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Students' Awareness and Perceived Effectiveness of Disaster Risk Management Practices in a Philippine University: Basis for an Institutional Disaster Risk Management Framework

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A R T I C L E I N F O

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A B S T R A C T

This study assessed students' awareness of and perceived effectiveness of existing disaster risk management (DRM) practices at Notre Dame of Marbel University (NDMU), Philippines, and used the results as the basis for an institutional DRM framework. Using a descriptive-quantitative survey design, awareness and effectiveness were measured across ten practices through a validated, four-point Likert-type questionnaire administered to 360 students from four colleges between 2016 and 2017. Students were generally very aware of (M = 2.79) and perceived as effective (M = 2.75) most practices, except student insurance and telephone hotline availability, which scored lowest on both dimensions. These findings informed a seven-component DRM framework recommended for institutional adoption.

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INTRODUCTION

Over the past few decades, disasters, both natural and human-induced, have increased in frequency and severity worldwide, prompting nations to adopt policies and measures that reduce their destructive effects on lives and livelihoods. Disaster preparedness practices are central to this effort: they equip individuals with the knowledge needed to respond appropriately when a hazard occurs and help minimize the resulting damage and loss of resources. Despite this, many communities and institutions still practice minimal disaster preparedness and remain largely unaware of the measures already available to them.

The Philippines is among the most disaster-prone countries in the world, ranking fourth among the countries hit by the highest number of weather-related disasters over a twenty-year period from 1995 to 2015 (United Nations Office for Disaster Risk Reduction [UNISDR] & Centre for Research on the Epidemiology of Disasters [CRED], 2015). The devastation brought by Typhoon Yolanda in 2013, one of the strongest tropical cyclones on record, underscored the importance of disaster risk management (DRM) not only at the national level but also at the local level, including schools and higher education institutions where large numbers of young people are especially vulnerable.

At Notre Dame of Marbel University (NDMU), a Catholic institution in Koronadal City, South Cotabato that has operated for 69 years, no formal disaster risk management program has yet been established, even though the university sits in an area prone to earthquake and soil liquefaction. Current safety measures are limited to annual fire and earthquake drills, together with an evacuation plan, fire extinguishers, fire hoses, and security personnel; however, these drills are often carried out informally and are not always taken seriously by students. A functioning DRM program is essential to school safety (Shaw, 2012), and information-based disaster planning is an integral component of any organization's risk management, since organizations that lack foresight and planning are typically the ones that struggle most to recover from disaster (Pember, 1996).

Given this gap, the present study examined NDMU students' level of awareness of the university's existing disaster risk management practices, assessed how effective these practices are perceived to be, and used the results as the empirical basis for proposing an institutional disaster risk management framework that NDMU could adopt. In doing so, the study contributes a context-specific, student-perception-based account of disaster preparedness in a Philippine higher education setting, a niche sample that remains underexplored relative to national- or barangay-level DRM studies (Bernhardsdottir, Musacchio, Ferreira, & Falsaperla, 2016; Das & Malaviya, 2014).

THEORETICAL REVIEW

National Disaster Risk Reduction and Management Framework

This study is anchored on the National Disaster Risk Reduction and Management Framework mandated under the Philippine Disaster Risk Reduction and Management Act of 2010, Republic Act No. 10121 (2010), which directs government agencies, local government units, and institutions, including

schools, to shift from a reactive, response-based approach toward a proactive, risk-informed model of disaster management. Disaster risk management itself is defined as the systematic process of using administrative decisions, organization, and operational skills to implement policies and strategies that reduce the adverse effects of hazards and related disasters (Garatwa & Bollin, 2002). Within an educational institution, this systematic process depends heavily on how well students understand and value existing safety practices, since their cooperation determines whether a plan is actually followed during an emergency (Stein, Vickio, Fogo, & Abraham, 2007).

School-Based Disaster Preparedness

Enhancing student awareness is an essential part of promoting disaster management (Shiwaku, 2014), and structured, school-based disaster education programs improve students' capacity to respond appropriately during emergencies (Shiwaku, Fujieda, Takeuchi, & Shaw, 2011). In the same vein, schools are encouraged to regularly inform students and families about earthquake preparedness procedures (Heath & Dean, 2008), and the routine conduct of fire drills builds the habitual, near-automatic responses that save lives during an actual fire (Kerkhoff, 2009). Basic supplies such as first aid kits likewise depend on consistent maintenance and staff readiness to be of real use during an emergency (Burton, 2003). These studies converge on the idea that awareness of, and perceived effectiveness in, concrete safety measures, drills, evacuation routes, fire safety equipment, first aid provisions, security systems, insurance, and communication channels together determine an institution's overall level of disaster preparedness.

As this study is descriptive rather than correlational, no statistical hypotheses were formulated. Instead, it was guided by the objectives of determining students' level of awareness of NDMU's existing disaster risk management practices, determining students' perceived effectiveness of these practices, and using both sets of results to develop an institutional disaster risk management framework.

Conceptual Framework

The study conceptualizes disaster risk management awareness and perceived effectiveness as the two empirical inputs that inform the design of an institutional DRM framework. Ten existing NDMU practices, namely, the execution of earthquake and fire drills, the presence of evacuation plans and exits, fire extinguishers and hoses, first aid kits, security cameras, and security personnel, and the availability of student insurance and telephone hotline numbers, were assessed along these two dimensions. The resulting profile of strengths and gaps then served as the empirical basis for the seven-component NDMU Disaster Risk Management Framework proposed in the Discussion section. Figure 1 illustrates this conceptual framework.

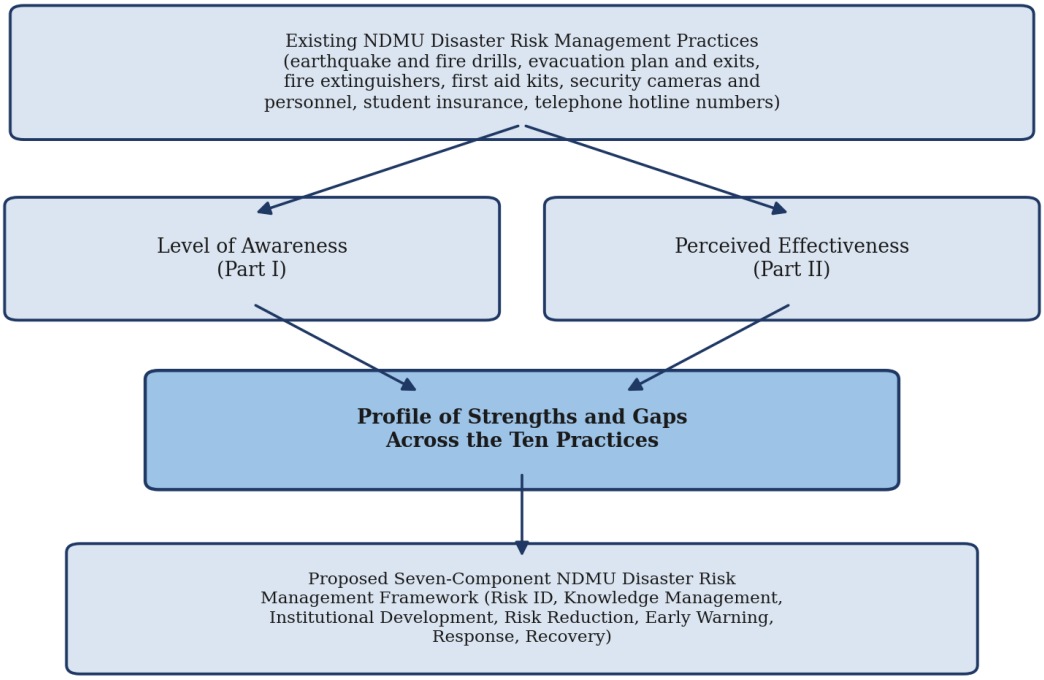


Figure 1. Conceptual Framework of the Study

METHODOLOGY

Research Design

This study used a descriptive-quantitative survey design, which was deemed appropriate for acquiring accurate, systematic, and factual responses that provide an actual picture of students' awareness and perceived effectiveness of disaster risk management practices at NDMU.

Research Locale

The study was conducted at Notre Dame of Marbel University, located at Alunan Avenue, City of Koronadal, South Cotabato, Philippines. NDMU is a Catholic institution run by the Marist Brothers and is the first Marist university in the country. The campus, which houses ninety-seven classrooms across several buildings of varying heights, is geographically situated in an area prone to earthquake and soil liquefaction.

Population and Sample

The population consisted of 3,500 officially enrolled students for school year 2016 to 2017, drawn from the university's four colleges: Arts, Business Administration, Education, and Engineering and Technology. Using the Slovin formula with a 5 percent margin of error, a sample of 360 students was determined. Respondents were proportionately allocated across the four colleges and then selected through simple random sampling using the lottery, or fish bowl, technique.

Research Instrument

Data were gathered using a self-made, two-part questionnaire. Part I measured students' awareness of ten current NDMU disaster risk management practices using a four-point Likert-type scale ranging from extremely aware to not at all aware. Part II measured students' perceived effectiveness of the same ten practices using a four-point Likert-type scale ranging from very effective to ineffective. The instrument was reviewed by the research adviser and validated by experts from the Provincial Disaster Risk Reduction and Management Office (PDRRMO).

Data Gathering Procedure

Prior to instrument construction, the researchers consulted the Director of the Department of Student Affairs and Development and the school nurse, who serves as NDMU's disaster risk management focal person, regarding the university's current DRM practices. The validated questionnaire was then personally distributed by the researchers to the student-respondents, who were assured of confidentiality and anonymity and were given five minutes to complete the survey before it was collected.

Data Analysis

Responses to each item were first tabulated as frequency counts and percentage distributions across the four scale points, which allowed the researchers to identify the specific response category that the majority of students selected for every disaster risk management practice.

The weighted mean for each item was then computed using the formula $WM = \Sigma(fX) / N$, where f is the number of respondents who selected a given scale point, X is the numerical value of that scale point (4, 3, 2, or 1), and N is the total number of respondents (360). The weighted mean for each of the two parts of the questionnaire as a whole (awareness and effectiveness) was likewise computed as the average of the ten item-level weighted means, giving the overall grand mean reported in Tables 1 and 2.

Weighted means were interpreted using a four-point verbal descriptor scale. The scale's class-interval width was derived by dividing the range of possible scores (4 minus 1) by the number of response categories (4), yielding an interval of 0.75. Applying this interval to the lowest possible score of 1.00 produced the four bands used throughout the study: for awareness, 3.26 to 4.00 (Extremely Aware), 2.51 to 3.25 (Very Aware), 1.76 to 2.50 (Moderately Aware), and 1.00 to 1.75 (Not at all Aware); for effectiveness, 3.26 to 4.00 (Very Effective), 2.51 to 3.25 (Effective), 1.76 to 2.50 (Fairly Effective), and 1.00 to 1.75 (Ineffective). This same descriptive statistical treatment, frequency and percentage distribution followed by weighted mean and verbal interpretation, was applied uniformly across both parts of the questionnaire and forms the sole basis for the results reported in this study, consistent with the descriptive, non-correlational design stated in the Research Design subsection.

RESULTS

Table 1 presents students' level of awareness of the ten existing disaster risk management practices at NDMU.

Table 1. Level of Awareness on Existing Disaster Risk Management Practices at NDMU (N = 360)

Disaster Risk Management Practice	Weighted Mean	Descriptive Rating
Execution of earthquake drill	2.69	Very Aware
Presence of evacuation exits	2.85	Very Aware
Presence of evacuation plan	2.83	Very Aware
Execution of fire drill	2.79	Very Aware
Presence of fire extinguisher and fire hose	3.01	Very Aware
Presence of first aid kits	2.92	Very Aware
Presence of security cameras (CCTV)	3.03	Very Aware
Presence of security personnel	3.29	Extremely Aware
Availability of student insurance	2.39	Moderately Aware
Availability of telephone hotline numbers	2.11	Moderately Aware
Overall Weighted Mean	**2.79**	**Very Aware**

As shown in Table 1, students were very aware of eight of the ten practices, with the presence of fire extinguishers and fire hose, and the presence of security cameras, receiving the highest awareness ratings. Students were extremely aware of only one practice, the presence of security personnel (M = 3.29), most likely because security guards are highly visible and interact with students daily at the university's gates. In contrast, students were only moderately aware of the availability of student insurance (M = 2.39) and of telephone hotline numbers (M = 2.11), the two practices that scored lowest overall. The overall weighted mean of 2.79 indicates that students are, on average, very aware of NDMU's current disaster risk management practices.

Table 2 presents students' perceived effectiveness of the same ten practices.

Table 2. Perceived Effectiveness of Existing Disaster Risk Management Practices at NDMU (N = 360)

Disaster Risk Management Practice	Weighted Mean	Descriptive Rating
Execution of earthquake drill	2.77	Effective
Presence of evacuation exits	2.80	Effective
Presence of evacuation plan	2.67	Effective
Execution of fire drill	2.76	Effective
Presence of fire extinguisher and fire hose	2.96	Effective
Presence of first aid kits	2.96	Effective
Presence of security cameras (CCTV)	3.06	Effective
Presence of security personnel	3.06	Effective
Availability of student insurance	2.39	Fairly Effective
Availability of telephone hotline numbers	2.11	Fairly Effective

Overall Weighted Mean	**2.75**	**Effective**

Students perceived eight of the ten practices as effective, with the presence of security cameras and the presence of security personnel receiving the highest effectiveness ratings (M = 3.06 each). As with the awareness results, student insurance and telephone hotline numbers were perceived as only fairly effective (M = 2.39 and M = 2.11, respectively). The overall weighted mean of 2.75 indicates that students generally perceive NDMU's current disaster risk management practices as effective, although this perception is markedly weaker for the two least-known practices.

DISCUSSION

The overall awareness level found in this study (grand M = 2.79, Very Aware) and the overall perceived effectiveness level (grand M = 2.75, Effective) place NDMU students within the same general band reported across recent Philippine higher-education disaster studies, even though these studies used differently scaled instruments. Using a five-point scale, Malonecio (2023) found that 249 higher education students in Aklan had a High level of disaster awareness (M = 3.98) and a Very High level of disaster preparedness (M = 4.69), while Cariaga (2020) found that 358 students at the University of Southeastern Philippines reported an overall High level of disaster preparedness (M = 3.50). Read alongside these two independent samples, the present findings reinforce a broader pattern in the literature: Filipino higher education students, across regions and institutions, tend to rate themselves as reasonably to highly aware of and prepared for disaster, most plausibly because disaster drills and DRRM-related orientation activities are now a fairly standard feature of Philippine school life.

A closer, practice-by-practice comparison, however, surfaces a difference that a single composite score would conceal. Cariaga (2020) reported that students were highly prepared for earthquake (M = 3.65) but only moderately prepared for fire (M = 3.21), a sizeable gap between the two hazards. NDMU students, in contrast, rated earthquake drill and fire drill awareness almost identically (M = 2.69 and M = 2.79) and rated their effectiveness almost identically as well (M = 2.77 and M = 2.76). This suggests that, at least at NDMU, fire-related practices have achieved a level of institutional visibility comparable to earthquake-related practices, which is not the case in every Philippine higher education institution and may reflect NDMU's practice of conducting both drills annually rather than emphasizing one hazard over the other.

The clearest gap in the present study, low awareness and effectiveness for student insurance and telephone hotline numbers against otherwise consistently high scores for physical safety measures, is a pattern not typically disaggregated in the Philippine higher-education studies reviewed above, most of which report a single composite awareness or preparedness score rather than a per-practice breakdown. Where the literature does speak to this specific gap, it points toward the same explanation suggested by the present data: emergency communication channels in schools are only as useful as the effort an institution invests in

publicizing and rehearsing their use (Menus, 2012), and a school's disaster management team must actively build and sustain awareness of a safeguard rather than assume that its mere existence is sufficient (Das & Malaviya, 2014). Non-formal or informal channels, orientation sessions, bulletin postings, social media reminders, have been shown to meaningfully raise disaster awareness where formal instruction alone falls short (Bernhardsdottir et al., 2016), and could plausibly close the specific gap observed here. In this respect, the present findings extend rather than simply confirm the existing literature: they indicate that composite awareness or preparedness scores, however high, can still mask meaningful unevenness across individual safety practices, an unevenness that institution-level DRM planning needs to address item by item rather than as a single undifferentiated target.

The consistently high ratings for earthquake and fire drills, evacuation signage, fire safety equipment, first aid kits, and security measures further suggest that repeated exposure builds familiarity and confidence: practices that students encounter regularly are the same practices they rate most favorably, consistent with the view that routine, repeated drills build automatic, reliable responses to hazards (Kerkhoff, 2009) and that visible, well-maintained equipment, such as first aid kits, reinforces students' confidence that an institution is prepared for emergencies (Burton, 2003).

Taken together, these findings show that NDMU already has a reasonably solid, if informally coordinated, foundation of disaster risk management practices, one that is broadly in line with what has been reported elsewhere in the Philippine higher education sector. What is missing is not new equipment or new drills, but a structure that formally organizes these practices, closes the communication gap around insurance and hotline access, and institutionalizes disaster risk management as an ongoing program rather than an annual activity.

CONCLUSIONS AND RECOMMENDATIONS

NDMU students are generally very aware of, and perceive as effective, the university's existing disaster risk management practices, particularly those tied to earthquake and fire preparedness and to campus security. However, awareness and perceived effectiveness drop markedly for practices that depend on active communication, namely student insurance and emergency hotline numbers, indicating a specific and addressable gap rather than a wholesale failure of disaster preparedness.

On this basis, the researchers recommend that NDMU formally adopt a disaster risk management program anchored on the mandate of the Republic Act No. 10121 (2010) and organized around seven components: (1) risk identification and assessment, following a systematic hazards analysis of the university's exposure to earthquake, fire, and other hazards (Pine, 2015); (2) knowledge management, to close the awareness gap on student insurance and hotline numbers through orientation sessions and information, education, and communication (IEC) materials; (3) institutional development, including the formation of a standing School Disaster Management Committee following a coordinated, cross-departmental network approach (Stein et al., 2007); (4)

application of risk reduction measures, covering both physical safeguards and staff and student training; (5) an early warning system; (6) a response protocol for search, rescue, and immediate relief; and (7) a recovery plan oriented toward restoring normal operations. Adopting this framework would convert NDMU's currently informal, drill-based practices into a documented, institutionally owned program.

FURTHER STUDY

This study is limited to a single institution and to ten disaster risk management practices already in place at the time of data collection; it did not employ inferential statistics to test relationships between student profile variables and awareness or effectiveness ratings. Future studies may replicate this design across multiple higher education institutions, apply correlational or comparative analysis, and examine additional practices not covered here, such as the imposition of curfew hours, the existence of a student manual, the presence of a weather station and alarm bell, and the implementation of a computerized student and faculty emergency database.

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