

Knowledge, Attitudes and Practices in School Disaster Risk Reduction and Management of Elementary School Heads in Fourth Congressional District of Quezon: Basis for Development of School Safety Manual

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Abstract

This study assessed the knowledge, attitudes, and practices of elementary school heads in School Disaster Risk Reduction and Management (SDRRM) in the Fourth Congressional District of Quezon, Philippines, during School Year 2024–2025, as a basis for developing a School Safety Manual. Anchored on the Knowledge–Attitude–Practice Theory and Comprehensive School Safety Framework, the study employed a quantitative descriptive–correlational design involving 38 elementary school heads selected through cluster sampling. Data were collected using an expert-validated, researcher-developed questionnaire and analyzed through weighted means, standard deviations, and Spearman’s rank correlation. Findings revealed high overall SDRRM knowledge ($M = 4.17$, $SD = 0.778$), very favorable attitudes ($M = 4.57$, $SD = 0.654$), and consistently implemented practices ($M = 4.44$, $SD = 0.654$). Significant positive relationships were established between knowledge and attitudes ($\rho = 0.544$, $p < .001$), knowledge and practices ($\rho = 0.480$, $p = .002$), and attitudes and practices ($\rho = 0.603$, $p < .001$). Implementation challenges ($M = 3.67$, $SD = 1.054$) involved inadequate funding, limited technical expertise, infrastructure safety, instructional resources, and stakeholder coordination, despite consistently applied coping strategies ($M = 4.29$, $SD = 0.750$). The findings supported developing a localized School Safety Manual and recommended specialized training, sustained technical assistance, adequate resource allocation, and stronger stakeholder collaboration. The study aligns with Sustainable Development Goals 3, 4, 11, 13, and 17 by supporting school safety, educational continuity, community resilience, climate adaptation, and institutional partnerships. Its sustainability contribution lies in providing evidence-based guidance for strengthening school governance, inclusive disaster preparedness, resource management, and resilient learning environments.

Keywords: Comprehensive School Safety Framework, Coping Strategies, Disaster Preparedness, Disaster Risk Reduction Education, Elementary School Heads, Knowledge–Attitude–Practice Theory, School Disaster Risk Reduction and Management, School Safety Manual, Sustainable Development Goals

1. Introduction

School Disaster Risk Reduction and Management (SDRRM) is essential to ensuring safe learning environments, protecting school communities, and sustaining educational continuity during disasters. In the Philippines, where exposure to typhoons, earthquakes, flooding, and climate-related hazards remains a significant concern, elementary school heads are responsible for translating disaster preparedness policies into effective school-level practices. Their knowledge, attitudes, and practices influence the implementation of safety measures, emergency preparedness, disaster response, and resilience education. Guided by the Knowledge–Attitude–Practice (KAP) Theory and the Comprehensive School Safety Framework, this study assessed the knowledge, attitudes, and practices of elementary school heads in the Fourth Congressional District of Quezon during School Year 2024–2025. It examined the relationships among these variables, the problems encountered in SDRRM implementation, and the coping strategies employed by school heads. The findings served as the basis for developing a context-responsive School Safety Manual to strengthen disaster preparedness, educational resilience, and sustainable school safety management.

The Philippines is highly vulnerable to natural and climate-related disasters because of its geographical location along the Pacific Ring of Fire and typhoon belt. Republic Act No. 9729, or the Philippine Climate Change Act of 2009, recognizes the country's exposure to environmental hazards, including typhoons, flooding, rising sea levels, and prolonged droughts. These conditions emphasize the importance of coordinated disaster prevention, preparedness, mitigation, response, and recovery across educational institutions and communities. Schools are essential institutions for learning, community protection, and disaster resilience. However, disasters threaten school infrastructure, disrupt instruction, damage educational resources, and expose learners and personnel to physical and psychological risks. The use of classrooms as evacuation centers may further affect educational continuity, particularly when facilities become damaged or unsuitable for instruction. Consequently, school safety requires preventive planning, effective facility management, emergency preparedness, and coordinated stakeholder participation. The World Bank (2022) likewise highlights the importance of resilient education systems, disaster preparedness, and school leadership in strengthening institutional capacity to sustain learning during emergencies. The UNESCO (2022), developed through international collaboration, identifies three essential pillars of school resilience: Safe Learning Facilities, School Disaster Management, and Disaster Risk Reduction and Resilience Education. These pillars emphasize the protection of educational infrastructure, institutional preparedness, and the integration of disaster resilience into teaching and learning. UNESCO (2023) highlights that comprehensive school safety contributes to educational continuity and inclusive, equitable quality education, particularly amid increasing climate-related hazards. In the Philippine educational system, the Department of Education (DepEd), through its Disaster Risk Reduction and Management Service (DRRMS), promotes the integration of disaster risk reduction, climate change adaptation, and education in emergencies into school governance. Effective implementation, however, depends substantially on the leadership capacity of school administrators. Aquino et al. (2023) emphasized that collaborative leadership, stakeholder engagement, and effective decision-making strengthen institutional resilience, while Gabuya's (2024) analysis demonstrated that proactive administrators, personnel training, and effective resource management contribute to greater school preparedness. Despite established policies and frameworks, differences in school-level implementation persist because of limitations in funding, technical capacity, instructional resources, and institutional coordination. These conditions highlight the importance of assessing the knowledge, attitudes, and practices of elementary school heads to determine their preparedness and identify areas requiring improvement. Accordingly, the present study examined SDRRM implementation in the Fourth Congressional District of Quezon as a basis for developing a School Safety Manual responsive to the needs of elementary schools.

Related literature identifies school leadership, disaster preparedness knowledge, safety-oriented attitudes, institutional practices, and stakeholder collaboration as essential dimensions of effective SDRRM. UNDRR and UNICEF (2024) emphasized inclusive, community-based, and child-centered disaster risk reduction education, while Masocha et al. (2025) found that disaster education frequently emphasizes knowledge and emergency response more than participatory learning and practical application. Similarly, Galang and Astillero (2025) identified gaps in learners' understanding of disaster mitigation and recovery despite strong awareness of response procedures. Mutanda and Ngcamu (2026) further established the importance of committed school leadership in strengthening disaster preparedness despite financial and technical limitations.

Knowledge of school heads in SDRRM. Knowledge provides the foundation for understanding disaster risks, safety policies, emergency procedures, and institutional preparedness. Tolentino (2021) found that Philippine school administrators demonstrated strong awareness of disaster preparedness and management but showed weaknesses in recovery and infrastructure-related competencies. Cubillas (2022) similarly reported high levels of DRRM knowledge among public elementary schools in flood-prone areas, although implementation gaps remained. Cresencio and Yabut (2023) identified strong understanding of school disaster management and disaster risk reduction education among coastal school administrators but observed differences in facility safety assessment and technical compliance. These findings indicate that knowledge is necessary but does not

independently ensure effective SDRRM implementation. UNESCO's VISUS multi-hazard school safety methodology further emphasizes science-based risk assessment and infrastructure safety evaluation.

Attitudes of school heads toward SDRRM. Leadership attitudes influence the prioritization, implementation, and sustainability of school safety initiatives. UNESCO (2019) emphasized the importance of proactive leadership in moving beyond compliance toward disaster prevention and resilience. Shaw et al. (2021) highlighted the role of positive leadership attitudes in maintaining educational continuity and stakeholder collaboration during complex emergencies. Dela Cruz and Ormilla (2022) identified a significant relationship between DRRM awareness and implementation, while Riñón (2023) associated leadership commitment, accountability, and shared responsibility with stronger institutional preparedness. The OECD (2023) likewise emphasized the influence of school leaders' safety priorities on preventive investments and emergency response effectiveness. At the international level, UNESCO (2024) stressed the importance of policy expertise and technical knowledge in strengthening school safety. Cañonera et al. (2025) found that Philippine school heads generally demonstrated positive attitudes toward disaster prevention, preparedness, and monitoring, although psychological recovery received comparatively less emphasis. Collectively, these studies suggest that leadership commitment and responsibility are essential in translating disaster-related knowledge into sustained institutional action.

Practices of school heads in SDRRM. Effective SDRRM practices include emergency drills, safety inspections, disaster preparedness planning, maintenance of emergency resources, coordination with local authorities, and integration of disaster education into school activities. Tizon and Comighud (2020) identified high levels of DRRM implementation and response capability in public schools, with significant relationships between implementation and administrative preparedness. Tolentino (2021) reported stronger practices in disaster preparedness and mitigation than in response and recovery. Similarly, Gabuya (2024) emphasized that updated disaster plans, emergency supplies, and regular drills improve institutional preparedness and recovery. Parcon and Satojito (2025) identified relationships among DRRM implementation, curricular integration, and community participation, emphasizing the importance of sustained leadership support. Save the Children and GADRRRES (2025) likewise associated standardized school safety practices with educational continuity and resilience to climate-related disruptions. In the Philippine context, the Department of Education (DepEd, 2024), through the Safer Learning Facilities Guidebook, provides guidance relevant to school infrastructure safety, hazard assessment, and the improvement of learning facilities. Furthermore, DepEd's introduction of PlanSmart for Safe Schools in 2025 reflects efforts to strengthen school safety planning through standardized protocols, hazard information, and digital tools.

Disaster risk reduction education and school resilience. Disaster education strengthens learners' preparedness, awareness, and capacity to respond appropriately to hazards. Loremia and Alcover (2020) found that integrating disaster preparedness into classroom and extracurricular activities enhanced students' knowledge. Parallag (2024) reported improvements in students' preparedness attitudes through consistent disaster education. According to UNESCO (2023), disaster risk reduction education should be inclusive and integrated into curricular and extracurricular programs. Similarly, the Inter-agency Network for Education in Emergencies (INEE, 2024) emphasizes the importance of establishing minimum standards for educational preparedness, response, and recovery to ensure safe, inclusive, and equitable learning opportunities during emergencies. These standards highlight the need for coordinated educational planning, protective learning environments, and sustained educational continuity in disaster-affected communities. Cvetković et al. (2024) similarly emphasized the influence of school leadership on teachers' and learners' safety attitudes, while Masocha et al. (2025) recommended participatory, localized, and skills-oriented disaster education. These findings demonstrate the importance of institutional leadership in connecting disaster knowledge with practical preparedness.

Problems encountered and coping strategies in SDRRM implementation. Persistent challenges include insufficient funding, inadequate technical expertise, limited instructional materials, staffing constraints, and difficulties coordinating with external agencies. Cubillas (2022) identified resource limitations as barriers to effective flood-related disaster preparedness. Tolentino (2021) and Cresencio and Yabut (2023) similarly emphasized financial and resource constraints, while Acierto et al. (2023) and Riñón (2023) identified inadequate funding, personnel, and training as obstacles to comprehensive DRRM implementation. To address these challenges, school administrators employ resource prioritization, stakeholder partnerships, curriculum integration, and professional development. Angwas (2025) emphasized leadership adaptability and collaboration in sustaining education during disasters. Parcon and Satojito (2025) and Gabuya (2024) likewise highlighted flexible leadership and community participation as essential coping mechanisms. UNICEF (2023) and the United Nations Office for Disaster Risk Reduction (UNDRR, 2022) advocated institutional manuals and operational guidelines to standardize disaster preparedness and strengthen educational continuity. These findings support the development of a School Safety Manual grounded in the actual challenges and experiences of elementary school heads.

At the global level, disaster risk reduction in education has become increasingly important because of climate-related hazards and disruptions to learning. UNICEF (2024) reported that at least 242 million students experienced educational disruptions associated with climate-related hazards, highlighting the need for stronger school infrastructure, preparedness systems, and institutional resilience. The Comprehensive School Safety Framework (2022–2030) provides an international foundation for integrating safe facilities, school disaster management, and resilience education. These priorities reinforce the need to protect learners and sustain educational services before,

during, and after disasters. At the national level, the Philippines faces recurring natural hazards that require comprehensive school disaster preparedness. National legislation and DepEd initiatives emphasize risk assessment, disaster prevention, climate change adaptation, emergency response, and educational continuity. However, Philippine studies reveal variations in implementation across geographical and institutional contexts. Dela Cruz and Ormilla (2022) identified relationships between DRRM awareness and implementation in Ifugao, while Acierto et al. (2023) found stronger implementation of safe learning facilities than disaster risk reduction education. Riñon (2023) emphasized leadership accountability and institutional preparedness, and Gabuya (2024) identified the importance of proactive administration and resource management in Samar. These findings demonstrate that the implementation of national DRRM policies depends on school-level capacity and local conditions. At the local level, the present study focused on elementary school heads in the Fourth Congressional District of Quezon during School Year 2024–2025. Although national policies establish expectations for school safety, the extent to which school heads understand, prioritize, and implement these requirements requires contextual assessment. Examining their knowledge, attitudes, practices, implementation challenges, and coping strategies provides a localized basis for identifying school safety needs and developing appropriate operational guidance.

The study is anchored on the Knowledge–Attitude–Practice (KAP) Theory, which explains the relationship among cognitive understanding, affective disposition, and behavioral action. Knowledge provides the information necessary to understand disaster risks and preparedness measures; attitudes reflect beliefs, values, commitment, and responsibility toward safety; and practices represent the actual implementation of disaster management activities. Within SDRRM, knowledge encompasses school heads' understanding of Safe Learning Facilities, School Disaster Management, and Disaster Risk Reduction in Education. Attitudes refer to their commitment to disaster prevention, school safety, emergency preparedness, and institutional responsibility. Practices include conducting safety inspections, organizing emergency drills, preparing disaster response plans, maintaining emergency resources, integrating disaster education, coordinating with stakeholders, and supporting recovery activities. Mangi et al. (2024) identified knowledge, attitudes, and practices as interconnected determinants of disaster preparedness behavior, emphasizing that sustainable preparedness depends on their collective reinforcement. The framework therefore recognizes that knowledge may encourage positive attitudes and effective practices, while repeated implementation can further strengthen knowledge and commitment. The conceptual framework examines the relationships between knowledge and attitudes, knowledge and practices, and attitudes and practices. These variables are assessed across the three pillars of comprehensive school safety. The framework also incorporates the problems encountered by school heads and their coping strategies as essential inputs for developing the proposed School Safety Manual. Thus, the study connects theoretical understanding, institutional behavior, and practical school safety interventions within a unified approach to SDRRM.

Existing literature establishes the importance of disaster preparedness knowledge, positive leadership attitudes, and effective institutional practices in strengthening school resilience. However, several studies reveal inconsistencies between awareness and implementation. Tolentino (2021) identified weaknesses in disaster response, recovery, and infrastructure-related competencies despite strong preparedness awareness. Cubillas (2022) similarly found that high DRRM knowledge did not consistently translate into effective implementation, while Cresencio and Yabut (2023) identified variations in technical knowledge and facility safety compliance. Gaps also persist in the implementation of disaster risk reduction education and psychosocial preparedness. Acierto et al. (2023) reported weaker implementation of disaster risk reduction education than safe learning facilities, while Cañonera et al. (2025) identified comparatively limited emphasis on psychological recovery. These findings indicate the need for a comprehensive assessment that considers cognitive, affective, and behavioral dimensions of SDRRM rather than examining institutional preparedness through a single indicator. Although previous studies have examined DRRM implementation in various Philippine educational settings, the reviewed literature does not establish a comprehensive assessment of the relationships among knowledge, attitudes, and practices of elementary school heads specifically in the Fourth Congressional District of Quezon. Furthermore, the identified constraints in financial resources, technical expertise, training, and stakeholder coordination emphasize the importance of developing practical guidance suited to local school conditions. To address these gaps, the study determined the levels of knowledge, attitudes, and practices of elementary school heads across Safe Learning Facilities, School Disaster Management, and Disaster Risk Reduction in Education. It also examined the significant relationships among these variables, identified implementation problems, and determined the coping strategies employed by school heads. The study tested the null hypotheses that no significant relationships exist between knowledge and attitudes, knowledge and practices, and attitudes and practices. The findings served as the basis for developing a School Safety Manual intended to strengthen preparedness planning, safety management, stakeholder coordination, and disaster risk reduction education. The study therefore provides a localized assessment of school leadership capacities and institutional needs, contributing to the improvement of SDRRM implementation in elementary schools.

The study aligns with several Sustainable Development Goals through its emphasis on school safety, educational continuity, disaster preparedness, climate resilience, and institutional collaboration.

SDG 4 – Quality Education. The study directly supports this goal by emphasizing safe, inclusive, and resilient learning environments. Effective SDRRM protects learners and school personnel, reduces disaster-related educational disruptions, and strengthens the continuity of teaching and learning. UNESCO (2023) emphasized that comprehensive school safety contributes to inclusive and equitable quality education. Assessing school heads' knowledge, attitudes, and practices provides a basis for improving disaster preparedness and integrating risk reduction education into school activities.

SDG 3 – Good Health and Well-Being. School disaster preparedness contributes to protecting the physical and psychological well-being of learners, teachers, and other school personnel. Effective safety procedures, emergency preparedness, disaster response, and recovery measures can reduce exposure to disaster-related harm. The study's assessment of school safety practices and institutional preparedness is therefore relevant to promoting safer and healthier educational environments.

SDG 11 – Sustainable Cities and Communities. Schools are important community institutions that contribute to local disaster preparedness and resilience. Strengthening school disaster management, emergency planning, and coordination with local government units supports safer communities and more effective disaster response. UNDRR and UNICEF (2024) emphasized inclusive, community-based disaster risk reduction, reinforcing the importance of schools in developing disaster-resilient communities.

SDG 13 – Climate Action. The study supports climate change adaptation through disaster risk assessment, preparedness planning, and institutional resilience. Given the Philippines' vulnerability to climate-related hazards, strengthening school heads' capacity to implement SDRRM measures contributes to reducing disaster risks and improving school readiness. The study's emphasis on preventive action and educational continuity is consistent with the need for climate-resilient educational institutions.

SDG 17 – Partnerships for the Goals. Effective SDRRM requires collaboration among school heads, teachers, learners, parents, DepEd officials, local government units, and disaster management partners. Aquino et al. (2023) emphasized collaborative leadership and stakeholder engagement in institutional resilience, while Parcon and Satojito (2025) highlighted the importance of community participation in sustaining DRRM programs. The proposed School Safety Manual may support coordinated responsibilities and strengthen partnerships in school disaster preparedness and management.

Collectively, these SDGs reflect the study's contribution to protecting educational communities, strengthening institutional preparedness, promoting climate resilience, and sustaining collaborative disaster risk reduction initiatives.

The study contributes to multidisciplinary sustainability by integrating educational resilience, public health and safety, environmental risk management, community participation, and institutional governance. Its assessment of elementary school heads' knowledge, attitudes, and practices provides a foundation for understanding how school leadership can support sustained disaster preparedness and educational continuity. In terms of educational sustainability, the study emphasizes the protection of learning environments and the continuity of instruction during emergencies. Strengthening school disaster management and integrating disaster risk reduction education can support safer learning conditions and reduce interruptions caused by disasters. Loremia and Alcover (2020) emphasized the importance of integrating disaster preparedness into educational activities, while Cvetković et al. (2024) highlighted the influence of school leadership on disaster preparedness attitudes among teachers and learners. For public health and safety sustainability, effective SDRRM promotes the protection of learners, teachers, and school personnel from physical hazards and disaster-related psychological risks. Preparedness planning, emergency drills, facility inspections, and appropriate response measures contribute to maintaining safer educational environments. Strengthening these practices supports the well-being of school communities before, during, and after disasters. Regarding environmental and climate sustainability, the study recognizes the importance of adapting school systems to natural and climate-related hazards. School heads' knowledge of disaster risks, commitment to preventive measures, and implementation of preparedness activities contribute to institutional capacity for managing environmental threats. These measures support climate adaptation and the long-term resilience of educational facilities and services. In relation to community sustainability, the study highlights the importance of collaboration among schools, families, local government units, and disaster management organizations. Strong stakeholder participation enhances preparedness, resource mobilization, and coordinated emergency response. Angwas (2025) emphasized the importance of adaptive leadership and collaboration in maintaining educational continuity, while Gabuya (2024) identified leadership commitment and effective resource management as important elements of school disaster preparedness. The study also contributes to institutional and governance sustainability by supporting evidence-based school safety planning, policy implementation, and leadership development. Assessing the relationships among knowledge, attitudes, and practices enables school administrators and education officials to identify areas requiring technical assistance, capacity building, and institutional improvement. The proposed School Safety Manual provides a practical basis for strengthening standardized procedures, preparedness responsibilities, and school-level disaster management. Finally, the study supports socio-economic sustainability by emphasizing preventive measures that may help minimize damage to school facilities, protect educational resources, and reduce interruptions to essential educational services. Strengthening school preparedness can contribute to more effective resource utilization and the continued functioning of schools during emergencies. Overall, the study demonstrates the multidisciplinary

importance of integrating disaster preparedness knowledge, positive leadership attitudes, and consistent safety practices into elementary school management. By examining these dimensions alongside implementation challenges and coping strategies, the research provides a foundation for developing a context-responsive School Safety Manual that supports educational continuity, institutional resilience, community safety, and sustainable disaster risk reduction in the Fourth Congressional District of Quezon.

2. Material and methods

2.1 Research Design

The study utilized a descriptive–correlational research design. The descriptive component determined the levels of knowledge, attitudes, and practices of elementary school heads in SDRRM, including the problems they encountered and the coping strategies they employed. The correlational component examined the significant relationships between knowledge and attitudes, knowledge and practices, and attitudes and practices. This quantitative design was appropriate because the study assessed existing conditions and relationships without manipulating variables. It provided an empirical basis for evaluating school heads' disaster preparedness and developing a School Safety Manual responsive to their identified needs.

2.2 Locale of the Study

The study was conducted in public elementary schools in the Fourth Congressional District of Quezon, located in Region IV-A (CALABARZON), Philippines, and commonly associated with the Lamon Bay Area. The district comprises ten municipalities: Alabat, Atimonan, Calauag, Guinayangan, Gumaca, Lopez, Perez, Plaridel, Quezon, and Tagkawayan. The district was selected because of its substantial number of public elementary schools within the Schools Division of Quezon and its exposure to natural hazards, particularly typhoons, floods, and landslides. These conditions made the area relevant for assessing school heads' knowledge, attitudes, and practices in disaster preparedness, school safety, and risk reduction management.

2.3 Respondents of the Study

The respondents were 38 public elementary school heads selected from the Fourth Congressional District of Quezon during School Year 2024–2025. The study population covered 212 public elementary schools distributed across the district's ten municipalities. The respondents served as the primary sources of information regarding their knowledge, attitudes, and practices in SDRRM, as well as the problems encountered and coping strategies employed in implementing school disaster preparedness and safety measures.

2.4 Sample and Sampling Procedure

Cluster sampling was employed to select respondents because of the district's extensive geographical coverage. The 212 public elementary schools were organized into four geographical clusters: Alabat Island, Western Mainland, Central Mainland, and Eastern/Southeastern Mainland. These clusters comprised 18, 57, 94, and 43 schools, respectively. A total of 38 elementary school heads were selected, consisting of three respondents from Alabat Island, nine from Western Mainland, 16 from Central Mainland, and ten from Eastern/Southeastern Mainland. This sampling procedure facilitated the selection of respondents from the geographically distributed public elementary schools within the district.

2.5 Research Instrument

The study utilized a researcher-developed survey questionnaire based on related literature, the Knowledge–Attitude–Practice (KAP) Theory, and existing Department of Education policies and guidelines on Disaster Risk Reduction and Management. The instrument consisted of five parts designed to assess the respondents' knowledge, attitudes, practices, implementation problems, and coping strategies.

The first part measured school heads' knowledge of Safe Learning Facilities, School Disaster Management, and Disaster Risk Reduction in Education, particularly their understanding of relevant policies, procedures, and technical aspects of school safety. The second part assessed attitudes toward SDRRM, including beliefs, values, commitment, and responsibility for disaster preparedness and school safety. The third part evaluated SDRRM practices, including facility inspections, hazard mapping, emergency drills, stakeholder coordination, curricular integration, and post-disaster recovery activities. The fourth part identified implementation problems related to school facilities, disaster management, and disaster risk reduction education, particularly funding limitations, technical expertise, coordination, resources, and time constraints. The fifth part assessed coping strategies, including maintenance prioritization, technical assistance, professional training, stakeholder collaboration, and efficient utilization of available resources. The questionnaire underwent expert validation before its administration.

2.6 Data Gathering Procedure

Before data collection, the researcher secured permission from the Schools Division Office of Quezon through a formal request and coordinated with district supervisors and elementary school heads in the Fourth Congressional

District of Quezon. Following approval, the researcher finalized the expert-validated questionnaire and explained the study's purpose and the importance of accurate responses to the selected participants. Voluntary participation and confidentiality were assured. The questionnaires were personally distributed to the 38 elementary school heads selected through cluster sampling during School Year 2024–2025. Respondents were given sufficient time to complete the instruments, while the researcher remained available to clarify instructions and address inquiries. Completed questionnaires were retrieved and examined for completeness and consistency, with incomplete or unclear responses appropriately addressed. The collected data were subsequently organized, coded, and prepared for statistical analysis. The results were used to determine the respondents' levels of knowledge, attitudes, and practices, examine relationships among the variables, identify implementation challenges and coping strategies, and provide the basis for developing the proposed School Safety Manual.

2.7 Data Analysis Techniques

The collected data were analyzed using descriptive and inferential statistical techniques. The weighted mean and standard deviation were employed to determine the levels of knowledge, attitudes, and practices of elementary school heads in SDRRM, as well as the extent of problems encountered and coping strategies employed. The weighted mean described the average responses, while the standard deviation measured response variability. A five-point rating scale was used to interpret the weighted means. For knowledge, mean scores of 4.21–5.00, 3.41–4.20, 2.61–3.40, 1.81–2.60, and 1.01–1.80 were interpreted as Very High Knowledge, High Knowledge, Moderate Knowledge, Low Knowledge, and No Knowledge at all, respectively. These classifications reflected the respondents' levels of understanding and ability to apply SDRRM concepts. For attitudes, the same mean ranges corresponded to Very Favorable Attitude, Favorable Attitude, Moderately Favorable Attitude, Unfavorable Attitude, and Very Unfavorable Attitude, respectively. These categories described the extent of school heads' positive or negative dispositions toward SDRRM implementation. For practices, mean scores within the same descending ranges were interpreted as Always Practiced, Often Practiced, Sometimes Practiced, Rarely Practiced, and Never Practiced. These interpretations indicated the frequency and consistency of implementing SDRRM activities within school operations. Problems encountered were assessed using the corresponding interpretations of Always a Problem, Often a Problem, Sometimes a Problem, Rarely a Problem, and Never a Problem. Similarly, coping strategies were classified as Always Applied, Often Applied, Sometimes Applied, Rarely Applied, and Never Applied, using the same descending mean ranges. These measures determined the frequency of implementation challenges and the extent to which respondents employed strategies to address them. Spearman's rank correlation was used to examine the relationships between knowledge and attitudes, knowledge and practices, and attitudes and practices in SDRRM. The descriptive and correlational analyses provided the empirical basis for assessing school heads' disaster preparedness and identifying priority areas for the development of the proposed School Safety Manual.

3. Results and Discussion

3.1 Knowledge, Attitudes, and Practices of Elementary School Heads in SDRRM

3.1.1 Level of Knowledge in School Disaster Risk Reduction and Management

The findings revealed that elementary school heads demonstrated a very high overall level of SDRRM knowledge ($M = 4.17$, $SD = 0.778$). School Disaster Management obtained the highest composite mean ($M = 4.27$, $SD = 0.724$), particularly in early warning systems, evacuation procedures, and DRRM team responsibilities ($M = 4.32$, $SD = 0.739$). Disaster Risk Reduction in Education also registered very high knowledge ($M = 4.23$, $SD = 0.767$), with community-based DRR education and stakeholder partnerships receiving the highest rating ($M = 4.29$, $SD = 0.732$). Safe Learning Facilities recorded a comparatively lower but still high knowledge level ($M = 4.00$, $SD = 0.843$). The lowest-rated indicators concerned research methods and interpretation of findings ($M = 3.79$, $SD = 0.875$) and structural safety standards ($M = 3.89$, $SD = 0.863$). These findings indicate that school heads possess substantial knowledge of disaster management procedures, preparedness systems, and DRR education, although technical competencies related to infrastructure safety and evidence-based assessment require improvement. This supports Capala (2024), who reported high DRRM knowledge and preparedness capabilities among school leaders, and Daminar and Cabonce (2026), who emphasized administrators' competence in disaster planning, response, and recovery. The relatively lower knowledge of school facilities is consistent with Malgapo and Dela Cruz (2024), who identified technical and infrastructure-related preparedness gaps, and Valencia (2019), who emphasized strengthening applied disaster risk assessment competencies. The findings also support the Knowledge-Attitude-Practice (KAP) Theory, which recognizes knowledge as the cognitive foundation of effective disaster preparedness and management.

3.1.2 Level of Attitudes toward School Disaster Risk Reduction and Management

Elementary school heads demonstrated very favorable attitudes toward SDRRM ($M = 4.57$, $SD = 0.654$). School Disaster Management received the highest composite mean ($M = 4.59$, $SD = 0.637$), particularly the belief that disaster preparedness should be integrated into all aspects of school management ($M = 4.68$, $SD = 0.574$) and the importance of regular emergency drills ($M = 4.66$, $SD = 0.582$). Disaster Risk Reduction in Education obtained a composite mean of 4.57 ($SD = 0.649$), reflecting strong commitment to promoting DRR education beyond

classrooms ($M = 4.61$, $SD = 0.595$). Safe Learning Facilities also registered very favorable attitudes ($M = 4.54$, $SD = 0.675$), particularly regarding shared responsibility for school safety ($M = 4.61$, $SD = 0.679$). The relatively low standard deviations indicated generally consistent attitudes among respondents. The findings suggest that school heads strongly value disaster preparedness, recognize their leadership responsibilities, and demonstrate commitment to sustaining safe learning environments. These results are consistent with Parallag (2024), who identified favorable attitudes toward disaster preparedness, and Nakano and Yamori (2021), who emphasized the importance of positive attitudes in translating knowledge into preparedness behaviors. Similarly, Loremia and Alcover (2020) highlighted the contribution of DRR education to awareness and commitment, while Atillo et al. (2025) emphasized leadership accountability in promoting school resilience. The findings also support Transformational Leadership Theory, which recognizes the influence of leadership values, commitment, and shared vision on organizational practices and stakeholder participation.

3.1.3 Level of Practices in School Disaster Risk Reduction and Management

The respondents consistently implemented SDRRM practices, obtaining an overall mean of 4.44 ($SD = 0.654$), interpreted as Always Practiced. Disaster Risk Reduction in Education registered the highest composite mean ($M = 4.46$, $SD = 0.675$), particularly in evaluating DRR programs ($M = 4.53$, $SD = 0.603$) and promoting inclusive, child-centered approaches ($M = 4.50$, $SD = 0.604$). School Disaster Management followed ($M = 4.44$, $SD = 0.681$), with emergency drills receiving the highest rating ($M = 4.55$, $SD = 0.686$). Safe Learning Facilities obtained a composite mean of 4.42 ($SD = 0.777$), with strong practices in identifying evacuation areas ($M = 4.53$, $SD = 0.647$) and ensuring facility accessibility ($M = 4.50$, $SD = 0.726$). However, coordination with external agencies for technical building safety evaluations received the lowest rating ($M = 4.26$, $SD = 0.921$). These findings indicate that SDRRM practices are regularly incorporated into school operations, particularly emergency preparedness, disaster education, and learner protection. Cresencio and Yabut (2023) similarly reported strong implementation of school safety measures, while Daminar and Cabonce (2026) emphasized consistent disaster planning and resource management among school administrators. Parcon (2025) highlighted the importance of community engagement in DRRM implementation, and Malgapo and Dela Cruz (2024) documented sustained emergency preparedness activities despite resource limitations. The results support the behavioral component of KAP Theory, demonstrating how disaster preparedness knowledge and favorable attitudes are reflected in institutional practices. However, the relatively lower rating for technical coordination highlights the continuing need for external expertise and stronger interagency collaboration.

3.2 Relationships among Knowledge, Attitudes, and Practices in SDRRM

3.2.1 Relationship between Knowledge and Attitudes

Spearman's rank correlation revealed a statistically significant, moderate positive relationship between knowledge and attitudes ($\rho = 0.544$, $p = 0.000$, $N = 38$). The relationship was significant at the 0.01 level, resulting in the rejection of the null hypothesis of no significant relationship between the two variables. This finding indicates that school heads with greater SDRRM knowledge tend to demonstrate more favorable attitudes toward disaster preparedness and school safety. Parallag (2024) similarly established a positive relationship between disaster knowledge and preparedness attitudes, while Nadal (2024) emphasized the interdependence of knowledge, skills, and attitudes in DRRM implementation. Mangi et al. (2024) further identified these dimensions as interconnected determinants of preparedness behavior. The result supports KAP Theory, which explains that knowledge contributes to the development of attitudes that encourage appropriate disaster preparedness behavior.

3.2.2 Relationship between Knowledge and Practices

The analysis identified a statistically significant, moderate positive relationship between knowledge and practices ($\rho = 0.480$, $p = 0.002$, $N = 38$). This relationship was significant at the 0.01 level, leading to the rejection of the null hypothesis of no significant relationship between knowledge and practices. The finding suggests that school heads with greater knowledge of SDRRM policies, procedures, and preparedness measures tend to implement disaster management practices more consistently. Nadal (2024) emphasized the importance of interconnected competencies in DRRM implementation, while Mangi et al. (2024) identified knowledge as an essential component of sustained disaster preparedness behavior. The result supports KAP Theory by demonstrating an association between cognitive preparedness and practical implementation, although the relationship was weaker than that between attitudes and practices.

3.2.3 Relationship between Attitudes and Practices

The strongest statistically significant relationship was observed between attitudes and practices ($\rho = 0.603$, $p = 0.000$, $N = 38$). The positive correlation was significant at the 0.01 level, resulting in the rejection of the null hypothesis of no significant relationship between attitudes and practices. This finding indicates that school heads with more favorable attitudes toward SDRRM tend to demonstrate stronger implementation of school safety measures. Nakano and Yamori (2021) emphasized that attitudes connect knowledge with actual disaster preparedness behaviors, while Mangi et al. (2024) highlighted the mutually reinforcing relationship among knowledge, attitudes, and practices. The result supports KAP Theory and underscores the importance of leadership commitment, responsibility, and positive safety beliefs in sustaining SDRRM implementation. It further suggests

that strengthening school safety requires simultaneous attention to knowledge development, leadership attitudes, and practical preparedness competencies.

3.3 Problems Encountered by Elementary School Heads in SDRRM Implementation

3.3.1 Problems Related to Safe Learning Facilities

Safe Learning Facilities emerged as the most problematic SDRRM domain, with a composite mean of 3.89 (SD = 0.921), interpreted as Often a Problem. Insufficient funding for facility maintenance, retrofitting, and safety improvements received the highest rating (M = 4.18, SD = 0.801), followed by limited technical expertise for structural inspections (M = 4.03, SD = 0.788). Other concerns included accessibility limitations for learners with special needs (M = 3.89, SD = 0.924) and insufficient support from local authorities (M = 3.87, SD = 0.935). These findings indicate that financial and technical limitations remain major barriers to maintaining safe and inclusive school facilities despite strong leadership preparedness. Malgapo and Dela Cruz (2024) similarly identified inadequate funding and infrastructure-related constraints as significant challenges in DRRM implementation, while Alarte (2024) highlighted continuing difficulties in accessibility, resource availability, and stakeholder coordination. The results support Systems Theory, which emphasizes that effective school disaster management depends on coordinated institutional resources, technical assistance, and stakeholder support rather than individual leadership capacity alone.

3.3.2 Problems Related to School Disaster Management

School Disaster Management registered a composite mean of 3.54 (SD = 1.128), interpreted as Often a Problem. The most frequently encountered challenges were inadequate emergency equipment and communication resources (M = 3.79, SD = 0.875), difficulties coordinating with local government units and disaster management agencies (M = 3.68, SD = 0.933), and insufficient personnel for functional DRRM teams (M = 3.61, SD = 1.054). Limited training and scheduling difficulties for emergency drills both obtained means of 3.37, while documentation challenges registered a mean of 3.39. These findings suggest that operational constraints persist even when school heads demonstrate substantial preparedness knowledge and consistent DRRM practices. Sangyu (2025) similarly identified inadequate training, resources, and institutional support as barriers to disaster management implementation. Alarte (2024) also emphasized the influence of resource availability and stakeholder coordination on school preparedness. Consistent with Systems Theory, the findings highlight the need for sufficient personnel, emergency resources, and coordinated institutional support to sustain effective disaster management.

3.3.3 Problems Related to Disaster Risk Reduction in Education

Disaster Risk Reduction in Education obtained a composite mean of 3.58 (SD = 1.114), interpreted as Often a Problem. Limited DRRM instructional materials received the highest rating (M = 3.92, SD = 0.941), followed by difficulties integrating disaster preparedness concepts into the curriculum because of time constraints (M = 3.63, SD = 1.172). Other concerns included limited parental and community support (M = 3.55, SD = 1.005), difficulties evaluating DRRM programs (M = 3.53, SD = 1.109), and insufficient participation among teachers and learners (M = 3.39, SD = 1.326). The findings indicate that disaster education remains constrained by instructional resources, scheduling demands, and stakeholder participation despite school heads' favorable attitudes toward DRR integration. Valencia (2019) emphasized the importance of strengthening instructional materials and structured curriculum integration, while Sangyu (2025) identified resource and training limitations affecting school-based DRRM. These results reinforce the importance of institutional support, instructional resources, and coordinated participation in sustaining disaster risk reduction education.

3.4 Coping Strategies Employed by Elementary School Heads in SDRRM

3.4.1 Coping Strategies for Safe Learning Facilities

Elementary school heads consistently applied coping strategies for facility-related challenges, obtaining a composite mean of 4.28 (SD = 0.683), interpreted as Always Applied. Prioritizing safety improvements within limited budgets (M = 4.37, SD = 0.675) and advocating inclusive and accessible facilities (M = 4.37, SD = 0.541) were the highest-rated strategies. Designating alternative safe areas (M = 4.29, SD = 0.732) and collaborating with community partners (M = 4.24, SD = 0.714) were also frequently implemented. Seeking technical assistance from DepEd or local government engineers received the lowest rating (M = 4.16, SD = 0.754), interpreted as Often Applied. These findings demonstrate that school heads prioritize resource optimization, accessibility, and community participation to address infrastructure limitations. Attilo et al. (2025) emphasized proactive planning and resourcefulness among school leaders, while Capala (2024) highlighted capacity building and teamwork in strengthening disaster preparedness. Oda and Ichinose (2025) likewise emphasized institutional collaboration and capacity development as essential to sustainable disaster risk reduction. The comparatively lower application of external technical assistance suggests the need to strengthen access to specialized facility safety expertise.

3.4.2 Coping Strategies for School Disaster Management

School Disaster Management obtained the highest coping strategy composite mean ($M = 4.30$, $SD = 0.798$), interpreted as Always Applied. Participation in DRRM training and workshops received the highest rating ($M = 4.37$, $SD = 0.819$), followed by delegation and personnel training ($M = 4.34$, $SD = 0.815$) and systematic documentation of disaster preparedness activities ($M = 4.34$, $SD = 0.745$). Scheduling emergency drills alongside school programs ($M = 4.32$, $SD = 0.739$) and maintaining emergency resources ($M = 4.29$, $SD = 0.732$) were also consistently applied. Strengthening coordination with external disaster management organizations obtained the lowest rating ($M = 4.13$, $SD = 0.935$), interpreted as Often Applied. These findings reflect the importance of leadership adaptability, professional development, and organizational coordination in addressing SDRRM implementation challenges. Capala (2024) identified training and teamwork as important mechanisms for strengthening disaster preparedness, while Atillo et al. (2025) emphasized proactive leadership and collaboration. Parcon (2025) further highlighted community partnerships as contributors to effective DRRM implementation. The findings suggest that school heads employ organized and capacity-oriented strategies, although coordination with external agencies remains an area requiring improvement.

3.4.3 Coping Strategies for Disaster Risk Reduction in Education

Coping strategies for Disaster Risk Reduction in Education obtained a composite mean of 4.29 ($SD = 0.769$), interpreted as Always Applied. The use of low-cost instructional materials ($M = 4.34$, $SD = 0.708$), recognition and rewards to encourage participation ($M = 4.34$, $SD = 0.669$), and engagement of parents and community members ($M = 4.34$, $SD = 0.708$) were among the highest-rated strategies. Creative integration of DRRM lessons into core subjects obtained a mean of 4.26 ($SD = 0.760$), while monitoring program implementation and assessing learners' understanding both registered means of 4.24 ($SD = 0.883$). The findings indicate that school heads employ instructional creativity, stakeholder engagement, and monitoring strategies to address limitations in teaching resources and curriculum integration. Parcon (2025) emphasized the importance of community participation in sustaining DRRM programs, while Oda and Ichinose (2025) highlighted capacity development and institutional collaboration in strengthening disaster preparedness competencies. These results demonstrate that adaptive instructional strategies and stakeholder participation contribute to maintaining DRR education despite existing constraints.

3.5 Development of the Proposed School Safety Manual

3.5.1 Empirical Basis for the School Safety Manual

The overall findings demonstrated very high SDRRM knowledge ($M = 4.17$, $SD = 0.778$), very favorable attitudes ($M = 4.57$, $SD = 0.654$), consistently implemented practices ($M = 4.44$, $SD = 0.654$), and regularly applied coping strategies ($M = 4.29$, $SD = 0.750$). However, implementation problems remained frequent ($M = 3.67$, $SD = 1.054$), particularly in infrastructure safety, funding, technical expertise, instructional resources, and stakeholder coordination. Significant positive relationships among knowledge, attitudes, and practices further established the interconnectedness of the three dimensions of SDRRM implementation. These findings provide the empirical basis for developing a localized School Safety Manual that strengthens existing competencies while addressing identified institutional gaps. The manual is intended to standardize school safety procedures, reinforce leadership responsibilities, strengthen technical preparedness, and promote inclusive disaster risk reduction practices. Its development is grounded in the demonstrated need for practical operational guidance that connects knowledge, leadership commitment, institutional practices, and adaptive coping mechanisms.

3.5.2 Components and Features of the Developed School Safety Manual

The developed School Safety Manual was designed as a comprehensive guide covering disaster prevention and mitigation, preparedness, response, recovery, and continuous improvement. Its components include hazard identification, vulnerability assessment, structural safety inspections, maintenance planning, emergency drills, evacuation procedures, early warning systems, communication protocols, and resource mobilization. It also incorporates learner protection, psychosocial support, educational continuity, monitoring, documentation, and post-disaster evaluation. Inclusive and child-centered provisions address learners with disabilities and other vulnerable groups through accessibility considerations, individualized evacuation procedures, and appropriate support mechanisms. The manual complements the Department of Education (DepEd, 2021) School Disaster Risk Reduction and Management Manual, particularly Booklet 1 (Disaster Risk Reduction in Basic Education) and Booklet 2 (Emergency Preparedness and Response), by providing localized, research-based guidance specifically designed for elementary school heads. Its leadership-centered approach emphasizes evidence-based planning, infrastructure safety management, stakeholder coordination, curriculum integration, and continuous improvement. By translating established disaster preparedness policies into practical school-level procedures, the manual is intended to strengthen institutional readiness, promote inclusive and resilient learning environments, and support educational continuity before, during, and after disasters.

4. Conclusion & Recommendations

The study concluded that elementary school heads in the Fourth Congressional District of Quezon demonstrated high to very high knowledge, very favorable attitudes, and consistently implemented practices in School Disaster Risk Reduction and Management (SDRRM). Significant positive relationships were established between knowledge and attitudes ($p = 0.544$, $p < .001$), knowledge and practices ($p = 0.480$, $p = .002$), and attitudes and practices ($p = 0.603$, $p < .001$), resulting in the rejection of the three null hypotheses. The strongest relationship was observed between attitudes and practices, emphasizing the importance of leadership commitment and positive dispositions in sustaining disaster preparedness. Despite strong SDRRM competencies, school heads encountered challenges involving inadequate funding, limited technical expertise, infrastructure safety, and insufficient resources. Nevertheless, they employed adaptive coping strategies through collaboration, resourcefulness, and proactive leadership. These findings provided an empirical foundation for developing a School Safety Manual to strengthen technical competencies, standardize safety practices, and promote resilient and inclusive learning environments.

It is recommended that elementary school heads undergo continuous specialized training in structural safety assessment, hazard evaluation, infrastructure resilience, and evidence-based planning while sustaining positive leadership attitudes and a school-wide culture of disaster preparedness. Schools should institutionalize regular emergency drills, contingency planning, monitoring, and periodic updating of School DRRM Plans. The Department of Education, local government units, and partner agencies should strengthen technical assistance, engineering support, capacity-building programs, financial assistance, and resource allocation for facility improvements, emergency equipment, and instructional materials. Collaboration with DRRM councils, nongovernment organizations, parents, and community stakeholders should be reinforced to enhance resource mobilization and coordinated disaster management. Schools are encouraged to integrate the developed School Safety Manual into their School Improvement Plans, Annual Implementation Plans, and daily operations. Future researchers may evaluate the manual's effectiveness and conduct related studies involving teachers, learners, parents, and other community stakeholders.

The study was confined to elementary school heads in the Fourth Congressional District of Quezon and focused on their knowledge, attitudes, practices, implementation challenges, and coping strategies in SDRRM. Consequently, its findings reflect the participating school heads and the conditions within the study locale. Although the findings provided the basis for developing a School Safety Manual, the effectiveness of the manual was not evaluated in the study, as its assessment was recommended for future research. Further studies involving teachers, learners, parents, and community stakeholders may provide additional perspectives on SDRRM implementation and the applicability of the developed manual.

5. Compliance with ethical standards

The study observed ethical considerations throughout the data collection process. Prior to conducting the research, formal permission was secured from the Schools Division Office of Quezon, and coordination was undertaken with district supervisors and participating elementary school heads. The researcher explained the purpose of the study and emphasized the importance of accurate responses. Participation was voluntary, and confidentiality was assured to all respondents. Participants were given sufficient time to complete the questionnaires and opportunities to seek clarification regarding the research instrument. These procedures supported the responsible collection of data while respecting the participation and confidentiality of the respondents.

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