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Disaster risk reduction knowledge among Filipino senior high school students

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ABSTRACT

Difficult times can happen anywhere and anytime. When calamities occur in a place where people are not ready to respond, the subsequent damage can lead to mortality, loss, and suffering. The school is an example of such communities where many vulnerable children are susceptible to the negative impact of natural or manmade hazards. The goal of this study was to examine the disaster-related knowledge, adaptation, preparedness and readiness, risk perception, and awareness of 503 students from Eastern Samar State University's senior high school department. Students' grasp of disaster risk reduction knowledge was acquired using a customised questionnaire, and descriptive statistics and non-parametric tests were used to analyse the data. Despite the fact that the school is located in a remote region, survey findings revealed that senior high school students are ready, aware, adaptive, and equipped to face the risks posed by catastrophes. Moreover, the sex of the respondents has significant differences with disaster preparedness and readiness, adaptation, and disaster-related knowledge. Likewise, the respondents' grade level, only the disaster-related knowledge, showed a significant difference among all categories. Also, all of the categories of disaster risk reduction have a significant difference with the respondents' academic strands. However, the family monthly income shows no differences in all categories of their perceptions of disaster risk reduction. Furthermore, disaster risk reduction education and initiatives in schools should be enhanced to reduce student's susceptibility to disasters.

Keywords: adaptation, awareness and risk perception, disaster's risk reduction, preparedness and readiness, Philippine

Because of the terrible effects of many disasters around the world, every country has made "Disaster Risk Reduction Management" a top priority (DRRM). A total of 168 countries attended the "World Conference on Disaster Reduction" in Japan in January 2005 to establish the "Hyogo Framework for Action (HFA)." This framework intends to include disaster preparedness, vulnerability reduction, and prevention mitigation into applicable programmes, plans, and guidelines, as well as policies on sustainable development. One of the countries that decided to adopt the HFA and commit to using DRRM measures and standards is the Philippines. (Mamon, Suba, & Son, 2018). The Philippines is known as a high-risk country in the world for suffering natural disasters like typhoons, eruptions of volcanoes, floods, earthquakes, and landslides. An average of 18 to 20 tropical depressions and storms enter the country each year, and 8 to 10 storms make landfall (NDRRMC, 2014).

An international report by the "International Bank for Reconstruction and Development" placed the Philippines, the third most vulnerable to disaster risks out of 173 countries in the world (COA, 2015). In 2017, the Philippines placed third in the "World Risk Index," which measures a country's exposure and vulnerability to natural hazards based on some factors, such as lack of DRRM capacities, susceptibility, and lack of preparedness and readiness during disasters occurrence (Baizas, 2018). The possibility of another major disaster in the Philippines is not a matter of where, but when [4]. The Philippine "Disaster Risk Reduction and Management Act of 2010", also known as the "Republic Act 10121", was enacted to strengthen its DRRM system and provide for a proactive approach to disaster response (Mamon, Suba, & Son, 2018).

In response to RA 10121, that orders all national government agencies to implement rules, programs, structures, and coordination mechanisms with extending DRRM budget

appropriation from the national level down to the local level. DepEd Order No. 50, s. 2011 entitled "Creation of Disaster Risk Reduction and Management Office" (DRRMO), which aims to spearhead mechanism to all DepEd establishments which aim to guarantee protection, prepare and escalate resiliency of all personnel under challenging times (DepEd Memo No. 5, 2011 & (DepEd Memo No. 21. 2015). Moreover, the section 14 of the Philippine DRRM Act of 2010 obliges DepEd to incorporate DRRM education in the curriculum to equip students and teachers with the DRRM knowledge like lessening the risks brought by natural disasters (Miasco, 2017).

Last year, Mamon and his colleagues performed a survey with 712 senior high school students at a selected school in one of the Philippines' metropolitan cities to examine disaster risk perception, preparedness and readiness, adaptation, and awareness. They discovered that the majority of respondents had a good comprehension of disaster-related concepts and ideas. Despite their low assessment of catastrophe risk, Grade 11 pupils are ready, aware, prepared, and acclimated to disaster threats. The researchers ascribed their positive findings to the existing DRRM-integrated senior high school curriculum (Mamon, Suba, & Son, 2018). Guevarra et al. (2007) conducted a related study in 2007 to examine the status of disaster readiness in selected Luzon schools by describing the schools' disaster preparedness plan and key school personnel's disaster awareness knowledge. Only 11 schools reported having a catastrophe recovery plan, despite the fact that 35 out of 37 schools have formed disaster committees. Key school workers are aware of national and local disaster preparedness programmes, as well as DepEd disaster-related rules, according to interviews. In addition, the most prevalent types of training conducted in schools were fire and earthquake drills (Guevarra, et al, 2007).

In Nepal, Tuladhar and colleagues in 2015 explored local people's knowledge of DRRM by interviewing 124 randomly selected individuals aged 18 to 74. Interview questions consisted

of items related to disaster knowledge, information, readiness, adaptation, and disaster risk perception. Results from this study revealed that DRR initiatives in the country are inadequate. Furthermore, no significant gender-based difference was found regarding the respondents' disaster knowledge, awareness, preparedness, and disaster risk perception (Tuladhar, et al, 2015). A school is the most critical aspect of the community since knowledge, skills, and values are honed. Thus, many people consider the school as a second home. In case of emergencies, the school occupants who are children are sometimes difficult to manage due to severe panic and may result in considerable damages to the school premises. The interruption of schools' operation -- which is one of the immediate effects of a hazard on the learning environment -- psychologically affects students, families, and teachers. However, the most affected occupants of the schools are mostly untrained children on disaster risk reduction drills (Hassanain, 2006).

Disasters are unexpected phenomena. The school community members will be at risk if they are not prepared and ready to respond to these catastrophic events. Several studies assessing the disasters' preparedness and knowledge are available online; however, this kind of study is uncommon for the senior high school students in the Philippines since the country had just adapted senior high school curriculum four years ago. This study, therefore, assessed the perception of disaster risk reduction knowledge among the students in the Senior High School department of Eastern Samar State University, Philippines.

Methodology

Respondents of the study

This investigation aimed to determine the disaster risk knowledge among the students in the Senior High School department of Eastern Samar State University; hence, a descriptive research design was adapted. The random sampling technique was utilized to gather the 503 participants of the study. The student-participants accomplished the survey questionnaire during

their vacant period as ordered by the senior high school department's program head. The collection of data was done for two weeks. Table 1 below shows the information about the participants of the study.

Table 1

Respondents in the Study (n=237)

Academic Strand (Specialization)	Grade level	
	Grade 11	Grade 12
Accountancy, Business and Management (ABM)	53	49
Humanities and Social Sciences (HUMSS)	56	51
Science Technology Engineering and Mathematics (STEM)	68	59
Technical Vocational Livelihood (TVL)	89	78
Total	266	237

Research Instrument

A survey questionnaire was adapted from Tuladhar and colleagues in 2015 (Tuladhar, et al, 2015). The survey instrument collected information on the students' sex, grade level, academic strand, family monthly income and responses to 20 questions categorized into five DRRM areas, namely disaster-related knowledge (3 items), disaster awareness (4 items), disaster preparedness and readiness (5 items), disaster adaptation (5 items), and disaster risk perception (3 items). Disaster-related knowledge measures the respondents' familiarity and understanding of a disaster's occurrence and of being informed about disaster risk education training and seminar. Disaster preparedness and readiness assess the respondents' knowledge and capacity to anticipate imminent and present disasters. Disaster adaptation is the adjustment of the individual in response to the disaster. Disaster awareness measures the respondents' level of consciousness, while disaster risk perception evaluates their judgment towards disasters' threats [1]. Each item was measured on a

five-point Likert scale with 0-1.0 = I do not know, 1.1-2.0 = strongly disagree, 2.1-3.0 = Disagree, 3.1-4.0 = Agree, and 4.1-5.0 = strongly agree, to determine students' responses on different DRR issues. The instrument's reliability was assessed by Cronbach's alpha and found to be adequate with a value of 0.83. Each respondent accomplished the survey within twenty minutes of the allotted time.

DATA ANALYSES

The descriptive statistics were utilized to describe the respondents' demographic profile. The non- parametric tests were employed to draw inferences on the data collected. The Mann Whitney U test and Kruskal Wallis test were utilized to compare means of students' demographic profiles to their disaster risk reduction knowledge.

Results and Discussions

Demographic profile of the respondents in the study

This study examined the students of senior high school department of Eastern Samar State University's perceptions of five disaster risk reduction issues: (1) disaster awareness, (2) disaster preparedness, (3) disaster adaptation, (4) disaster related-knowledge, and (5) disaster's risk perception. Table 2 shows that a total of 503 students participated in this study, which consisted of 53 percent grade 11 students and 47 percent in grade 12 students. Likewise, the study is dominated by male students over female students. And, most of the respondents belong to a family that earns 10,001 to 20,000 Family monthly income.

Table 2

Respondents' Demographic Profile (n=237)

		Frequency	Percentage (%)
Respondents' Grade Level	11	266	53
	12	237	47

Respondents' Sex	Male	267	53
	Female	236	47
Respondents' Strand	ABM	107	21
	HUMMS	127	25
	STEM	102	21
	TVL	167	33
Respondents' Family Income	≤ 10,000	148	29
	10, 001- 20,000	270	54
	20,001- 30,000	66	13
	30,001 ≥	19	4

Means and verbal interpretations of respondents' disaster risk reduction knowledge

The students' perception of disaster risk reduction knowledge was determined by a survey using a questionnaire from Tuladhar, et al (2015). (Table 3 shows the means and verbal interpretations of the disaster's risk reduction knowledge of the respondents. The overall mean responses for disaster-related knowledge, disaster preparedness and readiness, disaster adaptation, disaster awareness, and disaster risk perception were recorded at 3.2 (SD=0.69), 3.4 (SD=0.79), 3.3 (SD=0.86), 4.3 (SD=0.44), and 3.3 (SD=0.83), respectively. Among the categories, only the disaster awareness got a mean, which is interpreted as "Strongly Agree"; however, the other categories have means interpreted as Agree. These results show that the students of the Senior High School department of Eastern Samar State University have ample knowledge of disaster risk reduction, especially in disaster awareness. Despite the fact that the school is situated in a rural area, senior high school students are ready, aware adapted, and prepared from the risks inflicted by disasters.

Table 3

The means and verbal interpretation of the disaster risk reduction knowledge of the respondents

Category	Std. Deviation	Mean	Verbal Interpretation
Disaster-related knowledge	.69	3.2	Agree
Disaster preparedness and readiness	.79	3.4	Agree
Disaster adaptation	.86	3.3	Agree
Disaster awareness	.44	4.3	Strongly Agree
Disaster risk perception	.96	3.3	Agree

Testing differences and relationships between respondents' demographic profile and disasters risk reduction knowledge

The data gathered from the exploration are not normally distributed and have unequal variances; hence, non-parametric tests were employed to draw inferences between variables. Testing differences were made using the Mann-Whitney test for two independent samples and the Kruskal Wallis test for three independent samples.

Table 4 depicts the Mann-Whitney U test between demographic profile (sex and grade level) and disaster risk reduction knowledge. For the sex of the respondents, disaster preparedness and readiness, disaster-related knowledge, and disaster adaptation have significant differences. However, disaster awareness and disaster risk perception have no significant differences in terms of the sex of the respondents. On the other hand, the students' grade level shows a significant difference in disaster-related knowledge, while the different categories have no significant difference results.

Table 5 shows the Kruskal Wallis test between demographic profile (academic strand and family monthly income) and their knowledge on disaster's risk reduction. All of the categories of disaster risk reduction have a significant difference with the respondents' academic strands. Students under the STEM strand have more science subjects where DRRM is integrated compared

with the ABM, HUMMS, and TVL strands. Moreover, the family monthly income shows no differences in all categories of disaster risk reduction knowledge.

Table 4

The Mann-Whitney U test between demographic profile (sex and grade level) and disaster risk reduction knowledge

Category		Disaster-related knowledge	Disaster preparedness and readiness	Disaster adaptation	Disaster awareness	Disaster risk perception
Sex	Mann-Whitney U	26647.500	22422.500	23338.500	29607.500	31365.000
	Z	-3.327	-6.068	-5.333	-1.532	-.100
	Asymp. Sig. (2-tailed)	.001	.000	.000	.125	.920
Grade level	Mann-Whitney U	18625.500	30334.000	29871.500	28153.000	28285.000
	Z	-8.805	-.792	-1.075	-2.697	-2.076
	Asymp. Sig. (2-tailed)	.000	.429	.282	.007	.038

Table 5

The Kruskal Wallis test between demographic profile (academic strand and family monthly income) and disaster risk reduction knowledge

Category		Disaster-related knowledge	Disaster preparedness and readiness	Disaster adaptation	Disaster awareness	Disaster risk perception
Academic Strand	Chi-Square	11.081	33.180	20.535	93.891	33.891

	df	3	3	3	3	3
	Asymp.	.011	.000	.000	.000	.000
	Sig.					
Family	Chi-	241.657	18.557	15.101	49.403	11.380
Monthly	Square					
Income	df	3	3	3	3	3
	Asymp.	.060	.073	.082	.090	.060
	Sig.					

DISCUSSIONS

The United Nations International Strategy for Disaster Reduction (UNISDR) has reported that integrating DRRM education in the basic education curriculum helps strengthen the DRR preparedness and awareness among young students (Apronti, et al, 2015). Young students are the most vulnerable aspect of the community when a natural or man-made disaster occurs. In the local setting, this study has helped better understand the current DRRM knowledge of the students of Senior High School department, Eastern Samar State University. The university has its policies on DRRM already; however, it is essential to check if these young adults learn from the institutional drills and training on DRRM. Mamon, and colleagues in 2018 have conducted the same study [1]; however, the present study is different because the school setting is in a rural area or a province far from big cities. Moreover, several demographic profiles of the respondents, such as grade level, sex, academic strand (specialization) and family monthly income, were considered for drawing inferences between variables.

A total of 503 students participated in this study, 53 percent in grade 11 and 47 percent in grade 12 and dominated by male students over female students. Likewise, most of the respondents belong to a family that earns 10,001 to 20,000 family monthly income. Among all the categories of disaster risk reduction knowledge, disaster awareness got the highest mean, which can be interpreted as "Strongly Agree." In contrast, the other categories have very close means and are interpreted as "Agree." Even though the school is situated in a rural area, senior high school students are ready, aware, adapted, and prepared from the risks inflicted by disasters. These results are good; hence, institutional drills and DRRM training conducted by the university is somehow effective.

To compare the means of the respondents' demographic profiles, the Mann-Whitney U test and Kruskal Wallis test were utilized. For the sex of the respondents, disaster preparedness and readiness, disaster-related knowledge, and disaster adaptation have significant differences. However, disaster awareness and disaster risk perception have no significant differences. These results support observations that females tend to express better concerns and worry more than men in times of disasters (O'Neill, Brereton, Shahumyan & Clinch, 2016). Meanwhile, men are more willing to protect and do something before an emergency happens as a function of their family context (Cvetkovic et al, 2018). On the other hand, the students' grade level shows a significant difference in disaster-related knowledge, while the other categories have no significant difference results. For the current Senior High School curriculum, there is a specialized course offered titled "Disaster Risk Reduction Management (DRRM). In Eastern Samar State University, this course is an offer for grade 12; thus, the grade 12 students are more knowledgeable in this aspect. On the academic strand of the respondents, all categories of disaster risk reduction have significant differences. And since the students under the STEM strand have more science subjects where

DRRM is integrated and has a specialized subject on DRRM compared with the ABM, HUMSS, and TVL strands, students under this strand are expected to be more knowledgeable in terms of disaster risks management. And lastly, the family monthly income shows no differences in all categories of disaster risk reduction knowledge. This result implies that disaster risk management knowledge has nothing to do with the respondents' family income.

Disaster can strike anywhere. Hence, during emergencies, rapid action and response are required. Institutional actions depend on their preparedness for disasters by having an effective disaster preparedness plan (IFRC, 2000). Likewise, the effectiveness of a schools' disaster preparedness plan can be measured when students, teachers, and staff are not harmed after the occurrence of a disaster (Librera, Bryant & Martz, 2004). Thus, assessing students' knowledge of DRRM should be considered in school to measure if they are ready and prepared during challenging times.

No matter how successful a disaster preparedness plan is created, it is still ineffective if the students have no idea about it or do not participate in disaster drills (Patkus & Walpole, 2007). Hence, implementing and further assessing the school's disaster preparedness plans is a great action to lessen the impact of a disaster (Miasco, 2017). Likewise, authorities' negligence is a significant factor why schools fail to respond adequately during difficult times (Alexander, 2015). Furthermore, the government should spearhead disaster risk reduction management to help schools' administrators keep their premises safe and child friendly (Nderitu, 2009). Thus, initiating DRRM training to students and teachers and providing facilities and equipment for disaster drills is a great help that the government can offer to school communities (Kelly, 2010 & Villanueva & Villanueva, 2017).

CONCLUSION

Although the school is situated in a rural area, senior high school students are ready, aware adapted, and prepared from the risks inflicted by disasters. Further, for testing the difference between respondents' demographic profile and disaster risk reduction knowledge categories, the sex differences have significant differences with disaster-related knowledge, preparedness, and readiness and adaptation. Likewise, the respondents' grade level, only the disaster-related knowledge, showed a significant difference among all categories. Furthermore, all of the categories of disaster's risk reduction have a significant difference with the academic strand of the respondents. However, the family monthly income shows no differences in all categories of disaster risk reduction knowledge.

RECOMMENDATIONS

This paper provides a glimpse of senior high school students' perceptions of disaster risk reduction in a disaster-prone area. School officials, teachers, and parents recognize students' susceptibility to disasters and emergencies [8]; hence, equipping students with the requisite knowledge and skills on school-based DRRM measures for these unexpected phenomena could be life-saving. The issues and concepts in DRRM should be regularly reinforced and periodically assessed in the science curriculum of Eastern Samar State University so that understanding will continuously improve and not diminish with advancing grade level in school. Additionally, the development of an environment of safety and child-friendly in the school community should be integrated into disaster education efforts. Hence, pursuing capacity building for all stakeholders, including the local government unit involved in disaster risk reduction management. Further studies are recommended to generate more information on disaster preparedness, awareness, mitigation, prevention, adaptation, and resiliency in school communities and bridge the literature gap.

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