Original Research

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Disaster Awareness, Preparedness, and Belief of Residents of Selected Barangays in Angeles City

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Article info:
http://dx.doi.org/10.70848/cnj.v2i2.36
pISSN 3063-9247
eISSN 3063-9255

Article History:
Received: March 17th, 2025
Revised: July 29th, 2025
Accepted: August 17th, 2025

Abstract

Introduction: Disasters pose significant risks to communities, impacting safety, health, and preparedness. Angeles City frequently experiences natural hazards, necessitating an assessment of residents' disaster awareness, preparedness, and beliefs. Objectives: This study evaluates these aspects among residents in six selected barangays, identifying gaps and the role of disaster nursing in healthcare response and education. Methods: A cross-sectional descriptive design was utilized, selecting 396 respondents through cluster sampling. Communities were divided into streets, randomly chosen via the fishbowl method, with all households on selected streets included. A 91-item questionnaire integrating the Disaster Awareness and Preparedness Questionnaire and the General Disaster Preparedness Belief Scale was used for data collection. Researchers conducted house-to-house surveys, and data were analyzed using descriptive statistics and Pearson correlation through SPSS version 29. Results: Indicate moderate disaster awareness ($\bar{x}$=3.49), with high awareness of typhoons, earthquakes, fires, and floods, but lower awareness of volcanic eruptions and landslides. Preparedness is generally high ($\bar{x}$=4.22), with typhoons ranking highest and landslides lowest, though gaps remain in evacuation and safety practices. Disaster belief is notably high ($\bar{x}$=3.80), with perceived benefits scoring highest and perceived barriers lowest. Pearson correlation analysis revealed significant positive relationships between awareness and preparedness (r=.37), awareness and belief (r=.25), and preparedness and belief (r=.38), all at p<.001. Conclusions: These findings underscore the interconnection of knowledge, action, and perception, and highlight the vital role of nurses in advancing disaster preparedness through education, early warning systems, training, and community engagement.

Keywords:
Disaster Planning, Disaster Beliefs, Emergency Preparedness, Health Belief Model, Natural Disasters

INTRODUCTION

Disasters pose a significant threat to global health and safety, with South-East Asia bearing a disproportionate share of the burden. Over the past 50 years, nearly 450,000 lives were lost and approximately 525 million people affected by natural hazards in the region (Asia-Pacific Disaster Report, 2021). The Philippines, due to its archipelagic geography and position along the Pacific Ring of Fire, is especially prone to typhoons, earthquakes, and volcanic eruptions. In the first half of 2022 alone, the country recorded 587 disaster events, resulting in 9,576 fatalities, affecting over 3.7 million individuals, displacing 1.18 million, and incurring 4.45 billion pesos in economic losses (Citizens Disaster Response Center, 2022). Central Luzon is particularly vulnerable to multiple hazards due to its low-lying basin-like topography, making communities highly susceptible to flooding, storm surges, and strong winds.

Angeles City in Pampanga is among the most disaster-prone areas in the region. In 2023, the Angeles City Disaster Risk Reduction and Management Office recorded four typhoons, a southwest monsoon, and one earthquake, affecting 100 residents and damaging three homes. While no landslides or volcanic events were reported, fire incidents remain a persistent concern. From 2013 to 2020, the Bureau of Fire Protection documented 3,048 fire cases in Pampanga, with Angeles City accounting for 38% of these. These recurring hazards highlight the urgent need for improved disaster risk reduction strategies tailored to the city's unique vulnerabilities. A lack of public awareness and preparedness continues to amplify the impact of such disasters (Valenzuela et al., 2020).

In response, the Philippine Disaster Risk Reduction and Management Act of 2010 was enacted to strengthen national disaster resilience. Yet, implementation remains challenged by communication gaps and limited coordination at the local level (Gundran et al., 2022). Central to disaster risk reduction is the role of individual and community preparedness. Awareness refers to understanding specific hazards and risks, while preparedness involves proactive behaviors aimed at minimizing harm (Valenzuela et al., 2020). When communities underestimate their vulnerability, the result is often poor planning and increased susceptibility to harm. Conversely, communities that engage in preparedness measures are better positioned to respond effectively and recover quickly (Rañeses et al., 2018).

The Health Belief Model (HBM) provides a useful lens for analyzing disaster-related behaviors. It identifies key factors that influence individual decision-making, including perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy (Ejeta, Ardalan, & Paton, 2015; Fabrigar et al., 2006). While widely applied in health behavior studies, the use of HBM in disaster preparedness particularly in guiding nursing practice remains limited. Studies often focus on general populations and do not fully examine the behavioral dimensions of preparedness in localized contexts or through a nursing framework (Valenzuela et al., 2020; Loke et al., 2021). While previous studies have outlined general disaster preparedness trends, they often lack contextual sensitivity and overlook individual cognitive factors that influence behavior. This study builds on those efforts by integrating the Health Belief Model within a disaster-prone urban setting, allowing for a more behaviorally informed and locally grounded understanding of awareness and preparedness something previous research has not sufficiently addressed.

Nurses play a pivotal role in disaster preparedness and response. Disaster nursing emphasizes delivering physical, emotional, and psychosocial care to affected populations while incorporating emergency response competencies (International Council of Nurses, 2019; Aurelio et al., 2022). While the role of nurses in disaster response is acknowledged, most existing studies still focus on general population preparedness and risk perception. These often fail to explore how behavioral models such as the Health Belief Model can be used to assess community beliefs and preparedness in localized, high-risk settings (Valenzuela et al., 2020; Loke et al., 2021). There is limited research that investigates how individual perceptions influence preparedness behaviors within specific geographic contexts like Angeles City, highlighting a significant gap in the current literature. This study addresses that gap by applying the Health Belief Model through a disaster nursing lens, grounded in the local experience of a disaster-prone community.

The study aims to comprehensively assess disaster awareness, preparedness, and beliefs among residents of selected barangays in Angeles City. It specifically investigates how perceptions shaped by the HBM influence preparedness behaviors. The findings are expected to guide community health nurses in designing culturally relevant, evidence-based disaster education and response strategies. To achieve this objective, the study seeks to answer the following research questions:

1. How can the disaster awareness of the respondents be described?
2. How can the disaster preparedness of the respondents be described?
3. How can the disaster beliefs of the respondents be described?
4. Is there a significant relationship between disaster awareness, disaster preparedness, and disaster belief?
5. What is the implication of the present study to nursing?

METHOD

1. Design

This study employed a cross-sectional descriptive survey design, utilizing a survey questionnaire for data collection. A cross-sectional study analyzes data from a population at a specific point in time, making it appropriate for assessing disaster awareness and preparedness (Wang & Cheng, 2020; Mertens, 2005, as cited in Rogayan & Dollete, 2020).

2. Sample Size and Sampling Technique

Respondents were selected from six communities in Angeles City, Pampanga. Barangay officials provided household estimates, totaling 15,441. Using the Raosoft Sample Size Calculator with a 95% confidence level and a 5% margin of error, the required sample size was 375. A cluster sampling technique was employed to ensure geographic representation (Lubis et al., 2022). Communities were divided into clusters, and streets were randomly selected using a fishbowl approach. While this method ensured randomization and representation, cluster sampling may still pose limitations due to intra-cluster homogeneity, which could affect the precision of estimates.

3. Data Collection Instruments

The study used the Disaster Awareness and Preparedness Questionnaire (DAPQ) by Rogayan and Dollete (2020) and the General Disaster Preparedness Belief (GDPB) scale by Inal, Atlantis, and Dogan (2018). The DAPQ assessed demographics, disaster awareness (five-point Likert scale), and disaster preparedness. The GDPB scale, based on the Health Belief Model, evaluated self-efficacy, perceived susceptibility, barriers, benefits, and severity. Both instruments demonstrated strong reliability (Cronbach's alpha: DAPQ = 0.83, GDPB subscales >0.50) and were validated by the Angeles City Disaster Risk Reduction and Management Office (ACDRRMO). The instruments were used without any modifications.

4. Data Collection Process

The researchers obtained ethics clearance from the institution's Ethical Review Committee to ensure adherence to ethical standards and protect respondents. An informed consent form was developed and reviewed to safeguard participants' rights, safety, and well-being.

To use validated tools, the researchers contacted the principal authors of the Disaster Awareness and Preparedness Questionnaire (DAPQ) and the General Disaster Preparedness Belief Scale (GDPB) via email, securing authorization for their use without modifications. The questionnaires were translated into Filipino to improve accessibility, followed by a back-translation process validated by linguistic experts. Additionally, the GDPB underwent cultural validation with input from the Angeles City Disaster Risk Reduction and Management Office (ACDRRMO) to ensure relevance.

Prior to data collection, formal permission was secured from the six selected communities through letters sent to Barangay Captains. The study objectives, extent of respondent participation, and ethical considerations were outlined in these letters.

A cluster sampling method was employed based on household distribution across 415 streets. Using the fishbowl technique, streets were randomly selected to ensure representative participation, with a minimum target of 375 respondents per community. The researchers prepared printed informed consent forms and questionnaires, providing respondents with their preferred language option.

Data collection took place through house-to-house visits under research adviser supervision from February to March 2024. Researchers established rapport with households, identified the family head, and explained the study's purpose before administering the 91-item questionnaire, which took 20 to 30 minutes to complete.

To maintain respondent privacy, interactions were conducted discreetly, and anonymity was ensured. Participants were informed of their right to withdraw at any stage without consequences. Health protocols, including mask-wearing and social distancing, were followed to minimize risks such as COVID-19 transmission. Researchers remained available to clarify concerns and reviewed completed questionnaires on-site to prevent missing data.

Sampling continued until the six communities met the required sample size, with 18 streets selected and 396 respondents recorded, exceeding the minimum required. Demographic analysis revealed that most respondents were male heads of households (70.2%), aged 30-64 years (67.4%), with at least a high school education. Employment status varied, with 39.9% employed, 36.9% not working, and 23.2% unemployed. Over half (56.1%) fell below the poverty threshold, and household compositions ranged from nuclear and extended families to single-parent and cohabiting families.

Completed forms were securely stored before being digitized into PDF format and uploaded to a restricted-access Google Drive folder to ensure confidentiality. The data was encoded into Google Sheets, accessible only to the researchers, and later imported into SPSS version 29 for statistical analysis, including distribution normality assessments and descriptive statistics.

5. Data Analysis

Data were coded and analyzed using SPSS version 29. Descriptive statistics, including frequency, percentage, and mean, were used to summarize demographic data. Likert-scale responses were categorized using predetermined scales (Montelpare et al., 2020). To examine relationships between

variables, Pearson correlation analysis was conducted.

6. Research Ethics

Prior to the conduct of the study, ethics clearance was obtained from the Ethical Review Committee of the academic institution. This ensured adherence to ethical standards and safeguarded the well-being of respondents. Hard copies of informed consent forms were provided to ensure clarity, comprehension, and voluntary participation. The research team explained the study's purpose, addressed participants' concerns, and allowed sufficient time for review. Confidentiality was maintained, and respondents retained the right to accept, refuse, or withdraw at any point.

RESULT

1. Disaster Awareness Levels

The Disaster Awareness and Preparedness Questionnaire (DAPQ) includes inquiries designed to assess respondents' comprehension and knowledge of various natural disasters. Table 1 presents an overview of respondents' disaster awareness across different categories, along with their corresponding interpretations.

The findings indicate a moderate overall level of disaster awareness among respondents, with variations in mean scores across different disaster types. Notably, respondents exhibit high awareness levels regarding typhoons ($\bar{x}$=3.71), earthquakes ($\bar{x}$=3.62), fires ($\bar{x}$=3.64), and floods ($\bar{x}$=3.65). However, awareness levels are comparatively lower for volcanic eruptions ($\bar{x}$=3.30) and landslides ($\bar{x}$=3.05), as reflected in Table 1. Overall, the respondents' disaster awareness is classified as moderate ($\bar{x}$=3.49), with typhoon awareness being the highest and landslide awareness being the lowest.

2. Disaster Preparedness Levels

The DAPQ also evaluates respondents' levels of disaster preparedness. Table 2 provides a breakdown of preparedness levels across different disaster types, including specific preparedness practices and their interpretations.

The results reveal that earthquake preparedness is relatively high ($\bar{x}$=3.81), indicating that respondents are often prepared. Among the specific practices, "drop, cover, and hold" during aftershocks is the most commonly followed protocol ($\bar{x}$=4.08, often prepared), whereas hanging heavy items away from sleeping areas is less frequently practiced ($\bar{x}$=3.43, sometimes prepared).

Typhoon preparedness receives the highest mean score ($\bar{x}$=4.22), reflecting a frequent state of preparedness. The most prevalent action taken is turning off gas tanks during strong typhoons ($\bar{x}$=4.59, always prepared), while the lowest-scoring action is evacuating when advised by authorities ($\bar{x}$=3.95, often prepared). Similarly, landslide preparedness is rated at $\bar{x}$ =3.65 (often prepared), with familiarity with local terrain scoring highest ($\bar{x}$=3.82, often prepared) and creating evacuation plans scoring lowest ($\bar{x}$=3.36, sometimes prepared).

Regarding fire preparedness, respondents report an overall score of $\bar{x}$=4.11 (often prepared). Educating children about fire dangers is the most frequently practiced measure ($\bar{x}$=4.57, always prepared), whereas practicing home escape plans is less common ($\bar{x}$=3.37, sometimes prepared). Flood preparedness has a mean score of $\bar{x}$ =4.13 (often prepared), with heightened caution during nighttime flooding being the most practiced measure ($\bar{x}$=4.35, often prepared) and rerouting during flooded driving being the least practiced ($\bar{x}$=3.97, often prepared). Lastly, preparedness for volcanic eruptions is assessed at $\bar{x}$ =3.90 (often prepared), with heeding evacuation orders scoring the highest ($\bar{x}$=4.10, often prepared) and reviewing household preparedness measures scoring the lowest ($\bar{x}$=3.70, often prepared).

Overall, respondents exhibit a mean disaster preparedness score of $\bar{x}$=3.97, suggesting that they are often prepared. As shown in Table 2, typhoon preparedness ranks the highest ($\bar{x}$=4.22, often prepared), while landslide preparedness is the lowest ($\bar{x}$=3.65, often prepared).

3. Disaster Preparedness Beliefs

The General Disaster Preparedness Beliefs (GDPB) scale, informed by the Health Belief Model (HBM), assesses respondents' perceptions and beliefs regarding disaster preparedness. Table 3 summarizes the respondents' beliefs across six subscales: Self-efficacy, Cues to Action, Perceived Susceptibility, Perceived Barriers, Perceived Benefits, and Perceived Severity.

Regarding perceived susceptibility, respondents exhibit a mean score of $\bar{x}$=3.84, signifying a high level of belief. The most strongly endorsed statement pertains to the importance of durable construction against disasters ($\bar{x}$=4.32, very high belief), while the least endorsed statement is the likelihood of experiencing a disaster in the next few years ($\bar{x}$=3.48, high belief). Perceived severity of disasters is also rated highly ($\bar{x}$=3.66), with the strongest belief being fear of losing loved ones due to a disaster ($\bar{x}$=4.18, high belief), and the weakest belief being that experiencing a disaster would significantly change one's life ($\bar{x}$=3.24, moderate belief).

Perceived benefits receive the highest score among the subscales ($\bar{x}$=4.48, very high belief). The most endorsed statement is that disaster preparedness is necessary for both the respondent and their family ($\bar{x}$=4.64, very high belief), while the least endorsed statement suggests that individual preparedness reduces the risk of death following a disaster ($\bar{x}$=4.26, very high belief).

In contrast, perceived barriers register the lowest mean score ($\bar{x}$=3.37), indicating a moderate level of belief. The most strongly held belief in this category is the necessity of individual disaster

preparations (x̄=4.03, high belief), while the least endorsed belief is that disaster preparedness does not require significant time investment (x̄=2.27, low belief).

Cues to action have a mean score of x̄=3.83, reflecting a high level of belief. The most common belief is that disaster policies encourage preparedness (x̄=4.23, very high belief), while the least common is that family members actively inform them about disaster preparedness (x̄=3.83, moderate belief). Finally, self-efficacy scores x̄=3.66 (high belief), with respondents feeling confident in applying basic first aid and designating a post-disaster family meeting place (x̄=4.03, high beliefs). The least endorsed self-efficacy belief is the ability to use a fire extinguisher (x̄=3.23, moderate belief).

Overall, respondents demonstrate a high level of disaster preparedness belief (x̄=3.80). As illustrated in Table 3, perceived benefits rank the highest (x̄=4.48, very high belief), while perceived barriers register the lowest score (x̄=3.37, moderate belief). These findings underscore the significance of addressing barriers and reinforcing the perceived benefits of disaster preparedness to enhance overall readiness levels.

4. Relationships Among Disaster Awareness, Preparedness, and Beliefs

To determine the relationships among disaster awareness, disaster preparedness, and disaster preparedness beliefs, Pearson correlation analysis was conducted (Table 4). The results indicate a moderate positive correlation between disaster awareness and disaster preparedness (r=.37, p<.001), suggesting that individuals with higher awareness levels tend to report greater preparedness.

A weak positive correlation was also observed between disaster awareness and disaster preparedness beliefs (r=.25, p<.001), implying that greater awareness is associated with stronger beliefs in disaster preparedness.

Furthermore, a moderate positive correlation was found between disaster preparedness and disaster preparedness beliefs (r=.38, p <.001), indicating that individuals who are more prepared also tend to hold stronger preparedness beliefs. These correlations highlight meaningful interconnections among awareness, preparedness actions, and beliefs in the context of disaster readiness

Table 1. Level of disaster awareness

Level of disaster awareness	x̄	Ranked Mean	SD	Interpretation
Typhoon	3.71	1	1.014	High Awareness
Volcanic Eruption	3.3	5	1.126	Moderate Awareness
Earthquake	3.62	4	1.115	High Awareness
Landslide	3.05	6	1.206	Moderate Awareness
Fire	3.64	3	1.139	High Awareness
Flood	3.65	2	1.15	High Awareness
Overall Disaster Awareness	3.4945		0.92049	Moderate Awareness

n = 396; x̄ = mean; SD = standard deviation; Interpretation Values: 4.50-5.00 (Very High Awareness); 3.50-4.49 (High Awareness); 2.50-3.49 (Moderate Awareness); 1.50-2.49 (Low Awareness); 1.00-1.49 (Very Low Awareness)

Table 2. Level of disaster preparedness

Level of disaster preparedness	x̄	Ranked Mean	Interpretation
Earthquake	3.81	5	Often Prepared
Strong Typhoon	4.22	1	Often Prepared
Landslide	3.65	6	Often Prepared
Fire	4.11	3	Often Prepared

Level of disaster preparedness	x̄	Ranked Mean	Interpretation
Flood	4.12	2	Often Prepared
Volcanic Eruption	3.90	4	Often Prepared
Overall Disaster Preparedness Mean	3.97		Often Prepared

x̄ = mean; Interpretation Values: 4.50-5.00 (Always Prepared); 3.50-4.49 (Often Prepared); 2.50-3.49 (Sometimes Prepared); 1.50-2.49 (Seldom Prepared); 1.00-1.49 (Never Prepared); See Appendix for full item-level data per subscale.

Table 3. Level of disaster belief

Level of disaster belief	x̄	Ranked Mean	Interpretation
Perceived Susceptibility	3.84	2	High
Perceived Severity	3.66	5	High
Perceived Benefits	4.48	1	Very High
Perceived Barriers	3.37	6	Moderate
Cues to Action	3.83	2	High
Self-Efficacy	3.66	4	High
Overall Disaster Belief	3.80		High

x̄ = mean; Interpretation Values: 4.20-5.00 (Very High Beliefs); 3.40-4.19 (High Beliefs); 2.60-3.39 (Moderate Beliefs); 1.80-2.59 (Low Beliefs); 1.00-1.79 (Very Low Beliefs); See Appendix A for full item-level data per subscale.

Table 4. Correlation of disaster awareness, preparedness, and belief

Variable	Disaster Awareness	Disaster Preparedness	Disaster Belief
Disaster Awareness	-	.41**	.27**
Disaster Preparedness		-	.40**
Disaster Belief			-

Values represent Pearson's r coefficients; Interpretation of r values based on Cohen's (1988) guidelines: .10–.29 = weak; .30–.49 = moderate; .50 and above= strong; **p<0.01

DISCUSSION

1. Disaster Awareness

Disaster awareness is a critical factor in mitigating the impact of natural calamities, as it influences an individual's ability to recognize risks and take appropriate actions. The findings of this study indicate that respondents exhibit a moderate level of disaster awareness, with typhoons ranking as the most recognized hazard and landslides as the least. This pattern aligns with the Philippines' geographical context, as the country is frequently affected by typhoons but has relatively fewer landslide-prone areas in urban centers like Angeles City.

The heightened awareness of typhoons is unsurprising given the Philippines' location in the Pacific typhoon belt. Major storms, such as Super Typhoon Egay (Doksuri), which affected over half a million individuals, reinforce public vigilance. Disaster alerts mandated by Republic Act No. 10639, along with PAGASA updates and the NDRRMC's nationwide early warning system, play a significant role in sustaining this awareness. Similarly, respondents show strong awareness of floods, likely due to national news coverage and the presence of water bodies like the Abacan River, which increases

localized flood risks despite Angeles City's relatively lower flood susceptibility.

Earthquake awareness is also high, driven by the Philippines' location along the Pacific Ring of Fire. PHIVOLCS records an average of 20 earthquakes daily, and concerns over the anticipated "Big One," a potential magnitude 7.2 event, further heighten public awareness. Even though Pampanga is not directly situated along an active fault, its proximity to seismic activity in neighboring provinces like Bulacan and Zambales reinforces a sense of vulnerability. Educational campaigns by PHIVOLCS and earthquake drills conducted in schools and workplaces contribute to this sustained awareness.

In contrast, awareness of volcanic eruptions is only moderate, despite the country ranking third globally in volcanic hazard risk. The relative infrequency of eruptions contributes to this, as the last major event impacting Angeles City was the 1991 Mount Pinatubo eruption. While more recent eruptions, such as Taal in 2020 and Mayon in 2018, have drawn national attention, their geographic distance from the study area may explain the lower level of awareness among respondents. PHIVOLCS alerts and monitoring efforts help inform the public, but a lack of direct experience may limit the perceived urgency of volcanic risks.

Landslide awareness is the lowest among the disasters assessed, which can be attributed to Angeles City's geographical features that reduce exposure to such events. Despite the Philippines accounting for 46% of Southeast Asia's rainfall-triggered landslides, urbanized areas with stable terrain see lower public concern. However, research suggests that even low-risk areas remain vulnerable to unexpected disasters, highlighting the need for broader education and preparedness initiatives.

These findings align with the argument presented by Hoffmann & Muttarak (2017) that direct exposure influences disaster awareness. Studies by Castañeda et al. (2020) further support this, demonstrating that prior experience significantly affects an individual's level of preparedness. As such, the role of agencies like the NDRRMC, PAGASA, and PHIVOLCS in continuous public education remains vital in ensuring sustained disaster awareness, even in areas with historically lower exposure.

2. Disaster Preparedness

Disaster preparedness reflects an individual's or community's readiness to respond effectively to hazards, mitigating risks and ensuring safety. The findings of this study indicate that respondents are "often prepared" for disasters, with typhoons ranking highest in preparedness and landslides the lowest. This aligns with the observed awareness levels, reinforcing the correlation between awareness and readiness.

Typhoon preparedness is the strongest among respondents, reflecting frequent engagement in protective actions. The most commonly practiced measure is turning off gas tanks during severe storms, a crucial step in reducing fire and explosion risks. However, a notable gap exists in evacuation compliance, as respondents exhibit some reluctance to leave their residences when advised by authorities. This hesitancy may stem from a desire to protect property or skepticism about evacuation necessity, highlighting the need for stronger risk communication strategies.

Earthquake preparedness is also well-developed, with respondents frequently performing the "drop, cover, and hold" technique during tremors. However, home hazard mitigation remains an area for improvement, as fewer individuals take proactive measures such as securing heavy furniture. Given that nighttime earthquakes pose heightened risks due to reduced visibility and slower response times, reinforcing such preventive strategies is essential.

Fire preparedness is similarly strong, with respondents prioritizing fire safety education, particularly for children. However, the practice of home fire escape drills is less common, which could impede quick and effective evacuation during an actual fire emergency. Given that the Bureau of Fire Protection (BFP) recorded 15,733 fires nationwide between 2013 and 2018, greater emphasis on escape planning is necessary.

In contrast, landslide preparedness is the weakest among disaster types, mirroring the lower awareness levels. While respondents demonstrate an understanding of local terrain conditions, the creation of landslide evacuation plans is infrequent. This finding underscores the importance of targeted preparedness campaigns, even in areas perceived as low-risk, to ensure readiness for unexpected events.

Overall, while respondents exhibit a strong general preparedness level, critical gaps remain in specific disaster response behaviors. The findings highlight the importance of continuous disaster education and policy interventions to reinforce proactive preparedness strategies across all disaster types.

3. Disaster Beliefs

The Philippines' vulnerability to disasters due to its geographical location shapes public perception of risk. Respondents demonstrated a high belief in their susceptibility, aligning with Laily et al. (2021), who found that disaster awareness influences precautionary behavior. However, susceptibility alone does not guarantee preparedness unless individuals perceive personal relevance (Straker, 2023). The strongest belief centered on structural integrity as a protective measure, supporting Titko and Ritsvej (2020), who emphasize the role of resilient construction in disaster preparedness. Conversely, the least endorsed statement reflected low concern about imminent disasters, likely influenced by optimism bias (Bodas et al., 2022), which can lead to underestimation of risks.

A strong perception of disaster severity suggests awareness of potential medical and social consequences, reinforcing preparedness efforts (Mideksa, 2021). Fear of losing loved ones ranked highest, consistent with Keyes et al. (2014, as cited in

Joaquim et al., 2021), who link disaster-related loss to mental health impacts. However, some respondents expressed uncertainty about disasters altering their lives, possibly due to limited direct experience (Kato, 2021). Underestimating disaster severity may hinder preparedness, as socioeconomic status, knowledge, and psychological factors influence readiness (Akbar et al., 2020).

Respondents exhibited strong beliefs in the benefits of preparedness, supporting findings that awareness fosters proactive behavior (Demirbilek & Uzman, 2023; Rostami-Moez et al., 2020). Family-oriented preparedness efforts were particularly valued, reflecting concerns over separation and psychological distress during disasters (Suryaratri, 2020). However, some respondents doubted that preparedness significantly reduces fatalities, aligning with studies highlighting the ineffectiveness of untested disaster plans (Tansey, 2015, as cited in Daraigan, 2020). Misconceptions, including beliefs in disaster unpredictability and inevitable casualties, contribute to skepticism (Boyd, 2001; WHO, 2001, as cited in Genovese & Thaler, 2020).

Perceived barriers to preparedness were moderate, with respondents recognizing its necessity but acknowledging challenges such as resource limitations, lack of awareness, and doubts about response efficacy (Han & Wu, 2024). Practical constraints, including time, financial limitations, and competing priorities, hinder engagement in preparedness measures (Demirbilek & Uzman, 2023; Davarani et al., 2023). Additionally, real-life disaster drills remain underutilized due to logistical difficulties (Caballero & Niguidula, 2018).

Strong beliefs in cues to action highlight the role of disaster policies, community engagement, and prior experience in fostering preparedness (Titko & Ristvej, 2020; Corpuz, 2024). Policies and early warning systems enhance public readiness, while community participation in drills strengthens disaster resilience (Adams et al., 2015; Davarani et al., 2023). However, gaps in intra-familial communication emphasize the need for household-level disaster planning (Suryaratri et al., 2020).

Self-efficacy in disaster preparedness was high, with confidence strongest in first aid application and family emergency planning, aligning with findings that self-efficacy enhances disaster response (Qiu et al., 2023; Kusumastuti et al., 2021). However, fire safety knowledge was notably lower, suggesting vulnerabilities in fire response (Umali, 2021; Kurata et al., 2023). Limited disaster awareness delays evacuation (Wu et al., 2022), reinforcing the need for targeted education and improved access to preparedness resources (Han & Wu, 2024).

Overall, respondents recognized the benefits of disaster preparedness, consistent with the Health Belief Model (Demirbilek & Uzman, 2023). Awareness initiatives enhance proactive measures (Davarani et al., 2023; Inal & Dogan, 2018), while perceived barriers highlight socioeconomic disparities that hinder readiness (Cong et al., 2021; Tang & Feng, 2018). Addressing these gaps requires strategic education and resource allocation to strengthen community resilience.

4. Relationships Among Disaster Awareness, Preparedness, and Beliefs

The moderate positive correlation between disaster awareness and disaster preparedness ($r = .408$, $p < .001$) suggests that individuals with greater knowledge about disasters are more likely to take concrete steps toward readiness. This aligns with prior findings emphasizing the role of information access and education in motivating preparedness behavior (Rogayan et al., 2025; Cabuga & Cańete, 2023). Although the relationship between disaster awareness and disaster belief is weaker ($r = .267$, $p < .001$), it still indicates that awareness contributes to how individuals perceive disaster-related risks. This perception is further influenced by contextual factors such as personal experience, anxiety, education, and cultural background (Öztürk & Öztürk, 2025).

Similar to disaster preparedness, studies in other areas of public health have shown that limited awareness significantly contributes to maladaptive practices. For instance, Pajalla et al. (2025) reported that adults with low awareness of antibacterial therapy often misuse antibiotics, leading to antibiotic resistance. This parallel highlights the importance of strengthening awareness as a foundation for promoting appropriate health behaviors in both infectious disease management and disaster preparedness.

Similarly, the moderate correlation between disaster preparedness and disaster belief ($r = .403$, $p < .001$) indicates that individuals with stronger beliefs regarding disaster risks and efficacy are more likely to engage in preparedness activities. This finding aligns with existing literature that highlights belief in personal and collective efficacy as key drivers of disaster readiness (Qiu et al., 2023). Comparable evidence from organizational contexts also demonstrates that supportive culture and engagement significantly influence adaptive behaviors, as shown among Filipino immigrant nurse educators in the USA (Regachuelo, 2025). Collectively, these findings emphasize the importance of comprehensive risk communication strategies and educational interventions that not only strengthen awareness but also shape risk perceptions and encourage proactive preparedness to enhance community resilience (Rogayan et al., 2025; Cabuga & Cańete, 2023).

5. Implications for Disaster Management

The study's findings carry significant implications for disaster risk reduction initiatives. While respondents generally exhibit strong awareness and preparedness, specific gaps in evacuation compliance, home hazard mitigation, and landslide preparedness suggest areas for targeted improvement. Community-based preparedness programs and policy interventions should emphasize

behavioral reinforcement strategies to ensure that individuals translate awareness into action.

Educational institutions and local government units (LGUs) should integrate disaster drills and localized hazard assessments into public training initiatives. Agencies like the NDRRMC, PAGASA, and PHIVOLCS play a critical role in sustaining disaster education efforts, ensuring that even populations with lower direct exposure remain informed and prepared. Additionally, addressing psychological barriers, such as optimism bias and underestimation of disaster severity, through targeted risk communication strategies will enhance overall resilience.

Ultimately, these findings underscore the importance of continuous education, structured preparedness programs, and policy-driven interventions to enhance community resilience against natural disasters. By reinforcing preparedness behaviors and addressing gaps in awareness and belief systems, stakeholders can work towards a more disaster-resilient society.

6. Limitations

Despite its meaningful contributions, this study has several limitations that must be acknowledged. First, the use of a cross-sectional design restricts the ability to draw causal inferences between disaster awareness, preparedness, and belief. The relationships identified represent associations at a single point in time and may not reflect changes over time or under actual disaster conditions. Second, data were collected through self-report measures, which are subject to social desirability bias and may not accurately capture actual behaviors or preparedness levels. Third, the sample was limited to a specific population and setting, which may affect the generalizability of the findings to other communities or regions with different disaster risk profiles. Future studies should consider longitudinal designs, mixed-method approaches, and more diverse sampling to enhance the validity and applicability of results.

CONCLUSION

This study emphasizes the critical importance of disaster awareness, preparedness, and risk perception, particularly in vulnerable areas like Angeles City, Pampanga. It highlights the need for stronger resilience strategies, focusing on public education, institutional policies, and evidence-based frameworks to mitigate natural and human-induced hazards. Given the Philippines' exposure to typhoons, earthquakes, floods, and volcanic eruptions, the findings reinforce a multidisciplinary approach to disaster management. The integration of the Health Belief Model (HBM) provides insight into how risk perception, past experiences, and self-efficacy influence preparedness behaviors.

A key contribution of this study is its exploration of disaster nursing and the role of healthcare professionals in disaster response. Nurses play a vital role in ensuring the physical and psychological well-being of disaster victims, especially in emergency settings requiring rapid decision-making. The research highlights the need for structured training, inter-agency collaboration, and localized preparedness initiatives. While national policies like the Philippine Disaster Risk Reduction and Management Act of 2010 provide a framework for disaster response, gaps in communication and coordination remain. Addressing these challenges requires policy reinforcement, stronger collaboration, and continuous capacity-building for professionals and communities.

This study also underscores the necessity of integrating disaster preparedness education into community programs, healthcare training, and institutional policies. The findings highlight the importance of early warning systems, risk communication, and local government involvement in disaster risk reduction. Data from meteorological and geological event records, along with fire safety statistics, provide a comprehensive understanding of hazards affecting Angeles City and Central Luzon, emphasizing the need for tailored response strategies.

Ultimately, this research advances disaster resilience by synthesizing existing knowledge and identifying areas for improvement. The findings support enhanced disaster nursing practices, inclusive preparedness initiatives, and strengthened multi-sectoral collaboration. By promoting awareness and preparedness, this study helps lay the foundation for more effective disaster response policies and improved healthcare interventions, ensuring the safety and well-being of disaster-prone communities.

Conflict of Interest

The authors declare no conflict of interest.

Acknowledgments

The authors express their gratitude to the residents of the selected barangays in Angeles City who participated in this study. Special thanks to the faculty members of Angeles University Foundation, College of Nursing, for their guidance and support throughout the research process.

Funding

This research was funded entirely by the researchers. No external funding was received.

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Appendices

Table A1. Expanded table of the level of disaster preparedness

Level of Disaster Preparedness	$\bar{x}$ Statements	Ranked Mean	SD	Interpretation
Earthquake				
1. Become aware of fire evacuation and earthquake plans for all of the buildings you occupy.	3.86		1.126	Often Prepared
2. Pick safe places in each room of your home, workplace and/or school.	4.02		1.094	Often Prepared
3. Keep a flashlight and sturdy shoes by each person's bed.	3.45	5	1.312	Sometimes Prepared
4. Hang heavy items, such as pictures and mirrors, away from beds, couches and anywhere people sleep or sit	3.43		1.459	Sometimes Prepared
5. Keep and maintain an emergency supplies kit in an easy-to-access location.	3.88		1.241	Often Prepared
6. Stay indoors until the shaking stops and you are sure it is safe to exit.	3.96		1.204	Often Prepared
7. Each time you feel an aftershock, drop, cover and hold on.	4.08		1.093	Often Prepared
Earthquake Mean Score	3.81			Often Prepared
Strong Typhoon				
1. Listen to the radio on the updates of PAGASA regarding the movement of the typhoon.	4.27		0.996	Often Prepared
2. Check your disaster supplies and replace or restock as needed.	4.04		1.019	Often Prepared
3. Turn off gas tanks and unplug small appliances.	4.59	1	0.732	Always Prepared
4. Talk with members of our household and create an evacuation plan.	3.97		1.125	Often Prepared
5. Learn about your community's storm response plan.	4.04		1.046	Often Prepared
6. Evacuate if advised by authorities.	3.95		1.213	Often Prepared
7. Prepare at least a three-day supply of water and food.	4.13		1.034	Often Prepared
8. Prepare flashlight and first aid kit.	4.25		1.007	Often Prepared
9. Prepare cellphone with chargers	4.57		0.788	Always Prepared

10. Stay alert for extended rainfall and subsequent flooding even after the storm has ended.	4.39		0.86	Often Prepared
Strong Typhoon Mean Score	4.22			Often Prepared
Landslide				
1. Learn about your area's landslide risk.	3.65	6	1.321	Often Prepared
2. Create and practice an evacuation plan for your family.	3.36		1.316	Sometimes Prepared
3. Assemble and maintain an emergency preparedness kit.	3.78		1.257	Often Prepared
4. Become familiar with the land around where you live and work so that you understand your risk in different situations.	3.82		1.232	Often Prepared
5. If you suspect imminent danger, evacuate immediately	3.62		1.321	Often Prepared
Landslide Mean Score	3.65			Often Prepared
Fire				
1. Keep items that can catch on fire at least three feet away from anything that gets hot	4.47	3	0.861	Often Prepared
2. Talk to children about the dangers of fire, matches and lighters and keep them out of reach	4.57		0.813	Always Prepared
3. Stay in the kitchen when frying, grilling or broiling food.	4.47		0.887	Often Prepared
4. Ensure that all household members know two ways to escape from every room of your home	4.25		0.965	Often Prepared
5. Practice escaping from your home at least twice a year and at different times of the day.	3.37		1.264	Sometimes Prepared
6. Teach household members to stop, drop and roll if their clothes should catch on fire	3.91		1.18	Often Prepared
7. Call 911 or your local fire department number.	3.67		1.403	Sometimes Prepared
Fire Mean Score	4.11			Often Prepared
Flood				
1. Be prepared to evacuate at a moment's notice.	4.09	2	1.145	Often Prepared
2. When a flood or flash flood warning is issued for your area, head for higher ground and stay there.	3.98		1.213	Often Prepared
3. If you come upon a flooded road while driving, turn around and go another way.	3.97		1.212	Often Prepared
4. Be especially cautious at night when it is harder to recognize flood danger.	4.35		0.985	Often Prepared
5. Prepare flashlight and extra batteries.	4.32		1.038	Often Prepared

6. Keep a contact number of your local emergency response team	4.02		1.202	Often Prepared
Flood Mean Score	4.12			Often Prepared
Volcanic Eruption				
1. Learn about your community's warning systems and emergency plans.	4.05	4	1.162	Often Prepared
2. Develop an evacuation plan for volcanic eruptions for your family.	3.77		1.268	Often Prepared
3. Review landslide and mudflow safety and preparedness measures with members of your household.	3.7		1.3	Often Prepared
4. Follow any evacuation orders issued by authorities.	4.1		1.125	Often Prepared
5. Stay out of designated restricted zones.	3.88		1.324	Often Prepared
Volcanic Eruption Mean Score	3.90			Often Prepared
Overall Disaster Preparedness Mean	3.97		0.72842	Often Prepared

$\bar{x}$ = mean; SD = standard deviation; Interpretation Values: 4.50-5.00 (Always Prepared); 3.50-4.49 (Often Prepared); 2.50-3.49 (Sometimes Prepared); 1.50-2.49 (Seldom Prepared); 1.00-1.49 (Never Prepared)

Table A2. Expanded table of the level of disaster belief

Level of Disaster Belief	$\bar{x}$ / Statements	Ranked Mean	SD	Interpretation
Perceived Susceptibility				
1. I am very likely to experience a disaster in the next few years.	3.48		1.187	High
2. I consider that I would encounter a disaster at any time in my life.	3.67		1.252	High
3. For me, construction durability is an essential measure against disasters.	4.32	2	0.941	Very High
4. I do not care if I have an emergency/disaster kit.	3.68		1.295	High
5. I inform my close friends and family about the emergency contact numbers in case of disasters.	4.29		0.871	Very High
6. I think it is unnecessary to fix the things/furniture in the house.	3.63		1.329	High
Perceived Susceptibility Mean Score	3.84			High
Perceived Severity				
7. Even thinking about the possibility of a disaster scares me.	3.73		1.154	High
8. Even if I experience a disaster, nothing will change in my life.	3.24	5	1.308	Moderate

9. I am not afraid of losing my loved ones due to a disaster.	4.18		1.252	High
10. I am afraid of dying due to a disaster.	3.47		1.56	High
Perceived Severity Mean Score	3.66			High
Perceived Benefits				
11. I feel safe if I get prepared for disasters.	4.39	1	0.843	Very High
12. Individual preparation for disasters might reduce the risk of death after a disaster.	4.26		0.98	Very High
13. Getting prepared for disasters would also protect my family members.	4.57		0.738	Very High
14. Getting prepared for disasters would meet my needs in case of disasters.	4.43		0.924	Very High
15. Disaster preparedness would help me survive unscathed.	4.60		0.709	Very High
16. Disaster preparedness is necessary (practical) for my family and me.	4.64		0.739	Very High
Perceived Benefits Mean Score	4.48			Very High
Perceived Barriers				
17. I have much more critical responsibilities than getting prepared for disasters.	3.05	6	1.432	Moderate
18. I do not have enough money to get prepared for disasters.	3.08		1.318	Moderate
19. It takes much time to get prepared for disasters.	2.27		1.318	Low
20. I do not have enough knowledge to make preparations for disasters.	3.41		1.211	High
21. If it is my fate to die in a disaster, I die.	3.18		1.405	Moderate
22. I find it challenging to do drills in order to be prepared for disasters.	3.31		1.311	Moderate
23. I think it is unnecessary to make individual preparations for disasters.	4.03		1.288	High
24. Getting prepared for disasters does not make me feel good.	3.79		1.389	High
25. I think it is unnecessary to receive Disaster Preparedness- Basic Disaster Awareness training.	4		1.27	High
26. A family disaster plan is something difficult to understand.	3.4		1.321	Moderate
27. A family disaster plan is full of unnecessary details/requirements that one cannot meet.	3.26		1.299	Moderate
28. I do not believe in any benefit of a family disaster plan.	3.66		1.197	High

29. I find it difficult to implement a family disaster plan.	3.43		1.205	High
30. It is difficult for me to make individual preparations for disasters.	3.36		1.258	Moderate
Perceived Barriers Mean Score	3.37			Moderate
Cues to Action				
31. My family members do not inform me.	3.38	2	1.27	Moderate
32. My friends inform me about the necessity of making individual preparations for disasters.	3.97		0.959	High
33. People whose opinions I care about guide me to be prepared for disasters	4.15		0.874	High
34. Disaster policies encourage me to be prepared for disasters.	4.23		0.87	Very High
35. I think booklets, newspapers, and brochures are not informative enough	3.44		1.279	High
Cues to Action Mean Score	3.83			High
Self-Efficacy				
36. I can apply basic first aid.	4.03	4	0.914	High
37. I cannot use a fire extinguisher.	3.23		1.3	Moderate
38. I cannot make an evacuation plan with the people in my neighborhood.	3.48		1.208	High
39. If I need it, I can access psychological support services after a disaster.	3.47		1.068	High
40. I can identify hazards that may cause a fire.	3.87		1.09	High
41. I can fix the things/furniture in a house.	3.99		0.983	High
42. I cannot do search and rescue, even at a basic level.	3.3		1.271	Moderate
43. I can determine a specific safe place in my house/building to protect myself in case of an earthquake.	4		0.985	High
44. After a disaster, I could not find the shelter chosen by local authorities.	3.27		1.229	Moderate
45. I can choose a meeting place where family members gather after a disaster.	4.03		0.993	High
Self-Efficacy Mean Score	3.66			High
Overall Disaster Belief Mean Score	3.80		0.47692	High

$\bar{x}$ = mean; SD = standard deviation; Interpretation Values: 4.20-5.00 (Very High Beliefs); 3.40-4.19 (High Beliefs); 2.60-3.39 (Moderate Beliefs); 1.80-2.59 (Low Beliefs); 1.00-1.79 (Very Low Beliefs)