

Disaster Risk Reduction and Management Awareness and Practices of Secondary School Students in Guihulngan City, Philippines

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DOI: <https://doi.org/10.47772/IJRISS.2026.100900217>

Received: 20 September 2026; Accepted: 25 September 2026; Published: 06 October 2026

ABSTRACT

This study examined disaster risk reduction and management (DRRM) awareness and reported preparedness practices among junior and senior high school students of Guihulngan National Agricultural School, Negros Oriental, Philippines. A quantitative descriptive-comparative-correlational survey design was used with 179 students selected from a population of 324 through proportionate stratified sampling across Grades 7–12. A researcher-developed questionnaire assessed awareness of earthquakes, floods, typhoons, and landslides and the extent of DRRM practices. Descriptive statistics summarized awareness and practices, while group differences were examined by sex, age, and grade level and Pearson correlation tested the association between awareness and practices. Students were generally much aware of earthquakes ($M=4.13$), floods ($M=4.13$), landslides ($M=3.98$), and typhoons ($M=3.91$); DRRM practices were highly practiced overall ($M=4.04$). Awareness did not differ significantly by age ($p=.792$), sex ($p=.209$), or grade level ($p=.093$). Practices did not differ significantly by age ($p=.051$) or sex ($p=.375$), but did differ by grade level ($F=3.471$, $p=.005$). Awareness and practices were weakly and negatively related, but not significantly ($r=-.103$, $p=.174$). The findings suggest that high awareness alone is insufficient to ensure consistent protective behavior and support school DRRM programming that emphasizes repeated drills, scenario-based practice, grade-responsive activities, family knowledge sharing, and performance-based monitoring.

Keywords: disaster awareness; disaster preparedness; disaster risk reduction and management; school safety; secondary students

INTRODUCTION

Schools occupy a critical position in disaster risk reduction because learners spend a large proportion of their time in educational settings and may be directly exposed to earthquakes, floods, typhoons, landslides, and related hazards. Beyond serving as sites for the transmission of risk information, schools can cultivate protective routines, provide repeated opportunities to practice emergency procedures, connect learners with family and community response systems, and develop habits that support collective resilience. Recent disaster-education research increasingly treats children and adolescents as active participants in risk reduction rather than as passive recipients of warnings and instructions.

Evidence also shows that disaster education is most effective when it extends beyond awareness campaigns. Sakurai, Sato, and Murayama (2020) found that a school-based disaster education program supported long-term community engagement among disaster-affected students, although improvements in preparedness behavior were less pronounced than gains in participation. Shah et al. (2020) similarly identified schools as important settings for improving children's flood-risk knowledge and preparedness, while Parham et al. (2021) reported that practical, context-relevant, and participatory teaching approaches had stronger effects on student hazard perceptions than more passive methods. Together, these findings highlight a persistent challenge: knowledge is necessary, but it does not automatically become practiced protective behavior.

The school context can also influence households and communities. Harada, Shoji, and Takafuji (2023) documented intergenerational spillover effects from school-based disaster education, with children transmitting disaster information that influenced parents' attitudes and behaviors. Mutch (2023) emphasized that schools can build social capital and community resilience before, during, and after disasters, while Amri et al. (2022) showed that sustained integration of disaster risk reduction education requires coordination among schools, government, families, and communities. Seddighi et al. (2023) further identified communication, planning, coordination, logistics, and inclusive access as recurring implementation challenges in school disaster education.

These issues are especially relevant in the Philippines, where multiple natural hazards occur and school DRRM is embedded in national policy. Republic Act No. 10121 established a national framework for disaster risk reduction and management and emphasized preparedness, capacity development, community participation, and the mainstreaming of DRRM into education. Department of Education Order No. 37, s. 2015 institutionalized a comprehensive DRRM framework in basic education and directed schools to strengthen structures, systems, protocols, and practices for preparedness, response, recovery, and resilience.

Recent Philippine research also indicates that preparedness behavior is shaped by more than hazard knowledge. Ong et al. (2021), studying earthquake preparedness, found that attitude, perceived severity, subjective norms, and media influence affected intention to prepare. Gumasing et al. (2022) showed that perceived severity, self-efficacy, understanding of a typhoon, susceptibility, and previous experience interacted in shaping response efficacy. Kurata et al. (2022) demonstrated that typhoon-flood knowledge and experience influenced perceived severity and vulnerability, which subsequently contributed to behavioral control, subjective norms, attitudes, and response intentions. Pascual et al. (2024) similarly identified knowledge, previous experience, perceived severity, perceived vulnerability, and subjective norms as relevant to flash-flood preparedness.

The distinction between awareness and practice therefore warrants direct empirical examination in school settings. Students may know evacuation routes, recognize warning signs, understand the need for emergency kits, or identify appropriate protective actions, yet still differ in whether they consistently carry out these measures. School exposure to drills, opportunities to practice, confidence, perceived responsibility, access to resources, peer and family influence, and previous disaster experience can all shape the conversion of knowledge into action.

Against this background, the present study examined the DRRM awareness and reported practices of junior and senior high school students at Guihulngan National Agricultural School in Guihulngan City, Negros Oriental. The study focused on four locally relevant hazards—earthquakes, floods, typhoons, and landslides—and assessed whether awareness and practices differed according to age, sex, and grade level. It also tested whether higher awareness was associated with stronger DRRM practice. The results were used to formulate an action-oriented school disaster management plan.

Theoretical and Policy Framework

The study is anchored on Protection Motivation Theory (PMT) and the Theory of Planned Behavior (TPB). PMT, introduced by Rogers (1975), explains protective action through threat appraisal and coping appraisal. Threat appraisal concerns perceived severity and vulnerability, while coping appraisal concerns whether a recommended action is effective, whether the individual feels capable of performing it, and whether perceived barriers make the action difficult. In disaster contexts, awareness can support these appraisals by helping individuals recognize hazards, anticipate consequences, and understand recommended responses. However, awareness alone does not ensure action because protective behavior also depends on perceived susceptibility, self-efficacy, response efficacy, and other contextual conditions.

TPB (Ajzen, 1991) complements PMT by explaining how attitudes, subjective norms, perceived behavioral control, and behavioral intentions contribute to actual behavior. In school DRRM, learners may understand what to do but differ in whether they value preparedness activities, feel social encouragement from teachers and family members, believe they can perform emergency procedures, or have practical opportunities to do so. Wang and Tsai (2022) found that attitude, subjective norm, and perceived behavioral control influenced school disaster-preparedness behavior, supporting the relevance of TPB to educational disaster settings.

Recent Philippine studies have successfully combined PMT and TPB. Ong et al. (2021), Kurata et al. (2022), Pascual et al. (2024), and de Veluz et al. (2025) collectively show that knowledge, risk appraisal, attitudes, family and community influence, media information, previous experience, and perceived behavioral control jointly shape preparedness intentions and responses. This combined framework supports the present study's treatment of awareness and practice as related but distinct constructs whose association must be tested rather than assumed.

The theoretical framework is reinforced by Republic Act No. 10121 and DepEd Order No. 37, s. 2015. The former provides the national legal mandate for strengthening disaster knowledge, preparedness, institutional capacity, and community participation, while the latter translates these principles into school-based systems and practices. In this study, awareness represents students' understanding of hazards, warnings, vulnerabilities, and recommended protective actions, while DRRM practices represent reported application of preparedness and protective measures before, during, and after disasters.

METHODOLOGY

The study employed a quantitative descriptive-comparative-correlational survey design. The descriptive component measured students' level of awareness concerning earthquakes, floods, typhoons, and landslides and the extent of their reported DRRM practices. The comparative component examined whether awareness and practices differed when respondents were grouped according to age, sex, and grade level. The correlational component determined the strength and direction of the association between overall awareness and overall DRRM practice. The design was nonexperimental because the variables were measured as they naturally occurred without manipulation.

The study was conducted at Guihulngan National Agricultural School in Barangay Plagatasanon, Guihulngan City, Negros Oriental, during School Year 2024–2025. The school serves junior and senior high school learners from communities that may experience earthquakes, typhoons, floods, and rain-induced landslides and implements school safety orientations, emergency procedures, and disaster-preparedness activities.

The population consisted of 324 students enrolled in Grades 7–12. A sample of 179 students was determined and proportionately allocated across grade levels through stratified random sampling. The resulting sample included 29 Grade 7 students, 35 Grade 8 students, 40 Grade 9 students, 40 Grade 10 students, 15 Grade 11 students, and 20 Grade 12 students.

Table 1. Distribution of respondents by grade level

Grade level	n	%
7	29	16.20
8	35	19.55
9	40	22.35
10	40	22.35
11	15	8.38
12	20	11.17
Total	179	100.00

Data were gathered through a researcher-developed questionnaire covering students' demographic profile, hazard awareness, and DRRM practices. The instrument was reviewed by five evaluators using the Good and Scates validation procedure. After expert validation, a dry run was conducted among students who were not

included in the final sample, and reliability testing was undertaken using Cronbach's alpha. Because the revised manuscript does not report the resulting alpha coefficient, no numerical reliability estimate is claimed in this paper.

The survey used a five-point scale. Awareness means were interpreted as Very Much Aware (4.21–5.00), Much Aware (3.41–4.20), Aware (2.61–3.40), Slightly Aware (1.81–2.60), and Not Aware (1.00–1.80). Practice means were interpreted as Very Highly Practiced (4.21–5.00), Highly Practiced (3.41–4.20), Practiced (2.61–3.40), Less Practiced (1.81–2.60), and Not Practiced at All (1.00–1.80).

Frequency and percentage described the sample, while weighted means summarized hazard awareness and DRRM practices. An independent-samples t-test was specified for sex comparisons, and one-way analysis of variance was used for age and grade-level comparisons. Pearson's product-moment correlation coefficient measured the association between overall awareness and DRRM practices. All inferential tests were evaluated at $\alpha=.05$. The statistical values reported in the revised results tables were treated as the authoritative values for interpretation.

Ethical procedures included securing institutional and school approval, explaining the purpose of the study and the voluntary nature of participation, maintaining confidentiality of responses, and observing applicable parental-consent and learner-assent procedures because the respondents were minors.

RESULTS AND DISCUSSION

Awareness of Earthquakes, Floods, Typhoons, and Landslides

Across the four hazards, students demonstrated generally high awareness. Earthquakes and floods each obtained an overall mean of 4.13, landslides 3.98, and typhoons 3.91; all were interpreted as Much Aware. The values indicate that respondents generally understood hazard risks, warning information, vulnerable locations, precautionary measures, and appropriate responses. The relatively narrow range of means also suggests that awareness was not concentrated in only one hazard category.

Table 2. Overall DRRM awareness by Hazard

Hazard	Weighted mean	Interpretation
Earthquake	4.13	Much Aware
Flood	4.13	Much Aware
Typhoon	3.91	Much Aware
Landslide	3.98	Much Aware

Earthquake awareness was well established across the sample. The overall mean of 4.13 was accompanied by generally high subgroup means, although some age and grade differences were visible descriptively. Wei, Su, and Li (2020) reported that earthquake cognition and response among middle and high school students can vary with demographic characteristics, prior experience, and exposure to disaster information. Zhang et al. (2025) likewise found that earthquake awareness among high school students was shaped by educational experiences and extracurricular disaster-related activities. These findings support continued school-wide earthquake education even where baseline awareness is already high.

The earthquake result also underscores the importance of repeated practice. Vinnell et al. (2020) found that participation in a ShakeOut drill was associated with better knowledge of appropriate protective actions and additional preparedness behaviors. Parlak et al. (2023) similarly reported improved compliance with emergency plans after repeated earthquake drills. Thus, awareness should be reinforced through recurring opportunities to

practice protective actions, evacuation, communication, and post-event procedures rather than treated as an endpoint.

Flood awareness also reached 4.13. This finding is consistent with evidence that learners in hazard-prone communities can develop substantial flood knowledge, but preparedness depends on how risk information is communicated and practiced. Intaramuean, Nonomura, and Boonrod (2024), studying primary students in flood-prone areas, identified factors associated with flood knowledge, risk perception, and preparedness. Velásquez-Espinoza and Alcántara-Ayala (2025) likewise emphasized that student-centered disaster education and effective risk communication remain necessary even when learners recognize flood hazards.

Typhoon awareness had the lowest of the four hazard means, although 3.91 remained within the Much Aware category. The result indicates a sound knowledge base but also suggests room for stronger reinforcement of weather warnings, emergency supplies, evacuation decisions, and family preparedness. Huang et al. (2022) showed that trust and risk perception influence how high school students interpret typhoon risk, while Gumasing et al. (2022) demonstrated that understanding of a typhoon interacts with perceived severity, susceptibility, self-efficacy, and previous experience in shaping response efficacy.

Landslide awareness obtained a mean of 3.98. The result is important because landslide risk often involves interacting geological, environmental, and human factors that may be difficult for students to recognize without local examples. Wang et al. (2022) found that combined disaster education approaches—including classroom training, emergency materials, and evacuation drills—strengthened risk perception in geohazard-prone communities. MacAfee, Lohr, and de Jong (2024) further showed that local knowledge can improve understanding of the interconnected conditions that contribute to landslide risk. School activities should therefore connect landslide concepts with local slope conditions, rainfall, drainage, vegetation, warning signs, hazard maps, and evacuation routes.

Extent of DRRM Practices

Students reported a high extent of DRRM practice overall. The weighted mean was 4.04, interpreted as Highly Practiced. Of the 179 respondents, 157 fell within the Highly Practiced category, 15 within Very Highly Practiced, and seven within Practiced; none were classified as Less Practiced or Not Practiced at All. This distribution suggests that protective and preparedness behaviors were already embedded to a meaningful degree in the school population.

Descriptive subgroup patterns nevertheless indicate variation. Among age groups, the highest mean was reported by 11-year-old respondents (4.33, Very Highly Practiced), whereas the lowest was observed among 16-year-olds (3.88, Highly Practiced). Male students had a mean of 4.08 and female students 4.02. By grade level, Grade 7 reported the highest mean (4.21, Very Highly Practiced), while Grade 10 reported the lowest (3.93, Highly Practiced). These descriptive differences should not be interpreted as statistically meaningful without the inferential tests reported in the next section.

Table 3. Summary of DRRM practice levels

Grouping	Category	Weighted mean	Interpretation
Sex	Male	4.08	Highly Practiced
Sex	Female	4.02	Highly Practiced
Grade level	7	4.21	Very Highly Practiced
Grade level	8	4.06	Highly Practiced
Grade level	9	4.03	Highly Practiced

Grade level	10	3.93	Highly Practiced
Grade level	11	4.07	Highly Practiced
Grade level	12	4.05	Highly Practiced
Overall	All respondents	4.04	Highly Practiced

The high overall practice score is consistent with evidence that repeated school exposure to DRRM activities can strengthen behavior. Gokmenoglu et al. (2021) reported that a school-based disaster education program produced changes in knowledge, attitudes, and behavior. Amini Hosseini and Izadkhah (2020) described how school drills can develop self-protection, evacuation, and local emergency-response capacity, while Parlak et al. (2023) showed that repeating a drill improved adherence to an emergency disaster plan.

At the same time, a high self-reported practice score should not be equated with verified mastery of emergency skills. Aslanoğlu et al. (2024) demonstrated that structured education and training can significantly improve disaster preparedness, reinforcing the value of repeated and organized interventions. For Guihulngan National Agricultural School, the practical implication is to complement self-report measures with observable indicators such as correct execution of drill procedures, evacuation time, identification of safe areas, emergency communication, and performance of assigned roles.

Group Differences in Awareness and Practices

Inferential tests showed that overall DRRM awareness did not differ significantly by age, sex, or grade level. In contrast, DRRM practices differed significantly by grade level, but not by age or sex. The results indicate that students across demographic groups shared broadly comparable levels of awareness, whereas the degree to which preparedness behaviors were reported varied across year levels.

Table 4. Inferential results for awareness, practices, and their relationship

Outcome	Grouping / test	Statistic	p-value	Interpretation
Awareness	Age	F=0.624	.792	Not significant
Awareness	Sex	F=1.591	.209	Not significant
Awareness	Grade level	F=1.920	.093	Not significant
DRRM practices	Age	F=1.880	.051	Not significant
DRRM practices	Sex	F=0.791	.375	Not significant
DRRM practices	Grade level	F=3.471	.005	Significant
Awareness vs. practices	Pearson correlation	r=-0.1025	.174257	Not significant

The absence of significant differences in awareness suggests that DRRM knowledge was broadly distributed across the school population. Shared exposure to classroom integration, safety orientations, drills, announcements, media, and community experiences may have contributed to this relatively uniform awareness. The finding does not imply that all students possessed identical knowledge; rather, the observed variation was insufficient to establish statistically significant group differences at the .05 level.

Research from other settings shows that demographic effects are not uniform. Ciftci and Ciftci (2024) reported that disaster-awareness responses among international students were associated with age, gender, previous experience, and prior training in some analyses. The contrast with the present findings suggests that demographic

effects depend on hazard context, population characteristics, and educational exposure. Zhang et al. (2025) similarly emphasized the role of educational experiences in shaping high school students' disaster awareness, which may help explain why a common school environment can narrow differences across groups.

For practices, age produced $p=.051$ and sex $p=.375$, neither reaching statistical significance. Grade level, however, yielded $F=3.471$ and $p=.005$, indicating a statistically significant difference in the extent of DRRM practice across year levels. The descriptive means provide context: Grade 7 had the highest practice mean (4.21) and Grade 10 the lowest (3.93). The omnibus result confirms that the grade-level differences, taken collectively, were statistically meaningful, although the available analysis does not identify which specific pairs of grade levels differed. A post hoc comparison would be necessary for pairwise claims.

The significant grade-level pattern supports a vertically articulated DRRM program. Rather than providing identical activities to all year levels, the school can progressively increase the complexity of preparedness tasks: guided protective actions and route familiarization in lower grades; scenario analysis, emergency communication, hazard mapping, peer leadership, first aid, and coordination roles in higher grades. Such sequencing can reinforce skills over time and reduce unevenness in practical preparedness across grade levels.

Relationship Between Awareness and DRRM Practices

The correlation between overall DRRM awareness and practices was $r=-0.1025$ with $p=.174257$. The coefficient indicates a very weak negative association, and the p -value exceeded .05; therefore, no statistically significant relationship was established in this sample. Students who reported higher awareness did not necessarily report stronger DRRM practice.

This result should not be interpreted as evidence that awareness is unimportant. Instead, it indicates that knowledge alone may be insufficient to produce consistent behavior. PMT and TPB both anticipate this possibility: protective action can depend on perceived vulnerability, severity, response efficacy, self-efficacy, attitude, subjective norms, perceived behavioral control, resources, opportunities to practice, and social reinforcement. Recent Philippine studies support this multidimensional view of preparedness (Ong et al., 2021; Kurata et al., 2022; Pascual et al., 2024; de Veluz et al., 2025).

Broader empirical evidence also cautions against assuming a simple knowledge-to-action pathway. Velásquez-Espinoza and Alcántara-Ayala (2025) found that students could possess flood awareness while still showing limitations in preparedness and confidence. Trinh and Jensen (2025), using data from more than 125,000 respondents in 121 countries, similarly found that preparedness was associated with broader engagement with risk information rather than mere exposure to a single source. The present result therefore strengthens the case for DRRM programming that explicitly links information with repeated performance.

For the school, the implication is practical: awareness-building should be paired with drills, simulations, demonstrations, assigned emergency roles, hazard mapping, family preparedness tasks, and reflection after exercises. Monitoring should also include observable performance indicators rather than relying solely on self-reported knowledge and practice.

Proposed School DRRM Response

The study findings were translated into a proposed school disaster management response designed to sustain existing awareness while strengthening the conversion of knowledge into observable preparedness behavior. The plan is grounded in three empirical findings: students were generally much aware of the four hazards; DRRM practices were highly practiced but differed significantly by grade level; and awareness was not significantly correlated with practice. Accordingly, the proposed response emphasizes repeated practice, grade-responsive skill development, family and community linkages, and performance-based monitoring.

The plan is intended for year-round implementation under the leadership of the school principal and School DRRM Team, in coordination with teachers, learners, parents, local government and DRRM personnel, barangay officials, health and emergency-response partners, and other authorized stakeholders. Activities should be

integrated into existing school planning and budgeting processes and aligned with Republic Act No. 10121 and DepEd Order No. 37, s. 2015.

Table 5. School DRRM Implementation Priorities

Priority area	Key actions	Expected evidence
Earthquake preparedness	Update evacuation maps; reinforce Drop-Cover-Hold; conduct repeated drills; use drill scorecards; send family preparedness checklists.	Updated maps and protocols; documented drills; high rate of correct protective actions.
Flood and typhoon preparedness	Map flood-prone areas; interpret warning information; practice evacuation and emergency communication; demonstrate go-bag and household readiness.	Updated hazard/route maps; documented simulations; correct warning, route, and evacuation decisions.
Landslide preparedness	Use local slope-risk examples; identify warning signs; practice reporting and evacuation; coordinate technical orientation where available.	Risk information guide; documented scenario exercise; correct identification of warning signs and response actions.
Grade-responsive skills	Sequence tasks by grade level; use common performance rubrics; assign progressively complex roles and practical tasks.	All grade levels complete performance tasks; comparable rubric data; documented skill progression.
Awareness-to-practice monitoring	Use pre/post checks, drill observation checklists, quarterly review, corrective coaching, and annual reporting.	Monitoring file, drill scorecards, practical assessment results, corrective actions, annual DRRM report.

The proposed response is consistent with evidence that practical and participatory disaster education can improve preparedness. Amini Hosseini and Izadkhah (2020) emphasized the role of drills in developing school and community capacity; Gokmenoglu et al. (2021) documented behavioral gains from a school-based disaster education program; Parham et al. (2021) demonstrated the value of participatory teaching approaches; and Harada et al. (2023) showed that school-based education can produce beneficial spillover effects within families. These findings support a model in which learners repeatedly practice what they know and share preparedness knowledge beyond the school.

CONCLUSION AND RECOMMENDATIONS

Junior and senior high school students of Guihulngan National Agricultural School demonstrated substantial awareness of earthquakes, floods, typhoons, and landslides and reported a high extent of DRRM practice. Awareness was broadly comparable across age, sex, and grade level. Practices, however, differed significantly by grade level, suggesting that students at different year levels may have unequal exposure to, opportunities for, or reinforcement of preparedness activities.

The absence of a statistically significant relationship between awareness and practice is the study's central practical finding. It indicates that knowing about hazards and appropriate safety measures does not necessarily translate into consistently practiced protective behavior. The result is consistent with theoretical and empirical work showing that preparedness is shaped by psychological, social, experiential, and contextual influences in addition to knowledge.

The school should therefore sustain hazard-awareness activities while giving greater emphasis to performance-based DRRM learning. Repeated drills, realistic simulations, hazard mapping, emergency communication exercises, family preparedness tasks, and grade-responsive responsibilities should be embedded across the

school year. Practical competence should be monitored through observation checklists, drill performance, route identification, role execution, and post-activity reflection. The school should also strengthen coordination with parents, local DRRM offices, barangay officials, emergency-response agencies, and other authorized partners.

Future research should extend the study across multiple schools, use validated preparedness measures and objective behavioral indicators, examine disaster experience, drill participation, risk perception, self-efficacy, family preparedness, and information exposure, and apply longitudinal or intervention designs to determine whether gains in awareness are followed by sustained protective behavior. Because the present study is cross-sectional and based largely on self-report, its findings are associative and should not be interpreted as causal.

Limitations and Directions for Future Research

Several limitations should guide interpretation of the findings. First, awareness and DRRM practices were measured primarily through a self-report questionnaire. Self-report data are useful for describing students' perceptions and reported behavior, but they can be affected by recall error, social desirability, and differences in how respondents interpret response categories. A learner who reports that a preparedness behavior is highly practiced may not necessarily perform every step correctly under time pressure or in an actual emergency. For this reason, future school-based studies should combine questionnaires with performance-based measures such as drill observation rubrics, evacuation-time records, scenario responses, practical demonstrations, and direct verification of route and safe-area knowledge.

Second, the study was cross-sectional and conducted in a single public secondary school. The results therefore describe associations and group differences within the study population and should not be generalized automatically to all secondary schools in Negros Oriental or the Philippines. School location, hazard history, DRRM program maturity, teacher practices, family preparedness, and local government support may differ substantially across settings. Multi-school and district-level studies would provide stronger evidence about whether the patterns observed here—particularly the weak awareness-practice association and the grade-level difference in practice—are reproduced in other contexts.

Third, the available inferential results identify a significant overall difference in DRRM practices across grade levels but do not include post hoc pairwise comparisons. The analysis therefore supports the conclusion that at least some grade-level means differed, but it does not justify identifying a specific pair of grade levels as statistically different. Future analyses should retain the original learner-level dataset, verify assumptions for the selected tests, and conduct appropriate post hoc procedures when an omnibus test is significant. Likewise, the revised manuscript documents expert validation, pilot administration, and Cronbach's alpha testing of the questionnaire but does not report the final reliability coefficient; publication-quality replication should report the reliability evidence for each scale explicitly.

Finally, the study assessed awareness of four hazards and overall DRRM practice but did not directly measure several psychological and contextual mechanisms emphasized by PMT and TPB, including perceived vulnerability, response efficacy, self-efficacy, subjective norms, perceived behavioral control, disaster experience, and access to preparedness resources. Including these variables could clarify why students with similarly high awareness may differ in protective action. Longitudinal and intervention studies are particularly important because they can test whether repeated drills, simulations, family-based assignments, peer leadership, and other school interventions produce durable changes in actual preparedness behavior over time. Such designs would move the evidence base beyond description toward a clearer understanding of how school DRRM education can convert knowledge into reliable protective action.

REFERENCES

1. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
2. Amini Hosseini, K., & Izadkhah, Y. O. (2020). From “Earthquake and safety” school drills to “safe school–resilient communities”: A continuous attempt for promoting community-based disaster risk management in Iran. *International Journal of Disaster Risk Reduction*, 45, 101512. <https://doi.org/10.1016/j.ijdrr.2020.101512>
3. Amri, A., Lassa, J. A., Tebe, Y., Hanifa, N. R., Kumar, J., & Sagala, S. (2022). Pathways to disaster risk reduction education integration in schools: Insights from SPAB evaluation in Indonesia. *International Journal of Disaster Risk Reduction*, 73, 102860. <https://doi.org/10.1016/j.ijdrr.2022.102860>
4. Aslanoğlu, A., Bilgiç, N., Murad, A. A., Elshatarat, R. A., Abujaber, D. A., Al Qasim, E., Siddiq, N. A., Sobeh, D. E., Eltayeb, M. M., & Saleh, Z. T. (2024). The impact of educational and training programs on disaster awareness and preparedness among health sciences students: A quasi-experimental study. *International Journal of Disaster Risk Reduction*, 113, 104888. <https://doi.org/10.1016/j.ijdrr.2024.104888>
5. Ciftci, S., & Ciftci, L. (2024). Disaster awareness levels and institutional responsibility perceptions of international students in Turkey. *International Journal of Disaster Risk Reduction*, 114, 104939. <https://doi.org/10.1016/j.ijdrr.2024.104939>
6. Department of Education. (2015). DepEd Order No. 37, s. 2015: The comprehensive disaster risk reduction and management in basic education framework. Department of Education, Republic of the Philippines.
7. de Veluz, M. R. D., Ong, A. K. S., Redi, A. A. N. P., Maaliw, R. R., Lagrazon, P. G., & Monetiro, C. N. (2025). Expanding integrated protection motivation theory and theory of planned behavior: The role of source of influence in flood and typhoon risk preparedness intentions in Quezon Province, Philippines. *Climate Risk Management*, 48, 100706. <https://doi.org/10.1016/j.crm.2025.100706>
8. Gokmenoglu, T., Dasci Sonmez, E., Yavuz, I., & Gok, A. (2021). Turkish Ministry of National Education school-based disaster education program: Preliminary results of the program evaluation. *International Journal of Disaster Risk Reduction*, 52, 101943. <https://doi.org/10.1016/j.ijdrr.2020.101943>
9. Gumasing, M. J. J., Prasetyo, Y. T., Ong, A. K. S., & Nadlifatin, R. (2022). Determination of factors affecting the response efficacy of Filipinos under Typhoon Conson 2021 (Jolina): An extended protection motivation theory approach. *International Journal of Disaster Risk Reduction*, 70, 102759. <https://doi.org/10.1016/j.ijdrr.2021.102759>
10. Harada, T., Shoji, M., & Takafuji, Y. (2023). Intergenerational spillover effects of school-based disaster education: Evidence from Indonesia. *International Journal of Disaster Risk Reduction*, 85, 103505. <https://doi.org/10.1016/j.ijdrr.2022.103505>
11. Huang, L., Zhang, F., Wu, X., Peng, Y., Bao, H., & Zhang, Y. (2022). High school students’ trust and risk perception of typhoon disaster: Moderating role of government ability in disaster management. *International Journal of Disaster Risk Reduction*, 71, 102816. <https://doi.org/10.1016/j.ijdrr.2022.102816>
12. Intaramuean, M., Nonomura, A., & Boonrod, T. (2024). Exploring the factors associated with final-year primary school students’ flood knowledge, risk perception, and preparedness in flood-prone areas of South Thailand. *International Journal of Disaster Risk Reduction*, 111, 104697. <https://doi.org/10.1016/j.ijdrr.2024.104697>
13. Kurata, Y. B., Prasetyo, Y. T., Ong, A. K. S., Nadlifatin, R., & Chuenyindee, T. (2022). Factors affecting perceived effectiveness of Typhoon Vamco (Ulysses) flood disaster response among Filipinos in Luzon, Philippines: An integration of protection motivation theory and extended theory of planned behavior. *International Journal of Disaster Risk Reduction*, 67, 102670. <https://doi.org/10.1016/j.ijdrr.2021.102670>
14. MacAfee, E., Lohr, A. J., & de Jong, E. (2024). Leveraging local knowledge for landslide disaster risk reduction in an urban informal settlement in Manado, Indonesia. *International Journal of Disaster Risk Reduction*, 111, 104710. <https://doi.org/10.1016/j.ijdrr.2024.104710>
15. Mutch, C. (2023). How schools build community resilience capacity and social capital in disaster preparedness, response and recovery. *International Journal of Disaster Risk Reduction*, 92, 103735. <https://doi.org/10.1016/j.ijdrr.2023.103735>

16. Ong, A. K. S., Prasetyo, Y. T., Lagura, F. C., Ramos, R. N., Sigua, K. M., Villas, J. A., Young, M. N., Diaz, J. F. T., Persada, S. F., & Redi, A. A. N. P. (2021). Factors affecting intention to prepare for mitigation of “The Big One” earthquake in the Philippines: Integrating protection motivation theory and extended theory of planned behavior. *International Journal of Disaster Risk Reduction*, 63, 102467. <https://doi.org/10.1016/j.ijdrr.2021.102467>
17. Parham, M., Teeuw, R., Solana, M. C., & Day, S. (2021). Quantifying the impact of educational methods for disaster risk reduction: A longitudinal study assessing the impact of teaching methods on student hazard perceptions. *International Journal of Disaster Risk Reduction*, 52, 101978. <https://doi.org/10.1016/j.ijdrr.2020.101978>
18. Parlak, L., Kaya, N., Duru, P., & Örsal, Ö. (2023). Behaviors of a group of university students during an earthquake drill and their compliance with the emergency disaster plan: An action research. *International Journal of Disaster Risk Reduction*, 93, 103768. <https://doi.org/10.1016/j.ijdrr.2023.103768>
19. Pascual, L. A. C. A., Pascual, L. L., Ong, A. K. S., Briggs, C. M., Diaz, J. F. T., & German, J. D. C. (2024). Factors affecting the intention to prepare for flash floods in the Philippines. *International Journal of Disaster Risk Reduction*, 112, 104794. <https://doi.org/10.1016/j.ijdrr.2024.104794>
20. Republic of the Philippines. (2010). Republic Act No. 10121: Philippine Disaster Risk Reduction and Management Act of 2010.
21. Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *The Journal of Psychology*, 91(1), 93–114. <https://doi.org/10.1080/00223980.1975.9915803>
22. Sakurai, A., Sato, T., & Murayama, Y. (2020). Impact evaluation of a school-based disaster education program in a city affected by the 2011 Great East Japan earthquake and tsunami disaster. *International Journal of Disaster Risk Reduction*, 47, 101632. <https://doi.org/10.1016/j.ijdrr.2020.101632>
23. Seddighi, H., Lopez, M. L., Zwitter, A., Muldoon, M. L., Sajjadi, H., & Yousefzadeh, S. (2023). Non-formal disaster education programs for school students in Iran: A qualitative study of the challenges experienced by stakeholders. *International Journal of Disaster Risk Reduction*, 86, 103531. <https://doi.org/10.1016/j.ijdrr.2023.103531>
24. Shah, A. A., Gong, Z., Ali, M., Sun, R., Naqvi, S. A. A., & Arif, M. (2020). Looking through the lens of schools: Children’s perception, knowledge, and preparedness for flood disaster risk management in Pakistan. *International Journal of Disaster Risk Reduction*, 50, 101907. <https://doi.org/10.1016/j.ijdrr.2020.101907>
25. Trinh, T. T., & Jensen, O. (2025). Finding out about disaster risk: Global evidence on who seeks information, which sources they use, and whether it makes them better prepared. *International Journal of Disaster Risk Reduction*, 124, 105553. <https://doi.org/10.1016/j.ijdrr.2025.105553>
26. Velásquez-Espinoza, G., & Alcántara-Ayala, I. (2025). Flood risk perception and preparedness in Nicaraguan educational contexts: A study of student perspectives. *International Journal of Disaster Risk Reduction*, 120, 105375. <https://doi.org/10.1016/j.ijdrr.2025.105375>
27. Vinnell, L. J., Wallis, A., Becker, J. S., & Johnston, D. M. (2020). Evaluating the ShakeOut drill in Aotearoa/New Zealand: Effects on knowledge, attitudes, and behaviour. *International Journal of Disaster Risk Reduction*, 48, 101721. <https://doi.org/10.1016/j.ijdrr.2020.101721>
28. Wang, J.-J., & Tsai, N.-Y. (2022). Factors affecting elementary and junior high school teachers’ behavioral intentions toward school disaster preparedness based on the theory of planned behavior. *International Journal of Disaster Risk Reduction*, 69, 102757. <https://doi.org/10.1016/j.ijdrr.2021.102757>
29. Wang, X., Peng, L., Huang, K., & Deng, W. (2022). Identifying the influence of disaster education on the risk perception of rural residents in geohazard-prone areas: A propensity score-matched study. *International Journal of Disaster Risk Reduction*, 71, 102795. <https://doi.org/10.1016/j.ijdrr.2022.102795>
30. Wei, B., Su, G., & Li, Y. (2020). Evaluating the cognition and response of middle/high school students to earthquakes: A case study from the 2013 Mw 6.6 Lushan earthquake-hit area, China. *International Journal of Disaster Risk Reduction*, 51, 101825. <https://doi.org/10.1016/j.ijdrr.2020.101825>
31. Zhang, T.-F., Su, G.-W., Qi, W.-H., Sun, L., Wei, B.-Y., Guo, X.-X., Pei, M.-C., & Gao, Y. (2025). Characteristics of earthquake disaster awareness among Chinese high school students and implications for disaster education improvement: A case study in the Weinan area of China. *International Journal of Disaster Risk Reduction*, 125, 105564. <https://doi.org/10.1016/j.ijdrr.2025.105564>