Electrical Safety Practices and Challenges in Disaster-Prone Coastal Communities: A Case Study of "Boracay of the North", Philippines

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ABSTRACT

This study explores the knowledge, preparedness, challenges, and strategies related to electrical safety practices among residents of Barangay Balaoi, Pagudpud, Ilocos Norte, a disaster-prone coastal community in the Philippines. Using a mixed-method research design, the study employed structured surveys, semi-structured interviews, and focus group discussions to gather both quantitative and qualitative data. Descriptive statistics revealed that residents were slightly knowledgeable and slightly prepared to implement electrical safety practices, with notable deficiencies in areas such as grounding systems, proper use of extension cords, and emergency planning. Thematic analysis identified key challenges, including limited knowledge of electrical safety, insufficient tools and preparedness, lack of proactive safety measures, and resource constraints. Pearson correlation analysis indicated a strong positive relationship between residents' knowledge and preparedness, highlighting the importance of education in fostering readiness to address electrical hazards.

The study recommends enhancing community knowledge through targeted education programs, building capacity for emergency preparedness via hands-on training and affordable tools, and addressing resource constraints through financial assistance and subsidies for certified materials and professional services. Additionally, it emphasizes the need for stricter enforcement of electrical safety standards and further research to explore external factors affecting electrical safety practices. By addressing these gaps, the study aims to improve residents' ability to maintain safe electrical installations, reduce risks, and strengthen community resilience in disaster-prone environments. These findings provide valuable insights for policymakers and program implementers in designing effective interventions to promote electrical safety.

Keywords: Electrical safety practices, Community resilience Disaster preparedness, Knowledge and preparedness, Resource constraints, Targeted education programs

INTRODUCTION

Electrical safety is a critical component of household well-being and community resilience, particularly in regions prone to natural disasters. Damaged or improperly maintained electrical systems during typhoons, floods, and other calamities can result in fires, electrocution, and prolonged power outages, compounding risks for affected populations [21], [27]. Francioli [8] emphasized that low-income households often adopt energy use strategies that inadvertently increase fire risks, highlighting the need for targeted safety education. Similarly, Kulor et al. [14] observed that residential electricity consumers in developing regions frequently face hazards due to lack of awareness and insufficient adherence to safety protocols.

Globally, disaster risk reduction frameworks advocate for both structural and non-structural measures to enhance resilience and reduce the impact of electrical hazards. Ye et al. [31] emphasized that tropical cyclone–induced winds and flooding pose significant threats to power grid infrastructure across Asia, underscoring the importance of resilient electrical systems and community-level safety education. Nduhuura et al. [18] further highlighted that electricity outages in urban households disrupt daily activities and exacerbate vulnerability, particularly in developing countries. Ebrahimi et al. [7] noted that predictive models and hazard analyses are essential for understanding risks and improving emergency response planning.

In addition, community knowledge and preparedness play a decisive role in mitigating disaster-related electrical risks. Basahel [2] reported that safety leadership, safety attitudes, and knowledge directly influence compliance with electrical safety standards, while Gumasing and Sobrevilla [10] demonstrated that integrating behavioral

theories with ergonomic appraisal can enhance protective actions during natural calamities. Yari et al. [29] similarly found that behavioral, health-related, and demographic factors shape household responses to flood-induced hazards, highlighting the need for tailored awareness programs.

In the Philippine context, electrical safety is increasingly recognized as an integral part of disaster preparedness, yet many programs continue to prioritize evacuation and relief over technical safety awareness. Local governments are tasked with enforcing safety regulations and adapting electrical codes to local conditions, but compliance is often limited by financial constraints, resource shortages, and weak enforcement mechanisms [21], [25]. Lopez et al. [15] observed that low- and middle-income households in coastal communities face challenges in adopting disaster preparedness practices due to socioeconomic and infrastructural limitations. Similarly, Robielos et al. [20] emphasized that vulnerability assessments at multiple geopolitical levels are necessary to identify and mitigate household-level risks effectively.

Despite ongoing efforts, there remains a lack of localized research investigating the knowledge, readiness, and challenges of residents regarding electrical installation safety in disaster-prone areas. This knowledge gap limits the development of targeted interventions and effective community-based programs. To address this, the present study evaluates the knowledge, preparedness, and challenges of residents of Barangay Balaoi, Pagudpud, in relation to electrical installation safety.

By generating evidence-based insights, the study aims to inform local leaders, policymakers, and disaster risk management agencies on strategies to enhance household safety. Strengthening awareness and preparedness at the community level not only reduces the likelihood of accidents during calamities but also fosters a culture of electrical safety. Ultimately, improving electrical installation safety in Barangay Balaoi may serve as a model for promoting disaster resilience in other vulnerable communities across the Philippines [27].

Conceptual Framework

Grounded in established safety and preparedness theories and supported by relevant literature, this study aims to explore the relationships among key variables influencing residents' ability to maintain safe electrical installations and implement proper safety practices. As illustrated in Figure 1, the independent variables are residents' knowledge of electrical safety practices and the challenges they face in maintaining safe installations. The dependent variable is residents' preparedness to implement proper electrical safety measures, which reflects their ability to translate knowledge into actionable practices. This framework seeks to analyze how knowledge and challenges individually and collectively affect residents' preparedness, while also examining the interplay between these variables and the strategies that can be implemented to strengthen community programs for electrical safety.

At the core of the framework are four primary variables: knowledge, preparedness, challenges, and strategies. Knowledge refers to residents' understanding of electrical safety practices, including awareness of proper installation, maintenance, and emergency procedures. Preparedness reflects residents' ability to apply their knowledge to ensure electrical safety in both routine and emergency situations. These two variables are posited to have a dynamic relationship, as increased knowledge can improve preparedness, while preparedness may highlight gaps in knowledge that need to be addressed.

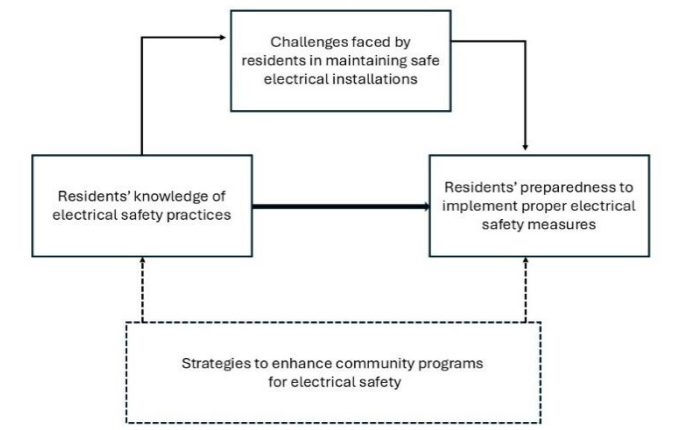

Figure 1. Research Paradigm of the Study.

The framework also highlights the role of challenges as a mediating variable. Challenges, such as financial constraints, limited access to professional electricians, and inadequate infrastructure, can hinder residents' ability to maintain safe electrical installations and implement safety measures. Even if residents have sufficient knowledge, significant challenges may reduce their preparedness and ability to act effectively. Furthermore, the framework examines the relationship between knowledge and challenges, exploring whether greater knowledge can help mitigate challenges or whether challenges negatively impact residents' ability to acquire and apply knowledge.

Finally, the framework emphasizes the role of strategies as interventions aimed at addressing challenges and enhancing both knowledge and preparedness. Strategies include educational initiatives to improve awareness, access to affordable resources and professional services, and collaboration with local governments to strengthen community programs. These strategies are designed to reduce the barriers posed by challenges, improve knowledge acquisition, and foster preparedness. The framework also acknowledges the feedback loop between strategies and outcomes, where improved preparedness and reduced challenges contribute to the development of more effective interventions.

By examining these relationships, the conceptual framework provides a comprehensive understanding of how residents' knowledge, preparedness, challenges, and strategies interact to influence electrical safety practices. This framework serves as a guide for identifying areas for improvement in community programs and interventions, ensuring a more holistic approach to promoting electrical safety.

RESEARCH METHODS

A. Research Design

This study utilized a descriptive-correlational research design to address its objectives and answer the research questions. The descriptive component was employed to systematically describe the levels of residents' knowledge, preparedness, and challenges related to electrical safety practices. This approach provided a clear and measurable understanding of the current state of these variables within the community. Descriptive research is appropriate when the goal is to summarize and present data in a way that highlights trends, patterns, and key characteristics of the population being studied.

The correlational component of the design was used to explore the relationship between residents' knowledge and preparedness in ensuring electrical safety. Correlational research is suitable for determining whether two variables are significantly related and the strength of their association. This approach allowed the study to examine how knowledge about electrical safety practices influences preparedness to implement those practices, aligning with the research question focused on identifying this relationship. While this design does not establish causation, it is appropriate for the study's scope as it provides valuable insights into the interaction between these variables, which can inform future interventions and programs.

The combination of descriptive and correlational approaches ensured that the study could both summarize the key variables and explore their interconnections, making this design sufficient and appropriate for addressing the study's objectives.

B. Locale of the Study

This study was conducted in Barangay Balaoi, a coastal community located in Pagudpud, Ilocos Norte, Philippines. Barangay Balaoi is a disaster-prone area that frequently experiences natural calamities such as typhoons, heavy rains, flooding and strong winds due to its geographical location along the northern coast of Luzon, Philippines. These disasters often result in damage to electrical installations, posing significant risks to residents' safety and well-being. The barangay is characterized by a mix of residential households, small businesses, and community facilities, making it an ideal setting to study electrical safety practices in a real-world context.

The selection of Barangay Balaoi as the study locale was based on its relevance to the research objectives. The community's vulnerability to disasters highlights the importance of assessing residents' awareness, readiness,

and challenges in implementing electrical safety practices. Additionally, the barangay's population includes individuals with diverse experiences related to electrical installations, such as household heads, electricians, and barangay officials involved in disaster preparedness efforts. This made the location suitable for accessing a representative sample of participants who could provide valuable insights into the study's focus areas.

Furthermore, Barangay Balaoi's demographic characteristics, such as its predominantly rural setting and reliance on local infrastructure, provided a unique opportunity to examine how residents adapt to electrical safety challenges in a disaster-prone environment. The locale's accessibility and the willingness of community members to participate in research activities further supported its selection as the most appropriate site for data collection.

C. Population and Sampling Procedures

The population of the study consisted of residents of Barangay Balaoi, Pagudpud, Ilocos Norte, specifically individuals aged 18 and above who were directly or indirectly involved in electrical safety practices within their households and community. To align with the research objectives, the study targeted specific groups of participants based on their roles and experiences in electrical safety practices. These groups included general residents to assess their awareness and understanding of electrical safety practices, residents with experience in electrical installations or those affected by disasters to evaluate their preparedness to implement proper safety measures, and key informants such as household heads, electricians, barangay officials, and program implementers to identify challenges in maintaining safe electrical installations and to gather strategies for strengthening community programs.

The study employed purposive sampling, a non-random sampling technique, to ensure the selection of participants based on their relevance to the research objectives. This method allowed the researchers to focus on individuals who met specific criteria, including residents aged 18 and above, those with prior knowledge or experience related to electrical safety practices, individuals affected by disasters involving electrical hazards, and community members actively involved in disaster preparedness and safety initiatives. Participants were also required to demonstrate a willingness to participate and provide accurate information about their experiences and perspectives on electrical safety.

For the quantitative component, a representative sample of residents was selected to answer structured survey questionnaires. The sample size was calculated using the total population of Barangay Balaoi, applying a 95% confidence level and a 5% margin of error to ensure statistical reliability. This calculation ensured that the sample size was appropriate for capturing the general trends and patterns in residents' knowledge, preparedness, and challenges related to electrical safety practices. Participants were chosen based on their eligibility, availability, and ability to provide reliable data regarding their awareness, knowledge, and readiness concerning electrical safety practices.

For the qualitative component, key informants were selected to participate in semi-structured interviews. These informants included household heads responsible for managing electrical installations within their homes, electricians with technical expertise and direct experience in handling electrical systems in the community, and barangay officials and program implementers actively involved in disaster preparedness and community safety programs. The selection of key informants was guided by the need to capture diverse perspectives and experiences regarding the challenges faced in maintaining electrical safety and improving community programs.

The sample size for qualitative data collection was determined using the principle of data saturation, wherein interviews continued until no new themes, categories, or insights emerged from additional discussions. This approach ensured that the qualitative data collected was comprehensive and reflective of the experiences and perspectives of the target population.

To ensure the validity and reliability of the data, several steps were taken. For the quantitative component, the survey instrument underwent pilot testing to ensure clarity, relevance, and reliability of the questions. Feedback from the pilot test was used to refine the questionnaire before deployment. For the qualitative component, triangulation was employed by gathering data from multiple sources (e.g., household heads, electricians, barangay officials) to validate the findings and ensure consistency across different perspectives. Additionally,

the use of a structured interview guide ensured that key topics were consistently covered during each interview, further enhancing the reliability of the qualitative data.

By combining purposive sampling, statistical rigor in determining the quantitative sample size, and data saturation for qualitative data collection, the study ensured a comprehensive and diverse dataset. This approach enabled the researchers to effectively address the research objectives, including assessing residents' knowledge, preparedness, challenges, and strategies for improving electrical safety practices and community programs in Barangay Balaoi.

D. Research Instrument

The study utilized a combination of a structured survey questionnaire and a semi-structured interview guide as the primary research instruments to address the research questions and objectives. These tools were carefully developed and aligned with the study's purpose, ensuring the collection of both quantitative and qualitative data to comprehensively address the research objectives.

The structured survey questionnaire was designed to gather quantitative data and consisted of three key sections. Part I focused on the demographic profile of respondents, collecting information such as age, gender, household role, and experience with electrical safety practices through a checklist format. Part II assessed the level of knowledge of residents regarding electrical safety practices using a 4-point Likert scale, with response options interpreted as 4 (Highly Knowledgeable), 3 (Moderately Knowledgeable), 2 (Slightly Knowledgeable), and 1 (Not Knowledgeable). Part III evaluated the preparedness of residents to implement proper electrical safety practices during emergencies. This section included Likert-scale items with responses interpreted as 4 (Highly Prepared), 3 (Moderately Prepared), 2 (Slightly Prepared), and 1 (Not Prepared). The data collected from these sections provided a basis for analyzing the level of knowledge, preparedness, and their potential relationship.

To collect qualitative data, a semi-structured interview guide was employed to gain in-depth insights from key informants, including household heads, electricians, barangay officials, and program implementers. The guide was designed to address specific research objectives, such as identifying challenges encountered by residents in maintaining safe electrical installations and exploring strategies or solutions to strengthen existing community programs in promoting knowledge, preparedness, and compliance with electrical safety practices. Open-ended questions encouraged participants to share detailed experiences, challenges, and recommendations, while the flexible format allowed for follow-up questions to clarify or expand on their responses.

The validity of the research instruments was ensured through expert validation. A panel of experts in electrical safety, disaster preparedness, and research methodology reviewed the survey questionnaire and interview guide to assess their relevance, clarity, and alignment with the research objectives. Feedback from the experts was incorporated into the instruments to refine their quality and ensure their suitability for the study. This rigorous process ensured that the instruments were reliable and effective for collecting accurate and meaningful data.

By using these research instruments, the study was able to gather comprehensive data to address the research questions, including the level of knowledge and preparedness of residents, challenges in maintaining electrical safety, and strategies for improving community programs.

E. Data Gathering Procedure

The data gathering process was conducted systematically to ensure the collection of reliable and relevant information aligned with the study's objectives. Initially, the researchers coordinated with the barangay officials of Barangay Balaoi, Pagudpud, Ilocos Norte, to seek permission to conduct the study within the community. During this step, the researchers explained the research objectives, scope, and methodology, and the barangay officials assisted in identifying potential participants who met the study's criteria. Participants were selected using purposive sampling, ensuring their relevance to the research objectives. The criteria for selection included residents aged 18 and above, individuals with prior knowledge or experience related to electrical safety practices, those who had been affected by disasters involving electrical hazards, individuals actively involved in disaster preparedness and community safety initiatives, and participants willing to contribute to the study.

The data collection process began with the distribution of survey questionnaires to general residents to address the first two research objectives: assessing residents' understanding of electrical safety practices and evaluating their readiness to implement proper electrical safety practices. Participants were given sufficient time to complete the questionnaires, and assistance was provided when necessary to ensure accurate responses.

To address the third research objective, which focused on identifying challenges faced by residents in maintaining safe electrical installations, semi-structured interviews were conducted with key informants, including household heads, electricians, and barangay officials. The interview guide included open-ended questions to explore the challenges encountered in maintaining safe electrical installations in households and the community. These interviews provided detailed insights into the barriers to electrical safety.

For the fifth research objective, which aimed to identify strategies to strengthen existing community programs in promoting electrical safety practices, additional semi-structured interviews were conducted with barangay officials and program implementers. Focus group discussions (FGDs) were also conducted with selected participants to gather diverse perspectives on electrical safety challenges, community readiness, and potential solutions.

The entire study, including the preparation of research instruments, pilot testing, data collection, and analysis, was conducted over a period of six months. The initial month was allotted for coordination with barangay officials, preparation of research tools, and pilot testing. Data collection was conducted over two months, followed by three months for data organization, analysis, and report writing.

Throughout the data collection process, the researchers ensured the accuracy and completeness of the data gathered. After completing data collection, all responses and interview transcripts were compiled and prepared for analysis. This systematic approach ensured that the data collected was relevant and aligned with the study's objectives..

F. Statistical Treatment

The data collected in the study were analyzed using a combination of quantitative and qualitative methods to comprehensively address the research objectives. Descriptive statistics, Pearson correlation analysis, and thematic analysis—following Braun and Clarke's (2006) six-phase model—were employed to ensure a systematic and thorough interpretation of the findings.

To assess residents' understanding of electrical safety practices, responses from the structured survey questionnaire were analyzed using descriptive statistics, specifically the calculation of the mean. This provided a clear summary of the knowledge levels of the respondents, offering insights into how well-informed they were regarding electrical safety practices. Similarly, to evaluate the preparedness of residents to implement proper electrical safety practices, data from the Likert-scale survey were analyzed using descriptive statistics, with the mean used to measure the overall preparedness levels. This analysis highlighted the extent of residents' readiness to implement safety measures during emergencies.

For identifying challenges faced by residents in maintaining safe electrical installations, data from the semi-structured interviews were analyzed qualitatively using thematic analysis guided by Braun and Clarke's (2006) six-phase framework. The process began with familiarization with the data, where interview transcripts were reviewed multiple times to identify initial ideas. This was followed by generating initial codes, which involved systematically coding key features of the data. These codes were then grouped into potential themes during the searching-for-themes phase, and the themes were subsequently refined and reviewed against the data set. In the defining-and-naming-themes phase, themes were clearly articulated and labeled to reflect their essence, and finally, the report was produced by presenting the themes with supporting data extracts. Additionally, frequency analysis was conducted to rank the challenges based on their prevalence, highlighting the most common and significant issues encountered by the community.

To explore the relationship between residents' knowledge and preparedness in ensuring electrical safety, Pearson correlation analysis was performed. This statistical test determined the strength and direction of the relationship

between the two variables, providing evidence on whether residents' knowledge of electrical safety influenced their level of preparedness.

Lastly, to identify strategies to strengthen existing community programs in promoting electrical safety practices, semi-structured interview responses from barangay officials and program implementers were analyzed using thematic analysis, once again guided by Braun and Clarke's (2006) six-phase model. The same rigorous process was followed to identify recurring suggestions and recommendations for improving community programs. Frequency analysis was also conducted to rank the most commonly suggested strategies or solutions, ensuring that the most relevant and impactful recommendations were highlighted.

By employing these statistical and analytical methods, the study ensured that both quantitative and qualitative data were systematically analyzed, providing meaningful insights and addressing the research objectives comprehensively.

G. Ethical Consideration

The study strictly adhered to ethical principles to ensure the protection of participants' rights, privacy, and well-being throughout the research process. Prior to data collection, the researchers sought approval from the appropriate authorities, including barangay officials and an ethics review board, to ensure compliance with ethical standards. Informed consent was obtained from all participants, who were provided with clear explanations of the study's purpose, objectives, procedures, and potential risks or benefits. Participants were assured that their participation was voluntary and that they could withdraw from the study at any time without any repercussions.

Confidentiality and anonymity were maintained by assigning unique codes to participants and ensuring that no identifying information was included in the data analysis or final report. All data collected, including survey responses and interview transcripts, were securely stored and used solely for the purposes of the study. Access to the data was restricted to the researchers to prevent unauthorized use or disclosure.

The researchers ensured that all participants were treated with respect and dignity throughout the study. Special care was taken to create a safe and comfortable environment during interviews and focus group discussions to encourage open and honest sharing of experiences and opinions. Participants were also given the opportunity to ask questions and seek clarification about the study before providing their consent.

To ensure the validity and reliability of the research instruments, expert validation and pilot testing were conducted prior to data collection. This process ensured that the instruments were appropriate, clear, and aligned with the study's objectives, minimizing potential risks or misunderstandings for participants. Furthermore, the researchers followed the principles of beneficence, ensuring that the study would contribute to the improvement of electrical safety practices and community programs in Barangay Balaoi, ultimately benefiting the participants and their community.

By adhering to these ethical considerations, the researchers ensured that the study was conducted responsibly, respecting the rights and welfare of all participants while maintaining the integrity of the research process.

RESULTS AND DISCUSSIONS

A. Residents' Knowledge of Electrical Safety Practices

Table 1 shows the residents' level of knowledge of electrical safety practices. The overall mean score is 2.02, which indicates that residents are slightly knowledgeable about electrical safety practices.

Among the statements, residents demonstrated the highest level of knowledge in safely disconnecting electrical power during emergencies (mean = 2.75, moderately knowledgeable) and turning off the main power source before evacuating during emergencies (mean = 2.75, moderately knowledgeable). However, the lowest levels of knowledge were observed in statements regarding proper grounding of electrical systems (mean = 1.50, not knowledgeable), using extension cords temporarily (mean = 1.55, not knowledgeable), and having an emergency plan for electrical safety during disasters (mean = 1.75, not knowledgeable).

TABLE I Residents' Level of Knowledge of Electrical Safety Practices

Statement	Mean	DI
1. I know that electrical systems in households must be properly grounded to prevent electrical shocks.	1.50	Not Knowledgeable
2. I understand the importance of using the correct wire size for specific electrical loads to avoid overheating and fire hazards.	2.40	Slightly Knowledgeable
3. I am aware that electrical circuits should not be overloaded to ensure safe operation of electrical systems.	2.00	Slightly Knowledgeable
4. I know that electrical outlets and switches should be securely installed to prevent accidents.	1.95	Slightly Knowledgeable
5. I understand that only certified electrical materials and devices should be used for installations and repairs.	1.78	Slightly Knowledgeable
6. I know how to safely disconnect electrical power during emergencies such as floods, fires, or earthquakes.	2.75	Moderately Knowledgeable
7. I am aware of the risks of using electrical appliances or outlets when they are wet or submerged during floods.	2.45	Slightly Knowledgeable
8. I understand the importance of having an emergency plan for electrical safety during natural disasters.	1.75	Not Knowledgeable
9. I know that electrical inspections should be conducted after a disaster to ensure the safety of the system.	1.78	Slightly Knowledgeable
10. I know that extension cords should only be used temporarily and not as a substitute for permanent wiring.	1.55	Not Knowledgeable
11. I understand the role of circuit breakers or fuses in protecting my home from electrical faults.	2.00	Slightly Knowledgeable
12. I am aware of the importance of regular inspection and maintenance of electrical systems to ensure safety.	1.75	Not Knowledgeable
13. I know that electrical work in my home should only be performed by a licensed electrician.	2.00	Not Knowledgeable
14. I understand the importance of turning off the main power source before evacuating during emergencies.	2.75	Moderately Knowledgeable
15. I know how to identify potential electrical hazards in my home after a disaster, such as damaged wires or exposed outlets.	2.00	Slightly Knowledgeable
Overall Mean Score	**2.02**	**Slightly Knowledgeable**

Note: DI – Descriptive Interpretation; 3.26–4.00-Highly Knowledgeable (K); 2.51–3.25-Moderately Knowledgeable (MK); 1.76–2.50-Slightly Knowledgeable (SK); 1.00–1.75-Not Knowledgeable (NK)

The initial interpretation of the data suggests that while residents have moderate knowledge in specific emergency-related electrical safety practices, their overall understanding of foundational electrical safety principles remains insufficient. This lack of knowledge in critical areas, such as grounding systems, emergency planning, and proper use of electrical materials, may increase the risk of accidents and injuries during disasters. For example, inadequate knowledge about grounding systems can lead to electrical shocks, while improper use of extension cords poses fire hazards.

The results imply the need for targeted educational interventions to improve residents' understanding of electrical safety practices. Programs should focus on addressing gaps in knowledge, particularly in areas where residents scored as "not knowledgeable." For instance, Basahel [2] emphasized that motivation and access to resources are key determinants of safety behavior, underscoring the importance of community engagement. Gumasing and Sobrevilla [10] similarly noted that integrating safety education into community programs enhances disaster preparedness and resilience.

These findings align with prior studies. For instance, AlQhtani et al. [1] emphasized that limited access to safety tools and resources is a common barrier to effective electrical safety practices. Kulor et al. [13] similarly found that many households in Ghana lacked surge protectors and other essential devices, increasing the risk of

appliance damage during power fluctuations. Mukhtar and Kantsi [17] also noted that while awareness of safety practices is generally high, the actual implementation of these practices often lags due to resource constraints.

Moreover, the results align with the broader framework of safety knowledge and compliance discussed by Basahel [2], who highlighted that motivation and access to resources are key determinants of safety behavior. Gumasing and Sobrevilla [10] also emphasized the importance of integrating safety education into community programs to enhance disaster preparedness and resilience.

In conclusion, the results reveal that residents are only slightly knowledgeable about electrical safety practices, with notable deficiencies in foundational principles. This underscores the need for comprehensive safety education programs that address these gaps and provide practical training to ensure residents are better prepared for emergencies. These findings are consistent with prior studies [1, 2, 10, 13, 17], which advocate for holistic approaches to improving knowledge and preparedness in disaster and electrical safety management.

B. Preparedness of Residents in Implementing Electrical Safety Practices

Table II presents the preparedness of residents to implement electrical safety practices. The overall mean score is 2.08, which indicates that residents are slightly prepared to implement electrical safety practices.

Among the statements, residents demonstrated the highest level of preparedness in avoiding the use of electrical outlets, switches, or appliances that have been exposed to water (mean = 3.25, prepared) and avoiding overloading electrical circuits and outlets to reduce the risk of fires (mean = 2.55, prepared). However, the lowest levels of preparedness were observed in statements regarding having the necessary tools to handle electrical emergencies (mean = 1.25, not prepared), knowing when to seek help from a licensed electrician after an electrical emergency (mean = 1.50, not prepared), and staying informed about electrical safety guidelines to minimize risks during emergencies (mean = 1.50, not prepared).

The data suggests that while residents show a moderate level of preparedness in specific practices, such as avoiding water-exposed electrical outlets and preventing circuit overloading, their overall readiness to handle electrical emergencies is insufficient. The lack of tools, knowledge of when to seek professional help, and staying updated on safety guidelines are critical gaps that may hinder their ability to effectively address electrical hazards during emergencies. For example, not having the proper tools or failing to consult a licensed electrician can lead to improper handling of electrical issues, increasing the risk of accidents or further damage.

TABLE II Preparedness of Residents to Implement Electrical Safety Practices

Statement	Mean	DI
1. I know how to locate and safely shut off the main power supply in case of an emergency.	2.50	Slightly Prepared
2. I have all the necessary tools to safely handle electrical emergencies.	1.25	Not Prepared
3. My home's electrical system is properly grounded to prevent electrical shocks.	1.75	Not Prepared
4. I ensure that electrical outlets and appliances are installed in safe locations.	2.51	Prepared
5. I avoid overloading electrical circuits and outlets to reduce the risk of fires.	2.55	Prepared
6. I know how to safely disconnect electrical appliances during emergencies.	1.75	Not Prepared
7. I regularly inspect my home's electrical system for signs of damage or wear.	1.75	Prepared
8. I follow safety precautions during power surges or brownouts (e.g., unplugging appliances).	2.40	Slightly Prepared
9. I avoid using electrical outlets, switches, or appliances that have been exposed to water.	3.25	Prepared
10. I educate my household members on electrical safety practices during emergencies.	2.40	Slightly Prepared
11. I have a plan in place to address electrical emergencies (e.g., fires, power outages).	1.80	Slightly Prepared
12. I am confident that my home's electrical materials and devices are safe and compliant.	2.48	Slightly Prepared

13. I have installed surge protectors to protect appliances during power fluctuations.	1.90	Slightly Prepared
14. I know when to seek help from a licensed electrician after an electrical emergency.	1.50	Not Prepared
15. I stay informed about electrical safety guidelines to minimize risks during emergencies.	1.50	Not Prepared
Overall Mean Score	**2.08**	**Slightly Prepared**

Note: DI – Descriptive Interpretation; 3.26–4.00-Very Prepared, 2.51–3.25 -Prepared, 1.76–2.50-Slightly Prepared, 1.00–1.75-Not Prepared

These findings highlight the need for community-based initiatives to improve residents' preparedness for electrical emergencies. Educational programs should focus on equipping residents with the necessary tools and knowledge to handle emergencies effectively. For instance, Basahel [2] emphasized that motivation and access to resources are key determinants of safety behavior, suggesting that providing affordable safety tools and materials could improve preparedness. Similarly, Gumasing and Sobrevilla [10] stressed the importance of integrating safety education into community programs to enhance disaster preparedness and resilience.

These results align with prior studies. AlQhtani et al. [1] found that limited access to safety tools and resources is a common barrier to effective electrical safety practices. Kulor et al. [13] similarly observed that many households in Ghana lacked essential devices, such as surge protectors, which increased the risk of appliance damage during power fluctuations. Mukhtar and Kantsi [17] also noted that while awareness of safety practices is generally high, the actual implementation of these practices often lags due to resource constraints.

Moreover, the findings underscore the importance of regular inspections and maintenance of electrical systems, as highlighted by Basahel [2], who noted that proactive measures and community engagement are critical in fostering safety compliance. Gumasing and Sobrevilla [10] also emphasized the role of education and training in improving disaster preparedness.

In conclusion, the results reveal that residents are only slightly prepared to implement electrical safety practices, with significant deficiencies in critical areas such as having the necessary tools, consulting professionals, and staying informed about safety guidelines. This underscores the need for targeted interventions to address these gaps and improve overall preparedness. These findings are consistent with prior studies [1, 2, 10, 13, 17], which advocate for holistic approaches to improving safety knowledge, preparedness, and compliance in disaster and electrical safety management.

C. Challenges in Maintaining Safe Electrical Installations

Table III outlines the challenges faced by residents in maintaining safe electrical installations, grouped into four key themes: limited knowledge of electrical safety practices, insufficient preparedness and tools for electrical safety, lack of proactive safety measures and education, and resource constraints. These challenges highlight critical gaps in knowledge, preparedness, and resources, which increase residents' vulnerability to electrical hazards.

TABLE III Challenges Faced by Residents in Maintaining Safe Electrical Installations

Challenges	Codes	F	%	Rank
Limited Knowledge of Electrical Safety Practices	Lack of knowledge on safely disconnecting power during emergencies	8	80%	1
	Difficulty identifying potential electrical hazards after disasters	6	60%	2
	Limited understanding of grounding electrical systems to prevent shocks	5	50%	3

Insufficient Preparedness and Tools for Electrical Safety	Lack of necessary tools to handle electrical emergencies	7	70%	1
	Limited installation of surge protectors to protect appliances during power fluctuations	6	60%	2
	Failure to ensure safe installation of outlets and appliances	5	50%	3
Lack of Proactive Safety Measures and Education	Lack of education for household members on electrical safety practices	6	60%	1
	Failure to regularly inspect electrical systems for damage or wear	5	50%	2
	Limited awareness of the importance of using certified materials for installations	4	40%	3
Resource Constraints	Inability to hire licensed electricians for electrical work	7	70%	1
	Financial limitations to purchase certified electrical materials	6	60%	2
	Lack of resources to conduct regular maintenance and inspections	5	50%	3

Limited Knowledge of Electrical Safety Practices

One of the most significant challenges identified in the study is the limited knowledge of electrical safety practices. A striking 80% of participants reported a lack of knowledge on safely disconnecting power during emergencies. Furthermore, 60% of respondents struggled to identify potential electrical hazards after disasters, while 50% lacked understanding of grounding systems to prevent shocks. This lack of knowledge was reflected in participants' responses, with one sharing, *"Alam ko lang yung basic gaya ng pag-unplug ng appliances. Pero pagdating sa breaker at grounding, hindi ako sigurado. Natatakot akong galawin baka mas lumala pa."* ("I only know the basics like unplugging appliances. But when it comes to breakers and grounding, I'm unsure. I'm afraid to touch them in case it worsens the situation.") Another participant expressed, *"Ang hirap pong siguraduhin na safe yung electrical system namin kasi mabilis kalawangin ang mga kable dito sa Balaoi dahil sa alat ng hangin. Kapag tag-bagyo, basa ang paligid kaya kinakabahan ako baka mag-short circuit."* ("It's hard to ensure our electrical system is safe because the wires here in Balaoi rust quickly due to the salty air. During typhoons, the area gets wet, and I get nervous about possible short circuits.")

The implications of this lack of knowledge are alarming, as it significantly increases the likelihood of accidents and disasters, particularly in disaster-prone areas. These findings are consistent with previous studies, which have shown that insufficient knowledge about electrical safety practices contributes to electrical injuries and burns [1]. For example, Lopez et al. [15] emphasize that limited awareness of basic safety measures, such as identifying exposed wires or switching off power during emergencies, is a key factor in household electrical accidents. To address this issue, public awareness campaigns are critical. As supported by Nocete and Enteria [19], educating residents on basic safety precautions can help reduce risks and improve safety outcomes in vulnerable communities.

Insufficient Preparedness and Tools for Electrical Safety

Building on the issue of limited knowledge, another major challenge identified is insufficient preparedness and a lack of tools to ensure electrical safety. A significant 70% of participants reported not having the necessary tools to handle electrical emergencies. Additionally, 60% indicated the absence of surge protectors to safeguard appliances during power fluctuations, while 50% admitted to failing to ensure the safe installation of outlets and appliances. One participant noted, *"Wala kaming mga kagamitan para sa mga electrical issues. Umaasa na lang kami na walang mangyayari kasi hindi namin alam ang gagawin."* ("We don't have the tools or equipment to deal with electrical issues. We just hope nothing goes wrong because we don't know what to do.") Another participant added, *"Sana may libreng pa-inspection bago magbagyo para makita kung alin ang dapat palitan. Mas okay kung may simple training para sa tamang paggamit ng main switch at basic safety steps."* ("I hope

there are free inspections before typhoons to identify what needs to be replaced. It would be better if there's simple training on using the main switch and basic safety steps.")

This lack of preparedness reflects a reactive approach to electrical safety, leaving residents ill-equipped to handle emergencies effectively. Studies corroborate these findings, highlighting the importance of equipping households with tools and devices to address electrical emergencies. For instance, Kulor et al. [14] found that the absence of surge protectors and other safety devices significantly increases the risk of electrical fires, particularly in areas prone to power surges. Furthermore, Basahel [2] emphasizes that safety motivation and leadership are critical in promoting compliance with safety standards, suggesting that community-wide initiatives could help address this challenge.

Lack of Proactive Safety Measures and Education

In addition to limited knowledge and preparedness, the study revealed a lack of proactive safety measures and education as another critical challenge. Among participants, 60% reported that they had not received any education on electrical safety practices for household members. Furthermore, 50% admitted to not conducting regular inspections of their electrical systems, while 40% were unaware of the importance of using certified materials for installations. One participant highlighted the need for more proactive safety measures, saying, *"Kailangan ng regular safety drills para alam ng mga tao kung paano mag-secure ng wirings at outlets bago dumating ang bagyo."* ("Regular safety drills are needed so people know how to secure wirings and outlets before a typhoon arrives.") Another participant observed, *"Hindi kami natuturuan kung paano mag-check ng mga electrical hazards, at hindi ko rin alam kung saan magsisimula."* ("We've never been taught how to check for electrical hazards, and I wouldn't even know where to start.")

Proactive education is essential for reducing risks and ensuring long-term safety. Research supports this finding, emphasizing that integrating safety knowledge into daily practices has a meaningful impact on reducing hazards [3]. Francioli [8] highlights the importance of education in reducing fire risks in low-income households, particularly through targeted interventions that address knowledge gaps. Without regular inspections and proper training, residents are left vulnerable to preventable electrical hazards, especially in high-risk environments.

Resource Constraints

Finally, resource constraints emerged as a significant barrier to maintaining electrical safety. Among participants, 70% reported being unable to afford licensed electricians for electrical work. Furthermore, 60% cited financial limitations in purchasing certified electrical materials, while 50% mentioned a lack of resources for regular maintenance and inspections. One participant lamented, *"Isa sa mga problema namin ay yung mga sirang outlet na hindi agad napapagawa dahil kulang sa budget. Minsan pinagtitiisan na lang namin kahit may sira pa konti."* ("One of our problems is broken outlets that we can't fix immediately because of budget constraints. Sometimes, we just endure it even if it's slightly damaged.") Another participant added, *"Maraming bahay ang hindi agad alam kung unsafe na yung wiring nila. Yung iba lang nalalaman pag may amoy sunog na o biglang nag-brownout."* ("Many households don't immediately know if their wiring is unsafe. Some only realize it when they smell something burning or when there's a sudden blackout.")

Resource constraints exacerbate the challenges faced by residents, particularly in low-income communities. These findings are consistent with existing literature, which highlights how financial limitations often lead to the use of substandard materials, increasing the likelihood of electrical hazards [8]. For example, Lopez et al. [15] emphasize that households with limited budgets are more likely to delay repairs or rely on unlicensed electricians, further compounding safety risks. Government subsidies and community programs are essential to support low- and middle-income households in improving electrical safety, as highlighted in previous studies.

In conclusion, the challenges faced by residents in maintaining safe electrical installations are multifaceted, encompassing limited knowledge, insufficient preparedness, lack of proactive measures, and resource constraints. These findings align with existing studies, which emphasize the critical role of education, tools, and resources in minimizing electrical hazards [1, 3, 14]. Addressing these challenges requires a comprehensive approach that includes education campaigns, resource allocation, and policy interventions. Programs such as free inspections, safety training, and community partnerships with licensed electricians can empower residents

to maintain safer electrical systems and reduce the risks associated with electrical hazards. By addressing these gaps, communities can build a safer and more resilient environment for all residents.

D. Relationship Between Knowledge and Preparedness in Ensuring Electrical Safety

Table IV shows the correlation between residents' knowledge of electrical safety and their readiness to implement safety practices.

The mean score for Knowledge of Electrical Safety is 2.02, which is interpreted as Slightly Knowledgeable, while the mean score for Readiness to Implement Safety Practices is 2.08, interpreted as Slightly Prepared. The Pearson correlation coefficient (r-value) is 0.72, indicating a strong positive relationship between the two variables. The significance level (p-value) is 0.05, which suggests that the relationship is statistically significant.

These findings imply that as residents' knowledge of electrical safety increases, their readiness to implement safety practices also improves. However, the slightly low mean scores for both indicators highlight a need for improvement in both knowledge and preparedness. This relationship underscores the importance of enhancing residents' understanding of electrical safety to foster better preparedness for implementing safety practices during emergencies. For instance, residents who are knowledgeable about electrical hazards and safety guidelines are more likely to take proactive steps to prevent accidents, such as avoiding overloaded circuits or inspecting electrical systems regularly.

The results corroborate findings from previous studies. Basahel [1] emphasized that knowledge is a key determinant of safety behavior, suggesting that individuals who are well-informed about safety practices are more likely to exhibit preparedness in emergencies. Similarly, Gumasing and Sobrevilla [2] highlighted the importance of integrating safety education into community programs to improve disaster preparedness and resilience. AlQhtani et al. [3] also found that limited knowledge and access to resources are common barriers to effective safety practices, which aligns with the slightly low scores observed in the current study. Furthermore, Mukhtar and Kantsi [4] noted that while awareness of safety practices is generally high, actual implementation often lags due to resource constraints, highlighting the need for targeted interventions to bridge the gap between knowledge and action.

In conclusion, Table 1 illustrates a significant positive correlation between knowledge of electrical safety and readiness to implement safety practices. While the relationship is strong, the slightly low mean scores for both indicators suggest that residents require further education and resources to enhance their preparedness. These findings align with prior studies [1, 2, 3, 4] that advocate for community-based initiatives to improve safety knowledge and preparedness, ultimately minimizing risks during electrical emergencies.

TABLE IV Correlation Between Residents' Knowledge and Preparedness in Electrical Safety

Indicator	Mean	DI	r-value	p-value	Interpretation
Knowledge of Electrical Safety	2.02	Slightly Knowledgeable	0.72	0.05	Significant
Readiness to Implement Safety Practices	2.08	Slightly Prepared			

Note: DI – Descriptive Interpretation; r – Pearson correlation coefficient; $p < 0.05$ – statistically significant.

E. Strategies to Strengthen Community Programs for Promoting Electrical Safety

Table V highlights three strategies to strengthen community programs for promoting electrical safety: Enhancing Community Knowledge Through Targeted Education and Awareness, Building Capacity for Emergency Preparedness and Response, and Addressing Resource Constraints to Improve Compliance with Safety Standards. Each theme includes specific challenges ranked by frequency and percentage, providing a clear direction for targeted interventions aimed at fostering safer communities.

Under the theme of Enhancing Community Knowledge Through Targeted Education and Awareness, the most pressing issue identified is the limited knowledge of safely disconnecting power during emergencies, reported by 80% of respondents. Many community members lack basic skills in handling electrical emergencies, which

increases the risk of accidents. One participant shared, *"Hindi namin alam kung paano ligtas na patayin ang kuryente sa panahon ng emergency. Minsan, hinahayaan na lang namin at umaasa na walang masamang mangyari."* (*"We don't know how to turn off the power safely during emergencies. Sometimes, we just leave it on and hope nothing worse happens."*) Another common challenge is the lack of knowledge on recognizing unsafe wiring or overloaded circuits, which 70% of respondents identified as a concern. This gap prevents individuals from identifying potential hazards in their homes. One respondent explained, *"Hindi ko alam kung ligtas ba ang wiring namin o hindi. Ginagamit na lang namin hangga't may nasisira o nagliliyab."* (*"I don't know if our wiring is safe or not. We just use it until something breaks or sparks happen."*) Furthermore, 60% of respondents noted insufficient resources for community-driven awareness campaigns, which limits the ability to educate residents effectively. One participant remarked, *"Kailangan namin ng mas maraming programa para turuan kami tungkol sa electrical safety, pero walang pondo o resources para sa mga kampanya na ito."* (*"We need more programs to teach us about electrical safety, but there's no funding or resources for these campaigns."*) These findings emphasize the need for localized and practical educational initiatives, supported by sufficient resources, to improve knowledge retention and engagement [1, 2].

The second theme, Building Capacity for Emergency Preparedness and Response, underscores the importance of equipping communities with the tools and training needed to handle electrical emergencies effectively. The most significant challenge, reported by 80% of respondents, is the limited training on how to safely shut off power during emergencies. One participant shared, *"Kailangan namin ng tamang pagsasanay para malaman kung ano ang gagawin sa panahon ng emergency, tulad ng ligtas na pagpatay ng kuryente o kung anong kagamitan ang dapat gamitin."* (*"We need proper training to know what to do during emergencies, like how to turn off the power safely or what tools to use."*) Another issue is the lack of safety drills or emergency response plans, which 60% of respondents identified as a concern. Communities rarely conduct drills, leaving residents unprepared for electrical incidents. One respondent explained, *"Hindi pa kami nagkaroon ng safety drill sa lugar namin. Kung may mangyari, hindi namin alam kung paano reresponde."* (*"We've never had a safety drill in our area. If something happens, we don't know how to respond."*) Additionally, 50% of respondents noted the lack of affordable tools, such as insulated gloves and voltage testers, which are essential for safely handling electrical systems. One participant remarked, *"Kung mas mura ang insulated gloves o testers, bibilhin namin. Pero sa ngayon, masyado silang mahal para sa amin."* (*"If insulated gloves or testers were cheaper, we'd buy them. But right now, they're too expensive for us."*) These findings highlight the need for hands-on training, community-wide safety drills, and affordable safety tools to enhance preparedness and reduce risks during emergencies [3, 4].

The third theme, Addressing Resource Constraints to Improve Compliance with Safety Standards, focuses on overcoming financial and resource barriers that prevent communities from adhering to safety regulations. The high cost of certified materials, such as wires and circuit breakers, was identified as the most critical issue by 70% of respondents. Many households opt for cheaper, unsafe alternatives due to financial constraints. One participant explained, *"Alam namin na mas ligtas ang certified na materyales, pero masyado silang mahal para sa amin. Ginagamit na lang namin kung ano ang kaya naming bilhin."* (*"We know certified materials are safer, but they're too expensive for us. We just use what we can afford."*) Another issue, reported by 60% of respondents, is the lack of affordable professional services for safe installations and repairs. Many households resort to DIY repairs despite the risks involved. One participant shared, *"Hindi namin kayang magbayad ng mga professional na electrician, kaya kami na lang ang gumagawa ng mga repair, kahit delikado."* (*"We can't afford professional electricians, so we just do the repairs ourselves, even if it's risky."*) Finally, 50% of respondents noted infrequent system checks due to financial constraints, which prevents timely identification and resolution of electrical issues. One respondent remarked, *"Wala kaming pera para regular na ipacheck ang system. Inaayos na lang namin kapag may problema na."* (*"We don't have the money to check the system regularly. We only fix it when there's already a problem."*) These findings suggest that financial support, such as subsidies for certified materials and free or low-cost professional services, is critical to improving compliance with safety standards and reducing accidents [5, 6].

The strategies align with existing literature on electrical safety. Studies emphasize the importance of community-specific education and localized materials in fostering awareness [1, 2], hands-on training, safety drills, and accessible tools in building preparedness [3, 4], and financial assistance and affordable professional services in

improving compliance [5, 6]. These strategies collectively demonstrate their effectiveness in promoting knowledge, preparedness, and compliance with electrical safety practices.

TABLE V Proposed Strategies to Strengthen Community Programs on Electrical Safety

Themes	Codes	f	%	Rank
Enhancing Community Knowledge Through Targeted Education and Awareness	Limited knowledge of safely disconnecting power during emergencies	8	80%	1
	Lack of knowledge on recognizing unsafe wiring or overloaded circuits	7	70%	2
	Insufficient resources for community-driven awareness campaigns	6	60%	3
Building Capacity for Emergency Preparedness and Response	Limited training on shutting off power safely during emergencies	8	80%	1
	Few safety drills or emergency response plans in place	6	60%	2
	Lack of affordable tools like insulated gloves or voltage testers	5	50%	3
Addressing Resource Constraints to Improve Compliance with Safety Standards	High cost of certified materials (e.g., wires, circuit breakers)	7	70%	1
	Lack of affordable professional services for safe installations and repairs	6	60%	2
	Infrequent system checks due to financial constraints	5	50%	3

CONCLUSION

The findings of this study reveal significant gaps in residents' knowledge, preparedness, and ability to maintain safe electrical installations, highlighting a pressing need for targeted interventions. While residents exhibited moderate knowledge in certain emergency-related electrical safety practices—such as safely disconnecting power and turning off the main power source during emergencies—their understanding of foundational principles remains insufficient. Critical areas, including grounding systems, proper use of extension cords, and the development of emergency plans for electrical safety, were identified as major deficiencies that increase the risk of accidents and injuries, particularly during disasters.

Similarly, residents were found to be only slightly prepared to implement electrical safety practices. Notable gaps include the lack of necessary tools, limited access to professional support, and inadequate awareness of safety guidelines. These deficiencies leave households vulnerable to electrical hazards, particularly in disaster-prone areas. Financial constraints further compound these challenges, as many households cannot afford certified materials or hire licensed electricians, often resorting to unsafe practices and substandard materials. Additionally, the lack of training and tools for handling emergencies leaves residents ill-equipped to respond effectively to electrical hazards.

The study also established a strong positive correlation between residents' knowledge of electrical safety and their readiness to implement safety practices. This finding underscores the critical role of knowledge in enhancing preparedness, suggesting that targeted education and training can directly reduce risks and foster safer communities. However, the slightly low mean scores for both knowledge and preparedness indicate that significant efforts are needed to bridge these gaps.

To address these challenges, the study proposes three key strategies: (1) enhancing community knowledge through targeted education and awareness programs, (2) building capacity for emergency preparedness and response through hands-on training and affordable tools, and (3) addressing resource constraints by providing financial assistance and subsidies for certified materials and professional services. These strategies align with existing literature advocating for holistic approaches to improving knowledge, preparedness, and compliance with safety standards.

In conclusion, the findings emphasize the need for comprehensive community-based initiatives to improve residents' knowledge, preparedness, and ability to maintain safe electrical installations. By implementing targeted educational programs, providing access to affordable tools and materials, and fostering proactive safety measures, communities can significantly reduce the risks associated with electrical hazards. These efforts will not only enhance disaster resilience but also promote long-term safety and well-being for residents.

VI. Implications for Policy and Long-Term Capacity-Building

The findings of this study provide actionable insights for the local government of Pagudpud, Ilocos Norte, in alignment with the national government's disaster risk reduction and management (DRRM) framework under the Philippine Disaster Risk Reduction and Management Act of 2010 (RA 10121). These results highlight the need for targeted policies and programs to address the gaps in electrical safety knowledge, preparedness, and resource availability among residents.

At the local government level, policies should prioritize regular electrical safety inspections for households, particularly in disaster-prone areas. The municipal government of Pagudpud can collaborate with barangay officials to establish programs that provide free or subsidized inspections and distribute certified electrical materials to low-income households. These initiatives can be supported by national agencies such as the Department of Energy (DOE) and the Department of Social Welfare and Development (DSWD) to ensure funding and technical expertise are available.

To strengthen community capacity, barangays in Pagudpud can integrate electrical safety education into their disaster preparedness programs. Community-based training initiatives can teach residents essential skills, such as identifying electrical hazards, proper use of grounding systems, and safely disconnecting power during emergencies. These programs can be implemented in partnership with the Department of the Interior and Local Government (DILG) and local electricians, ensuring that training is both practical and accessible.

Long-term capacity-building efforts should also include the establishment of pre-disaster electrical safety measures, such as barangay-led inspections before typhoon season, and the provision of tools like surge protectors and insulated equipment to vulnerable households. These initiatives can be integrated into the National Disaster Risk Reduction and Management Plan (NDRRMP) under disaster preparedness and prevention objectives.

Finally, addressing financial constraints is critical to ensuring the success of these initiatives. The local government can work with national agencies and private organizations, such as the National Electrification Administration (NEA) and the Philippine Disaster Resilience Foundation (PDRF), to provide financial assistance or subsidies for households in need. Public-private partnerships can also play a role in funding and implementing community programs that focus on improving electrical safety and disaster resilience.

By aligning local initiatives with national policies and frameworks, the government of Pagudpud can create a safer and more resilient community. These efforts will not only reduce the risks of electrical hazards but also contribute to the long-term safety, well-being, and disaster preparedness of its residents.

LIMITATIONS OF THE STUDY

While this study provides valuable insights into residents' knowledge, preparedness, and challenges in maintaining safe electrical installations, several limitations should be noted. First, the study focused on a specific community, which may limit the generalizability of the findings to other areas with different socioeconomic, environmental, or cultural contexts. The unique challenges faced by this community, such as financial constraints and exposure to natural disasters, may not fully represent the experiences of other populations. Second, the study relied on self-reported data collected through surveys and interviews, which introduces potential biases such as recall bias and social desirability bias. Participants may have overestimated or underestimated their knowledge, preparedness, or behaviors, potentially affecting the accuracy of the findings. For instance, respondents may have provided answers they believed were socially acceptable rather than reflecting their true experiences. This limitation should be considered when interpreting the results, as it may influence the reliability of the reported

data. Future research could benefit from incorporating objective measures, such as observational studies or third-party assessments, to complement self-reported data and provide a more accurate picture.

Additionally, the descriptive interpretations of knowledge and preparedness levels were based on mean scores, which may not fully capture the nuances of individual experiences or behaviors. While mean scores provide a useful summary, they may oversimplify variations in participants' understanding and actions, potentially masking important differences within the data. The study also did not account for external factors that could influence electrical safety practices, such as the availability of government programs, access to professional electricians, or variations in infrastructure quality. These factors may play a significant role in shaping residents' ability to implement safety measures, but they were not explored in detail. A more comprehensive investigation into these external influences could provide a deeper understanding of the barriers and facilitators to electrical safety.

Lastly, the study primarily focused on electrical safety practices during emergencies and disasters, which may have excluded other important aspects of electrical safety, such as long-term maintenance and compliance with safety standards in routine settings. These aspects are critical for sustained safety and prevention of electrical hazards. Future research could expand on these areas to provide a more holistic understanding of electrical safety practices. Despite these limitations, the study offers a strong foundation for designing targeted interventions to improve electrical safety knowledge, preparedness, and compliance. By addressing these limitations in future research, a more comprehensive and inclusive approach to electrical safety can be achieved.

RECOMMENDATIONS

Based on the conclusion and limitations of this study, several recommendations are proposed to address the gaps in knowledge, preparedness, and challenges faced by residents in maintaining safe electrical installations. First, there is a need to enhance community knowledge through targeted education and awareness programs. This can be achieved by developing and implementing community-based educational campaigns that focus on foundational principles of electrical safety, such as grounding systems, proper use of extension cords, and emergency response protocols. Utilizing accessible platforms like workshops, seminars, social media, and local radio can help disseminate information tailored to the specific needs and socioeconomic conditions of the community. Collaborating with local schools and organizations to integrate electrical safety education into existing programs is also essential to ensure sustainability and reach younger generations.

Second, building capacity for emergency preparedness and response is crucial. Practical hands-on training sessions should be conducted to equip residents with the skills needed to handle electrical emergencies, such as safely disconnecting power, using fire extinguishers, and identifying hazards. Providing households with affordable and essential tools, such as voltage testers and insulated gloves, can further improve their ability to respond to emergencies effectively. Additionally, community-wide emergency plans and drills should be established to familiarize residents with procedures during disasters involving electrical hazards.

Third, addressing resource constraints is vital to improving access to safe materials and professional services. Financial assistance programs or subsidies should be introduced to enable residents to afford certified electrical materials and hire licensed electricians for installations and repairs. Partnerships with local governments and non-governmental organizations (NGOs) can support the provision of free or discounted electrical inspections and maintenance services to low-income households. Moreover, community cooperatives or bulk purchasing initiatives should be encouraged to reduce the cost of acquiring high-quality electrical supplies.

Fourth, future research should expand its scope to address unexplored factors. Follow-up studies in diverse communities should be conducted to identify variations in electrical safety knowledge, preparedness, and practices across different socioeconomic, environmental, and cultural contexts. External factors, such as the availability of government programs, infrastructure quality, and access to professional electricians, should also be investigated to provide a more holistic understanding of electrical safety challenges. Additionally, future studies should explore long-term maintenance practices and compliance with electrical safety standards in routine settings to complement the findings of this study.

Fifth, policies and regulations should be developed and enforced to promote electrical safety compliance. Local authorities should advocate for stricter enforcement of electrical safety standards and regulations to ensure safe installations and minimize risks. Incentives, such as tax reductions or certifications, could be offered to households and businesses that comply with safety standards. Furthermore, electrical safety guidelines should be incorporated into disaster risk reduction policies to ensure comprehensive disaster preparedness.

Lastly, response bias and data collection methods should be addressed in future studies. To improve the accuracy of findings, self-reported surveys and interviews should be complemented with observational methods or third-party assessments. A more detailed scoring system should also be used to capture individual variations in knowledge and preparedness levels, ensuring a nuanced understanding of residents' experiences.

By implementing these recommendations, communities can significantly improve their knowledge, preparedness, and ability to maintain safe electrical installations. These efforts will not only reduce the risks associated with electrical hazards but also contribute to building safer and more resilient communities in the long term.

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