Preparedness and Sensitivity among college students in the Davao Region. Specifically, to the following:

1. To determine the disaster preparedness and sensitivity level of students in terms of the following:
 - 1.1. Disaster Training Level;
 - 1.2. Pre-Disaster Preparedness Level;
 - 1.3. Behavior During Disaster;
 - 1.4. Behavior After Disaster; and;
 - 1.5. Personal Disaster Awareness Assessment.

2. To identify specific platforms and program interventions that will complement preparedness education among SUCs in Davao Region.

Methods

Descriptive (survey) analyses method which allows qualitative analysis was used to reveal the presence or absence of the awareness and sensitivity of disaster among college students. A Quantitative Survey is designed distributed among students in seven (7) SUCs in Davao region. The questionnaire composed of questions informed by previous researches which was translated into google forms for the widest dissemination to students via online platforms in adherence to health emergency protocols in response to COVID 19 pandemic. The set of questions is preceded by a series of demographic questions that would allow the sample population to be segmented. These include, *inter alia*, age, gender, SUC, and in which province they belong. The questionnaire was constructed for this study purpose and piloted among 50 undergraduate students from private HEIs. The length and complexity of the questionnaire were influenced, in part, by the balance between the quest for data and getting the students to complete the survey. The questionnaire was designed to assess students' knowledge and awareness about disaster preparedness. The questionnaire has six sections – demographic, understanding of preparedness, disaster awareness, perception of roles and responsibilities, preparedness actions, and access to information (Community of Accredited Online Schools) (Tanner and Doberstein, 2015; Bhat et al., 2017; Rohith et al., 745-753). The internal consistency reliability check produced an alpha coefficient (Cronbach's alpha) of 0.91 (greater than 0.7), indicating an acceptable correlation between the items of the questionnaire, and its content validity was further examined by five (5) professors and researchers related to the field. Based on the mentioned steps the finalized questionnaire for the field survey was developed. The data collected from the study were tabulated and analyzed using statistical tools percentage, mean, and Kruskal Wallis test in which a p-value less than 0.05 is considered significant at a 5% level of significance.

Participation in the survey was entirely voluntary and anonymous. In order to get as large and representative a sample as possible, each participating SUC has a designated enumerator/counterpart. An official communication was sent to all SUC Presidents through their respective RDEs to explain the rationale behind the survey and to encourage their respective students to participate. The google form link was sent and shared via social platforms for the widest reach. In order to accommodate these characteristics, the rating scale contained five points with well-spaced anchor points representing the possible range of their level of disaster awareness, preparedness, and resiliency. The scale contained a neutral category and the negative categories were presented first.

Results

Demographics

The study was participated by SUC students in the region officially enrolled for the Academic Year 2020-2021. Since the population is too large, a Stratified Random Sampling was utilized where each SUC is equivalent to one stratum. At least not less than 10% of the students per SUC were identified to provide a better representation. Data revealed that there is a total of 33,644 SUC students enrolled for the First Semester of AY 2020-2021. There were 6,818 students who took part in the survey. The geographical characteristics of the respondents showed

that the majority hailed from Davao del Sur, 32% (2,161). 30 (2,038) from Davao de Oro; 22% (1,499) from Davao Occidental, 11% (770) from Davao del Norte; 2% (164) from Davao Oriental; 1.7% (109) from Davao City; and 1% (69) outside Davao Region (Table 3). It is important to note the demographics of the surveyed students in order to know and see the connection between how they perceive preparedness and how prepared they actually are.

In terms of age of respondents, the result indicates that 13.4% are within the age group 15-18, 67.2% are within the age group 19-22, 11.3% are within the age group 23-26, and 8.3% are within the age group 27 and above. Ages 15 to 18 are the predominant age group which is also the usual enrolment age range for students in the baccalaureate degree programs.

The result further shows the higher participation of females in the study (4,555, 66.8%) than that of males (2,181, 32%), and others prefer not to disclose (83, 1.2%), respectively. This goes to show that the gender gap has tilted in favor of females as a result of increased access to tertiary education, especially among state colleges and universities (SUCs) in the Davao region. Hence, gender-balanced institutions of higher learning have been achieved in this area by the SUCs. This is also a manifestation that SUCs in the Davao region promote quality education for all regardless of gender preferences among students.

Disaster Awareness and Education Level

1. Disaster Awareness among Respondents

Table 1 shows the disaster awareness and education among the SUC students in the Davao region on the basis of an analysis of the collected data. Results revealed that all the students who were included in the sample have the concept of disasters. Eight questions were asked to the students about their disaster education level. Three of these questions are related to the situation of whether or not to receive training on disaster and emergency conditions. The ratio of basic disaster training receiving students is 54.1%. 60.1% of students have received this training in educational institutions, 27.9% of them from family, and 12% of them from non-governmental organizations and other sources. Though, the share of educational institutions in the increasing awareness of disaster is ample.

With regards to the courses/training undertaken by the students related to disaster and emergency situations before their entry to the university/college, 56.8% appear that they have not taken any lessons in this regard. When students were asked if they had received disaster and emergency situations-related courses in their planning educations, a relative percentage of 55.1 answered yes and that course seems to be indicated in the NSTP courses. Disaster awareness and mitigation of natural disaster damage are seen to be discussed in the scope of the course. This course is taught as compulsory courses in the general education courses. When an overall assessment is made, 60.1% of students surveyed, that they have related education on disaster and emergency situations.

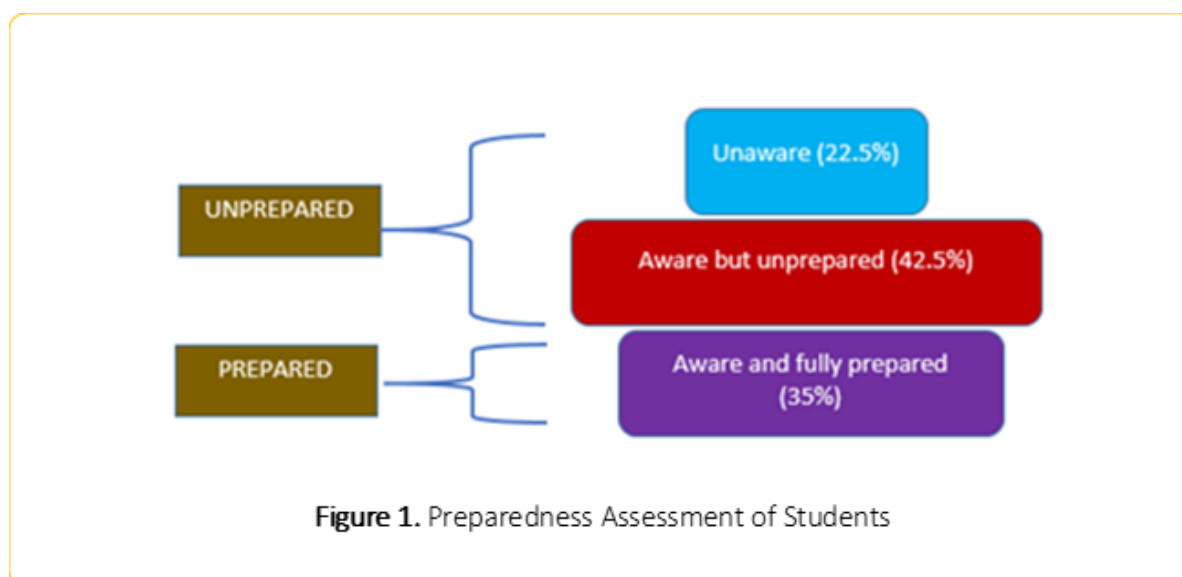
Meanwhile, while students have the concept of disaster however when they were asked about their understanding of disaster and emergency training, only 5.2 % (355) can expound in detail and believed that the training was sufficient and 94.8% believed that it was not. This goes to show that an information source repertoires has to be strengthened and reconsidered to meet information insufficiencies and explore more structural factors to address the gap.

Table 1. Disaster awareness and training situations among respondents.

Responses	Training in Basic Disaster Awareness		Special course/program taken related to disaster and emergency situations (prior to entry to SUC)		Enrolled courses related to disaster and emergency situations (After admission/enrolment to SUC)	
	Frequency	%	Frequency	%	Frequency	%
YES	3,689	54.1	2,945	43.2	3,757	55.1
NO	3,129	45.9	3,873	56.8	3,061	44.9
TOTAL	6,818	100	6,818	100	6,818	100

2. Preparedness Level before Disaster

Preparedness level before a disaster is essential to be able to minimize the losses resulting from the disaster. It is revealed (Figure 1) from the matrix measuring the level of disaster preparedness that the majority of the respondents, which is 42.5 % (2,898) are aware of the risk that may happen to them but not have taken action to prepare. Although there is a relatively good percentage of 35 (2,386) fully prepared students, there are still 22.5% (1,534) who are unaware. Figure 1 illustrates the assessment outcome.



Looking into how the respondents understand preparedness, more than half (72%) stated that they are aware of the kinds of disaster that may affect them, they know how to handle emergency situations, and they know how and who to get help from in case of emergencies, and they have the emergency items

or getaway kits in place. An overwhelming 77.8% of them know about which government institution needs to be contacted or coordinated with when disaster strikes. This goes to show that their understanding of the term “being prepared” falls mostly on knowing which disasters may happen and what to do in case they occur without really putting much effort into being prepared prior to the occurrence of such calamities. A very high percentage

of 98.8 among respondents know the disasters that may directly affect them, but not evident that they are proactively acting upon disaster preparedness. This could be attributed to how they feel about the likelihood of a disaster happening in their respective provinces, such that, it is very unlikely for a disaster to happen anytime soon.

Another consideration to be factored in is the disaster experience of respondents. It turned out that those who claimed that they have not experienced any disaster are also those who do not have household emergency plans but have survival items in their respective households. Considering the assumption that previous disaster survival state would affect preparedness level for pre-disaster, where 65% of the respondents that have experienced one or more natural disasters in specifying types of disaster; earthquake (96.1%), floods (83%), typhoon (45%) and fire (1.0%) as are listed. Mindanao is a seismically active region due to the presence of several active faults, thus earthquake sequence occurred. In addition, there are several areas in the region labeled as flood-prone areas which further illustrate the situation. Conversely, 39.7% of the respondents stated that they do not have disaster kits available in their homes. Others do have but the contents are insufficient or incomplete.

Table 2. Pre-disaster preparedness among respondents.

Responses	Availability of disaster kit at home		Structurally safe spaces at home		Measures to emergency situations at home	
	Frequency	%	Frequency	%	Frequency	%
YES	4,111	60.3	818	11.2	682	10
NO	2,707	39.7	6,000	88.8	6,136	90
TOTAL	6,818	100	6,818	100	6,818	100

Meanwhile, the disaster preparedness status of the dwelling houses of the respondents was also determined based on their respective self-assessments. It is attempted to detect whether the residence has earthquake resistance analysis or not. 88.8% (6,000) revealed that their respective houses do not have earthquake analyses. 35% of the respondents do not know where is the structurally safe place in their houses and 90% of them did not get any measures in their dwelling houses. It is quite difficult to mention the condition of preparedness against disaster and emergency situations in the line of the data revealed.

Table 3. Status of experiencing disaster incident.

Responses	N	Mean	Standard Deviation
YES	4,909	818	682
NO	2,707	6,000	6,136

In a situation of considering a disaster incident or not a student has an effect on pre-disaster preparation level, for the detection of statistically significant effect for the item statements in Table 2, answers by students are scored (Yes=1, No=2 and will have a score between 4 & 8). In the area of "have, they experienced any disaster incident" (Table 6). The mean score for those who say "yes" is 7.3015 and the mean score for those who say "no" is 7.5506, by using a t-test, the difference between the mean score of these two groups, pre-disaster preparedness level of significance was determined. It can be seen in the difference in variance (Levene's Test), the test statistics value is 5.312, and its p-value is 0.025. This indicates that there is a significant difference between the variances of the two groups. Value of the t-test statistic -2.188, degree of freedom 184.625, and p-value of 0.038. In this context, a statistically significant difference between the mean of the two groups has been identified. However, the p-value is very close to a 0.05 level of significance showing that this difference is not very substantial (Table 4).

Table 4. Disaster incident experiencing the situation and pre-disaster preparedness.

	Levene's Test for Equality of Variance		T-Test for Equality of Means		
	F	Sig.	f	df	Sig. (2-tailed)
Equal variances assumed	5.312	0.025	-2.091	185.102	0.041
Equal variances not assumed			-2.188	184.625	0.038

3. Behavior During Disaster

In this area, behavior, awareness, and sensitivity during disaster and emergency situations are determined. During an earthquake, it can be determined if respondents know the "duck, cover and hold". Only 1.2% (82) do not know this behavior particularly aimed to protect the head and neck area and as one of the safety measures on how to protect themselves from falling objects or debris in case of earthquakes. Towards the behavior of "stop, lie down, roll", 95% of the students express that they do not have any knowledge about this matter. This is supposed to protect them from fire and smoke. Further, only 5.8% are aware of the presence of possible nuclear, chemical, radioactive, and biological threats in their respective households (Table 5).

Table 5. Behaviors during disaster.

Responses	Knowledge about "duck, cover and hold"		Knowledge about "stop, lie, down, roll"		Presence of possible nuclear, chemical, radioactive and biological threat"	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Yes	6,736	98.8	6,477	95	395	5.8
No	82	1.2	341	5	6,423	94.2
Total	6,818	100	6,818	100	6,818	100

In order to get students' relationship between their behavior at the time of disaster and the education they received about the disaster, cross-tables (crosstabs) reflected in Table 6 are presented. When the awareness level of students during the disaster is examined for the ones who take basic disaster training in their education prior to their admission to the SUCs or take one or a few disasters and emergency situation courses in their respective institutions (SUC), it could be said that all these taken education and courses about disaster and emergency situation are not enough. This situation reveals the inadequacy of the information received. Training related to disaster usually being based on theoretical knowledge and not to be repeated during certain periods cause students to forget the information. For this reason, students are of the opinion that utilization of visual and social media would be more effective in disaster awareness education. Thus, the knowledge of earthquake level of students who have taken education is 79%, their fire knowledge level is 15% and their flood disaster knowledge level is 24%.

Table 6. Disaster education and awareness during a disaster.

Responses	Knowledge about "duck, cover and hold"		Knowledge about "stop, lie, down, roll"		Presence of possible nuclear, chemical, radioactive and biological threat"	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
	Yes	5,386	79	1,023	15	1,636
No	1,432	21	5,795	85	5,182	76
Total	6,818	100	6,818	100	6,818	100

4. Behavior after Disaster

Public emergencies and disasters affect students and to some extent destructive to their physical environment. This can affect not only how well they perform at school but also the trajectory of their lives. It's not like it gets all better quickly and everyone can move on. Reality tells us that in most instances, we don't catch up in the sense that we can do everything we would have done in the absence of crisis and make up for all of the lost time, we tend to catch in the rate of individual's capacity. It is on this note that a family/individual's plan after the disaster is to overcome with ease and self-assurance.

In this context, questions were asked to the students related to their behavior and awareness after a probable disaster. For possible post-disaster situations, 53.2% (3,627) of the respondents express that their family/individual disaster plan is not available, 62.3% (4,248) can identify their assembly or gathering area, 82.8% (5,645) already know where to go for their temporary housing (Table 7). The lingering effects of unexpected emergencies and disasters are different for everyone. Knowing what to do after an emergency can help reduce stress and aid in a quicker recovery. The recovery process is not easy and takes time, flexibility, and patience. It is in this context that even though the result is relatively high, more preparedness mechanisms need to be in place as physical and emotional distress sustained during disaster needs a long-term process. Hence, family/individual plan for a probable disaster needs to be taken seriously in their respective households.

Table 7. Behavior after disaster.

Responses	Availability of family individual plan for a probable pre-disaster situation		Identification of assembly/gathering area during a probable pre-disaster incident		Identification of evacuation centers during a probable pre-disaster incident		First aid knowledge can be applied until teams reach in probable disaster incident	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
	Yes	3,191	46.8	4,248	62.3	5,645	82.8	5,093
No	3,627	53.2	2,570	37.7	1,173	17.2	1,725	25.3
Total	6,818	100	6,818	100	6,818	100	6,818	100

Experts generally agree that individuals will require partial or complete self-sufficiency for at least 72 hours following a disaster. In the study, students were asked to evaluate their personal knowledge and education levels related to the most common types of disasters that usually occur in the region (earthquake, typhoon, flooding, fire). In this general evaluation, a 5-point Likert Scale was utilized in the interpretation of data retrieved (Strongly disagree=1; Partially disagree =2; Not Certain =3; Partially agree= 4; Totally agree=5 points). Table 8 shows the result that the percentage of students who stated that they do have the knowledge and training to protect themselves during earthquakes is 74.8%; during typhoons is 54.8%; during flooding is 76.8%, and during a fire is 69.2%. When the mean score of the personal evaluation was computed with regard to their knowledge and education levels for disaster, the most positive opinion reported types of disaster are flooding (3.84); earthquake (3.74); fire (3.46); and typhoon (2.74).

Table 8. Personal evaluation related to knowledge and personal education level for disaster.

Item Statements	Strongly disagree		Partially disagree		Not Certain		Partially Agree		Totally Agree		Average
	f	%	f	%	f	%	f	%	f	%	
	I have enough knowledge and training to protect myself during earthquake.	0	0	5,595	82.06	702	10.30	521	7.64	0	
I have enough knowledge and training to protect myself during the flood.	1,155	16.94	3,404	49.94	2,245	32.92	14	.20	0	0	3.84
I have enough knowledge and training to protect myself during the fire.	921	13.5	1,315	19.28	4,582	67.22	0	0	0	0	3.46
I have enough knowledge and training to protect myself during typhoons.	401	5.88	632	9.27	3,759	55.06	3,222	47.26	0	0	2.74

For purposes of interpreting personal evaluation related to their knowledge and training level for disaster for students who take training for disaster, data is presented in Table 9. It is evident that the students who have taken disaster training are reported to have more positive opinions compared to those who have none. Indeed, the overall average evaluation of earthquake disasters increased from 3.74 to 4.98, flood disasters from 3.84 to 3.98,

fire disasters from 3.46 to 3.94, and typhoon disasters from 2.74 to 3.49. Indeed, it can be said that disaster training students received raises sensitivity levels and awareness of disasters significantly. Data presentation of the comparison is presented in Table 9.

Table 9. Personal evaluation related to knowledge and training level for disaster of students who received training about disaster.

Item statements	Average
I have enough knowledge and training to protect myself during an earthquake.	4.98
I have enough knowledge and training to protect myself during a flood.	3.98
I have enough knowledge and training to protect myself during a fire.	3.94
I have enough knowledge and training to protect myself during typhoons.	3.49

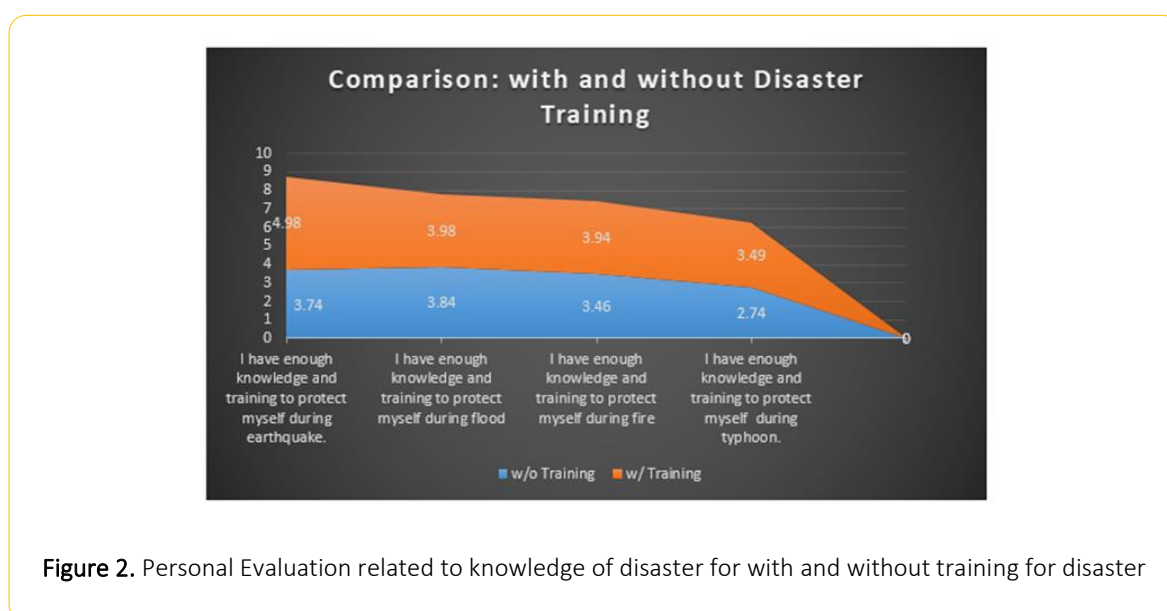


Figure 2. Personal Evaluation related to knowledge of disaster for with and without training for disaster

Conclusions

Awareness, education, and preparedness can reduce the disruptive impacts of a natural disaster on communities. It is a well-known fact that good quality education will bring success in the fight against disaster. This will also minimize potential losses in every household/individual. The positive rate of disaster education is a good indication that increased awareness of the possibility of reducing disaster risk among students will contribute much to balancing the prevailing view that disasters are unpredictable and unavoidable events. This conforms to the idea of Birkman et al. (2012) that a well-informed and motivated population can lead to disaster risk reduction but it requires the collection and dissemination of knowledge and information on hazards, vulnerabilities, and capacities. Hence, the conclusion of the study is herein presented:

1. Generally, students have the concept of disaster however, when they were asked about their understanding of disaster and emergency training, only 5.2 % (355) can expound in detail and believed that the training was sufficient and 94.8% believed that it was not. This goes to show that an information source repertoire

has to be strengthened and reconsidered to meet information insufficiencies and explore more structural factors to address the gap;

2. For the level of disaster preparedness, the majority of the respondents, 42.5 % (2,898) are aware of the risk that may happen to them but not have taken action to prepare. Although there is a relatively good percentage of 35 (2,386) for fully prepared students, there are still 22.5% (1,534) who are unaware;
3. Their respected houses do not have earthquake analyses. 35% of the respondents do not know where is the structurally safe place in their houses and 90% of them did not get any measures in their dwelling houses. It is quite difficult to mention the condition of preparedness against disaster and emergency situations in the line of the data revealed;
4. When the awareness level of students during the disaster is examined for the ones who take basic disaster training in their education prior to their admission to the SUCs or take one or a few disasters and emergency situation courses in their respective institutions (SUC), it could be said that all these taken education and courses about disaster and emergency situation are not enough; and
5. The lingering effects of unexpected emergencies and disasters are different for everyone. It is evident that the students who have taken disaster training are reported to have more positive opinions compared to those who have none.

Hence, in the light of the findings of the study, the following recommendations are offered:

1. The present approaches for disaster preparedness among SUC students need to be redesigned in a manner that provision of lifelong learning is built;
2. Maintain through-life studentship with SUCs and exploit the latest learning and teaching technologies to adopt non-formal and informal modes of learning;
3. SUCs have to develop and maintain active ties with the industries that provide adequate exposure to students through teaching and research activities and exploit the latest trends and technologies; and
4. Integrating disaster knowledge into the existing curricula or implementing disaster education programs as a general education course.

Recomendations

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References

- Bhat, B. A., Anees, S.-U.-M., Geelani, S. N., Nusrat, Jan, I., and Zargar, B. A. (2017). A Study on Disaster Awareness And Preparedness Among College Students In District Ganderbal of Kashmir Valley. *IJSART*, 156-159.
- Cariaga, J. (2020). Disaster Preparedness on Natural Calamities among students of University of Southeastern Philippines Region XI: Basis for a Proposed Intervention Program. *TẠP CHÍ KHOA HỌC ĐẠI HỌC TÂN TRÀO*, 22-27.

- CFE-DM. (2018). Philippines: Disaster Management Reference Handbook, . *Center for Excellence in Disaster Management and Humanitarian Assistance* .
- Community of Accredited Online Schools. (n.d.). School Emergency Preparedness: Natural Disasters & Other Emergencies.
- Dynes, R. R. (2019). The Accident at Three Mile Island: The Contribution of the Social Sciences to the Evaluation of Emergency Preparedness and Response. *Journal of Planning Literature*.
- Hasan, K., Moriom, M., Shuprio, S. I., Younos, T. B., and Chowdhury, a. M. (2021). Exploring disaster preparedness of students at university in Bangladesh. *Natural Hazards*, 817-849. doi:https://doi.org/10.1007/s11069-021-05080-
- Maminta, L. G. (2019). Level of Awareness and Disaster Preparedness. *1st UPY International Conference on Applied Science and Education 2018* (pp. 1-5). IOP Publishing.
- Matunhay, L. M. (2018). Disaster Management: Towards Building Community Resilience . *International Journal of Sceintific Research and Management*.
- Napitupulu, D., Rahim, R., Abdullah, D., Setiawan, M., Abdillah, L., Ahmar, A., Simarmata, J., Hidayat, R., Nurdiyanto, H., and Pranolo, A. (2019). Analysis of Student Satisfaction Toward Quality of Service Facility. *Journal of Physics*.
- OCD-NDRRMC. (2015). *National progress report on the implementation of the Hyogo Framework for Action (2013-2015)*.
- Ozkazanc, S., and Yuksela, U. D. (2015). Evaluation of disaster awareness and sensitivity level of higher education students. *Procedia - Social and Behavioral Sciences*, 745-753.
- Pailoplee, S., and Boonchalua, N. (2016). Earthquake Activities in the Philippines Islands and the Adjacent Areas. *Geosciences Journal*, 877-889.
- Parks, S. (2021, May 6). Monitoring Natural Disastern in the Philippines. *Planet*.
- Patel, R., Etmnani, R., Kermanshachi, S., and Tafazzoli, M. (2022). Exploring Disaster Preparedness and Awareness due to Natural Hazards Using Structural Equation Modelling (SEM). *Construction Research Congress 2022* (pp. 160-171). University of Texas.
- Philippines, U. (2020, January 20). *E-news Mindanao*.
- Rohith, V. R., Kolathayar, S., Priyatham, K., and Kumar, V. K. (745-753). Disaster Preparedness Index: A Valid and Reliable Tool to Comprehend Disaster Preparedness in India. *Urbanization Challenges in Emerging Economies*, 2015.
- Smith, K. (2003). *Environmental Hazards: Asessing Risks and Reducing Disaster*. Routledge.
- Statista. (2022, June 21). Disaster risk reduction expenditures of the government Philippines 2009-2017. *Statista Research Department*.
- Tanner, A., and Doberstein, B. (2015). Emergency preparedness amongst university students. *Disaster Risk Reduct*, 409-413.

UNDRR. (2019). Disaster Risk Reduction in the Philippines: Status Report. *United Nations Office for Disaster Risk Reduction (UNDRR)*, .

UNDRR. (2019). *Hyogo Framework for Action*. Retrieved from UNISDR: <https://www.unisdr.org/we/coordinate/hfa>

