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THE INFLUENCE OF INCOME LEVEL, HOME OWNERSHIP, ATTITUDE, PERCEPTIONS AND EXPERIENCE ON PUBLIC PREPAREDNESS FOR DISASTERS ACROSS DIFFERENT AGE GROUP IN PENANG

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A final year project submitted in partial fulfillment of the requirement for the degree of

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(3) Equal contribution has been made by each group member in completing the FYP

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LIST OF ABBREVIATIONS

ATT	Attitude
β	Standardized Beta Coefficient
B	Unstandardized Beta Coefficient
COG_PER	Cognitive Perception
DRR	Disaster Risk Reduction
DF/df	Degrees of Freedom
DV	Dependent Variable
EMO_PER	Emotional Perception
Gen X	Generation X
Gen Y	Generation Y
Gen Z	Generation Z
IV	Independent Variable
KMO	Kaiser-Meyer-Olkin (Measure of Sampling Adequacy)

p-value	Probability Value
R^2	Coefficient of Determination
SPSS	Statistical Package for the Social Sciences
X^2	Chi-Square

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ABSTRACT

This study explores how income level, homeownership, attitude, perceptions, and experiences affect disaster preparedness across age groups in Penang. With rising risks of floods, landslides, and earthquakes, it is vital to understand the socioeconomic and psychological factors shaping readiness. A total of 384 respondents from Generations X, Y, and Z were surveyed using a structured questionnaire within a quantitative framework. Factor analysis, reliability testing, correlation, and multiple regression were employed to assess the relationships between variables and preparedness. Results indicate that attitude and perception significantly enhance preparedness behaviors across all generations, highlighting the central role of psychological factors. Income level shows a small but significant positive effect, while homeownership exerts a positive yet non-significant influence. Conversely, prior disaster experience has a significant negative effect, suggesting that previous encounters may reduce rather than strengthen preparedness. These findings underscore the importance of integrating socioeconomic and psychological perspectives in disaster risk management. While financial and institutional factors contribute to readiness, attitudes and perceptions remain the strongest drivers. The study recommends age-specific preparedness programs, community training, and targeted awareness campaigns to address generational differences. Such strategies can strengthen resilience and promote a culture of preparedness in Penang.

Keywords: Disaster Preparedness, Income Level, Home Ownership, Attitude, Perception, Past Experience, Age Groups, Penang

Subject Area: HV551.2-639 Emergency management

PREFACE

This research project, *"The Influence of Income Level, Home Ownership, Attitude, Perceptions, and Experience on Public Preparedness for Disasters Across Different Age Groups in Penang"*, is submitted in partial fulfilment of the requirements for the Bachelor's degree at Universiti Tunku Abdul Rahman (UTAR).

The study was undertaken to examine the relationships between selected factors and the level of disaster preparedness among the public, with a particular focus on variations across age groups. The topic was chosen in response to the increasing urgency of disaster risk management in Malaysia, especially in Penang, where both urban development and climate-related hazards present significant challenges to community resilience.

The completion of this project marks the culmination of months of research, data collection, and analysis. It is hoped that the findings will contribute to the academic discourse on disaster preparedness and serve as a valuable reference for policymakers, community leaders, and organisations in formulating targeted and effective preparedness strategies.

CHAPTER 1: INTRODUCTION

1.0 Introduction

This chapter presents the background of the study, followed by the problem statement, research questions, and objectives that guide the investigation. The significance of the study is highlighted, and key concepts are clarified through the definitions of key terms used throughout the research.

1.1 Background of the Study

Disasters are typically thought of as abrupt, unanticipated events with significant effects that frequently have a clear chronological clear "before" and "after," much like an earthquake that occurs suddenly. Disasters, however, can also be viewed as the result of gradually building vulnerabilities, whereby underlying flaws gradually accumulate until they are revealed by a triggering event such as a hurricane, famine, or pandemic. Sometimes the transition from normalcy to tragedy is so subtle that it is only apparent in hindsight (Aronsson-Storrier & Dahlberg, 2022). Disasters, whether natural or man-made, pose significant threats to communities around the world. With the increasing frequency and intensity of events such as floods, landslides, and storms, public preparedness has become a critical component of disaster risk management. Effective preparedness can significantly reduce the impact of disasters on lives, property, and livelihoods. However, the level of

preparedness among individuals and households often varies due to a range of socioeconomic and psychological factors.

Penang is one of Malaysia's most urbanized states, with a population of over 1.80 million in 2024 and an expected growth rate of 1.60% (Department of Statistics Malaysia, 2024). Timur Laut, which includes George Town, the state's capital and a UNESCO World Heritage Site, has the highest population density, with 4,782 people per square kilometer. Penang plays a crucial role in the country's economic and industrial development. However, rapid urban expansion, combined with its steep and varied topography, has increased the state's vulnerability to natural disasters, particularly landslides**,** flash floods and earthquakes. These events are often triggered by intense rainfall, deforestation, and unregulated construction activities (Zulkafli et al., 2023), while the northeastern region has become increasingly prone to flooding due to climate change and shifting rainfall patterns (Yee et al., 2022). Penang has been subjected to an earthquake with tremors, but those earthquakes did not originate from Malaysia. They were caused by seismic activities from neighboring Indonesia, namely the Sumatra Subduction Zone and Sumatra Fault Zone (Badrolhisham & Latiff, 2021).

To address these risks, Penang has implemented various disaster management initiatives, including the Dedicated Disaster Management Unit, the Penang Green Agenda 2030, and Community-Based Disaster Risk Management (CBDRM) programs. Despite these efforts, challenges remain. Public preparedness levels are still inconsistent, with common issues including limited awareness and overreliance on government assistance (Penang Green Agenda 2030, 2020). These concerns highlight the need to better understand the key factors influencing disaster preparedness among the population. Given Penang's high level of urbanization, growing climate vulnerability, and diverse demographic composition, it serves as a critical site for exploring how income level, home ownership, attitudes, perceptions, and prior disaster experience affect public preparedness across different age groups.

This localized focus provides valuable insight for designing targeted and inclusive disaster preparedness strategies.

Rapid urbanization in Penang has led to environmental concerns such as increased flooding and landslides. As built-up areas replace natural landscapes, the ability of the land to absorb rainwater is reduced. Landslides are also becoming more common in Penang, especially in hillside areas where development has disturbed soil stability and removed natural vegetation. Ahmad et al. (2023) found that 24.71% of residents in Mukim 17 and 20.62% in Mukim 18 are living in areas with very high landslide risk. Flood risks are also rising, with a 29.6% increase in average yearly rainfall between 2010 and 2018. Poor drainage systems, loss of natural water catchment areas, and high tides contribute to more severe and frequent floods, particularly in low-lying areas like George Town (Safizadeh et al., 2022). Although Penang is not in a major earthquake zone, it is located near the Sumatran fault. Research by Jena et al. (2023) has found that some parts of Penang have moderate to high earthquake hazards, especially in dense urban areas.

Due to these growing risks such as floods, landslides, and potential earthquakes, public preparedness for disasters in Penang is becoming increasingly important. Communities need to be aware of the hazards around them and know how to respond effectively when disasters occur. Public preparedness for disasters is critical because it enables people and communities to take proactive actions to safeguard themselves and their property, eventually saving lives and minimizing injuries. Preparedness reduces the demand for emergency services, enabling them to focus on the most pressing needs and promoting a speedier, more efficient community recovery. Public preparation improves society's ability to endure and recover from disasters by encouraging resilience and self-reliance. However, there are still gaps in understanding how factors like income level, home ownership, attitude, perceptions and past experience, shape public preparedness. Different age groups may respond to disasters differently.

Disaster preparedness is a critical issue that varies significantly depending on socioeconomic and psychological. Research from around the world demonstrates that income level plays a major role in determining how well people prepare for disasters. Studies show that individuals with higher incomes generally engage more in preparedness activities because they have greater access to necessary resources. However, financial inequality remains a persistent challenge, particularly for vulnerable groups who struggle to afford basic disaster readiness measures (Rivera, 2022). Beyond income, homeownership has also been identified as an important factor. Research from Indonesia found that owning a home fosters stronger community ties and social networks, which in turn enhances collective disaster preparedness efforts (Akbar et al., 2023).

Interestingly, not all factors consistently influence preparedness behaviors. For instance, prior experience with disasters does not always lead to better preparedness. A meta-analysis of nurses in Turkey found that past disaster exposure did not significantly improve their self-reported readiness levels (Ulupınar et al., 2024). On the other hand, risk perception has been shown to be a strong motivator for preparedness. Households that perceive floods as a serious threat are more likely to take preventive actions, particularly when they believe floods could endanger lives or cause environmental damage (Yin et al., 2021). However, general attitudes toward disaster preparedness do not always translate into action, as seen in a study where elderly individuals' positive or negative attitudes had little impact on their actual preparedness levels (Sitohang & Saragi, 2023).

In Malaysia, disaster preparedness research highlights the influence of socioeconomic and cultural factors. A research in Malaysia found that financial resilience can influence preparedness for disaster events (Hamid et al., 2023). Similarly, research on Malaysia's East Coast revealed that past disaster exposure influences risk perception but has only a limited effect on actual preparedness

behaviors (Ridzuan et al., 2024). Financial constraints remain a major barrier, with low-income households particularly those earning below RM 2500 per month struggling to build financial resilience against disasters (Salim et al., 2024). Additionally, cultural attitudes, including religious beliefs and gender roles, shape how communities perceive and respond to disaster risks (Abid et al., 2025).

Despite these insights, there is a noticeable gap in research specific to Penang. Most studies in Malaysia focus on broader national trends or other high-risk regions, leaving Penang's unique disaster preparedness challenges under examined. This is particularly concerning given Penang's vulnerability to floods and other climate-related disasters. Additionally, there is a lack of age-specific analysis, meaning little is known about how preparedness behaviours differ among different generations.

This study aims to fill these gaps by investigating how income level, homeownership, attitudes, risk perceptions, and past experiences influence disaster preparedness across different age groups in Penang. By understanding these factors, policymakers and community leaders can design more effective interventions that enhance resilience and ensure all segments of the population are better prepared for future disasters.

1.2 Problem statement

In recent years, the importance of public preparedness for emergencies and disasters has gained increasing attention in both academic and policy-making circles. Effective preparedness at the community level is essential to minimizing the impact of disasters, enhancing resilience, and ensuring timely response and recovery.

However, while global literature has explored various determinants of public preparedness, there remains a significant research gap in understanding how these factors interact within specific local contexts. To be more specific, particularly in regions like Penang in Malaysia.

Existing studies tend to examine public preparedness in general terms, often without a nuanced analysis of how these variables such as income level, home ownership, attitude, emotional perceptions, cognitive perceptions, and experience, may influence public preparedness behaviors. There is evidence that factors influencing preparedness attitudes and behaviors are complex and multifaceted. Factors such as demographic characteristics, trust in government efforts, past exposure to a disaster, and number of dependents in a household can influence preparedness for a disaster. Besides, different population groups, different households, and different individuals, all have different disaster preparedness needs and vulnerabilities (Kohn et al., 2012).

Factors such as income level, home ownership status, personal attitudes toward risk, individual emotional and cognitive perceptions of vulnerability, and past experiences with emergency disasters are known to play a critical role in shaping preparedness actions. Yet, the interplay between these variables and how their influence may differ across age groups has not been sufficiently investigated, especially when we talk particularly within the context of Penang, where disaster is quite common to happen in this area.

Penang, being a rapidly urbanizing and demographically diverse state, faces unique challenges in promoting community-wide preparedness. Age groups differ significantly in their access to resources, information processing, risk perception, and behavioral response to disaster preparedness campaigns. Without a clear understanding of how preparedness is influenced by both socio-economic and

psychological factors across different age groups, public policy and community outreach efforts risk being ineffective or poorly targeted (Kohn et al., 2012).

Addressing this problem is essential for enhancing disaster resilience and reducing vulnerability among different segments of the population in Penang. Without an in-depth understanding of how preparedness is shaped by socio-economic and psychological factors across age groups, public policies and community-based disaster strategies may fail to reach or resonate with the people who need them most. This gap not only limits the effectiveness of disaster response plans but also poses a risk to lives, property, and long-term community stability. By shedding light on these dynamics, the study can inform more equitable and efficient preparedness interventions tailored to the diverse needs of Penang's residents.

1.3 Research Questions

This study seeks answers to the following research questions:

Primary Research Question:

> Does income level, home ownership, attitude, perception, and experience influence public preparedness for disasters among different age groups in Penang?

Secondary Research Questions:

1. Does income level affect the level of disaster preparedness among residents of different age groups in Penang?
2. What is the relationship between home ownership status and disaster preparedness across different age groups in Penang?
3. Do individuals' attitudes toward disaster preparedness influence their actual preparedness behavior in Penang?
4. Does perception contribute to disaster preparedness across generations in Penang?
5. Does past experience with disasters increase the likelihood of disaster preparedness actions among different age groups in Penang?

1.4 Research Objectives

The main objective of this study is to investigate the influence of income level, home ownership, attitude, perception, and past disaster experience on public preparedness for disasters across different age groups in Penang. The specific objectives are:

1. To examine the relationship between income level and the level of public disaster preparedness across different age groups in Penang.
2. To assess how home ownership status impacts disaster preparedness among residents of different age groups in Penang.
3. To analyze the effect of individual attitudes toward disaster preparedness across different age groups in Penang.

4. To evaluate the role of perception in shaping preparedness actions among different age groups in Penang.

5. To determine how past disaster experiences influence preparedness levels across different age groups in Penang.

1.5 Significance of the Study

1.5.1 Academic Contribution

In Malaysia, bridging the knowledge gap does not typically focus on generational disaster preparedness, but instead explores other dimensions such as the effectiveness of early warning systems, public awareness, inter-agency coordination, and socio-economic vulnerabilities (Rosmadi et al., 2023). Much of the existing research emphasizes infrastructure resilience, community-based disaster risk reduction (DRR), and institutional responses (Hawa et al., 2023), often neglecting how disaster preparedness varies across age groups.

While prior studies, such as Cvetković and Šišović (2024), have established that factors like income, education, property ownership, and employment status influence social resilience in Serbia, this study adapts and tests these relationships in a Malaysian urban context. Additionally, this research advances resilience theory by examining subjective factors such as risk perceptions, attitudes, and past disaster experiences, which is socioeconomic status and preparedness behavior. This integration of

psychological and socioeconomic dimensions offers a more holistic understanding of resilience, bridging gaps between structural and cognitive approaches in disaster studies.

1.5.2 Practical Implications

The results of this study can enable individuals to actively contribute to improving Penang's public preparedness for disasters. Community members can plan local efforts to support vulnerable households by knowing how income levels impact preparedness. This could be done through skill-sharing programs where those with greater resources help others become ready or by organising neighbourhood emergency supplies drives. Through community workshops or social media groups, homeowners can use the information on housing stability to make their homes more disaster-resilient and inspire their neighbours to follow suit.

The study demonstrates how individual attitudes and prior experiences impact readiness behaviours. Community networks allow people to exchange personal anecdotes and useful advice, which increases the urgency and relevance of preparedness. One practical method locals may foster a culture of safety in their communities is by planning or attending training sessions, emergency exercises, or preparedness fairs.

The relationship between readiness and property ownership points to potential avenues for community-led resilience initiatives. Locals may establish disaster response plans, push for the upgrading of older properties in their community, or organise preparedness groups akin to block watches.

Through individual accountability for readiness and collaborative efforts, Penang's total resilience can be greatly increased. Small acts, such as getting one's own family ready or assisting older neighbours in making emergency plans, add up to make the entire community safer in the event of a disaster.

1.5.3 Policy Implications

A one-size-fits-all approach involves strategies and forward-thinking which is suitable to influence government policy and industry standards that might have an impact in terms of disaster preparedness in different socio-economic or different age groups. This approach can be strongly related to the disaster preparedness policy as we tend to neglect the fact that different socio-economic and different age groups will have different needs for disaster preparedness. For example, in terms of socio-economic factors, a lower income household will need more disaster preparedness support. On the other hand, while we look into different age groups for disaster preparedness, the senior population might need a special preparedness plan for disaster preparedness. Thus, with these kind of findings from our research, we are able to identify the vulnerable groups towards disaster, so that the policy frameworks and strategy can be improved. Then it would be possible to reduce the vulnerability of disasters by implementing policy with a good strategy that works for everyone with different socio-economic factors and different age groups, especially the highly vulnerable groups without neglecting the lesser vulnerable groups. Meanwhile, resilience can be increased by ensuring that preparedness initiatives can effectively reach and influence a diverse population (Adepoju et al., 2022).

1.6 Scope of Study

This study examines how income level, home ownership, attitude, emotional perception, cognitive perception, and experience influence public preparedness for disasters among different age groups in Penang, Malaysia. The study focuses on people who live in Penang's urban and suburban regions since these places are frequently vulnerable to landslides, floods, and storms, among other disaster hazards. Participants from a variety of age groups, including younger, adults, and the elderly, are included in the study to determine how influencing factors and preparedness levels are different by generation.

To evaluate and analyze the relationship between the dependent variable of public preparedness for disasters and the chosen independent variables of income level, home ownership, attitude, emotional perception, cognitive perception and experience, this study uses a quantitative approach to collecting data from participants through structured questionnaires.

1.7 Definition of Key Terms

- Income Level: An individual’s or a community's financial earnings or economic standing, usually divided into low, middle, and high income categories (Polcarová & Pupíková, 2022).
- Home ownership: Indicates that a person or household is the legal owner of a residential property (Friedman et al., 2021).

- Attitude: According to AlQahtany and Abubakar (2019), an individual's opinion, whether positive or negative, about the importance of taking part in emergency preparedness actions, such as making emergency plans, collecting necessary supplies, or attending disaster education programs. It shows how willing someone is to acknowledge and appreciate the importance of being ready for any disaster.

- Perception: According to Ni et al. (2025), an individual's personal assessment of the likelihood and severity of possible disaster risks. It includes how people interpret information about risks and their possible effects, which influences their motivation to participate in preparedness actions.

    - Emotional dimension: Personal feeling of concern, worry or dread that a person feels or experiences, that might influence a situation according to each of the individual's affective reactions or decision making (Oh et al., 2015).

    - Cognitive dimension: Cognitive is how individual assess and process information using their own knowledge, familiarity and controllability. Cognitive involves reasoning, understanding and evaluating situations based on information assessed (Oh et al., 2015).

- Experience: An individual's past exposure, either directly or indirectly, to natural disasters like earthquakes, floods, or other crises (Leng et al., 2020).

- Public Preparedness: Public disaster preparedness is the extent to which individuals and communities take proactive actions to protect life and property prior to the onset of a natural disaster. According to Rohith et al. (2018), state that being prepared involves performing crucial steps including establishing evacuation routes, protecting critical documents, improving interior safety, and developing family emergency plans.

- Age Group: Generational cohorts, which group people according to the years of their birth and shared experiences. Generation X (1965-1979) is distinguished by its independence and adaptability, formed by the switch from analog to digital technologies. Millennials, also known as Generation Y (1980–1994), are known for their collaborative and technologically savvy personalities. As digital natives, Generation Z (1995–2009) is always connected and impacted by social media and global occurrences (Nadeem & Nadeem, 2024).

- Disaster: As Aronsson-Storrier and Dahlberg (2020) highlight, disasters should be viewed as "the manifestation of vulnerabilities that have slowly built up over time," rather than as discrete, unpredictable events.

1.8 Organization of the Proposal

Our research will consist of five chapters, where each of the chapters will be aligned with our research objectives. This proposal is structured as follows:

- Chapter 1: Introduction – The background of the study, problem statement, research questions, research objectives, significance of the study, scope of study, and definitions of key terms will be presented in this chapter.

- Chapter 2: Literature Review – Reviewing existing literature on independent variables such as income level, home ownership, attitudes, perceptions, and experience towards public preparedness for disasters. The literature review also highlights theoretical frameworks and identifies research gaps in existing literature.

- Chapter 3: Methodology – The methodology is where we want to address the research questions by using the components of methodologies such as research design, research framework, sampling design, data collection, questionnaire design, measurements of variables, and methods of analysis.

- Chapter 4: Research Results – The anticipated result for our study will be discussed, which includes relationships among the variables of the study, and the implications of the variables for disaster preparedness strategies. This chapter includes data screening and cleaning, factor analysis, reliability analysis, multivariate assumptions, descriptive analysis, correlation analysis, and a multiple regression analysis.

- Chapter 5: Discussion and Conclusion – This chapter provides discussion of major findings, implication of study, limitations of study, recommendations for future research and conclusion.

1.9 Conclusion

This study fills a vital gap in understanding the impact of income level, home ownership, attitudes, perceptions, and past experiences on disaster preparedness among different age groups in Penang. Given the state's growing vulnerability to floods, landslides, and earthquakes, recognising these elements is critical for developing focused and effective contingency plans. This study intends to provide significant insights for academics, politicians, and communities by combining

socioeconomic and psychological views, ultimately contributing to increased resilience and lower disaster risks in Penang.

CHAPTER 2: LITERATURE REVIEW

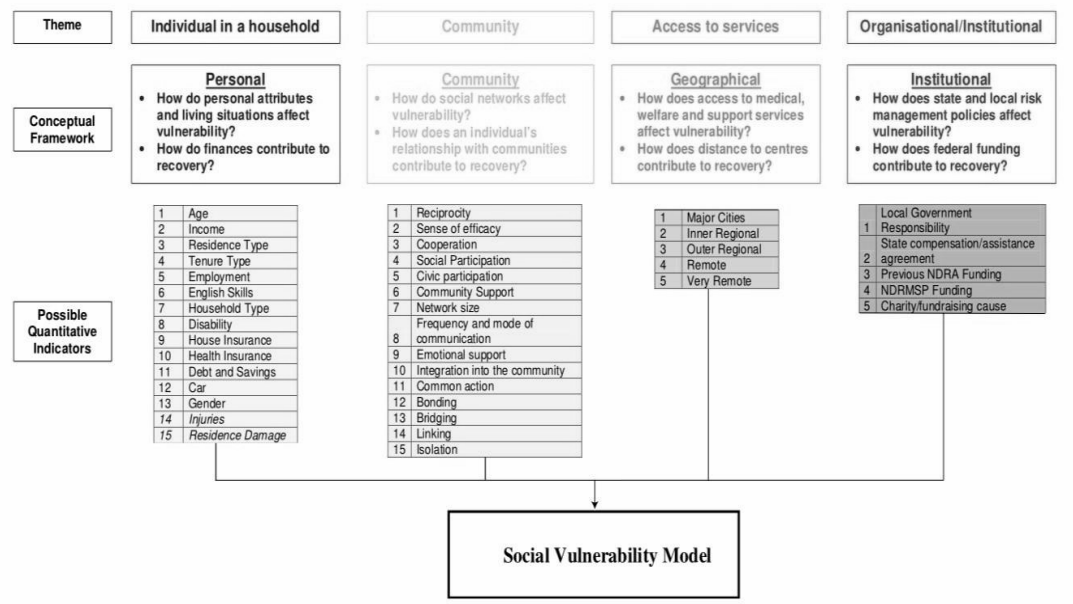
2.0 Introduction

This chapter begins by presenting the theoretical foundation underpinning the study, drawing on socioeconomic and psychological factors to support the conceptual framework. Next, the chapter provides a detailed literature review and hypothesis development, focusing on the relationship between the dependent variable, public preparedness for disasters, and key independent variables: income level, home ownership, attitude, perceptions and past experience. Each factor is examined in the context of existing research to understand its influence on disaster preparedness behavior. Finally, the chapter concludes by presenting the conceptual framework, which outlines the hypothesized relationships among variables and guides the empirical analysis of public preparedness across different age groups in Penang.

2.1 Theoretical Framework

2.1.1 Theory of Social Vulnerability (SVT)

Figure 2.1.1 Theory of Social Vulnerability



Source: Atıcı et al (2020)

The concept of social vulnerability was presented in a disaster study by several researchers like Blaikie et al. (2004) who established the Pressure and Release (PAR) Model, and Cutter et al. introduced the Hazards-of-Place Model in 2003. These models stress that vulnerability is not just a result of threats, but also of social, economic, political, and environmental aspects. The studies from Blaikie et al. (2004) highlight that exclusion and poverty are examples of underlying issues. However, Cutter et al. (2003) combined environmental hazards with social vulnerability factors such as ethnicity, wealth, and living conditions (Singh et al., 2014).

According to Mah et al. (2023), SVT model had integrated several variables from different areas which consisted of the area of education, at-risk groups such as children and older adults, and employment. Additionally, housing situations such as homeownership and housing materials, household composition as families with single parents, tiny socioeconomic status like income and wealth, and health of population statistics also are the variables

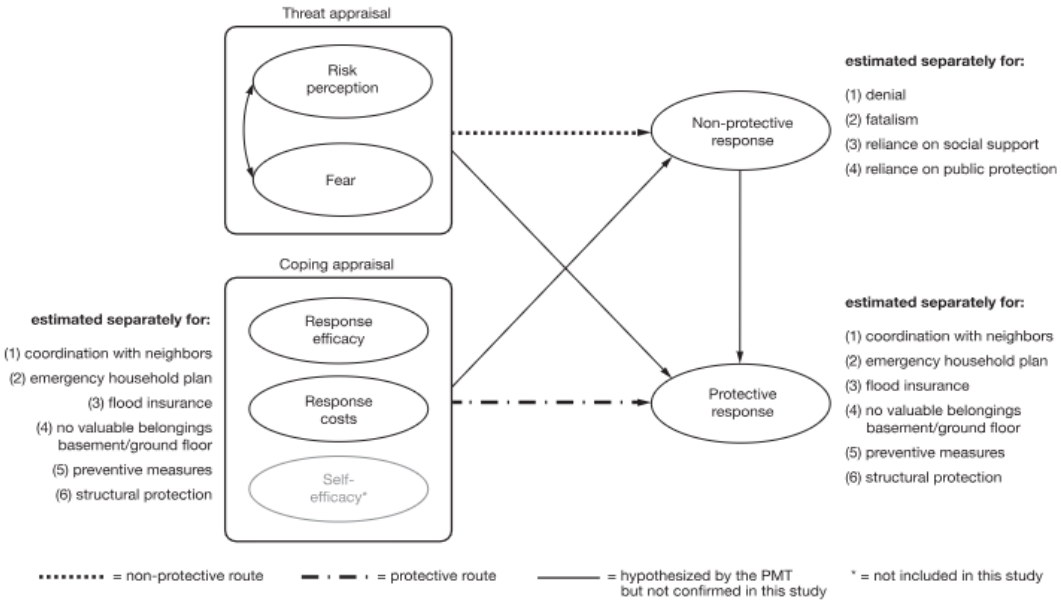
included in the SVT model. Both individual and systemic vulnerabilities are demonstrated by these indicators, which are frequently derived from the records, surveys, and census data. For instance, two key indicators of a stable economy are from earnings and homeownership. Vulnerability is frequently indirectly impacted by attitudes and perceptions with disaster preparedness measures or social support systems.

In the previous research, the Social Vulnerability Index (SVI) was used to foresee and predict the results such as disaster preparedness and health issues. Mah et al. (2023) found that social factors including household stability and financial status had an impact on the social vulnerability index which accurately predicted mortality rates and the outcomes of disaster response. As such, SVT provides a strong base for investigating how individual social traits and structural factors bring the impact towards the degree of public preparedness for disasters.

Kapuka and Hlásny (2020) found that low-income level and homeownership were found to be the two primary variables that could influence the degree of social vulnerability. The results showed that northern areas like Ohangwena, Omusati, and Oshana had the greatest vulnerability ratings, and these regions also have significant and continuous levels of disaster, especially floods and wildfires, putting them at risk from both sides. The hazard data proved that high exposure frequently came with high vulnerability.

2.1.2 Theory of Protection Motivation (PMT)

Figure 2.1.2 Theory of Protection Motivation



Source: Babcicky and Seebauer (2019)

The Theory of Protection Motivation (PMT) was initially created by Rogers (1983) and has its origins in health psychology. The PMT was first created to explain how emotional appeals affect health-related behaviour. This theory was commonly used in the past studies on natural and environmental disasters related such as droughts, earthquakes, volcanic hazards, tornadoes, wildfires and flood risks (Babcicky & Seebauer, 2019).

PMT distinguishes between two main perceptual processes. One is threat appraisal, also known as risk perception, which explains how an individual analyses the likelihood of a risk occurring and the possible harm it may do to things that are important to them, assuming no change in behaviour. The second, known as a coping appraisal, involves assessing a person's capacity to manage and prevent harm from the danger, as well as the expenses associated with coping (Grothmann & Reusswig, 2006).

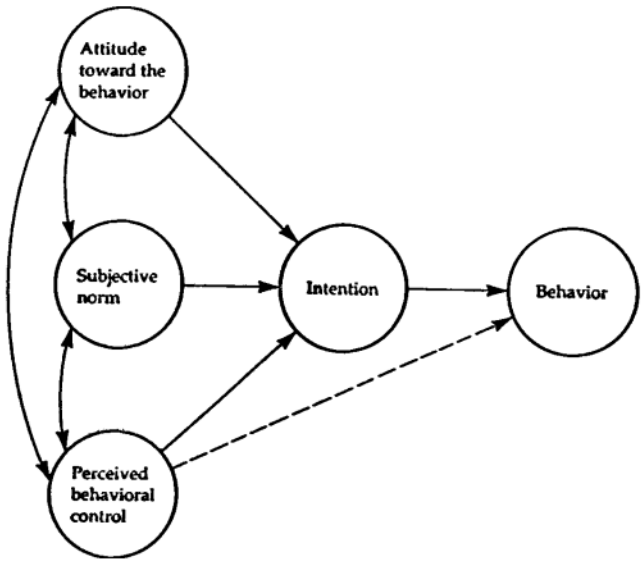
Also, Harish et al. (2023) studied that threat appraisal shows perceptions of households to the current and anticipated flood risks. Coping evaluation describes how families determine their ability to deal with the effects of floods. A household's socioeconomic status, building features, past flood experiences, and perceived dependence on government protections are all taken into consideration when conceptualising PMT.

In the study from Faryabi et al. (2023) surveyed 528 families in southern Iran to investigate the suitability of Protection Motivation Theory (PMT) as a predictor of disaster preparedness behaviours. The study indicates that three best indicators of preparatory behaviours were perceived vulnerability, fear, and protective motive. The findings show that PMT could act as a helpful framework and application in the study for clarifying how environmental and psychological aspects, such as experience, attitude, and perception, might influence public preparation for disasters.

Wu and Li (2024) evaluate how residents' tendency to adopt preventive behaviours during a rainy flood disaster was influenced by emergency information and previous disaster experience. The findings showed that individuals with past flood experience and those who got emergency alerts with accurate information were more likely to perceive their risk level, ability to manage, and the appropriate location of responsibility. Protective behaviours were shown to be significantly predicted by perceived coping abilities and perceived attribution of blame. Thus, the results aligned with the theoretical frameworks.

2.1.3 Theory of Planned Behaviour (TPB)

Figure 2.1.3 Theory of Planned Behaviour



Source: Ajzen (1991)

The Theory of Planned Behaviour (TPB), which is based on Ajzen's (1991) cognitive theory, asserts that a person's intention to carry out a particular behavior as such being prepared for a disaster plays a significant influence in determining whether the behaviour will really occur. The motivational elements that impact a behaviour are reflected in intention, which shows how much effort is willing to put to carry out that behaviour (Najafi et al., 2017). Intention in the context of disaster preparedness can refer to a household's readiness to prepare for emergencies, store supplies, or create evacuation plans. A person is more likely to act if their intention is stronger (Ajzen, 1991).

Three major psychological factors include attitude towards behaviour, subjective norms, and perceived behavioural control have an impact on

intention, according to the TPB framework (Tabatabaei et al., 2025). An individual's general assessment of disaster preparedness practices, whether favourable or unfavourable, is referred to as their attitude. An individual's intention to prepare an emergency kit, for instance, is likely to rise if they feel that doing so is both necessary and beneficial (Gumasing & Sobrevilla, 2023).

Conversely, subjective norms reflect the perceived social pressure to engage in or refrain from engaging in behaviour. This includes the influence of family members, public figures, the media, and government initiatives (Glanz et al., 2008). In disaster contexts, individuals may be more likely to prepare if their peers, neighbors, or family members are also actively engaged in preparedness (Zaremohzzabieh et al., 2021).

Following the concept of self-efficacy, perceived behavioural control describes how easy or difficult disaster preparedness actions are seen to be. People are more likely to plan to take preparedness measures when they have confidence in their capacity to do so, such as knowing how to stockpile food or practicing evacuation (Ng, 2022; Najafi et al., 2017). However, even well-meaning intentions could not result in action when people are physically or financially constrained. Numerous research has drawn attention to this intention-behavior gap (Tabatabaei et al., 2025; Ajzen, 2002).

The TPB's ability to accurately forecast behaviours associated with disasters has gained widespread academic recognition. Research has shown its explanatory power in a variety of scenarios, ranging from household emergency preparation (Najafi et al., 2017) to earthquake preparedness (Zaremohzzabieh et al., 2021). According to Nugraha et al. (2025), TPB is

therefore thought to be more accurate than other behavioural theories for forecasting preparatory actions.

Some academics have suggested expanding the model by adding other variables in recognition of the shortcomings in the original TPB (Ajzen, 1991; Ajzen, 2002; Armitage & Conner, 2001; Rivis & Sheeran, 2003; Madden et al., 1992). The idea of extending TPB with context-specific external elements was noted by Ajzen (1991). For instance, it has been demonstrated that the risk perception of a person's assessment on possibility and seriousness of a disaster significantly affects their intentions to be prepared (Lindell & Perry, 2011).

2.2 Review of Literature

2.2.1 Dependent Variable - Public Preparedness for Disasters Across Different Age Group in Penang.

Disaster preparedness is a set of actions taken to prepare for disasters by preparing and executing reasonable and practical actions. It refers to proactive actions taken by governments, organizations, communities, or people to effectively respond and handle the immediate effects of disasters, whether caused by human actions or natural hazards. The primary goal is to reduce the number of fatalities and loss of livelihoods brought on by disasters (Hargono et al., 2023).

The significance of Community-Based Disaster Preparedness (CBDP) as a local strategy for disaster risk reduction and management is emphasized by Permana et al. (2022). Through active participation and comprehension of local needs and circumstances, CBDP aims to increase community capacity. Strong community awareness and engagement are necessary for the successful implementation of CBDP. NGOs that successfully implement CBDP techniques in their disaster response activities include The American Red Cross and The Salvation Army.

According to Asih (2023), the Disaster Risk Reduction (DRR) program is a systematic approach to reducing the probability and consequences of disasters. Comprehensive tactics including risk assessments, early warning systems, public education, and incorporation into plans for sustainable development are all part of this strategy. DRR is particularly important in rural areas, where resilience and recovery can be greatly enhanced by building community capacity. Communities are less vulnerable over the long run and more prepared to handle disasters when DRR principles are incorporated into development planning.

In summary, Permana et al. (2022) and Asih (2023) both stresses how critical community participation is to disaster preparedness. While Permana et al. focus on Community-Based Disaster Preparedness (CBDP) as a localized, participatory approach involving NGOs, Asih emphasizes the broader Disaster Risk Reduction (DRR) strategy, which combines education, early warning systems, and sustainable development to build long-term community resilience, particularly in rural areas.

2.2.2 Income Level

According to Shi et al. (2021) income can be defined as earnings from labor or capital. Income can also be viewed as a flow of goods and services over a period of time, and a net monetary receipt after any expenses. Additionally, income can be used as a measure of access towards resources of an individual or even a household.

Rivera (2022) is a study among the Hispanics and Latinos in the US. This study shows a positive relationship between low-income level and disaster preparedness. This is because low-income individuals lack resources, leading to a lesser ability for preparedness. They have lower confidence in preparing for a disaster because they might feel helpless or overwhelmed. However, the relationship is negative between high income level and disaster preparedness. This is because high income individuals have a lower personal responsibility as they will expect external help to protect them using their money power. Thus, they will underestimate risks and assume others will help them to prepare for a disaster.

The study conducted by Kim and Kim (2022) in South Korea takes a nationwide sampling with a total of 1243 numbers of respondents aged between 19 to 69. The study is sampled by district and gender. In South Korea, the relationship between income level towards disaster preparedness is significantly positive. Which means, high income individuals have more access towards resources for preparedness. They tend to have greater knowledge of disaster preparedness and awareness for a disaster. On the other hand, low-income individuals lack resources and information, thus their disaster preparedness will be low.

Liao and Hu (2025) have collected 394 respondents for their study. This study is conducted in Taiwan by using national data from Academia Sinica's Basic Social Change Survey, focusing on only adults above the age of 65. The relationship is negative between high income level and disaster preparedness. This is because individuals with high income levels live in safer environments with lower perceived risk. They also feel more financially secure, assuming that money can offset the impacts brought by disaster, reducing their urgency for disaster preparedness.

In short, the relationship between income level and disaster preparedness is different across different contexts. In the US, low-income individuals are less prepared, while high-income individuals are also less prepared. However, in South Korea, income is positively linked to preparedness. Meanwhile, in Taiwan there is a negative relationship between income level and preparedness.

H1(a): Income level has a significantly positive effect on public preparedness of Gen X in Penang.

H1(b): Income level has a significantly positive effect on public preparedness of Gen Y in Penang.

H1(c): Income level has a significantly positive effect on public preparedness of Gen Z in Penang.

2.2.3 Homeownership

Arundel & Ronald (2021) define homeownership as giving all the individuals opportunities or chances to have a safe home and the ability to build up wealth and financial stability through the real estate market. In the previous research on disasters, it was found that homeownership is a key indicator to predict an analysis of whether this will affect their disaster preparedness. Consequently, the results show that owning a home makes one more likely to prepare for the disaster than non-homeowners.

Carswell et al. (2022) evaluated 66,700 households using the data from the 2017 American Housing Survey (AHS) in the United States. This study found that homeownership has a significant positive relationship with disaster preparedness, as they implement at least three of the AHS's recommended disaster preparedness practices. As a result, it shows that a homeowner is far more likely to be prepared for a disaster, as homeownership has a high statistical significance coefficient and is more likely to prepare for a disaster than non-homeownership. Even after adjusting to other factors, homeownership status consistently predicts preparedness for disasters.

Likewise, the study conducted by McCarthy & Friedman (2023) surveyed 16,725 families in the United States and divided them into three groups, which are homeowners, subsidised renters and unsubsidised renters. This study indicates that homeownership has a significant relation with disaster preparedness, as the homeowner is more prepared for disasters than both unsubsidised and subsidised renters. The findings show that both categories of renters are much less prepared than homeowners, even after adjusting for neighborhoods and demographic factors, as the outcome is that three-quarters of households have property or renter’s insurance, and over three-quarters have evacuation funds and enough non-perishable food to last for at least three days.

However, Ozdemir et al. (2021) indicated that homeownership have no significant relationship to the planning processes on the disaster. As the result shows that, although homeowners often have more materials and information on hand compared than renters, but it appears that having a house does not increase the likelihood that individuals will make plans for what to do in the event of an earthquake. Therefore, even if owning a house may increase person's access to knowledge and resources, it does not ensure that an individual will take the crucial step of developing a disaster preparedness.

In overall, individuals who own a home tend to be considerably more prepared for the disaster as the several research consistently shows that homeowners will prepare much more than renters. It indicated that having a safe and secure residence and some funds has a significant impact on disaster preparedness. However, some research found that homeownership and other preparation factors, especially planning practices, have not been found to be significantly correlated in disaster readiness, indicating that homeownership is not the only factor that can influence in disaster preparedness.

H2(a): Homeownership had a positive significance toward disaster preparedness in Gen X in Penang.

H2(b): Homeownership had a positive significance toward disaster preparedness in Gen Y in Penang.

H2(c): Homeownership had a positive significance toward disaster preparedness in Gen Z in Penang.

2.2.4 Attitude

Attitude is an evaluative tendency towards an entity, such as a person, policy, event, or object, is called an attitude. Attitudes are made up of memories of previous actions, affective reactions, and cognitive ideas. These components comprise the structure of an attitude, and a combination of their attitudes provides the entity's overall evaluation. People may experience ambivalence when these factors are contradictory, which can result in conflicting behaviours or indecision (Zeigler-Hill, 2020). This conceptualisation expands upon the fundamental framework created by Eagly and Chaiken (1998).

Several studies have indicated that attitude is significantly associated with disaster preparedness, primarily because attitude shapes an individual's perceived responsibility, emotional disposition, and motivation to take preventive action (Prastyawati et al., 2024; Fatoni et al., 2022, Retnowati et al., 2020, Kruger et al., 2018). Prastyawati et al. (2024) suggest that attitudes among teenagers have a major impact on their readiness for disasters. Since individuals who strongly agree with statements about self-rescue and family safety are more likely to take preparedness actions, their study demonstrated that a positive attitude is a crucial factor in how youth respond to disaster threats.

Similarly, a regression analysis by Fatoni et al. (2022) validated the importance of attitude, demonstrating that a positive attitude had a statistically significant impact on preparedness behaviour. Positive-attitude respondents were more likely to keep emergency supplies, participate in catastrophe drills, and create family emergency plans. Nonetheless, the same study found that rural Indonesian communities had a moderate average

attitude score, underscoring the need for more focused interventions. Furthermore, their results showed that the influence of attitude was strengthened when paired with variables including work position, education level, and disaster preparedness training. Fatoni et al. (2022) note that although attitude plays a positive influence, awareness by itself does not necessarily result in behaviour. This implies that people may be unable to act on their information even when they are well-informed due to weak or uninterested attitudes.

In summary, cultivating the psychological preparedness necessary for disaster preparedness requires a positive outlook. Enhancing public perceptions by instruction, realistic role-playing, and community involvement can greatly improve people's intentions and real actions during emergencies (Fatoni et al., 2022; Prastyawati et al., 2024).

H3(a): Attitude has a significantly positive effect on public preparedness for disasters in Gen X in Penang.

H3(b): Attitude has a significantly positive effect on public preparedness for disasters in Gen Y in Penang.

H3(c): Attitude has a significantly positive effect on public preparedness for disasters in Gen Z in Penang.

2.2.5 Perceptions

According to Persson et al. (2022), perception is the process by which people become aware of sensory inputs and make subjective beliefs or

impressions based on how things look. This process combines being aware of sensory inputs with making interpretive judgments. It is commonly understood to have two fundamental dimensions: emotional perception and cognitive perception. Emotional perception is the ability of observers to effectively recognize and understand emotions based on a variety of expressive cues, including facial, bodily, vocal, linguistic, and symbolic expressions, while taking into consideration contextual information (Lange et al., 2021). Cognitive perception is the process of interpreting sensory information using prior knowledge, learning, and cognitive processes. It enables people to have a better awareness of their surroundings and adjust their behavior accordingly (Thórisson et al., 2024).

Yin et al. (2021) conducted a study of 369 urban homes in the flood-prone Odaw River/Korle Lagoon basins of Accra Metropolitan, Ghana. In particular, households that perceived higher flood probability, severity, risk to life, and fear were more likely to take flood disaster preparedness (FDP) actions like cleaning drains, purchasing sandbags, and raising buildings. The study found a significant positive relationship between perception and disaster preparedness. These heightened perceptions were influenced by exposure to flood-related knowledge, actual disaster experience, and living near high-risk flood zones, all of which encouraged preventive activities.

The study conducted by Wu et al. (2022) investigated the correlation between evacuation readiness and risk perception among 166 inhabitants of Longchi Township, Dujiangyan City, China. This area was significantly impacted by the 2008 Wenchuan earthquake and its aftermath. People who had higher perceptions of the effect and risk of disasters were more inclined to plan for evacuation, according to the study, which indicated a substantial positive association between preparedness behavior and risk perception. The likelihood to evacuate was higher among participants who had more

disaster knowledge and had participated in disaster risk reduction (DRR) activities. This suggests that proactive disaster readiness is significantly influenced by enhanced risk perception.

In summary, both studies have discovered that higher risk perception greatly improves disaster preparedness. Planning an evacuation or taking precautions against disaster are examples of proactive measures that households are more likely to do when they perceive a larger threat, severity, or the likelihood of disaster.

H4(a): Emotional perception has significantly positive effect on public preparedness for disasters in Gen X in Penang.

H4(b): Emotional perception has significantly positive effect on public preparedness for disasters in Gen Y in Penang.

H4(c): Emotional perception has significantly positive effect on public preparedness for disasters in Gen Z in Penang.

H5(a): Cognitive perception has significantly positive effect on public preparedness for disasters in Gen X in Penang.

H5(b): Cognitive perception has significantly positive effect on public preparedness for disasters in Gen Y in Penang.

H5(c): Cognitive perception has significantly positive effect on public preparedness for disasters in Gen Z in Penang.

2.2.6 Experience

According to Paulsen (2020), experience is conscious awareness or understanding and consideration of objects, events, or ideas, formed by interactions with oneself and with the environment in a given period. Experience is thus viewed as presentational form on the one hand and the opposite acting process with its recursive links in the layers of: attention, categorization, meaning, and transformation-as sensing, perceiving, reflecting, and creating.

According to Thompson et al. (2022), disaster preparedness among aged Americans in the United States was investigated through the national survey dataset. The findings suggest that previous experience of a disaster was positively associated with higher levels of disaster preparedness. The researchers concluded that disaster experience is likely to make people aware and motivate them towards preventive action. Similarly, Aswathi et al. (2021) researched in Wayanad, India, and found a positive relationship between prior disaster experience and public preparedness. The study thus illustrated how individual experience enhanced risk awareness and elicited preventive action-even in the small rural communities.

Ulupınar et al. (2024) analyzed disaster preparedness among nurses in Turkey through their study of participants from İstanbul, İzmir and Tekirdağ provinces. The results indicated that prior disaster experience did not significantly affect disaster preparedness. The researchers reported that experience by itself did not prove to be enough for disaster preparedness despite some minor positive trends in individual cases. The researchers emphasized that formal education together with training is needed to fulfil

their roles in shaping disaster preparedness especially within healthcare settings.

The research conducted by Ridzuan et al. (2024) focused on disaster preparedness levels of young adult renters who live in flood-affected areas across Peninsular Malaysia's Eastern states of Pahang, Terengganu and Kelantan. The research revealed that people who had experienced floods before had higher awareness of disaster risks, but their awareness did not necessarily translate into taking preparedness measures. Only the positively inclined towards preparedness would behave, and experience thus needing to be supplemented by internal frames of mind in order to result in actual behavior of preparedness.

In general, across countries and contexts, there are mixed findings on the relationship between disaster experience and preparedness. Most studies find a positive relationship between past experience and public preparedness, while other research suggests that experience is not enough by itself.

H6(a): Experience has a significantly positive effect on public preparedness for disasters in Gen X in Penang.

H6(b): Experience has a significantly positive effect on public preparedness for disasters in Gen X in Penang.

H6(c): Experience has a significantly positive effect on public preparedness for disasters in Gen X in Penang.

2.3 Conclusion

The literature on the independent variables of income levels, home ownership, attitude, perceptions and past experience, as well as the hypothesis are presented in this chapter. This study also discussed several theoretical frameworks, including Theory of Social Vulnerability, Theory of Protection Motivation and Action of Planned Behaviour.

CHAPTER 3: METHODOLOGY

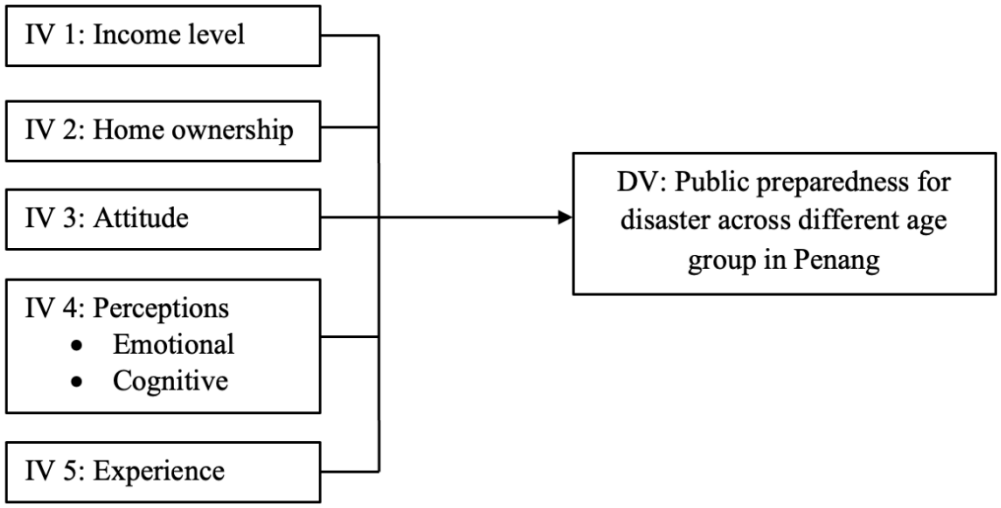
3.0 Introduction

To achieve the research objectives, this chapter outlines the methodology used in the study. It begins with the research design, followed by a presentation of the research framework that guides the investigation. The chapter then details the sampling design, and the scale of measurements applied in data collection. A quantitative approach was adopted, using primary data collected through an online survey. Purposive sampling was employed to select participants who met specific criteria relevant to the study.

3.1 Research Design

This study uses a quantitative research approach to determine the relationship between public preparedness for disaster and the income level, homeownership, attitudes, perception and past disaster experience among the different age groups in Penang. Google Forms is used to create a structured online survey that is used to gather data, and it is distributed to Penang residents of different age groups. To analyze the data, this study will employ multiple regression analysis to examine the relationship between the dependent variables and independent variables.

3.2 Research Framework



3.3 Sampling Design

3.3.1 Sampling Location

The sample site is the location that was chosen for data location. The target population are Malaysian (Penang) citizens from different age groups (Generation X, Y, Z), the sampling location is Penang.

3.3.2 Sampling Technique

This study employs a purposive sampling technique to select respondents from the population of Penang, specifically targeting individuals from Generation X, Generation Y, and Generation Z. A total of 128 respondents from each generational group were deliberately selected to ensure equal representation across the age groups. There are a total number of 384 respondents. Within each generation, participants were chosen randomly, ensuring that the data collected reflects the perspectives of each targeted generation.

3.3.3 Sampling Size

According to the Department of Statistics Malaysia, it is calculated that the targeted population for Generation X, Y and Z is approximately 1279900. This calculation is calculated based on the population of each age group for people in Penang. We will be using the Krejcie & Morgan's Sample Size Formula as shown in Appendix 1.8 to determine the sample size. By using a 95% confidence level, ±5% margin of error, and an estimated proportion of 0.5, the sample size of our study is expected to be 384 respondents (Ahmed, 2024). The survey will be conducted in Penang. The sample size table as shown in Appendix 1.9, this study's sample size is also expected to be 384 respondents, since our population is approximately 1279900 which is greater than 1000000 (Bukhari, 2021).

3.4 Questionnaire Design/Measurements of Variables

In our survey questionnaire, six sections were provided for respondents to complete the survey. Section A is the demographic part that consists of 6 questions such as income level, education level and marital status. Section B to E is the question regarding our independent variable while section F consists of only 1 dependent variable.

The survey contains 5 questions on homeownership, 6 questions about attitude, 9 questions related to perception, and 3 questions about past disaster experience. A set of 14 questions is used for evaluating the dependent variable which is disaster preparedness.

Questionnaires	**Sources**
Income Level	
• B1 - below RM2,560 • B2 - RM2,560 - RM3,439 • B3 - RM3,440 - RM4,309 • B4 - RM4,310 - RM5,249 • M1 - RM5,500 - RM6,339 • M2 - RM6,430 - RM7,689	(B40, M40, T20. And T15 in 2024: A Deep Dive Into Malaysia's Income Groups, 2024)

• M3 - RM7,690 - RM9,449 • M4 - RM9,450 - RM11,819 • T1 - RM11,820 - RM15,869 • T2 above RM15,870	
Homeownership	
• Do you own a home? • Poverty ownership. **If you do not own a home, you may skip this question. • How long do you live in Penang? • What is your household composition? • Duration living in current home.	(Tomio et al., 2014) (Abdur et al., 2025) (Guo & Sim, 2025)
Attitude	
• Training in disaster planning should be taught in Penang. • Training in disaster planning is necessary • It is necessary to have an emergency plan in Penang for any anticipated hazards	(Alkalash et al., 2023)

• It is necessary to have a disaster management committee in Penang • Individuals should know their duties and roles during disaster response in Penang. • To improve disaster management training through stimulation exercises, drills, or workshops should be provided	
Perceptions	
• I am aware of the types of disasters that can occur in Penang (e.g., floods, landslides, storms). • I understand the warning signals and early warning systems for disasters. • I know how to escape from these disasters. • Disasters can have a serious impact on my properties. • Disasters can have a serious impact on Penang. • Disasters pose a direct threat to my safety. • I would like to participate in local Disaster risk reduction (DRR) activities. • I have participated in many DRR activities • If I receive an early warning, I am willing to cooperate with the community for Disaster Risk Reduction (DRR).	(Wu et al., 2022)

Past Disaster Experience	
● Have you ever personally experienced a disaster (e.g., flood, landslide, severe storm, earthquake)? ● How many times have you experienced a disaster in your lifetime? ● Did experiencing a disaster lead you to take any specific preparedness actions?	(Rivera, 2022)
Disaster Preparedness	
● Identified the best evacuation route from our home. ● Identified a safe elevated area rescue from floods. ● Developed a family emergency plan. ● Provided information on disaster preparedness to other family members and friends. ● Discussed the community's emergency warning system. ● Protected vital records. ● Procured a life insurance policy. ● Created an emergency supplies kit. ● Secured all hazardous materials (such as gas cylinder	(Rohith et al., 2018)

etc.) ● Secured all the movable objects at home (TV, Computers, etc.) ● Identified the locations and operational procedures of utility shut-off valves. ● Acquired a fire extinguisher and learned how to operate. ● Acquired an all-hazards alert radio. ● Collected the contacts of emergency services (Ambulance, Fire, Police, etc.)	

3.4.1 Scale of Measurement

We will be using a 5-point likert scale to measure the scale of Sections C, D, and F of the questionnaire, whereas nominal and ordinal measurement scales are combined in Sections A, B, and E.

3.4.1.1 Nominal Scale

Used to classify variables into different categories, often referred to as a categorical variable scale. They have no particular numerical value or significance since they are used to distinguish between individuals, things,

or events. Examples of these include identity numbers, sportspersons' jersey numbers, and car registration numbers. Nominal scales are employed in research to analyse categorical variables including blood group, political party, marital status, gender, and place of residence. On the nominal scale, it makes no difference how many numbers there are or what sequence they present in (Anjana B.S, 2021).

3.4.1.2 Ordinal Scale

Variables on an ordinal scale are given numbers that indicate their relative position or order within the data collection. In contrast to just identifying the variables, they are ordered in a certain order. allowing for their naming, grouping, and ranking. The ordinal scale is used in research to rank students in a class (1, 2, 3), rate product satisfaction (very unsatisfied-1, unsatisfied-2, neutral-3, satisfied-4, very satisfied-5), compare the frequency of occurrences (very often-1, often-2, not often-3, not at all-4), evaluate the degree of agreement (totally agree-1, agree-2, neutral-3, disagree-4, totally disagree-5), and more. The characteristics are ranked either in ascending or decreasing order on this scale. The numbers show the order or rating of amount or quality (Anjana B.S, 2021).

3.4.1.3 5-point Likert Scale

A Likert scale is a collection of assertions (items) provided for a scenario that is being studied, either actual or imagined. Participants must show their degree of agreement with the stated statement (items) on a metric scale,

ranging from strongly disagree to strongly agree. Since each observation in this case reveals a distinct aspect of the attitude towards the problem, they are all inherently related to one another (Joshi et al., 2015).

3.5 Methods of Analysis

3.5.1 Factor Analysis

Exploratory factor analysis (EFA) is used in this study to investigate the dimensionality and underlying structure of the variables being examined. EFA, a basic quantitative research method, is a vital instrument in the early phases of inquiry since it reveals the correlations between variables and finds significant patterns in intricate datasets. EFA's main goal is to make data interpretation easier by assembling observable variables into logical clusters according to common variance. This method systematically arranges variables that don't seem to be related to conceptually significant elements that reflect the essential aspects of the topic being studied. The direction and degree of the association between observable variables and their underlying latent components, factor loadings are an essential part of exploratory factor analysis (EFA). There is a lot of disagreement in the literature over the appropriate range for factor loadings, and recommendations differ depending on the study's context, sample size, and number of variables per factor. Factor loadings typically have values between -1 and +1 and are interpreted as standardised regression coefficients. Stronger correlations between the variable and the factor are indicated by higher absolute values, whilst weaker correlations are suggested by lower values (Sürücü et al., 2022).

A factor loading's minimal threshold, which accounts for around 10% of the overlapping variance between a variable and its factor, is frequently said to be 0.32. Tabachnick and Fidell (2007) endorse this threshold, arguing that loadings below 0.30 might not show significant associations or make a significant enough contribution to the interpretation of the factor. This cutoff point is frequently regarded as being too low, though, particularly for research that needs reliable and understandable factor structures. Researchers like Hair et al. (1995) categorise factor loadings according to the following standards for stricter requirements:

Table 3.5.1 Factor Loading

Factor Loading (Absolute Value)	Interpretation
±0.30	Minimal
±0.40	Important
±0.50 or higher	Practically significant

Source: Hair et al., 1995

Stricter standards are advised for research that want greater precision. Because smaller factors need bigger individual contributions to stay stable, Sürücü et al. recommended a cutoff of 0.50 or higher for factors with four or fewer variables. Given that the total variance explained by several variables might make up for somewhat weaker individual loadings, a somewhat lower threshold of 0.40 might be appropriate for factors with more than four variables. Some studies support loadings of 0.70 or higher

since they show that the factor accounts for almost half of the item's variation, which is important in domains where measurement accuracy is crucial, such as psychology or the health sciences.

The sample size also influences the cutoff selection. More stable factor solutions are typically produced by larger samples (e.g., >200), which permit slightly lower loadings to be maintained without sacrificing dependability. On the other hand, to reduce the possibility of overfitting or unstable components, smaller samples might require more stringent thresholds (such as ≥ 0.50). Cross loadings, in which an item weighs heavily on several aspects, also need to be carefully considered. It's usually advised to keep an item under its primary component if the cross-loadings differ by at least 0.10.

3.5.2 Reliability test

A popular statistical metric for evaluating the internal consistency reliability of multi-item scales or questionnaires is Cronbach's Alpha (α), which makes sure that every item consistently measures the same underlying construct (Amirrudin et al., 2020). Higher values (nearer to 1) indicate greater dependability as it assesses the intercorrelations among the components. In domains like psychology, education, and the social sciences, where tools like Likert-scale surveys need to be validated for consistency, this statistic is very useful (Kennedy, 2022).

The reliability of a scale is determined by the magnitude of Cronbach's Alpha (George & Mallery, 2003):

- $\alpha \geq 0.90$: Excellent reliability (rare in practice).
- $0.70 \leq \alpha < 0.90$: Good reliability (acceptable for research).
- $0.60 \leq \alpha < 0.70$: Moderate reliability (may require item revision).
- $\alpha < 0.60$: Poor reliability (scale should be re-evaluated) (Nunnally & Bernstein, 1994; Kennedy, 2022).

These thresholds ensure that the instrument produces stable and reproducible results. For instance, Kennedy (2022) demonstrated that sample sizes below 100 often yield unreliable α estimates, whereas larger samples (≥100) provide more stable and higher reliability coefficients.

Although Cronbach's Alpha is a reliable indicator of internal consistency, sample size and data variability can affect its accuracy. Higher sample sizes (≥100, for example) produce more accurate dependability estimates and lower standard errors (Kennedy, 2022). Furthermore, because homogeneous data may artificially deflate reliability, response variability, as represented by variance and standard deviation, positively increases α (Amirrudin et al., 2021). To provide a more thorough evaluation of reliability, researchers should report α as an interval estimate (e.g., 95% confidence interval) (Kennedy, 2022).

3.5.3 Multiple Regression Analysis and Pearson Correlation

Multiple regression analysis is a method that aims at describing the relationship between one dependent variable and several independent variables by estimating what changes in the dependent variable can be attributed to changes in each of the independent variables. Each independent

variable is given a coefficient in a linear equation which is applied to predict the dependent variable most accurately, thus allowing a researcher to establish the relative effect of each factor. Even though newer contestants, like neural network approaches, are gaining traction in the Big Data age, multiple regression is still widely used in establishing and predicting relationships among variables (Hair et al., 2019).

The Pearson correlation analyzes the relationship between an independent variable (IV) and a dependent variable (DV) by measuring the strength and direction of their linear association. It produces a value between -1 and +1, where values closer to +1 or -1 indicate a strong positive or negative relationship, respectively, while values near 0 suggest little to no linear connection. Commonly used as a preliminary step in regression analysis, it helps identify which IVs are most strongly associated with the DV. However, it only reflects bivariate relationships and does not account for the influence of other variables, so its findings should be complemented with more advanced techniques in multivariate analysis (Hair et al., 2019).

According to Evans (1996), which interprets correlations:

- <0.20 as very weak,
- 0.20-0.39 as weak,
- 0.40-0.59 as moderate,
- 0.60-0.79 as strong, and
- >0.80 as very strong.

3.6 Conclusion

Chapter three examines the techniques used in this study. This is a study that is based on primary research, where researchers collect the data directly. The response is then examined using both descriptive analysis.

CHAPTER 4: RESEARCH RESULTS

4.0 Introduction

In Chapter 4, data analysis was carried out using SPSS 29. This chapter is structured to address the research objectives and hypotheses through a series of statistical analyses, including factor analysis, reliability testing, multivariate analysis, descriptive analysis, correlation analysis and regression analysis.

4.1 Data Screening and Cleaning

A precise total of 384 complete and valid responses were successfully collected, meeting the required sample size. This results in a 100% response rate based on the target number, indicating strong participation and sufficient data for conducting analysis. To guarantee the quality and dependability of the dataset, data screening and cleaning procedures were completed before the primary statistical analyses were performed. This procedure included looking for outliers that would skew the results and verifying that no responses were missing. Ensuring a clean dataset boosts the validity and robustness of the findings.

4.2 Factor Analysis

4.2.1 Factor Analysis of Dependent Variable

Table 4.2.1 Factor analysis results for Dependent Variables

Code	Statement	Factor loading
DV: Public Preparedness		
DV1	Identified the best evacuation route from our home.	0.789
DV2	Identified a safe elevated area rescue from floods.	0.780
DV3	Developed a family emergency plan.	0.827
DV4	Provided information on disaster preparedness to other family members and friends.	0.760
DV5	Discussed the community's emergency warning system.	0.759

DV6	Protected vital records.	0.814
DV7	Procured a life insurance policy	0.691
DV8	Created an emergency supplies kit	0.799
DV9	Secured all hazardous materials (such as gas cylinder etc.)	0.797
DV10	Secured all the movable objects at home (TV, Computers, etc.)	0.720
DV11	Identified the locations and operational procedures of utility shut-off valves.	0.786
DV12	Acquired a fire extinguisher and learned how to operate.	0.706
DV13	Acquired an all-hazards alert radio.	0.759
DV14	Collected the contacts of emergency services (Ambulance, Fire, Police, etc.).	0.738
Eigen Value		8.238

Percentage of variance	58.839
Kaiser Meyer Olkin Measure of Sampling Adequacy (KMO)	0.958
Bartlett's Test of Sphericity (Approx. Chi-Square)	3356.298
DF	91
Sig.	<0.001

Notes: DV refers to public preparedness

Before employing them in other analyses like multiple regression or multivariate analysis of variance, factor analysis is especially useful for reducing the number of factors from a large number of linked variables to a more manageable number. Adding more statements to the questionnaire can occasionally result in a vague grasp of the variables. Irrelevant items can be eliminated from the final questionnaire with the aid of factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.958, which is well above the recommended threshold of 0.60, indicating that the data are highly suitable for factor analysis. Bartlett's Test of Sphericity was also significant ($\chi^2 = 3356.298$, $df = 91$, $p < 0.001$), proving that the correlation matrix was not an identity matrix. Showing the eigenvalue of 8.238, explains 58.84% of the total variance. Specifically, the highest loading was found for item DV3 (0.827), DV6 (0.814), DV8 (0.799), and DV9 (0.797). Other strong loadings included DV1 (0.789), DV11 (0.786), and DV2 (0.780). Additional items such as DV4 and DV5 both loaded at 0.760 and 0.759, respectively, while DV13 and DV14 showed values of 0.759 and 0.738. Finally,

DV10, DV12, and DV7 also demonstrated meaningful loadings of 0.720, 0.706, and 0.691, respectively.

4.2.2 Factor Analysis of Independent Variables

Table 4.2.2 Factor analysis results for Attitude

Code	Statement	Factor loading
1st IV Attitude		
ATT1	Training in disaster planning should be taught in Penang.	0.823
ATT2	Training in disaster planning is necessary.	0.843
ATT3	It is necessary to have an emergency plan in Penang for any anticipated hazards.	0.869
ATT4	It is necessary to have a disaster management committee in Penang.	0.800

ATT5	Individuals should know their duties and roles during disaster response in Penang.	0.842
ATT6	To improve disaster management training through stimulation exercises, drills, or workshops should be provided.	0.838
Eigen Value		4.197
Percentage of variance		69.957
Kaiser Meyer Olkin Measure of Sampling Adequacy		0.904
Bartlett's Test of Sphericity (Approx. Chi-Square)		1391.694
DF		15
Sig.		<0.001

Attitude: Six items (ATT1–ATT6) were used to measure the Attitude construct. The KMO measure of sampling adequacy was 0.904, indicating that the data were highly suitable for factor analysis. Bartlett's Test of Sphericity was significant ($\chi^2 = 1391.694$, $df = 15$, $p < 0.001$), further supporting the factorability of the correlation matrix.

Only one component was extracted, with an eigenvalue of 4.197, accounting for 69.96% of the total variance. All items loaded strongly on a single factor, with factor loadings of ATT3 (0.869), ATT2 (0.843), ATT5 (0.842), ATT6 (0.838), ATT1 (0.823) and ATT4 (0.800), confirming unidimensionality of the construct. The communalities after extraction were all above 0.64, indicating that the items were well-represented by the extracted factor.

Table 4.2.3 Factor analysis results for Perceptions

Code	Statement	Factor loading
2nd IV Emotional Perception & 3rd IV refers to Cognitive Perception.		
EMO_PER1	I am aware of the types of disasters that can occur in Penang (e.g., floods, landslides, storms).	
EMO_PER4	Disasters can have a serious impact on my properties.	
EMO_PER5	Disasters can have a serious impact on Penang.	
EMO_PER6	Disasters pose a direct threat to my safety.	

EMO_PER9	If I receive an early warning, I am willing to cooperate with the community for Disaster Risk Reduction (DRR).
COG_PER2	I understand the warning signals and early warning systems for disasters.
COG_PER3	I know how to escape from these disasters.
COG_PER7	I would like to participate in local Disaster risk reduction (DRR) activities.
COG_PER8	I have participated in many DRR activities.
Kaiser Meyer Olkin Measure of Sampling Adequacy	0.867
Bartlett's Test of Sphericity (Approx. Chi-Square)	1512.646

Notes:1st IV refers to Attitude.

Notes: 2nd IV refers to Emotional Perception.

Notes: 3rd IV refers to Cognitive Perception.

Table 4.2.4 Table Total Variance Explained for Perceptions (Oblimin rotation of two-factor solution)

Component	Initial Eigenvalues			Extraction Sums of Squared Loading		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.516	50.177	50.177	4.516	50.177	50.177
2	1.293	14.362	64.539	1.293	14.362	64.539
3	0.827	9.189	73.728			
4	0.566	6.291	80.019			
5	0.419	4.655	84.674			
6	0.412	4.573	89.246			
7	0.348	3.870	93.116			
8	0.326	3.621	96.738			
9	0.294	3.262	100.00			

Table 4.2.5 Table Rotated Component Matrix for Perceptions (Oblimin rotation of two-factor solution)

	Component	
	1	2
EMO_PER6	0.847	
EMO_PER4	0.842	
EMO_PER5	0.807	
EMO_PER9	0.626	0.423
EMO_PER1	0.538	.0.487
COG_PER8		0.824
COG_PER3		0.795
COG_PER2	0.329	0.722
COG_PER7	0.458	0.596

Nine items were used to measure the Perception construct. The KMO measure of sampling adequacy was 0.867, indicating that the data were well-suited for factor analysis. Bartlett's Test of Sphericity was significant (χ^2 = 1512.646, df = 36, $p < 0.001$), confirming that correlations among the items were sufficient to proceed with factor analysis.

Two components were extracted based on the eigenvalue-greater-than-one criterion. The first component had an eigenvalue of 4.516, explaining 50.18% of the total variance, while the second component had an eigenvalue of 1.293, contributing an additional 14.36%. Together, these two components accounted for 64.54% of the total variance.

The rotated component matrix supported a clear two-factor structure. Items EMO_PER6 (0.847), EMO_PER4 (0.842), and EMO_PER5 (0.807) demonstrated strong loadings on Component 1, suggesting they are representative of the Emotional Perception dimension. EMO_PER9 (0.626 on Component 1; 0.423 on Component 2) and EMO_PER1 (0.538 on Component 1; 0.487 on Component 2) exhibited moderate cross-loadings, indicating that these items are associated with both emotional and cognitive aspects of perception, although their higher loadings on Component 1 still justify their classification under the Emotional Perception factor.

Items COG_PER8 (0.824) and COG_PER3 (0.795) loaded on Component 2, which represents Cognitive Perception. However, COG_PER2 (0.329 on Component 1; 0.722 on Component 2) and COG_PER7 (0.458 on Component 1; 0.596 on Component 2) also showed cross-loadings, indicating some degree of shared variance with emotional perception,

though their higher loadings on Component 2 support their classification under the cognitive dimension.

These results confirm that the Perception construct is multidimensional, comprising both emotional and cognitive components, with a few items demonstrating shared characteristics across the two dimensions.

4.3 Reliability Analysis

Table 4.3 Reliability Analysis

Variables	Number of items	Cronbach's alpha
DV (PUBLIC PREPAREDNESS)	14	0.946
ATTITUDE	6	0.913
EMOTIONAL PERCEPTION	5	0.845
COGNITIVE PERCEPTION	4	0.788

4.3.1 Reliability Analysis of Variables

Cronbach's Alpha was used in the reliability analysis to evaluate each of the variables in this study. Table 4.3 shows that all variables had high values of reliability that were about the acceptable threshold of 0.70, with the majority over 0.80. The public preparedness has a very high level of internal consistency, as demonstrated by its outstanding Cronbach's Alpha of 0.946. Similarly, attitude showed good dependability with a value of 0.913, and strong consistency values of 0.845 and 0.788 were derived from emotional perception and cognitive perception, respectively. As a result, all variables are extremely dependable, especially the score of public preparedness and attitude. No items were eliminated because every Cronbach's Alpha value was above the acceptable range, indicating that the variables were appropriate for further investigation.

4.3.2 Multicollinearity Test

Table 4.3.2: *Multicollinearity Test*

Independent Variables	Collinearity Statistics	
	VIF	Tolerance
ATTITUDE	2.441	0.41
EMO_PERCEPTION	2.878	0.347
COG_PERCEPTION	1.545	0.647

Multicollinearity occurs when multivariate linear regression analysis incorporates variables that are significantly correlated not only with the dependent variable but also with one another (Shrestha, 2020).

From the table, the VIF values of the factors, ranging from Attitude, Emotional Perception, and Cognitive Perception, are from 1.545 to 2.878, all of them being above 1 but below 5. Among the factors, Emotional Perception (EMO_PERCEPTION) has the highest VIF value (2.878), whilst Cognitive Perception (COG_PERCEPTION) has the least VIF value (1.545). On the contrary, the tolerance values for all the independent variables are well above 0.1, with Cognitive Perception having the highest tolerance value (0.647) and Emotional Perception having the lowest tolerance value (0.347).

Given these results, there's an indication of the presence of low multicollinearity, as all the VIF values stand lower than the usual 5-point cutoff, whereas all the tolerance levels fluctuate above 0.1. It can be noted that it is the Emotional Perception that is slightly more correlated with other variables (VIF = 2.878), though its level is not alarming. Therefore, multicollinearity would not be a problem within this study, and the independent variables can be confidently analyzed with no biases through the analysis.

4.4 Multivariate Assumption

4.4.1 Normality Test

Table 4.4.1 Normality Test

Variable	N	Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	Std. Error
PUBLIC_PREPAREDNESS	369	(-0.637)	0.127	(-0.363)	0.253
EMO_PERCEPTION	369	(-0.846)	0.127	(-0.046)	0.253
COG_PERCEPTION	369	(-0.231)	0.127	(-0.919)	0.253
ATTITUDE	369	(-0.777)	0.127	(-0.294)	0.253

Referring to Table 4.4.1, the variable EMO_PERCEPTION has the highest relative skewness value compared to any variable (0.846), whereas COG_PERCEPTION has the lowest skewness value (0.231). All the skewness values show sufficient symmetrical distributions as they fall between the acceptable range of -2 and +2. Besides, EMO_PERCEPTION has the flattest distribution with a kurtosis of 0.046, while COG_PERCEPTION shows the most noticeable peak at 0.919. Each kurtosis value falls within the acceptable range of -7 to +7, and all variables are consistently and reliably approximated by the moderate standard errors

for skewness (0.127) and kurtosis (0.253). Thus, all the variables fall within normal distribution range.

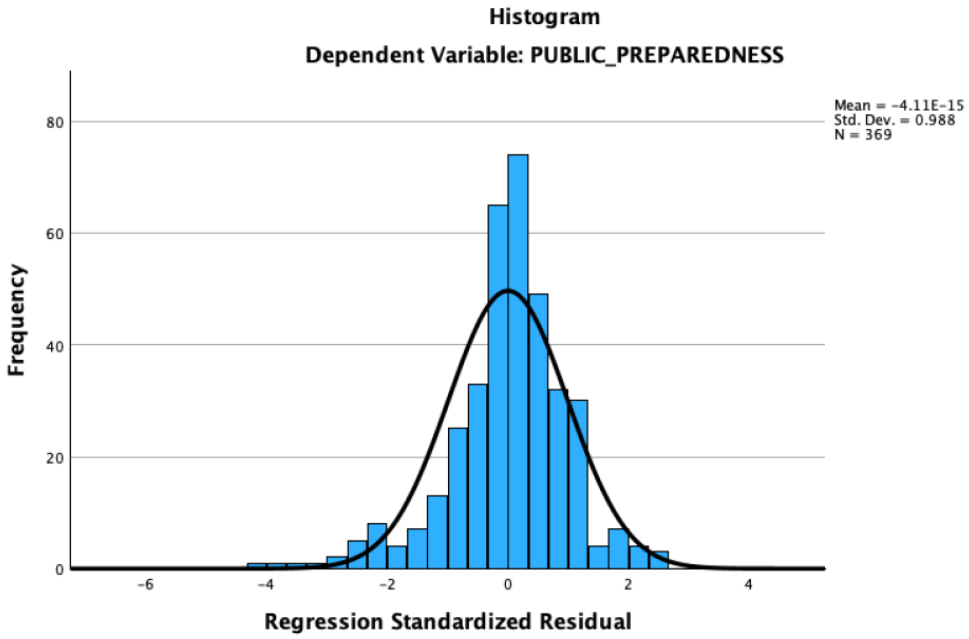


Figure 4.4.1 Histogram

Figure 4.4.1 shows the histogram of regression standardized residual of the dependent variable, public preparedness with normal bell-shaped curve. Most data points center about the zero mean, with frequency dropping equally towards the tails. The residuals mainly fall within -4 and +4, indicating a well-balanced distribution, with a standard deviation of 0.988 and a mean that is close to zero (4.11E15). Therefore, the data demonstrates that it is normally distributed.

4.5 Descriptive Analysis

Descriptive analysis is utilized to determine the numerical data. Tables and charts help readers understand what they are reading. A total of 384 questionnaires have been made available for our study survey. All the conclusions and data generated for the following sections will be based on the responses provided by the 384 respondents.

4.5.1 Demographic Profile

The research study is made up of eleven questions. This section contains the respondents' individual information. The questionnaires addressed many aspects of the respondents' backgrounds, such as age, gender, education level, marital status, employment status, income level, homeownership, and previous disaster experience.

4.5.1.1 Age Group

Table 4.5.1.1: *Statistic of Respondents' Age Group*

Age group	Frequency	Percent	Valid Percent	Cumulative Percent

Gen X (1965–1979)	128	33.33	33.33	33.33
Gen Y (1980–1994)	128	33.33	33.33	66.67
Gen Z (1995–2009)	128	33.33	33.33	100.00
Total	384	100.00	100.00	

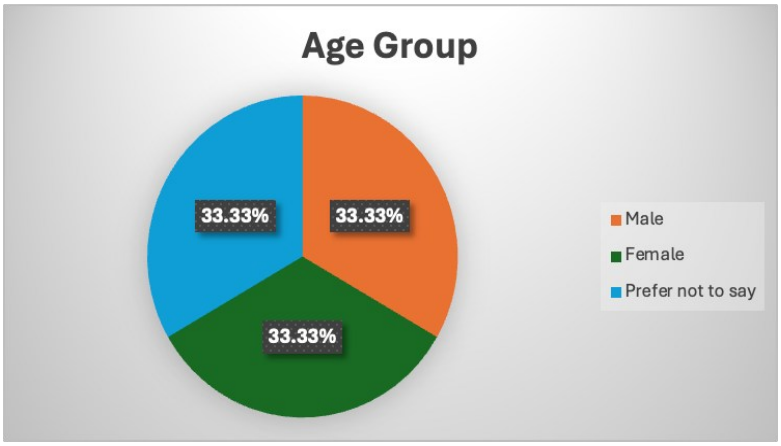


Figure 4.5.1.1: Statistics of Respondents' Age Group

The respondents were distributed equally across the three age groups, as shown in Table 4.5.1.1 and Figure 4.5.1.1. In the study, Gen X (33.33%), Gen Y (33.33%), and Gen Z (33.33%) were

equally represented. Meaningful comparisons between age groups are made possible by this balanced distribution.

4.5.1.2 Gender

Table 4.5.1.2: *Statistic of Respondents' Gender*

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	122	31.77	31.77	31.77
Female	202	52.60	52.60	84.37
Prefer not to say	60	15.63	15.63	100.00
Total	384	100.00	100.00	

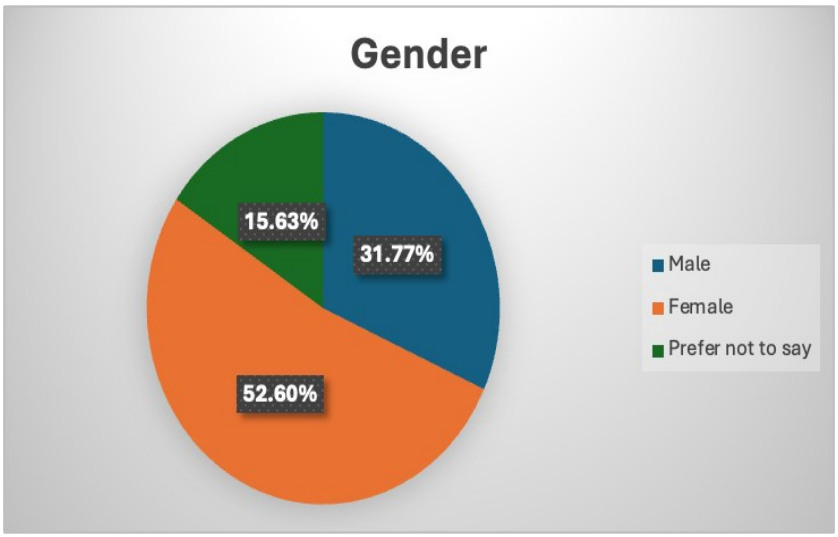


Figure 4.5.1.2: Statistic of Respondents' Gender

Table 4.5.1.2 and Figure 4.5.1.2 show that a total of 384 respondents participated in the survey. Among them, 122 respondents (31.77%) were male**,** 202 respondents (52.60%) were female**,** and 60 respondents (15.63%) preferred not to disclose their gender. This indicates that the majority of respondents in the survey were female, followed by male respondents, while a smaller portion preferred not to state their gender.

4.5.1.3 Educational Level

Table 4.5.1.3 *Statistic of Respondents' Educational Level*

Educational Level	Frequency	Percent	Valid Percent	Cumulative Percent

Primary school	5	1.30	1.30	1.30
Secondary School	40	10.42	10.42	11.72
Diploma / Certificate	61	15.89	15.89	27.61
Bachelor's Degree	253	65.88	65.88	93.49
Master's Degree and above	25	6.51	6.51	100.00
Total	384	100.00	100.00	

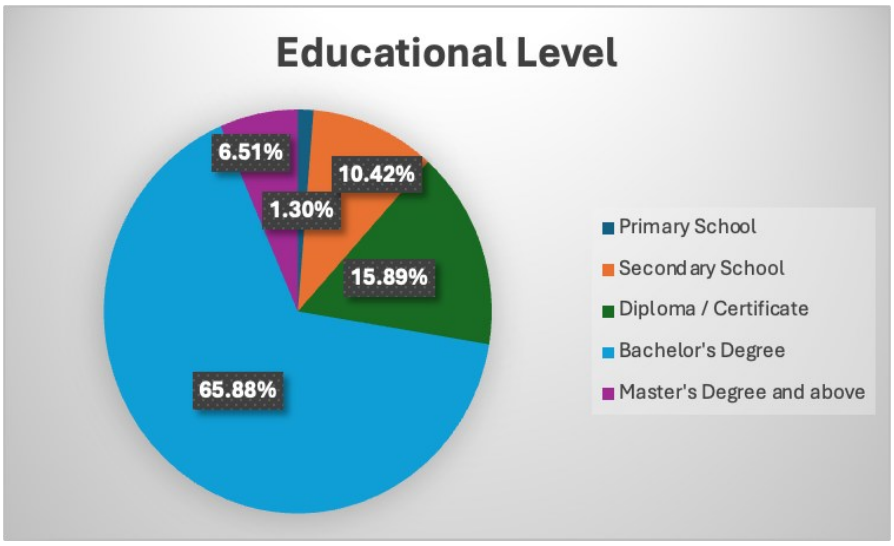


Figure 4.5.1.3: Statistic of Respondents' Educational Level

Table 4.5.1.3 and Figure 4.5.1.3 show that a total of 384 respondents participated in the survey. Among them, 5 respondents (1.30%) had Primary School education, 40 respondents (10.42%) had Secondary School education, 61 respondents (15.89%) held a Diploma/Certificate, 253 respondents (65.89%) held a Bachelor's Degree, and 25 respondents (6.51%) had a Master's Degree or higher. This indicates that the majority of respondents were highly educated, with most holding a Bachelor's Degree (65.89%), followed by Diploma/Certificate holders (15.89%).

4.5.1.4 Marital Status

Table 4.5.1.4: *Statistic of Respondents' Marital Status*

Marital Status	Frequency	Percent	Valid Percent	Cumulative Percent
Single	237	61.72	61.72	61.72
Married	79	20.57	20.57	82.89
Divorced	12	3.13	3.13	85.42
Widowed	11	2.86	2.86	88.28
Prefer not to say	45	11.72	11.72	100.00

Total	384	100.00	100.00

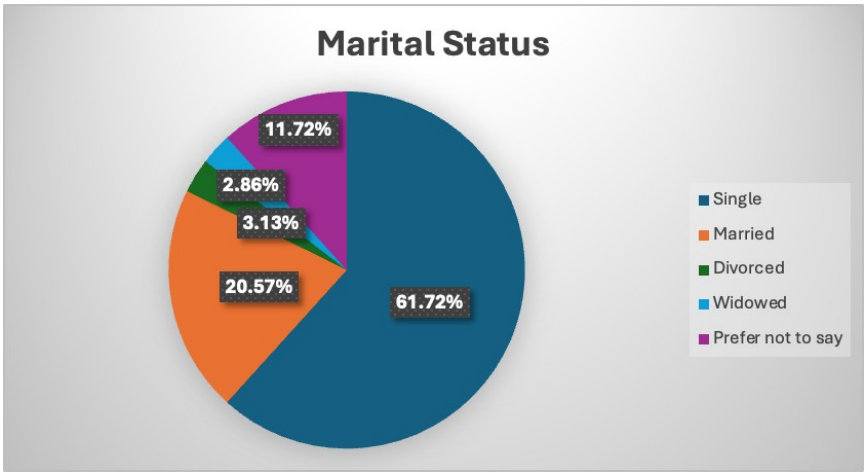


Figure 4.5.1.4: Statistic of Respondents' Marital Status

Table 4.5.1.4 and Figure 4.5.1.4 show that a total of 384 respondents participated in the survey. Among them, the majority, 237 respondents (61.72%), were single, followed by 79 respondents (20.57%) who were married. A smaller portion of respondents were divorced (3.13%) or widowed (2.86%), while 45 respondents (11.72%) preferred not to disclose their marital status.

4.5.1.5 Employment Status

Table 4.5.1.5: *Statistic of Respondents' Employment Status*

Employment Status	Frequency	Percent	Valid Percent	Cumulative Percent
Student	108	28.13	28.13	28.13
Employed	191	49.74	49.74	77.87
Self-employed	55	14.32	14.32	92.19
Unemployed	11	2.86	2.86	95.05
Retired	19	4.95	4.95	100.00
Total	384	100.00	100.00	

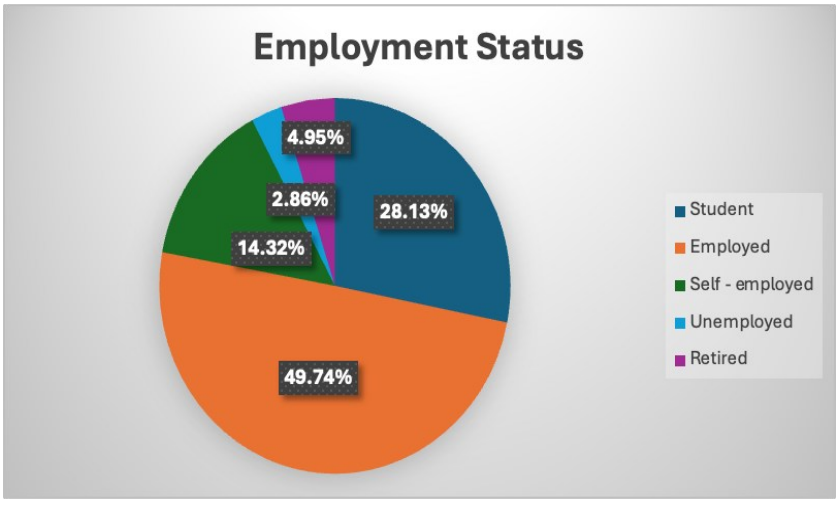


Figure 4.5.1.5: Statistic of Respondents' Employment Status

Table 4.5.1.5 and Figure 4.5.1.5 show that a total of 384 respondents participated in the survey. Among them, the majority, 191 respondents (49.74%), were employed, followed by 108 respondents (28.13%) who were students. A smaller portion of respondents were self-employed (14.32%), retired (4.95%), or unemployed (2.86%).

4.5.1.6 Income Level

Table 4.5.1.6: *Statistic of Respondents' Income Level*

Income Level	Frequency	Percent	Valid Percent	Cumulative Percent
B1 - below RM2,560	130	33.85	33.85	33.85
B2 - RM2,560 - RM3,439	32	8.33	8.33	42.18
B3 - RM3,440 - RM4,309	66	17.19	17.19	59.38
B4 - RM4,310 - RM5,249	22	5.73	5.73	65.11
M1 - RM5,500 - RM6,339	26	6.77	6.77	71.88

M2 - RM6,430 - RM7,689	25	6.51	6.51	78.39
M3 - RM7,690 - RM9,449	29	7.55	7.55	85.94
M4 - RM9,450 - RM11,819	24	6.25	6.25	92.19
T1 - RM11,820 - RM15,869	21	5.47	5.47	97.66
T2 above RM15,870	9	2.34	2.34	100.00
Total	384	100.00	100.00	

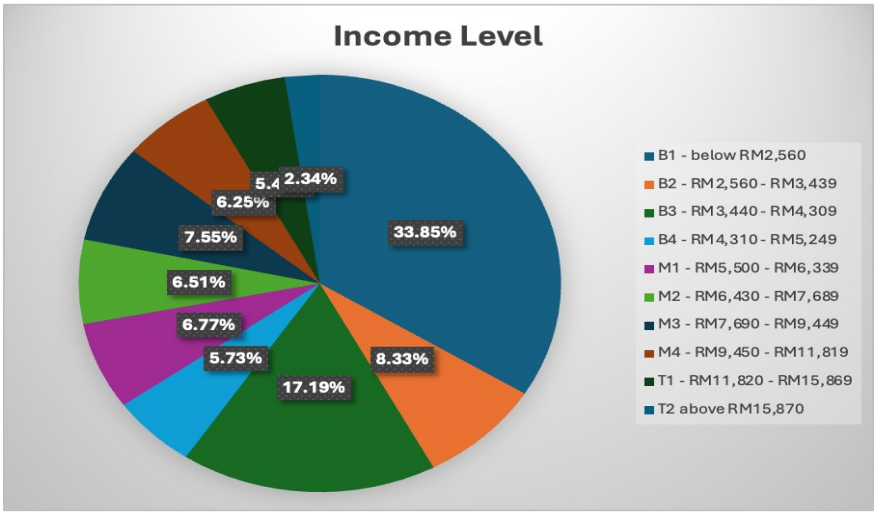


Figure 4.5.1.6: Statistic of Respondents' Income Level

Table 4.5.1.6 and Figure 4.5.1.6 show that a total of 384 respondents participated in the survey. The majority, 130 respondents (33.85%), were in the B1 income group (below RM2,560), followed by 66 respondents (17.19%) in the B3 income group (RM3,440–RM4,309). Smaller percentages were recorded in other groups, such as B2 (8.33%), M1 (6.77%), M2 (6.51%), and M3 (7.55%). The least represented group was T2 (above RM15,870), with 9 respondents (2.34%). This indicates that a significant portion of respondents fell into the lower-income groups (B1–B3), which comprised over 59% of the total respondents.

4.5.1.7 Homeownership

Table 4.5.1.7: *Statistic of Respondents' Homeownership - Do you own a home?*

Do you own a home?	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	206	53.65	53.65	53.65
No	178	46.35	46.35	100.00
Total	384	100.00	100.00	

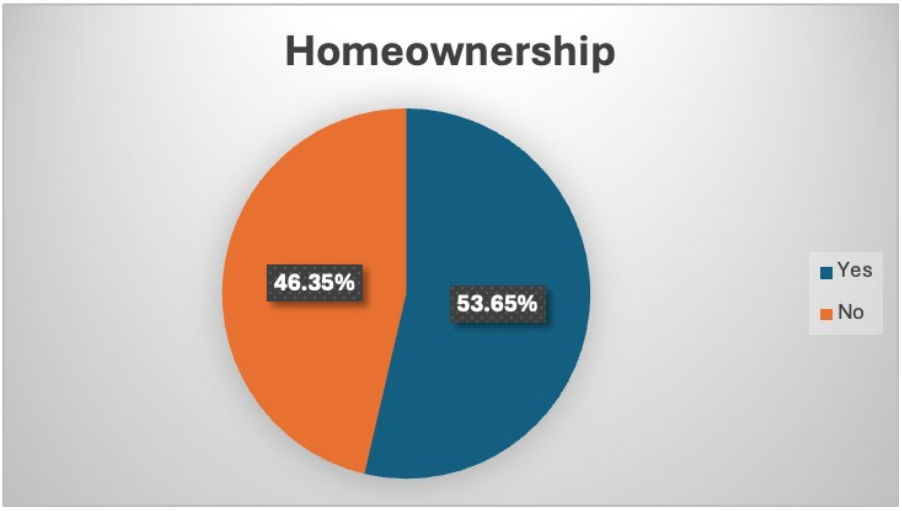


Figure 4.5.1.7: Statistic of Respondents' Homeownership - Do you own a home?

Table 4.5.1.7 and Figure 4.5.1.7 show that a total of 384 respondents participated in the survey. Among them, 206 respondents (53.65%) owned their homes, while 178 respondents (46.35%) did not own a home. This indicates a relatively balanced distribution, with a slightly higher proportion of homeowners compared to non-homeowners.

4.5.1.8 Duration in Penang

Table 4.5.1.8: *Statistic of Respondents' Duration of Residence in Penang*

Duration in Penang	Frequency	Percent	Valid Percent	Cumulative Percent
Less than a year	57	14.84	14.84	14.84

1 to 5 years	69	17.97	17.97	32.81
5 to 10 years	63	16.41	16.41	49.22
10 to 15 years	57	14.84	14.84	64.06
15 to 20 years	54	14.06	14.06	78.13
20 years or more	84	21.88	21.88	100.00
Total	384	100.00	100.00	

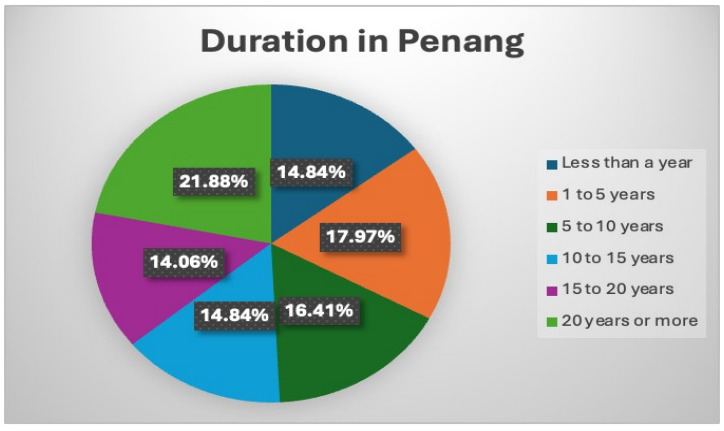


Figure 4.5.1.8: Statistic of Respondents' Duration of Residence in Penang

Table 4.5.1.8 and Figure 4.5.1.8 show that a total of 384 respondents participated in the survey. The largest group, 84 respondents (21.88%), lived

in Penang for 20 years or more, followed by 69 respondents (17.97%) who had lived there for 1 to 5 years, and 63 respondents (16.41%) who had stayed for 5 to 10 years. A total of 57 respondents (14.84%) had lived in Penang for less than one year, while the same number (57 respondents, 14.84%) had lived in Penang for 10 to 15 years, and 54 respondents (14.06%) had lived there for 15 to 20 years. This indicates that the sample included a good mix of respondents with both long-term and short-term residence in Penang.

4.5.1.9 Household Composition

Table 4.5.1.9: *Statistic of Respondents' Household Composition*

Household Composition	Frequency	Percent	Valid Percent	Cumulative Percent
Single	143	37.24	37.24	37.24
Husband-wife	59	15.36	15.36	52.60
Two generations	100	26.04	26.04	78.65
Three generations	46	11.98	11.98	90.63
Others	36	9.38	9.38	100.00

Total	384	100.00	100.00

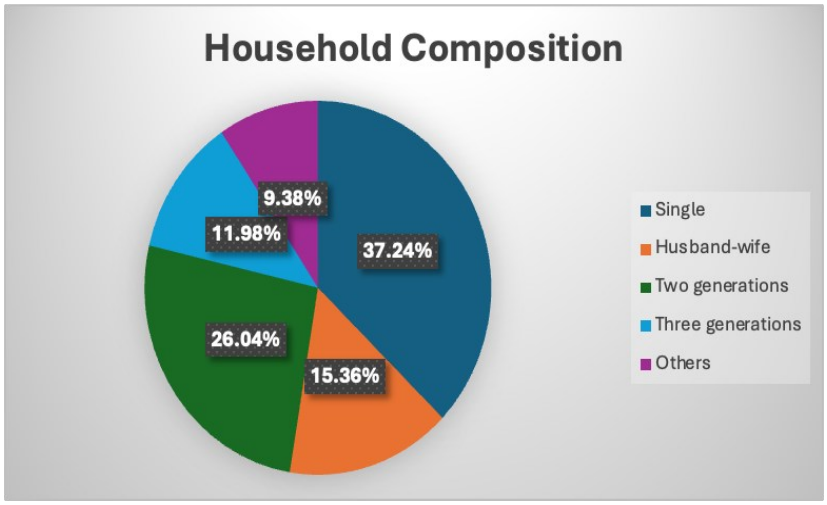


Figure 4.5.1.9: Statistic of Respondents' Household Composition

Table 4.5.1.9 and Figure 4.5.1.9 show that a total of 384 respondents participated in the survey. The largest group, 143 respondents (37.24%), lived in a single-person household, followed by 100 respondents (26.04%) living in two-generation households. Meanwhile, 59 respondents (15.36%) lived in a husband-wife household, 46 respondents (11.98%) in three-generation households, and 36 respondents (9.38%) indicated other household arrangements. This suggests that most respondents lived alone or in multi-generational households.

4.5.1.10 Duration in Current Home

Table 4.5.1.10: *Statistic of Respondents' Duration in Current Home*

Duration in Current Home	Frequency	Percent	Valid Percent	Cumulative Percent
1 to 5 years	126	32.81	32.81	32.61
6 to 10 years	98	25.52	25.52	58.33
11 to 15 years	80	20.83	20.83	79.17
16 or more years	80	20.83	20.83	100.00
Total	384	100.00	100.00	

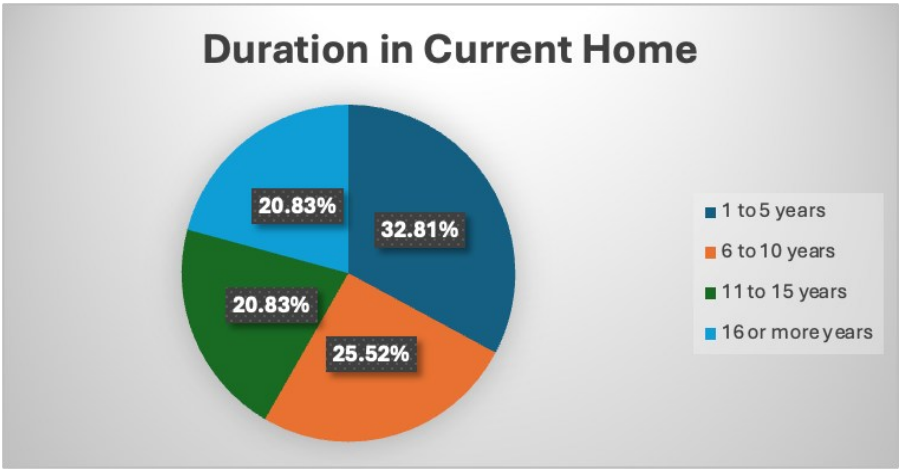


Figure 4.5.1.10: Statistic of Respondents' Duration in Current Home

Table 4.5.1.10 and Figure 4.5.1.10 show that a total of 384 respondents participated in the survey. The largest group, 126 respondents (32.81%), had lived in their current home for 1 to 5 years, followed by 98 respondents (25.52%) who had lived there for 6 to 10 years. Another 80 respondents (20.83%) had stayed for 11 to 15 years, while an equal number (80 respondents or 20.83%) had lived in their current home for 16 or more years. This indicates that the sample contained a mix of both short-term and long-term residents in their current homes.

4.5.1.11 Past Disaster Experience

Table 4.5.1.11: *Statistic of Respondents' Past Disaster Experience*

Past Disaster Experience	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	279	72.66	72.66	72.66
No	105	27.34	27.34	100.00
Total	384	100.00	100.00	

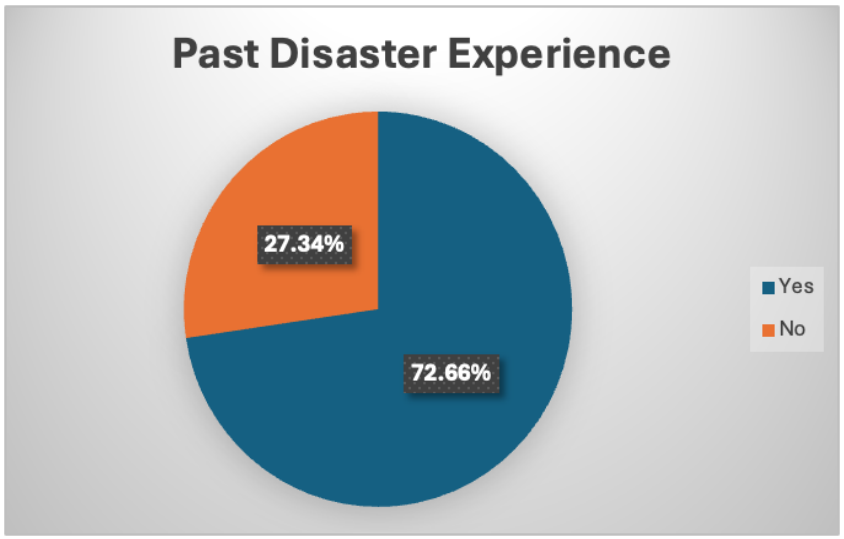


Figure 4.5.1.11: Statistic of Respondents' Past Disaster Experience

Table 4.5.1.11 and Figure 4.5.1.11 show that a total of 384 respondents participated in the survey. Among them, 279 respondents (72.66%) reported that they had personally experienced a disaster, while 105 respondents (27.34%) had not. This suggests that the majority of respondents had direct disaster experience, which may influence their level of disaster preparedness.

4.6 Correlation Analysis

Table 4.6: *Correlation Analysis*

Variables	**Attitude**	**Emotional Perception**	**Cognitive Perception**	**Public Preparedness**

Attitude	1	0.767**	0.484**	0.537**
Emotional Perception	0.767**	1	0.592**	0.612**
Cognitive Perception	0.484**	0.592**	1	0.677**
Public Preparedness	0.537**	0.612**	0.677**	1

Note:

N = 369

$p < 0.01$ (2-tailed) All correlations are statistically significant at the 1% level.

A Pearson correlation analysis was conducted to examine the relationships by measuring the strength and direction of their linear association between the independent variables of attitude, emotional perception, cognitive perception and the dependent variable, public preparedness. The results presented in Table 4.6. Categorical variables, such as income level and home ownership, were not included due to the restriction of Pearson correlation. All correlations were found to be positive and statistically significant at the 0.01 level (2-tailed), indicating meaningful associations among the variables.

The correlation between attitude and public preparedness was moderate ($r = 0.537$, $p < 0.01$), suggesting that individuals with more positive attitudes toward preparedness are likely to exhibit higher levels of actual preparedness. Similarly, emotional perception was moderately to strongly correlated with public preparedness ($r = 0.612$, $p < 0.01$), indicating that individuals who are emotionally engaged and concerned about disasters tend to be better prepared.

The strongest relationship was observed between cognitive perception and public preparedness ($r = 0.677$, $p < 0.01$), showing a strong positive correlation. This implies that individuals who possess greater awareness and understanding of emergency preparedness concepts are more likely to take actions to prepare themselves.

In terms of the interrelationships among the independent variables, attitude showed a very strong positive correlation with emotional perception ($r = 0.767$, $p < 0.01$), suggesting that positive attitudes often coexist with emotional concern or awareness. Additionally, attitude was moderately correlated with cognitive perception ($r = 0.484$, $p < 0.01$), and emotional perception demonstrated a moderate to strong correlation with cognitive perception ($r = 0.592$, $p < 0.01$).

These findings support the hypothesis that all three independent variables of attitude, emotional perception, and cognitive perception are positively associated with public preparedness, with cognitive perception showing the strongest association.

4.7 Regression Analysis - Multiple Regression Coefficients

Table 4.7: *Multiple Regression Coefficients*

Intercept	**Unstandardized Regression Coefficient B**	**Std. Error**	**Standardized Regression Coefficient β**	**T statistics**	**Sig. p-value**
(Constant)	1.024***	0.285	-	3.593	< 0.001
Attitude	0.153**	0.053	16.3%	2.886	0.004
Emo Perception	0.227***	0.065	21%	3.465	< 0.001
Cog Perception	0.411***	0.042	44.3%	9.789	< 0.001
Income Level	0.030*	0.015	9.1%	2.002	0.046
Experience	-0.295***	0.078	-14.3%	-3.800	< 0.001
Home Ownership	0.073	0.087	4%	0.841	0.401

R	0.749
R^2	0.561
Adjusted R^2	0.550
Std. Error of Estimate	0.61463
F-test	51.051
Sig. F Change (p-value)	< 0.001 ***
N	369

Note: The *, **, and *** indicate statistical significance levels where * ($p < 0.05$), ** ($p < 0.01$), and *** ($p < 0.001$). The lower the value of p, the more significant the statistics are.

First and foremost, the overall regression model shows an R^2 value at 0.561. This means that there is a 56.1% of the variance explained in our dependent variable, public preparedness, as it is explained by the independent variables in the model.

The adjusted R^2 of our model is 0.55, which proves that the model still remains strong even after adjusting for the number of variables. This means the chosen factors collectively have a correlation or a substantial influence on public preparedness for disasters in Penang.

For our first variable, attitude has a positive relationship influencing public preparedness when (B=0.153**, p=0.004). Therefore, we can say that we do not reject H3. A positive attitude towards disaster preparedness will significantly increase preparedness. The value of the intercept value, B for attitude is not very high, which means the effect of attitude towards public preparedness is not as strong as other independent variables with a higher B value, like cognitive perception and emotional perception.

The second variable of our regression is emotional perception, it also has a positive relationship influencing preparedness when (B=0.227***, p<0.001). Thus, we do not reject H4. The p-value shows that emotional perception is highly significantly correlated with preparedness, as people with higher emotional responses have stronger preparedness towards disaster. The value of B is quite high, making emotional perception a strong variable affecting public preparedness.

The third variable is cognitive perception with (B=0.411***, p<0.001). Therefore, we do not reject H4. Cognitive perception is positively correlated with preparedness, as individuals with higher cognitive awareness tend to be more prepared for disasters. It has the highest value of B, indicating that cognitive perception is the strongest variable among the others. It has the strongest effect on public preparedness.

The fourth variable will be income level with (B=0.03*, p=0.046). There is a positive relationship between income level and public preparedness. Thus, we do not reject H1. The p-value indicates that income level has a significant effect on public preparedness; however, the value of B is quite low, indicating that income level is not a strong variable with a small effect on public preparedness. Households with higher incomes may have more resources to prepare for a disaster.

For our fifth variable, experience has a negative relationship with public preparedness (B=-0.295***, p<0.001). Thus, we reject H5 stating that experience has a significantly positive effect on public preparedness for disasters. Individuals with disaster preparedness experience are associated with lower preparedness.

Lastly, home ownership has an intercept at B=0.073 which means home ownership have a positive relationship with Public Preparedness. However, the p-value of 0.401 shows that this predictor is insignificant. This is because the variable is greater than 0.05, which means home ownership is a non-significant variable. Therefore, H2 is rejected since home ownership does not substantially affect preparedness levels.

Hypothesis	Decision
H1: Income level has a significantly positive effect on public preparedness for disasters in Penang.	Accept
H2: Home ownership has a significantly positive	Reject

effect on public preparedness for disasters in Penang.	
H3: Attitude has a significantly positive effect on public preparedness for disasters in Penang.	Accept
H4: Emotional perception and cognitive perception have a significantly positive effect on public preparedness for disasters in Penang.	Accept
H5: Experience has a significantly positive effect on public preparedness for disasters in Penang.	Reject

4.8 Age Group Focused

Table 4.8 (a): *Age Group Focused*

	Age Group		
	Gen X	**Gen Y**	**Gen Z**
R	0.834	0.855	0.579
R^2	0.696	0.731	0.335
Adjusted R^2	0.672	0.71	0.281
Std. Error of Estimate	0.52461	0.50869	0.73552
F-test	29.23	33.881	6.26
Sig. F Change (p-value)	<0.001 ***	<0.001 ***	<0.001 ***

N	125	122	122

Note: The *, **, and *** indicate statistical significance levels where * ($p < 0.05$), ** ($p < 0.01$), and *** ($p < 0.001$). The lower the value of p, the more significant the statistics are.

Our study further breaks down the research into 3 different age groups, Gen X, Gen Y, and Gen Z. Based on this regression model, there is a high proportion of variance for Gen X towards public preparedness with a value of R^2 at 0.696, which means there is a 69.6% of the variance in public preparedness which is explained by the independent variables. Besides, Gen Y also have a high proportion of variance towards public preparedness with a value of R^2 at 0.731, which means that there is a 73.1% of the variance in public preparedness which is explained by the independent variables. However, Gen Z have a low proportion of variance towards public preparedness with a value of R^2 at 0.335, which means there is only a 33.5% of the variance in public preparedness which is explained by the independent variables.

Furthermore, the ANOVA test for the model fit of Gen X shows a F-test value at 29.23 and a P-value < 0.001, indicating that the predictors of Gen X explain a significant large portion of the variance in the Public Preparedness. Moving on to Gen Y, it has an ANOVA test for the model fit which shows a F-test value at 33.881 and a P-value < 0.001, indicating that the predictors of Gen Y explain a largest significant portion of the variance in the Public Preparedness among the 3 age groups. While the ANOVA test for the model fit of Gen Z shows a lower F-test value at 6.26 and a P-value < 0.001, indicating that the predictors of Gen Z explain a significant low portion of the variance in the Public Preparedness.

Multiple Regression Coefficients Table: Age Group Focused

Table 4.8 (b): Multiple Regression Coefficients - *Age Group Focused*

Variables	**Age Group**	**Unstandardized Regression Coefficient B**	**Std. Error**	**Standardized Regression Coefficient β**	**T statistics**	**Sig. p-value**
(Constant)	Gen X	1.177*	0.470	-	2.504	0.014
	Gen Y	1.931***	0.423	-	4.560	<0.001
	Gen Z	1.383	0.867	-	1.596	0.113
Attitude	Gen X	0.149*	0.061	17.4%	2.438	0.016
	Gen Y	0.265**	0.100	26.2%	2.639	0.009
	Gen Z	0.026	0.166	1.8%	0.154	0.878

Emo Perception	Gen X	0.379***	0.085	37.3%	4.484	<0.001
	Gen Y	0.170	0.112	16.8%	1.522	0.131
	Gen Z	0.000	0.181	0%	-0.002	0.998
Cog Perception	Gen X	0.271***	0.066	30.7%	4.091	<0.001
	Gen Y	0.343***	0.073	35.6%	4.724	<0.001
	Gen Z	0.542***	0.083	55.2%	6.491	<0.001
Income Level	Gen X	0.046*	0.022	11.6%	2.127	0.036
	Gen Y	-0.003	0.028	-0.6%	-0.097	0.923
	Gen Z	0.066	0.045	11.7%	1.457	0.148

Experience	Gen X	-0.334*	0.142	-13.4%	-2.357	0.020
	Gen Y	-0.695***	0.129	-28.4%	-5.383	<0.001
	Gen Z	-0.072	0.136	-4.2%	-0.528	0.599
Home Ownership	Gen X	-0.155	0.170	-5.2%	-0.908	0.366
	Gen Y	-0.067	0.115	-3.4%	-0.578	0.564
	Gen Z	0.215	0.257	6.8%	0.837	0.405

Note: The *, **, and *** indicate statistical significance levels where * ($p < 0.05$), ** ($p < 0.01$), and *** ($p < 0.001$). The lower the value of p, the more significant the statistics are.

This study will dive deep into each of the variables in each of the different age groups, Gen X, Gen Y, and Gen Z. The purpose is to see how individuals at different age group reacts towards disaster preparedness.

The first variable is attitude. For Gen X, attitude is significant with a positive relationship with preparedness as (B=0.149*, p=0.016). For Gen Y, attitude is

significant and has a positive relationship with preparedness when (B=0.265**, p=0.009). For Gen Z, attitude is not significant as (B=0.026, p=0.878), which means it has no effect on preparedness.

When we are trying to compare the age groups for the first variable attitude, Gen X and Gen Y do not reject H3(a) and H3(b) respectively since they both have a positive relationship, however Gen Z rejects H3(c) as it is not significantly correlated with preparedness. Thus, we can say that attitude is a strong variable for Gen X and Gen Y, while Gen Y has the strongest attitude towards preparedness as it has the highest value of B=0.265.

The second predictor is emotional perception. For Gen X, emotional perception has a significantly positive relationship with preparedness where (B=0.379***, p<0.001). However, for Gen Y and Gen Z, emotional perception is not significant with (B=0.17, p=0.131) and (B=0.000, p=0.998) respectively, which means emotional perception does not have much effect on public preparedness in Gen Y and Gen Z. We were able to understand why the relationship remains significant even though both the intercept and the unstandardized coefficient (B) are zero. The findings indicate that emotional perception does not have a direct linear relationship with public preparedness. However, the significance of the relationship arises from the model's strong fit, which reflects the combined effects of multiple variables contributing to the outcome.

When we compare Gen X, Gen Y, and Gen Z for the second variable, emotional perception, Gen X is the only generation that shows a significant coefficient towards preparedness. While the other 2 age groups, Gen Y and Gen Z, do not have a significant relationship between emotional perception and public preparedness. Thus, we do not reject H4(a) for Gen X, but we have to reject H4(b) and H4(c) for Gen Y and Gen Z respectively.

The third independent variable is cognitive perception. All 3 of the age groups shows a significant coefficient of cognitive perception towards public preparedness. They all also have a positive relationship between cognitive perception and public preparedness, with a strong effect of cognitive perception towards public preparedness. The β and p value of Gen X, Gen Y, and Gen Z are (B=0.271***, p<0.001), (B=0.343***, p<0.001), and (B=0.542***, p<0.001) respectively.

When we compare all the age groups with the third variable, cognitive perception is highly significant across all age groups. Gen Z's cognitive perception has the strongest effect and influence towards preparedness as Gen Z has the highest B among the 3 age groups. All 3 age groups have a positive relationship between cognitive perception and public preparedness. Therefore, we can say that all the age groups Gen X, Gen Y, and Gen Z do not reject H5(a), H5(b), and H5(c) respectively.

The fourth independent variable is income level. Only the income level of Gen X is significant with a positive relationship with public preparedness at (B=0.046*, p=0.036). However, income level of both Gen Y and Gen Z are not significant when (B=-0.003, p=0.923) and (B=0.066, p=0.148) respectively. This means that income level of Gen Y and Gen Z are not correlated with public preparedness.

When we compare all the age groups with the fourth predictor, income level of Gen X is the only age groups that has a positive relationship with public preparedness. Thus, for Gen X we do not reject H1(a) since it has a positive relationship. While income level of Gen Y and Gen Z are not significant. Hence, we can say that we reject H1(b) and H1(c) for both Gen Y and Gen Z. In short, only income level of Gen X matters.

The fifth independent variable is experience of a disaster. For Gen X and Gen Y, there is a significant relationship between experience and public preparedness, but the relationship is negative where (B=-0.334*, p=0.020) and (B=-0.695***, p<0.001) respectively. On the other hand, experience is not significant towards public preparedness for the age group of Gen Z with (B=-0.072, p=0.599).

When we compare the fifth predictor which is experience for Gen X, Gen Y, and Gen Z, H6(a), H6(b), and H6(c) are rejected across all age groups. This is due to the fact that, experience for all Gen X, Gen Y, and Gen Z shows a negative relationship with public preparedness. The experience for Gen X and Gen Y are significant towards public preparedness, however experience for Gen Z is non-significant towards public preparedness. Although we can say that experience in Gen X and Gen Y have a negative relationship with public preparedness, but Gen Y have a stronger negative effect proven by the larger value of B=-0.695***.

Last but not least, our last predictor will be home ownership, where this variable is non-significant towards public preparedness across all age groups, Gen X, Gen Y, and Gen Z. The p value of home ownership across all the age groups are all greater than 0.05 which makes this variable non-significant across Gen X, Gen Y, and Gen Z. Therefore, we reject H2(a), H2(b), and H2(c) across all 3 age groups, since home ownership are non-significant across all age groups.

Hypothesis in different age groups

Hypothesis	Decision
H1(a): Income level has a significantly positive effect on public preparedness of Gen X in Penang.	Accept
H1(b): Income level has a significantly positive effect on public preparedness of Gen Y in Penang.	Reject
H1(c): Income level has a significantly positive effect on public preparedness of Gen Z in Penang.	Reject
H2(a): Homeownership had a positive significance toward disaster preparedness in Gen X in Penang.	Reject
H2(b): Homeownership had a positive significance toward disaster preparedness in Gen Y in Penang.	Reject
H2(c): Homeownership had a positive significance toward disaster preparedness in Gen Z in Penang.	Reject
H3(a): Attitude has a significantly positive effect on public preparedness for disasters in Gen X in Penang.	Accept
H3(b): Attitude has a significantly positive effect on public preparedness for disasters in Gen Y in Penang.	Accept

H3(c): Attitude has a significantly positive effect on public preparedness for disasters in Gen Z in Penang.	Reject
H4(a): Emotional perception has a significantly positive effect on public preparedness for disasters in Gen X in Penang.	Accept
H4(b): Emotional perception has a significantly positive effect on public preparedness for disasters in Gen Y in Penang.	Reject
H4(c): Emotional perception has a significantly positive effect on public preparedness for disasters in Gen Z in Penang.	Reject
H5(a): Cognitive perception has a significantly positive effect on public preparedness for disasters in Gen X in Penang.	Accept
H5(b): Cognitive perception has a significantly positive effect on public preparedness for disasters in Gen Y in Penang.	Accept
H5(c): Cognitive perception has a significantly positive effect on public preparedness for disasters in Gen Z in Penang.	Accept
H6(a): Experience has a significantly positive effect on public preparedness for disasters in Gen X in Penang.	Reject
H6(b): Experience has a significantly positive effect on public preparedness for disasters in Gen Y in Penang.	Reject
H6(c): Experience has a significantly positive effect on public	Reject

preparedness for disasters in Gen Z in Penang.	

Overall insights

Gen X's public preparedness is positively influenced by attitude, emotional perception, cognitive perception, and income level. While experience has a negative relationship towards public preparedness. However, home ownership is non-significant.

Gen Y's public preparedness is positively influenced by attitude and cognitive perception, while negatively influenced by experience. However, emotional perception, income level and home ownership are non-significant.

Gen Z's public preparedness is only influenced by cognitive perception with a positive relationship. All other variables like attitude, emotional perception, income level, experience, and home ownership have no significant effect.

4.9 Conclusion

Data analysis is performed using SPSS 29.0. It is helpful for analyzing the information obtained from the questionnaire. There is no missing data, and no transformation of reversed questions needed. Reliability analysis was used to confirm the questionnaire scales' internal consistency. Furthermore, Multiple Regression Analysis provides us with data of the correlation between the variables between variables. The dataset's robustness and suitability for upcoming multivariate studies, such as the extraction and interpretation of underlying factor structures, were guaranteed by these outcomes.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.0 Introduction

The research findings were thoroughly examined in Chapter 5. Major findings are discussed. The second topic covered is how this study influences the work of experts in a particular field. Finally, this chapter discussed the study's limitations and recommendations for additional research.

5.1 Discussion of Major Findings

The major findings in Chapter 5 are thoroughly examined in this section, which emphasises the relationships between the dependent variable, public preparedness for disasters, and the independent variables, income level, home ownership, attitude, emotional perception, cognitive perception, and past experience.

5.1.1 Relationship between Income Level and Public Preparedness

H1: Income level has a significantly positive effect on public preparedness for disasters across different age groups in Penang.

The results show that income level has a small but statistically significant positive effect on public preparedness (B = 0.030*, p = 0.046). This indicates that those with higher incomes are slightly more likely to be prepared for disasters. As a result, the hypothesis is supported, however the strength of the link is quite minor.

A study by Rivera (2022) among Hispanics and Latinos in the US showed a complicated relationship between disaster preparedness and income. According to the study, individuals who had low incomes typically showed less preparedness because they had fewer resources, lacked confidence, and felt helpless. It's interesting to note that those with higher incomes also demonstrated less preparedness since they frequently underestimated threats since they believed outside help would be accessible. This stands in part in contrast to the current data, which shows that in the current sample, somewhat better preparedness outcomes correlate with higher income.

Kim and Kim (2022) conducted a nationwide survey of 1,243 respondents in South Korea and discovered a significantly positive relationship between income and preparedness for disasters. While those with low incomes faced limited resources and information, high-income individuals had stronger knowledge, greater access to preparedness resources, and higher levels of catastrophe awareness. This is very consistent with current studies showing that enhanced preparedness can be facilitated by increased financial capability.

5.1.2 Relationship between Home ownership and Public Preparedness

H2: Home ownership significantly affect disaster preparedness across different age groups in Penang.

The results indicate that homeownership has a positive but not statistically significant effect on public preparedness (B = 0.073, p = 0.401). This suggests that owning a home does not significantly improve individual preparedness for disasters. As a result, the hypothesis is rejected, indicating that homeownership does not influence preparedness levels in the current study.

Ozdemir et al. (2021) reported similar results, finding no significant relationship between homeownership and disaster preparedness practices. According to their findings, owning a house does not ensure that individuals will take the crucial step of developing comprehensive preparation plans, even if they frequently have access to more resources and knowledge. This is similar with the current study's findings, which suggest that simply owning a home may not correspond to better preparedness outcomes.

A potential explanation for the insignificance of homeownership in the current study is that several disaster preparedness programs do not necessitate property ownership or substantial financial resources. Both homeowners and renters can

take simple steps including deciding on evacuation routes, participating in neighborhood awareness programs, and preparing an adequate amount of basic emergency supplies. Because these acts are accessible to any individual, owning a home does not always provide a significant advantage in preparedness. Furthermore, government support and community-based programs may provide equal access to preparedness resources, reducing the disparity between homeowners and renters and making homeownership less crucial.

5.1.3 Relationship between Attitude and Public Preparedness

H3: Attitude significantly affects disaster preparedness across different age groups in Penang.

The results show that attitude has a positive significant relationship with the public preparedness for disasters, as the correlation coefficient (r) value is 0.537. This reflects that people are more likely to be well-prepared when they have more positive thoughts about being prepared for the disaster. According to Protective Motivation Theory (PMT), it states that a positive attitude supports the belief that preparation measures are effective and personally achievable. This process merely creates preparedness but also sustains motivation over time, allowing for continued preparation.

Similar to the study, Fatoni et.al (2022) showed support for the importance of attitude by showing that a good attitude has a statistically significant influence on preparedness action. A positive mindset was associated with a higher likelihood of storing emergency supplies, practicing disaster drills, and developing family emergency plans. Moreover, the study also found that the attitude had more of an impact when associated with aspects including employment status, educational attainment, and training in disaster preparedness.

Prastyawati et al. (2024) claim that a view among teenagers significantly influences their preparedness for disasters. According to the study, those who strongly agree with suggestions about family safety and self-rescue also tend to prepare, suggesting that a positive mindset has a significant impact on how children respond to disaster risks. As such, it concludes that attitudes have a positive relationship between public preparedness for disasters.

5.1.4 Relationship between Perception and Public Preparedness

H4: Perception significantly affects disaster preparedness across different age groups in Penang.

The perception variable of this study is divided into two distinct elements which are cognitive perception and emotional perception. In the findings, public

preparedness and emotional perception had a moderate to strong positive correlation with the value of 0.612, indicating that those who are emotionally involved and worried about disasters are better prepared. Moreover, public preparedness and cognitive perception showed the greatest correlation with the 0.677 value, meaning that those who are more knowledgeable about disaster preparation concepts are also more likely to engage in proactive preparedness measures.

And these results are like the findings of past studies. Yin et al. (2021) found a strong positive relationship between perception and disaster preparation after studying 369 residences in the flood-prone Odaw River/Korle Lagoon basins of Accra Metropolitan, Ghana. Households that experienced higher levels of anxiety, flood probability, severity, and mortality threat were more likely to prepare by elevating homes, sandbagging, and draining. These viewpoints were influenced by past experience, disaster knowledge, and living in a high-risk area.

Still, Wu et al. (2022) discovered that higher risk perception significantly increased evacuation planning, particularly among those who were more knowledgeable about disasters and actively participated in disaster risk reduction (DRR) programs. Consequently, proactive preparation for disasters is greatly influenced by better risk perception.

5.1.5 Relationship between Past Experience and Public Preparedness

H5: Experience has a significantly positive effect on public preparedness for disasters across different age groups in Penang.

The result indicated that experience and public preparedness for disaster have a negatively significant effect, with the value of B= -0.295, $p<0.001$. This suggests that individuals with past experience of disasters tend to be less prepared to handle such events in the future. Which is to say that having past disaster experience does not appear to make individuals more prepared, but it may make them less prepared. Therefore, the hypothesis is rejected, which claims that experience significantly enhances public preparedness for disasters.

Although the outcome is contrary to the hypothesis, it is similar with findings from previous studies. Ulupınar et al. (2024) suggested that past experience with disasters had no statistically significant impact on preparedness. Despite some certain special cases showing positive trends, the study concluded that experience itself was insufficient to ensure preparedness. They emphasised the need to integrate formal education and training with experience, especially in healthcare fields, to enhance the preparedness.

In the same way, Ridzuan et al. (2024) demonstrated that although knowledge of catastrophic risks was increased by previous flood experience, preparation actions were not necessarily the outcome of this insight. Experience must be

supported by the right perspective to transition into actual preparedness behaviour, as only those with a positive view on preparation were likely to act.

In conclusion, both studies indicate that past disasters experience itself does not ensure preparation, although being helpful in raising awareness. Experience, formal training, targeted teaching, and a proactive mindset are all necessary for effective disaster preparedness for individuals to convert their knowledge into practical and set up action.

5.2 Implication of Study

This section outlines the practical implications of the study, focusing on how the findings can be applied to real-world disaster preparedness efforts in Penang. The results offer valuable insights for government agencies, local authorities, academic institutions, and community organizations in designing targeted and inclusive strategies to improve public preparedness.

5.2.1 Practical Implications

The first independent variable income level has a positive effect on disaster preparedness across age groups in Penang. The income level was positive and significantly associated with disaster preparedness among Generation X,

showing that higher income has greater capacity for investing in preparedness measures. For Generation Y and Generation Z, the relationship was also positive but not statistically significant, implying that while higher income may still be linked to better preparedness, the evidence for these groups is not strong enough to confirm the effect. This suggests that those with higher incomes are slightly more likely to participate in preparedness activities because they can afford to buy emergency supplies and invest in protective house measures. To close this gap, government agencies, local governments, and community organizations could adopt targeted interventions for low-income households, such as subsidized preparedness kits, free disaster response seminars, or community-wide safety drills. By lowering financial barriers, these measures can assist ensure that catastrophe preparedness is not limited by economic capacity.

Home ownership was not significantly associated with disaster preparedness in any age group. For Generation X and Generation Y, the relationship was negative but not significant, indicating no clear evidence that owning a home affects preparedness behaviors. In Generation Z, the coefficient was positive but also not statistically significant, suggesting that tenure status has a limited influence on preparedness regardless of age. In contrast, the independent variable of home ownership showed a positive but statistically insignificant link with disaster readiness across age groups in Penang. This demonstrates that homeowners and renters exhibit similar readiness behaviors, which can be attributed to shared access to catastrophe information, equivalent risk exposure, or community-based preparedness programs. However, preparedness efforts must include both homeowners and renters, to ensure that renters are not overlooked in disaster awareness campaigns and that all residents, regardless of property ownership, have equal access to resources, training opportunities, and early warning systems.

For Generation X, attitude showed a positive and statistically significant relationship with disaster preparedness, meaning that individuals with more positive attitudes toward preparedness tend to be better prepared. A positive and significant relationship was observed for Generation Y, with a stronger effect size compared to Generation X. For Generation Z, the relationship was also positive but not statistically significant, suggesting that while the direction aligns with the other groups, there is insufficient evidence to confirm a meaningful effect. Third independent variable, attitude was found to have positive relationship with disaster preparedness across different age groups in Penang. A positive attitude leads to proactive actions, such as creating emergency plans, disaster planning training, and having a disaster committee to stimulate exercises, drills, or workshops. Local governments and disaster management organizations must concentrate on fostering favorable public perceptions of disaster readiness to increase preparedness results. Furthermore, disaster preparedness ought to be a frequent topic in schools, to encourage young people to start thinking seriously and optimistically about catastrophe preparation at a young age. The government and disaster management organizations may reach a wider audience by promoting and showcasing disaster preparedness content through infographics, public service announcements, and social media campaigns, since the majority of people today spend a large amount of time on digital mobile devices. By highlighting the value of being proactive in disaster preparedness, these platforms can inspire people to take personal accountability for their own safety and wellbeing.

Among Generation X, emotional perception was positively and significantly associated with disaster preparedness, showing that individuals who are more emotionally engaged with the idea of disasters tend to prepare more. For

Generation Y, the relationship was positive but not statistically significant, indicating that while higher emotional concern may encourage preparedness, the evidence is not conclusive for this group. Generation Z showed no meaningful relationship, suggesting that emotional factors may not play a significant role in their preparedness behavior.

Cognitive perception had a positive and statistically significant relationship with disaster preparedness for all three age groups. In Generation X, the effect was significant, while in Generation Y, the relationship was slightly stronger. Generation Z displayed the strongest effect size, indicating that greater knowledge, understanding, and risk assessment skills are strongly linked to higher preparedness across all generations, particularly among younger respondents.

Furthermore, the fourth independent variable, perception (emotional and cognitive) has a positive effect on disaster preparedness for all age groups. This implies that people's emotional perception, which are their feelings of fear, worry, or concern and their cognitive perception of comprehension, knowledge, and assessment of the hazards associated with disasters are important factors in driving preparedness efforts. People are more inclined to take significant action to safeguard themselves and their families when they believe that disasters are serious, imminent, and personal threatening. As part of larger Disaster Risk Reduction (DRR) programs, governments, local authorities, and disaster management organisations must concentrate on improving public awareness to improve disaster preparedness at the community level. DRR entails lowering vulnerability as well as raising awareness and capability in addition to lowering dangers. Therefore, influencing people's attitudes and thoughts about risk must be a crucial component of DRR. This can be accomplished by using integrated

communication techniques that blend logical, fact-based communications with emotionally stirring storytelling. Survivor testimonies, actual case studies, and localised impact statistics, for instance, should all be incorporated into disaster risk communication efforts since they can both increase emotional urgency and foster cognitive understanding.

For Generation X, past disaster experience had a negative and significant relationship with preparedness, meaning that greater experience was linked to lower preparedness levels. This negative relationship was even stronger for Generation Y, indicating a substantial decline in preparedness among those with more prior disaster exposure. Generation Z also showed a negative coefficient, but the relationship was not statistically significant, suggesting that experience does not play a strong role in influencing preparedness in this group. The independent variable of past experience has been found to have a negative relationship with disaster preparedness across age groups. This suggests that in this study, individuals who have previously encountered natural disasters such as floods, landslides, or storms tend to report lower levels of preparedness. One possible explanation is that some people assume that future disasters will not be as severe or that they will be able to cope without additional preparation. In other cases, past experiences may lead to emotional fatigue or a belief that preparedness efforts are unnecessary or ineffective. To counter this, authorities and community leaders should actively transform past experiences into constructive learning opportunities by encouraging experience-sharing within communities. For example, individuals who have been affected by disasters can be invited to share their stories through interviews, community talks, or awareness campaigns to highlight the consequences of being unprepared.

5.3 Limitations of Study

Despite the valuable insights provided by this study, several limitations should be acknowledged. A research investigation took place exclusively in Penang's urban and suburban areas within Malaysia. Although Penang's disaster-prone status made it a suitable research site the findings might not apply to rural areas or other Malaysian states that show different patterns of population characteristics and environmental risks and public knowledge levels. The study's results need to be applied cautiously to national areas since they were derived from Penang's urban and suburban populations.

Besides, the research employed structured questionnaires which participants completed independently through online distribution platforms. The methods enabled respondents to submit data faster, but they also introduced potential biases. Respondents might have felt pressure to answer questions in ways that appeared correct to society while they might have misinterpreted the questions which affected the data accuracy. Because of the self-reporting nature of the measurement there was no way to confirm whether respondents actually performed the preparedness behaviours they reported since the data mainly showed intentions and perceptions instead of actual behavioural observations.

Another limitation lies in the scope of variables considered. While the study examined five key factors, which are income level, home ownership, attitude, perception, and past experience—there may be other variables potentially influential were not included. These could include levels of education, the access to media, trust in government, and cultural or religious beliefs. All of these might affect public preparedness but were discounted in this study. Their exclusion could limit the comprehensiveness of the model and the depth of analysis regarding behavioural drivers.

Lastly, the research utilized a cross-sectional approach to gather data which occurred at one specific time point. This method enables researchers to capture a current picture of disaster preparedness between generations, yet it prevents tracking preparedness levels across time or during specific events. Establishing causal relationships between independent variables and dependent variables proves challenging through this research design. A longitudinal study combined with mixed-method research could lead to a more comprehensive understanding of behavioural evolution and motivational factors.

5.4 Recommendations for Future Research

Given the study's limitations, numerous areas for further research are suggested to improve awareness of public disaster preparedness in Malaysia. First, future study should broaden its geographical scope beyond Penang's urban and suburban settings to include rural areas and other Malaysian states. Although Penang's disaster-prone qualities make it very important, its population demographics, infrastructure, education levels, and disaster exposure patterns may differ dramatically from those of other regions. Incorporating a more diverse sample from rural and less urbanized regions might enhance the findings' generalizability and reflect differences in public knowledge, cultural values, resource accessibility, and preparedness behaviors. For instance, urban residents might have easier access to official emergency information and supplies, whereas rural residents might rely more on informal communication or conventional coping strategies.

Second, there are specific methodological issues with the use of structured, online, self-administered surveys. Although this approach was successful in rapidly and effectively reaching respondents, it also carried the risk of response bias. It's possible that participants gave socially acceptable responses, particularly when discussing readiness behaviors. Additionally, certain questions may be misunderstood, which could compromise the accuracy of the data. It is recommended that future research utilize mixed-methods approaches, which integrate qualitative methods like focus groups, interviews, and ethnographic observations with quantitative surveys. These techniques would offer a deeper comprehension of public attitudes and motivations, validate self-reported behaviors, and provide complex reasoning underlying preparedness decisions.

Third, future researchers should investigate expanding the range of characteristics covered in the study. Although the current study focused on income level, home ownership, attitude, perception, and past experience, several other possibly important aspects were not investigated. These include social capital, community cohesion, education level, access to early warning systems or disaster information, trust in government officials, and cultural or beliefs related to religion. By incorporating these factors, a more thorough model of disaster preparedness may be provided, exposing deeper levels of impact that influence behavior across various demographic and cultural groups.

Finally, a cross-sectional design was used in the study to collect data at a specific moment in time. This method restricts the ability to track changes over time or determine causal linkages between factors, even if it enables a quick comparison of preparation levels across various age groups. As a result, longitudinal designs that monitor respondent opinions and levels of preparedness over time should be taken into account in future research. This would make it possible for researchers to look at how people's experiences, awareness, and behaviors change before and after disasters or

changes in legislation. Combining longitudinal data with qualitative follow-ups can provide a more dynamic and layered view of behavioural changes and decision-making processes across time.

5.5 Conclusion

This study looked at income level, home ownership, attitude, perspective, and past experience towards disaster preparedness across age groups in Penang. Home ownership was not a significant predictor, although the income level had a slight but considerable favourable impact. While prior disaster experience was surprisingly associated with reduced preparedness, attitude and perception particularly cognitive understanding emerged as powerful drivers of preparedness. These findings highlight the need for disaster risk reduction strategies that not only address financial and resource gaps and cultivate positive attitudes, enhance knowledge, and create emotionally engaging risk communication to translate awareness into action. The results offer useful information for policy and practice, their geographic, methodological, and scope restrictions indicate that future studies should use mixed techniques, expand sampling, and use longitudinal designs to capture changing preparedness behaviours over time.

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APPENDICES

Appendix 1.1: Survey Questionnaire

Personal Data Protection Statement

Acknowledgement of Notice:

( ) I have been notified by you and that I hereby understood, consented and agreed per UTAR above notice.

( ) I disagree, my personal data will not be processed.

Section A: Demographic Information

1. What is your age group

( ) Gen X(1965 – 1979)

( ) Gen Y(1980 – 1994)

( ) Gen Z(1995 – 2009)

2. Gender.

( ) Male

( ) Female

( ) Prefer not to say

3. Educational Level.

( ) Primary School

( ) Secondary School

( ) Diploma / Certificate

( ) Bachelor's Degree

( ) Master's Degree and above

4. Marital Status.

( ) Single

( ) Married

( ) Divorced

( ) Widowed

( ) Prefer not to say

5. Employment Status.

( ) Student

( ) Employed

( ) Self - employed

( ) Unemployed

( ) Retired

6. Income Level.

( ) B1 - below RM2,560

( ) B2 - RM2,560 - RM3,439

( ) B3 - RM3,440 - RM4,309

( ) B4 - RM4,310 - RM5,249

( ) M1 - RM5,500 - RM6,339

( ) M2 - RM6,430 - RM7,689

( ) M3 - RM7,690 - RM9,449

( ) M4 - RM9,450 - RM11,819

( ) T1 - RM11,820 - 15,869

( ) T2 - above RM15,870

Section B: Independent Variables - Homeownership Influence Disaster Preparedness

This section is to obtain the status of current home ownership of the respondent.

7. Do you own a home?

( ) Yes

( ) No

8. Poverty ownership.

( ) Rental (Property available for lease or rent to tenants)

( ) Self-occupied (Property which is occupied throughout the year by the owner)

9. How long do you live in Penang?

( ) Less than a year

( ) 1 to 5 years

( ) 5 to 10 years

( ) 10 to 15 years

( ) 15 to 20 years

( ) 20 years or more

10. What is your household composition?

( ) Single

( ) Husband-wife

( ) Two generations

( ) Three generations

( ) Others

11. Duration living in current home.

( ) 1 to 5 years

( ) 6 to 10 years

( ) 11 to 15 years

( )16 or more years

Section C: Independent Variables - Attitude Towards Disaster Preparedness

This questionnaire aims to assess public attitudes toward disaster preparedness, related to emotional components, cognitive components (perceptions, opinions, beliefs) and behavior.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Training in disaster planning should be taught in Penang.	1	2	3	4	5
Training in disaster planning is necessary.	1	2	3	4	5
It is necessary to have an emergency plan in Penang for any	1	2	3	4	5

anticipated hazards.					
It is necessary to have a disaster management committee in Penang.	1	2	3	4	5
Individuals should know their duties and roles during disaster response in Penang.	1	2	3	4	5
Individuals should know their duties and roles during disaster response in Penang	1	2	3	4	5

Section D: Independent Variables - Perceptions of Disaster Risks

This section aims to evaluate individuals' understanding of disaster risks, their perceived vulnerability, and their confidence in disaster preparedness measures. It also assesses their awareness of evacuation procedures and willingness to participate in disaster risk reduction (DRR) activities.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am aware of the types of disasters that can occur in Penang (e.g., floods, landslides, storms).	1	2	3	4	5
I understand the warning signals and early warning systems for disasters.	1	2	3	4	5
I know how to escape from these disasters.	1	2	3	4	5
Disasters can have a serious impact on my properties.	1	2	3	4	5
Disasters can have a serious impact on Penang.	1	2	3	4	5

Disasters pose a direct threat to my safety.	1	2	3	4	5
I would like to participate in local Disaster risk reduction (DRR) activities.	1	2	3	4	5
I have participated in many DRR activities	1	2	3	4	5
If I receive an early warning, I am willing to cooperate with the community for Disaster Risk Reduction (DRR).	1	2	3	4	5

Section E: Independent Variables - Past Disaster Experience

This part examines how past disaster experience influences disaster preparedness, covering exposure, behavioural response, information-seeking, financial investment, and personal responsibility. It follows a structured approach with quantitative and qualitative measures to provide insights into preparedness behaviours.

27. Have you ever personally experienced a disaster (e.g., flood, landslide, severe storm, earthquake)?

( ) Yes

( ) No

28. How many times have you experienced a disaster in your lifetime?

( ) Once

( ) 2-3 times

( ) More than 3 times

29. Did experiencing a disaster lead you to take any specific preparedness actions?

( ) Yes

( ) No

Section F: Dependent Variables - Disaster Preparedness

This section examines overall preparedness for natural disasters, focusing on factors like risk perception, past experiences, resource access, and community involvement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Identified the best evacuation route from our home.	1	2	3	4	5
Identified a safe elevated area rescue from floods.	1	2	3	4	5
Developed a family emergency plan.	1	2	3	4	5
Provided information on disaster preparedness to other family members and friends.	1	2	3	4	5
Discussed the community's emergency warning system.	1	2	3	4	5
Protected vital records.	1	2	3	4	5

Procured a life insurance policy.	1	2	3	4	5
Created an emergency supplies kit.	1	2	3	4	5
Secured all hazardous materials (such as gas cylinder etc.).	1	2	3	4	5
Secured all the movable objects at home (TV, Computers, etc.).	1	2	3	4	5
Identified the locations and operational procedures of utility shut-off valves.	1	2	3	4	5
Acquired a fire extinguisher and learned how to operate.	1	2	3	4	5

Acquired an all-hazards alert radio.	1	2	3	4	5
Collected the contacts of emergency services (Ambulance, Fire, Police, etc.).	1	2	3	4	5

Appendix 1.2: Output Window from SPSS 29.0

Table 4.5.1.1: *Statistic of Respondents' Age Group*

Age_Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gen X	128	33.3	33.3	33.3
	Gen Y	128	33.3	33.3	66.7
	Gen Z	128	33.3	33.3	100.0
	Total	384	100.0	100.0	

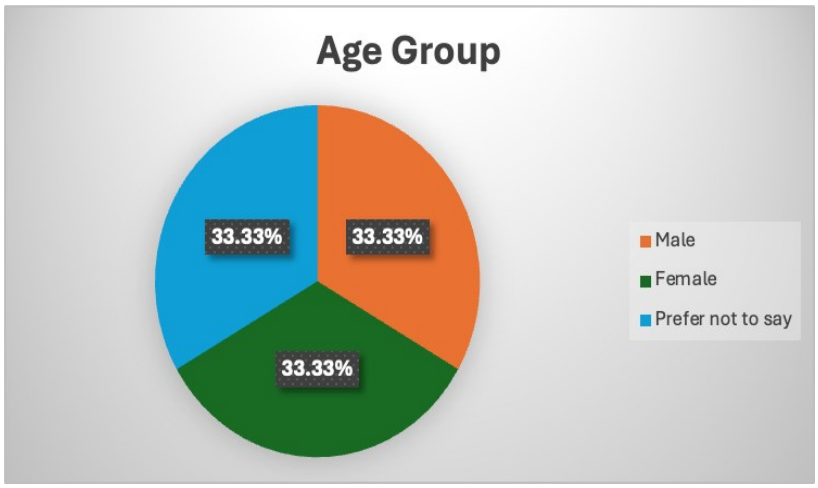


Table 4.5.1.2: *Statistic of Respondents' Gender*

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	121	31.5	31.5	31.5
	Female	203	52.9	52.9	84.4
	Prefere not to say	60	15.6	15.6	100.0
	Total	384	100.0	100.0	

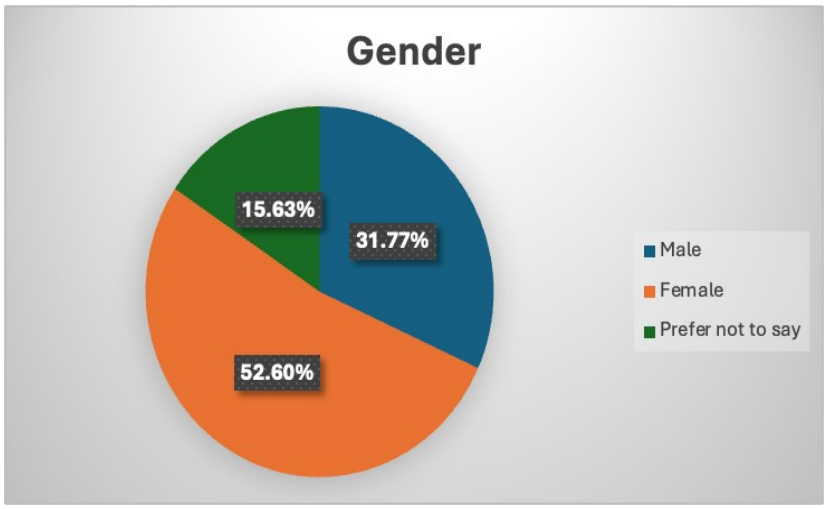


Table 4.5.1.3 *Statistic of Respondents' Educational Level*

Educational_Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary School	5	1.3	1.3	1.3
	Secondary School	40	10.4	10.4	11.7
	Diploma / Certificate	62	16.1	16.1	27.9
	Bachelor's Degree	253	65.9	65.9	93.8
	Master's Degree and above	24	6.3	6.3	100.0

Total	384	100.0	100.0	

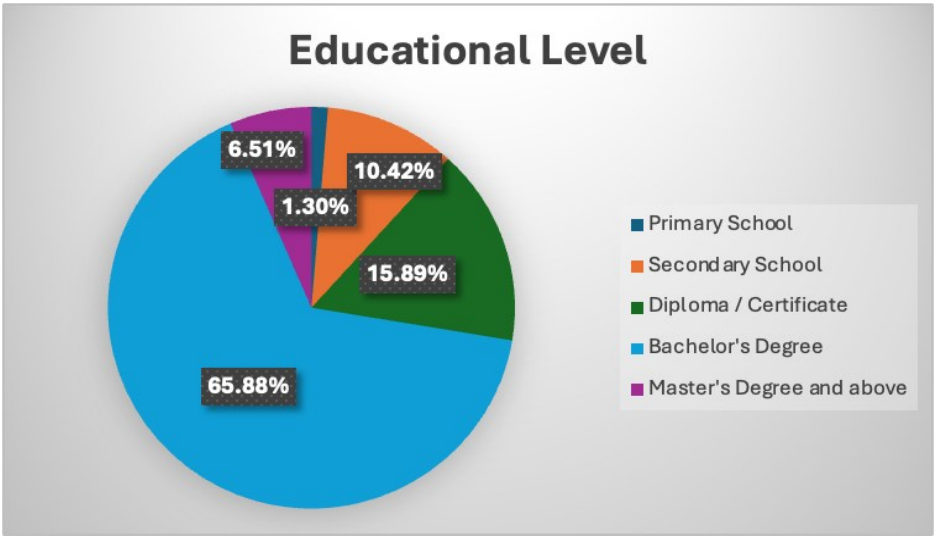


Table 4.5.1.4: *Statistic of Respondents' Marital Status*

Marital_Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	236	61.5	61.5	61.5
	Married	79	20.6	20.6	82.0
	Divorced	13	3.4	3.4	85.4
	Widowed	11	2.9	2.9	88.3

	Prefer not to say	45	11.7	11.7	100.0
	Total	384	100.0	100.0	

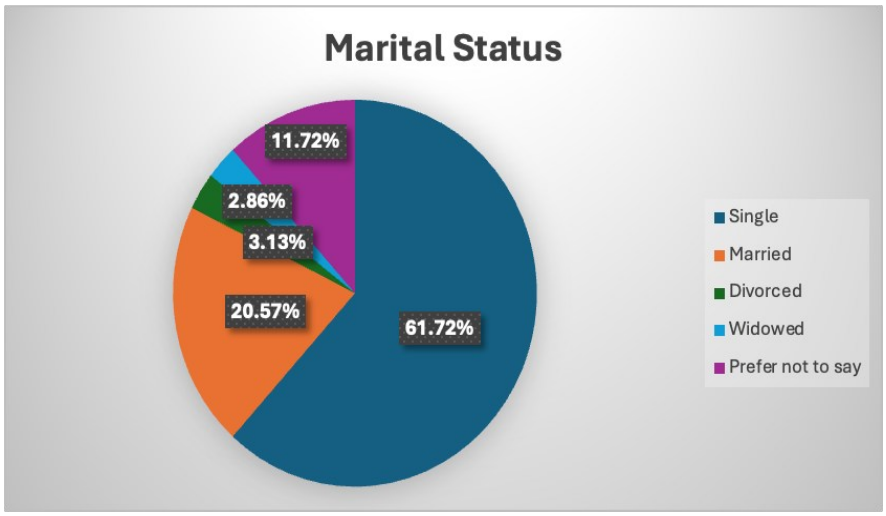


Table 4.5.1.5: *Statistic of Respondents' Employment Status*

Employment_Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	108	28.1	28.1	28.1
	Employed	192	50.0	50.0	78.1

	Self-Employed	53	13.8	13.8	91.9
	Unemployed	11	2.9	2.9	94.8
	Retired	20	5.2	5.2	100.0
	Total	384	100.0	100.0	

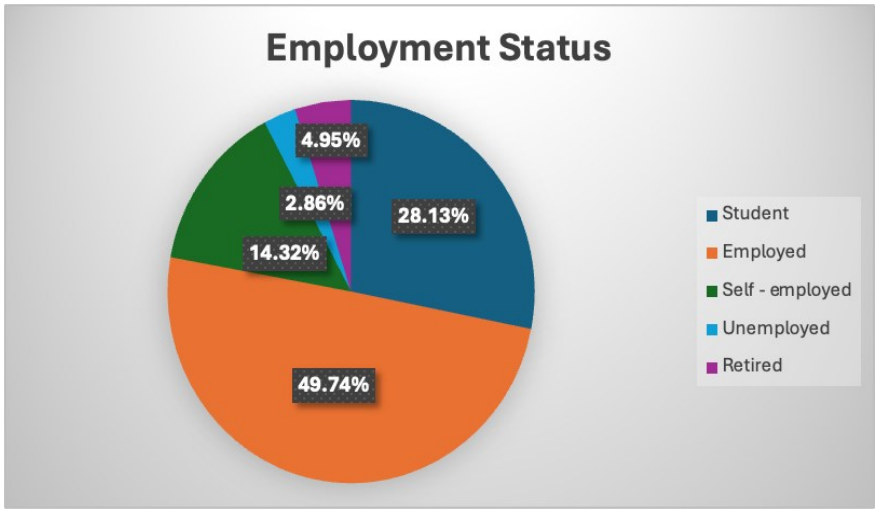


Table 4.5.1.6: *Statistic of Respondents' Income Level*

INCOME_LEVEL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	B1	130	33.9	33.9	33.9

	B2	32	8.3	8.3	42.2
	B3	66	17.2	17.2	59.4
	B4	22	5.7	5.7	65.1
	M1	25	6.5	6.5	71.6
	M2	26	6.8	6.8	78.4
	M3	30	7.8	7.8	86.2
	M4	24	6.3	6.3	92.4
	T1	21	5.5	5.5	97.9
	T2	8	2.1	2.1	100.0
	Total	384	100.0	100.0	

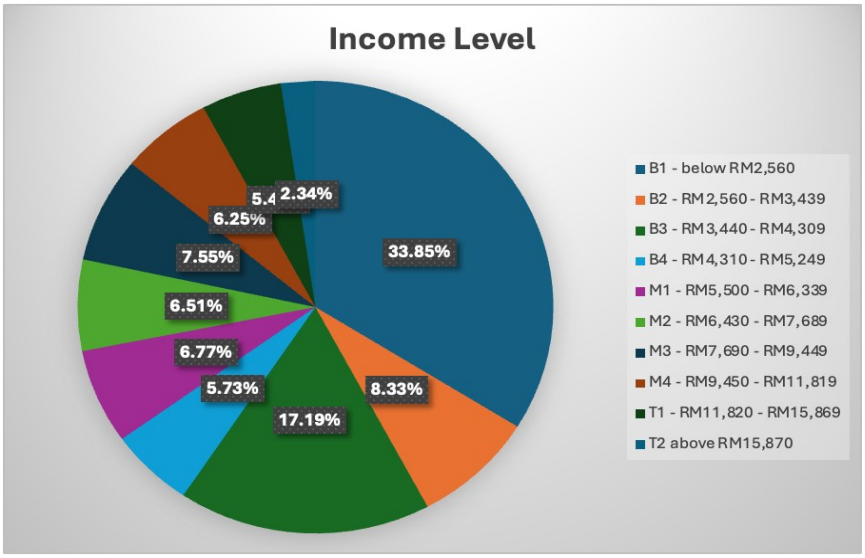


Table 4.5.1.7: *Statistic of Respondents' Homeownership - Do you own a home?*

HO1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	206	53.6	53.6	53.6
	No	178	46.4	46.4	100.0
	Total	384	100.0	100.0	

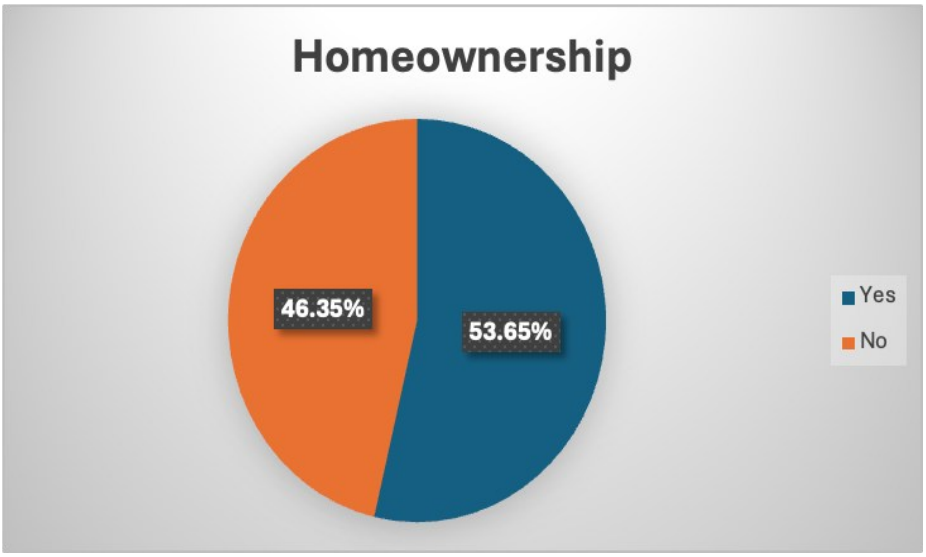


Table 4.5.1.8: *Statistic of Respondents' Duration of Residence in Penang*

HO3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than a year	57	14.8	14.8	14.8
	1 to 5 years	69	18.0	18.0	32.8
	5 to 10 years	63	16.4	16.4	49.2
	10 to 15 years	57	14.8	14.8	64.1
	15 to 20 years	55	14.3	14.3	78.4
	20 years or more	83	21.6	21.6	100.0
	Total	384	100.0	100.0	

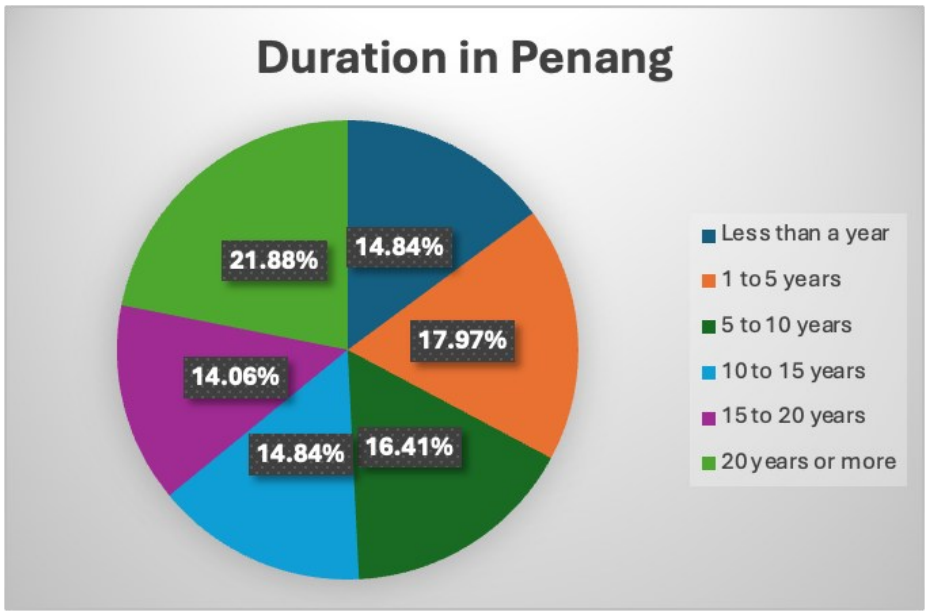


Table 4.5.1.9: *Statistic of Respondents' Household Composition*

HO4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	143	37.2	37.2	37.2
	Husband-Wife	60	15.6	15.6	52.9
	Two-Gneration	100	26.0	26.0	78.9
	Three-Gneration	46	12.0	12.0	90.9
	Others	35	9.1	9.1	100.0

Total	384	100.0	100.0	

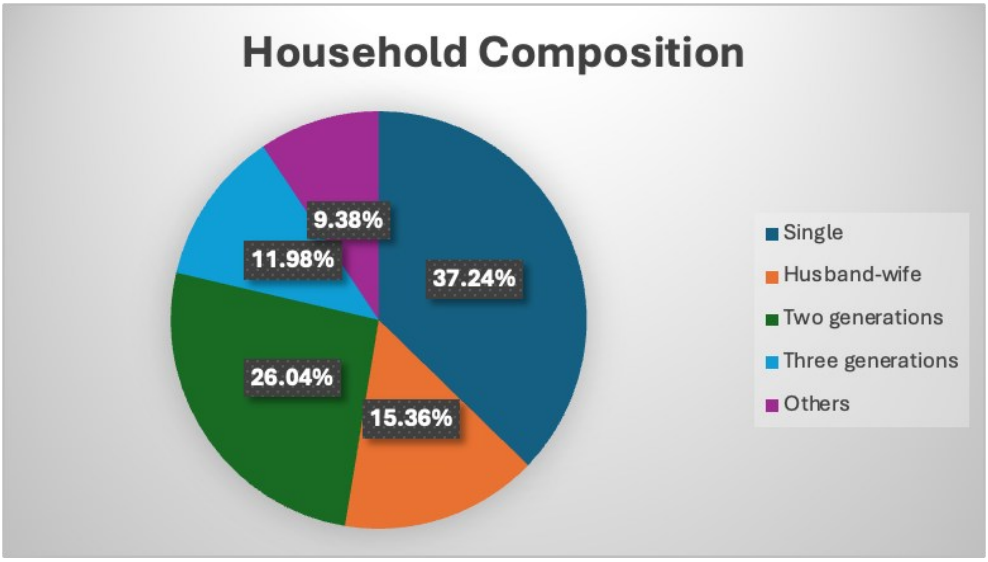


Table 4.5.1.10: *Statistic of Respondents' Duration in Current Home*

HO5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 to 5 years	124	32.3	32.3	32.3
	6 to 10 years	99	25.8	25.8	58.1
	11 to 15 years	81	21.1	21.1	79.2
	16 or more years	80	20.8	20.8	100.0

Total	384	100.0	100.0	

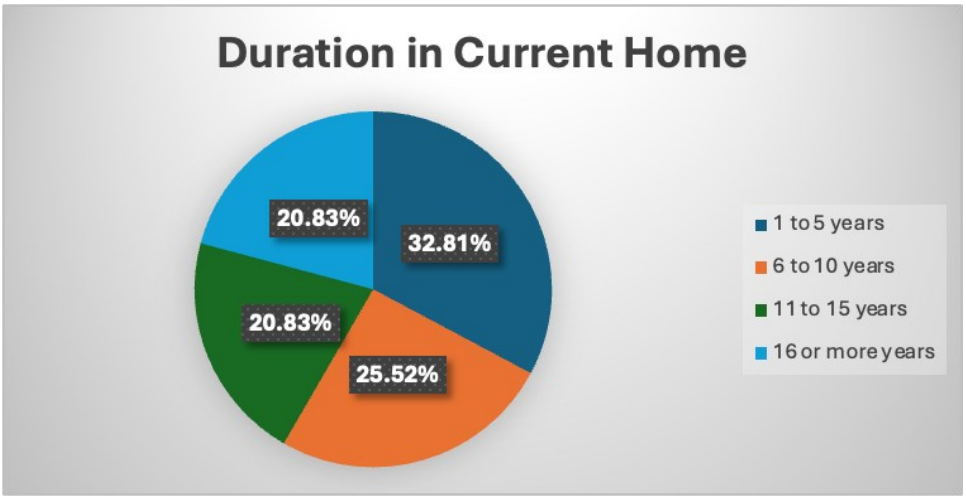
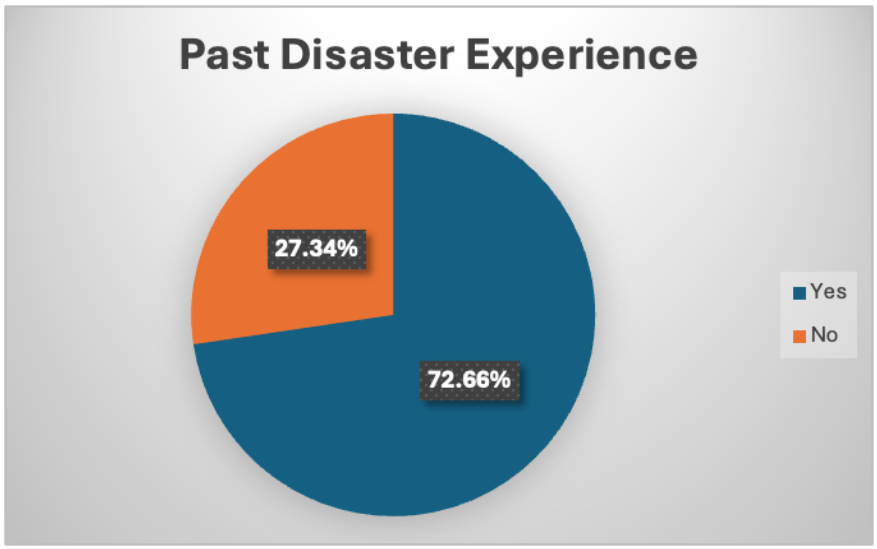


Table 4.5.1.11: *Statistic of Respondents' Past Disaster Experience*

EXPERIENCE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	280	72.9	72.9	72.9
	No	104	27.1	27.1	100.0
	Total	384	100.0	100.0	



Appendix 1.3: Reliability Test

Public Preparedness for Disaster across Different Age Group in Penang

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.946	.946	14

Attitude

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.913	.914	6

Emotional Perception

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.845	.848	5

Cognitive Perception

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items

.788	.793	4

Appendix 1.4: Multicollinearity Test

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	ATTITUDE	.410	2.441
	EMO_PERCEPTION	.347	2.878
	COG_PERCEPTION	.647	1.545

a. Dependent Variable: PUBLIC_PREPAREDNESS

Appendix 1.5: Normality Test

Descriptive Statistics

	Minimum	Maximum	Mean Statisti	Std. Deviatio	Skewness Statistic

	N	Statistic	Statistic	c	n Statistic	
	Statistic					
ATTITUDE	369	1.00	5.00	3.9910	.97504	-.777
EMO_PERCEPTION	369	1.40	5.00	4.0916	.84837	-.846
COG_PERCEPTION	369	1.00	5.00	3.6165	.98854	-.231
PUBLIC_PREPAREDNESS	369	1.00	5.00	3.8784	.91662	-.637
Valid N (listwise)	369					

	Skewness		Kurtosis	
	Std. Error	Statistic	Std. Error	
ATTITUDE	.127	-.294	.253	
EMO_PERCEPTION	.127	-.046	.253	
COG_PERCEPTION	.127	-.919	.253	
PUBLIC_PREPAREDNESS	.127	-.363	.253	
Valid N (listwise)				

Appendix 1.6: Pearson Correlation

Correlations

		Attitude	Emo_Perception	Cog_Perception	Public_Preparedness
ATTITUDE	Pearson Correlation	1	.767**	.484**	.537**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	369	369	369	369
EMO_PERCEPTION	Pearson Correlation	.767**	1	.592**	.612**
	Sig. (2-tailed)	<.001		<.001	<.001
	N	369	369	369	369
COG_PERCEPTION	Pearson Correlation	.484**	.592**	1	.677**
	Sig. (2-tailed)	<.001	<.001		<.001
	N	369	369	369	369
PUBLIC_PREPARED NESS	Pearson Correlation	.537**	.612**	.677**	1
	Sig. (2-tailed)	<.001	<.001	<.001	

N	369	369	369	369

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix 1.7: Pilot Test Results

Public Preparedness for Disaster across Different Age Group in Penang

Reliability Statistics

Cronbach's Alpha	N of Items
.946	14

Attitude

Reliability Statistics

Cronbach's Alpha	N of Items
.913	6

Emotional Perception

Reliability Statistics

Cronbach's

Alpha	N of Items
.845	5

Cognitive Perception

Reliability Statistics

Cronbach's Alpha	N of Items
.788	4

Appendix 1.8 Table for Determining Sample Size from a given Population

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Appendix 1.9 Formula for determining sample size

$$S = \frac{X^2 \cdot N \cdot P \cdot (1 - P)}{d^2 \cdot (N - 1) + X^2 \cdot P \cdot (1 - P)}$$