International Journal on Science and Technology (IJSAT)
E-ISSN: 2229-7677 ● Website: www.ijsat.org ● Email: editor@ijsat.org

Public Institutions Compliance to Earthquake Drills and Their Capabilities: Inputs for Enhanced Disaster Response Plan

Norman Alexis G. Nunez[1] & Xeres Yvonne Onesa-Quimora[2]

INSTITUTION: Taguig City University, Taguig City, Philippines

Abstract

This study evaluated the compliance and capabilities of public institutions in conducting earthquake disaster emergency drills, focusing on key components such as alarms, response, evacuation, assembly, head count, and evaluation. The research involved respondents from the Office of Civil Defense (OCD) and the Health and Human Services Group (HHSG), ensuring balanced perspectives.

Findings revealed moderate compliance levels, with strengths in inclusivity, documentation, and accountability, but highlighted challenges in areas like communication, accessibility, and systematic evaluations. Similarly, the institutions' capabilities across the five steps of disaster drills—getting everyone on board, communicating the plan, setting goals, running the drill, and assessing results—were rated as moderate, with gaps identified in realism, feedback integration, and alignment of compliance with practical execution.

Correlation analysis indicated a positive relationship between compliance and capabilities, emphasizing that higher adherence to essential components enhances institutional preparedness. The study concludes with actionable recommendations to strengthen disaster response plans, improve stakeholder engagement, and ensure comprehensive earthquake preparedness, contributing to more resilient public institutions.

Keywords: Earthquake drills and capabilities disaster response plan.

INTRODUCTION

The Republic of the Philippines (RP) is an archipelagic nation located in Southeast Asia. Three prominent bodies of water surround the archipelago: the Pacific Ocean on the east, the South China Sea on the west and north, and the Celebes Sea and the coastal waters of Borneo on the south. The Philippines constitutes an archipelago of 7,107 islands and has a total land area of approximately 300,000 square kilometers.

Large mountainous terrain, narrow coastal plains and interior valleys and plains make up the country's topography. The country's capital is Manila. The Philippine Statistics Authority (PSA) announced that based on 2020 C,035,343. This count is declared official for all purposes by the President of the Philippines, pursuant to proclamation No. 1179 dated 06 July 2021 with a growth rate of 1.96%. Ninety percent (90%) of the Filipino population is Christians. Eighty-three percent (83%) is predominantly Roman Catholics. It has a democratic form of government. The country is divided into three major island groups. Luzon is the largest island group with an area of 141,000 square kilometers, followed by Mindanao covering 102,000 square kilometers, and the Visayas with 57,000 square kilometers. The rest are small islets that emerge and disappear with ebbing and rising of tides. The Philippines has a tropical and maritime climate. Using temperature and rainfall as bases, its climate can be divided into two major seasons: (1) the rainy season, from June to November; and (2) the dry season, from December to May. The dry season may be subdivided further into (a) the cool dry season, from December to February; and (b) the hot dry season, from March to May. The Philippines is a newly industrialized country, with an economy anchored on agriculture but with substantial contributions from manufacturing, mining, remittances from overseas Filipinos, and service industries such as tourism, and business process outsourcing.

Natural Hazards Likely to Affect the Country The Philippines is susceptible to various types of natural hazards due to its geographical location and physical environment; being situated in the "Pacific Ring of Fire", between two Tectonic plates (Eurasian and Pacific), an area encircling the Pacific Ocean where frequent earthquakes and volcanic activity result from the movements of said tectonic plates. In fact, the country experiences an average of 20 earthquakes per day (most are too weak to be felt). There are also about 300 volcanoes, of which 22 are active and have been recorded in history to have erupted; while 5 are considered to be the most active namely: Taal, Mayon, Bulusan, Kanlaon and Hibok-Hibok. Also, being located along the typhoon belt/superhighway in the Pacific makes it vulnerable to extreme weather events. An average of 20-30 typhoons/tropical cyclones visit the country every year, with 5-7 of them considered the most destructive. Its 36,289 kms. of coastline is also vulnerable to tsunami, making the country also highly-susceptible to sea level rise and storm surges. Accompanying or resulting from these tropical cyclone events are secondary phenomena such as landslides, floods/flashfloods/flooding, tornadoes, drought, and heavy/monsoon rains. Over the past decades, the Philippines have been labeled as one of the most disaster-prone countries in the world mainly because of its geographic and geologic location and physical characteristics. The 1,200-km-long Philippine fault zone (PFZ) is a major tectonic feature that transects the whole Philippine archipelago from northwestern Luzon to southeastern Mindanao. This arc-parallel, left-lateral strike slip fault is divided into several segments and has been the source of large-magnitude earthquakes in recent years, such as the 1973 Ragay Gulf earthquake (M 7.0), 1990 Luzon earthquake (Mw 7.7) and 2003 Masbate earthquake (Ms 6.2). Disaster preparedness including disaster risk reduction has been strengthened in our country especially through the passage of Disaster Risk Reduction Management Act of 2010

(Republic Act (RA) 10121) and with its implementing Rules and Regulations supported by the Climate Change Act of 2009 (RA 9729). Efforts to familiarize the coordination mechanism to different parts of the country have been stepped up to contribute to local disaster preparedness.

The earthquake caused damage within in an area of about 20,000 square kilometers, stretching from the mountains of the Cordillera Administrative Region and through the Central Luzon region. The earthquake was strongly felt in Metropolitan Manila, Destroying many buildings and leading to panic and stampedes and ultimately three deaths in the National Capital Region. The popular tourist destination of Baguio City, was among the areas hardest hit by the Luzon earthquake. The earthquake caused 28 collapsed buildings, including hotels, factories, government and university buildings, as well as many private homes and establishments. In Cabanatuan City, Nueva Ecija, the tallest building in the city, a six-story concrete school building housing the Christian College of the Philippines, collapsed during the earthquake, which occurred during school hours. Around 154 people were killed at the CCP building. In Dagupan City, Pangasinan, about 90 buildings in the city were damaged, and about 20 collapsed. Some structures sustained damage because liquefaction caused buildings to sink as much as 1 meter (39 inches). The earthquake caused a decrease in the elevation of the city and several areas were flooded. The city suffered 64 casualties of which 47 survived and 17 died. Most injuries were sustained during stampedes at a university building and a theater. Five municipalities in La Union were also affected: Agoo, Aringay, Caba, Santo Tomas, and Tubao with a combined population of 132,208. Many buildings collapsed or were severely damaged. 100,000 families were displaced when two coastal villages sank due to liquefaction. The province suffered many casualties and 32 of them died. The Department of Environment and Natural Resources (DENR) immediately initiated rehabilitation efforts after the July 16 earthquake. Livelihood programs for the victims and the rehabilitation of damaged watersheds were implemented. These, as well as the efforts of other government agencies and non- governmental organizations, however, are mostly of a curative nature and are not enough. There must be preventive approaches developed, if not against earthquakes (which we cannot prevent), at least in terms of early warning, land use planning, improved building codes, and the like. Former President Aquino thus signed on August 6, 1990 the Memorandum Order creating the "Inter-Agency Committee on Documenting and Establishing Database on the July 1990 Luzon Earthquake". This Inter-Agency Committee chaired by DENR and the Department of Science and Technology (DOST) was tasked to undertake a unified, systematic and scientific documentation of information on earthquakes, particularly the July 16 killer quake for future planning and research. The Philippine government, through the Department of Environment and Natural Resources (DENR) and the Department of Science and Technology (DOST) is undertaking steps to mitigate the effects of future major earthquake not only in areas affected but also in other developed and liquefaction prone areas in the country.

The National Disaster Coordinating Council (NDCC) Leading the collaborative efforts in disaster preparedness planning and mitigation, as well as disaster response operations and rehabilitation both in the government and private sector is the National Disaster Coordinating Council (NDCC). The NDCC is the highest policy-making, coordinating and supervising body at the national level for disaster risk management in the country chaired by the Secretary of National Defense with the Office of Civil Defense (OCD), and has the heads of seventeen (17) other departments and agencies as members. The NDCC is also responsible for advising the President of the Republic of the Philippines on the status of the national disaster preparedness programs and management plans, disaster operations, and rehabilitation efforts of all stakeholders; and it also recommends to the President the declaration of the state of calamity and the release of the national calamity fund as needed. NDCC's legal authority is Presidential Decree (PD) 1566 issued on 11 June 1978, entitled, "Strengthening the Philippine Disaster Control Capability and Establishing the National Program on Community Disaster Preparedness". 2. The Office of Civil Defense (OCD) One of the five (5) bureaus of the Department of National Defense (DND) (per PD No. 1 as implemented by Letter of Intent (LOI) No. 19, s-1972, and DND Order Nos. 737 and 737-A, s-1973), the Office of Civil Defense (OCD), officially established on 1 July 1973, serves as the executive arm and secretariat of the National Disaster Coordinating Council per PD 1566. As the nerve center for alert and monitoring, resource mobilization, response coordination, and information management, it has the primary task of coordinating the activities and functions of various government agencies and instrumentalities, private institutions and civic organizations for the protection and preservation of life and property during emergencies. It has in its vision a service-oriented organization, prepared population and a safe nation. Its mission is to basically administer a comprehensive national civil defense and civil assistance program by providing leadership in the continuous development of measures to reduce risk to communities and manage the consequence of disasters. Presently, OCD is maintaining 17 fully-operational regional centers which provide secretariat services and serve as executive arm to 17 regional disaster coordinating councils. OCD and its Regional Centers operate on a 24/7 basis, manned by OCD personnel round-the-clock, with complementation from selected NDCC member-agencies, such as, the Department of Social Welfare and Development (DSWD), Department of Health (DOH), Armed Forces of the Philippines (AFP), Department of Public Works and Highways (DPWH), Philippine National Red Cross (PNRC), among others, during emergency situations.

The NDCC Comprehensive Disaster Risk Management Framework Paradigm Shift Since the OCD and NDCC's creation, PD 1566 has been the basic law that guides the disaster management programs, projects and strategies implementation in the country. However, it has been observed and noted from past experiences, combined with lessons learned and gaps examination, that the law that creates the Council is more leaning and gives more emphasis on response action, thus, making the implementers reactive to possible disasters rather than taking a proactive stance in disaster risk management. In early 2005, the OCD-NDCC took a bold step in embracing a paradigm shift of disaster

management approaches and strategies from reactive to proactive (from disaster response and preparedness to disaster risk reduction/management (DRR/M). To pursue the DRM Framework, the Government of the Republic of the Philippines, through the NDCC.

Republic Act (RA) 10121 "An Act Strengthening the Philippine Disaster Risk Reduction (DRR) and Management System Providing for the National Disaster Risk Reduction and Management Framework and Institutionalizing the National DRR and Management Plan, Appropriating Funds Therefore and for Other Purposes" or "Philippine DRR and Management Act of 2010" – passed into Law on May 27, 2010 (Implementing Rules and Regulations (IRR) of RA 10121 approved on September 27, 2010) 6. The NDRRMC Framework The framework envisions "safer, adaptive and disaster resilient Filipino communities toward sustainable development." Background Under the previous approach espoused by the old law (i.e., PD 1566 series of 1978), disaster management centered only on the hazard and the impacts of a disaster. It is assumed that disasters cannot be avoided. Most of the plans were on the provision of relief goods and infrastructures like dikes and flood control systems. The government's response to disaster was focused on disaster response. The national and local governments were reactive to disasters. Recognizing this flawed policy/approach which is detrimental in achieving sustainable development, the Philippine Government approved on 27 May 2010 Republic Act No. 10121 or the DRRM Act of 2010. Said law mandated the development of the National DRRM Framework upon which the National DRRM Plan shall be based. With the ever increasing risk of the Filipino community to disasters, the development of a National DRRM Framework which promotes a responsive and proactive manner of addressing disasters is imperative. Recent studies show that on the average, annual direct damages of disasters cause as much as PhP 15 Billion and that typhoons alone affect our Gross Domestic Product by 0.5% annually. Undeniably, disasters set back development programming by destroying years of development initiatives. The Framework aims to raise awareness and understanding on the Philippines' DRRM goal. It shows the country's overall direction and set of priorities on DRRM. It has integrated Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) to attain sustainable development through mainstreaming DRR and DRM in our national and local development plans. It seeks to lessen vulnerabilities and increase the capacities of the government and all communities. Furthermore, it promotes multistakeholder partnerships on DRRM projects/activities.

Earthquakes are one of the most difficult-to-predict natural disasters. We have plenty of technology to measure them but very little in the way of predicting their severity. With about 20,000 minor earthquakes happening every year around the globe, preparing for a big one is like trying to find a very dangerous needle in an enormous haystack. Unlike a hurricane or tornado, you can't just close your office and wait out the storm. By the time you know there's a danger, it's already arrived. You and your team need to know what to do when that happens. An earthquake drill can help your institutions remain steady even as the earth itself isn't.

Background of the Study

Increase awareness of the participants to ensure the safety of occupants during and after a damaging earthquake; Help public institutions disaster groups design a specific response for earthquake; Provide participants on the proper action and response during an earthquake, and assess various elements of the response plan designed by stakeholders to mitigate the destruction to people lives and their properties, if not to totally avoid losses.

The first aspect shall be the review of the different phases of an Earthquake Drill:

Phase 1-Alarm: During the drill, the 1 minute alarm indicates earthquake or shaking.

Phase 2. Response: While the alarm is ongoing, everyone should perform duck, cover, and hold". Remain in this position until the shaking stops.

Phase 3. Evacuation: As soon as the shaking stops, immediately evacuate the building and proceed to identified evacuation areas using the pre-determined routes guided by the class marcher or teachers.

Phase 4. Assembly: All the designated evacuation area, students must be grouped together according to the class where they belong.

Phase 5. Evaluation: The overall coordinator will announce the termination of drill or "All clear"

Most of this information is captured in an after-action report that will identify all of the key elements listed above and include some next steps to improve. By involving all relevant parties, documenting the lessons learned, and sharing them transparently, you'll be far more prepared to deal with a real-life disaster. To make this easier, download our after-action report template. As they carry out those stages, note any gaps or issues you run into.

An evaluation of the drill must be conducted to identify problems encountered during the drill and how this can be improved in future earthquake drills.

Observers will give their comments and suggestions when all are gathered in the evacuation areas.

The ***research framework*** for this project study will be depicted in the research paradigm (Figure 1), thus, the four important boxes shall be the guiding post on how this researcher will conduct his project study, viz:

The top most rectangular box depicts the respondents of this project study. The big square just below the top most box contains two (2) vertical rectangular boxes, where the two (2) major variables are presented. The last very tiny but quite long horizontal box depicts the output of the project study.

The respondents of this project study shall be the personnel of the two public institutions in Camp Aguinaldo, Quezon City, which are the OCD and HHSG personnel who have direct knowledge and experiences in dealing with earthquake drills.

The first variable of this project is a review of public institutions compliance to essential components of earthquake drills in terms of alarm, response, evacuation, assembly, head count, and evaluation.

The second variable of this project is a review of public institutions capabilities to perform earthquake disasters emergency drill in terms of getting everyone on board communicating the plan, setting goals, running the drill, and assessing the results.

The final output of this project study will be recommendations to provide inputs for and enhanced Disaster Response Plan.

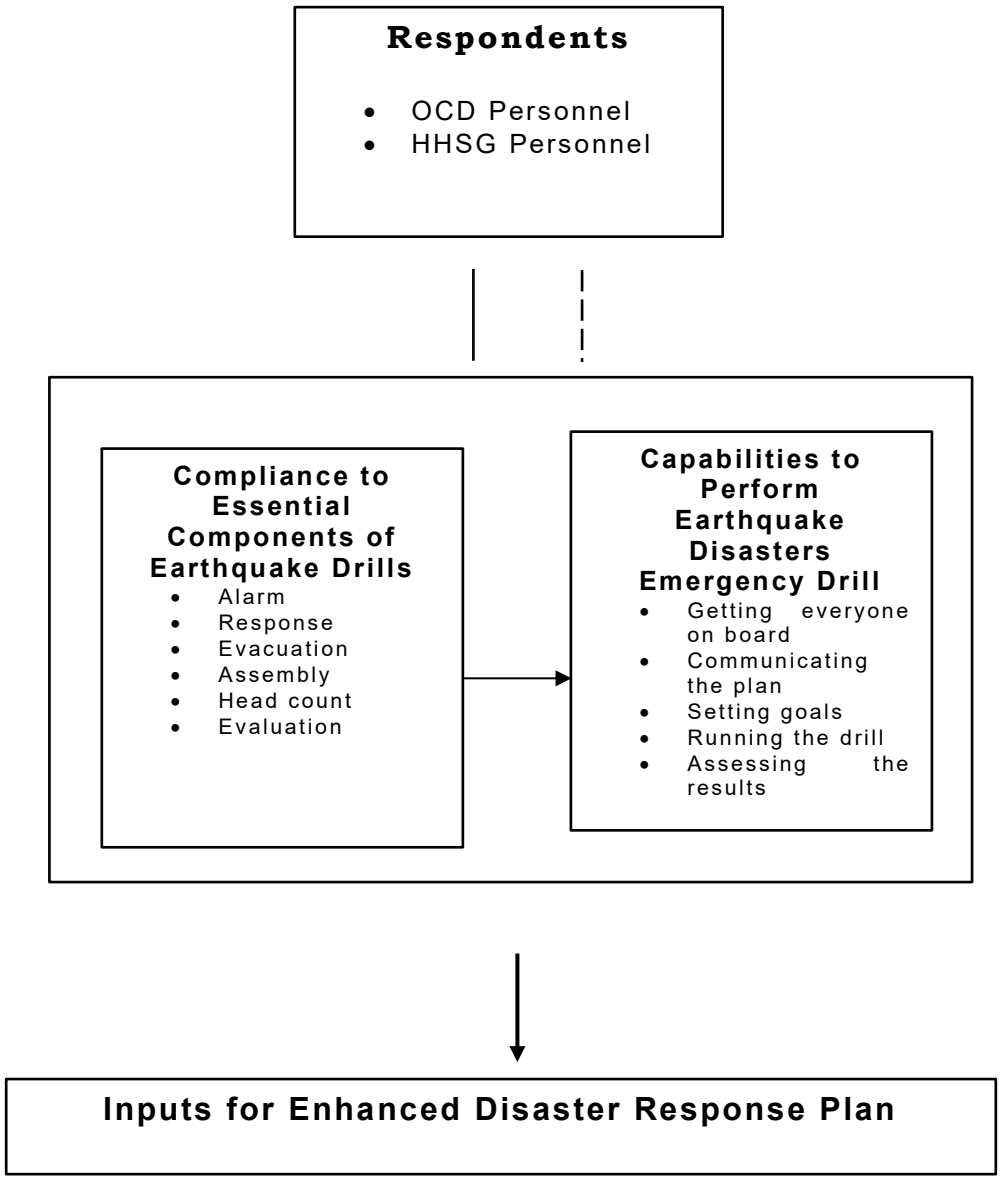

Figure 1. Research Paradigm

This project study provided inputs for enhancing the disaster response plan of public institutions in confronting with earthquake disaster.

Specifically, the following **objectives** attained by this project study:

1. To determine the compliance of public institutions to the essential components of earthquake drills as assessed by the two groups of respondents in terms of:

1.1 Alarm;

1.2 Response;
1.3 Evacuation;
1.4 Assembly;
1.5 Head count; and
1.6 Evaluation.

2. To determine as to whether there is a significant difference in the assessment of the two groups of respondents on the compliance of public institutions to the essential components of earthquake drills in terms of the foregoing variables.

3. To determine the capabilities of public institutions to perform the five steps of an earthquake disasters emergency drill as assessed by the two groups of respondents in terms of:

3.1 Getting everyone on board;
3.2 Communicating the plan;
3.3 Setting goals;
3.4 Running the drill; and
3.5 Assessing the results.

4. To determine as to whether there is a significant difference in the assessment of the two groups of respondents on the capabilities of public institutions to perform the five steps of an earthquake disasters emergency drill in terms of foregoing variables.

5. To determine as to whether there is a significant relationship between the compliance of public institutions on the essential components of earthquake drills and their capabilities to perform earthquake disasters emergency drills.

6. To provide recommendations to be used as inputs for enhancing the disaster response plan of public institutions in confronting with earthquake disasters.

Hypotheses of the Study

1. To determine as to whether there is a significant difference in the assessment of the two groups of respondents on the compliance of public institutions to the essential components of earthquake drills.

2. To determine as to whether there is a significant difference in the assessment of the two groups of respondents on the capabilities of public institutions to perform the five steps of an earthquake disasters emergency drill

3. To determine as to whether there is a significant relationship between the compliance of public institutions on the essential components of earthquake drills and their capabilities to perform earthquake disasters emergency drills

As to its ***scope and limitations***, this project study will be conducted in the National Capital Region (NCR) comprising of selected public institutions. The Office of the Civil Defense (OCD) and the Headquarters and Headquarters Support Group (HHSG), all stationed in Camp Aguinaldo will be the source of the participants.

The first major variable for this project study is the determination on the compliance of public institutions to the essential components of earthquake drills in terms of: alarm; response; evacuation; assembly; head count; and evaluation. On the other hand, the second major variable shall be the identification of the capabilities of

public institutions to perform the five steps of an earthquake disasters emergency drill in terms of: getting everyone on board; communicating the plan; setting goals; running the drill; and assessing the results.

With regard to the ***significance of this project study***, it shall be very useful and of great importance to the following stakeholders:

Public institutions will gain the advantage of refining their emergency protocols, improving coordination between departments, and ensuring that their facilities meet safety standards, which ultimately protects lives and property.

Officials and employees. Developing a clear understanding of their roles during a disaster, learning how to efficiently execute evacuation procedures, communicate effectively during emergencies, and mitigate risks associated with structural failures or aftershocks

Graduate students especially those studying public administration or disaster management, gain practical insights into the implementation of real-world disaster response plans, helping them bridge theoretical knowledge with hands-on experience.

Researcher involved in studying disaster response acquire valuable data from observing these drills, enabling them to evaluate the effectiveness of current protocols and recommend improvements based on empirical evidence.

Future researchers, accumulated knowledge and findings of previous studies, allowing them to build on existing research, innovate new strategies, and contribute to the ongoing evolution of disaster preparedness frameworks for greater societal safety.

METHODOLOGY

This part presents the research **methodology** of the project study as follows:

The ***research design*** to be utilized in this study the quantitative, descriptive comparative and correlational. Descriptive comparative is where the "researcher considers two variables (not manipulated) and establishes a formal procedure to compare and conclude that one is better than the other" (Calmorin and Calmorin as cited by Gualin, 2021). The comparison on this study is between the difference in the assessment of OCD personnel and HHSG personnel.

A research made questionnaire based on the essential components of earthquake drills and capabilities to perform the five steps of an earthquake disasters emergency drill of public institutions shall be the source in the formulation of the survey instrument.

Research Locale

As to the research locale of this project study, it was conducted in the principal offices of the two (2) public institutions, as aforementioned. The respondents, specifically detailing their classification based on organizational roles. The sample is evenly divided between OCD Personnel and HHSG Personnel, with each group comprising 50 respondents. This balanced representation ensures that the perspectives of both groups are equally captured and considered in the analysis.

The ***population, sample, and sampling technique*** to be employed by this researcher shall only be purposive sampling. He will not identify the entire population of the two (2) public institutions under study. Instead, the researcher used the "purposive sampling" which "is a non-probability sample that is selected based on characteristics of a population and the objective of the study" (Crossman, 2017). The researcher purposively identified 50 each OCD and HHSG personnel who have been at least five (5) years in their respective offices and were able to be involved in planning and executing disaster plans, particular the earthquake response plan.

As to the ***data gathering procedure***, the researcher will first request permission from heads of the two (2) pubic institutions through letter requests to gather data through face-to-face conduct of the gathering of data by a way of distributing survey questionnaire (SQ)..

The **research instrument** used by this researcher contained the essential components of earthquake drills and capabilities to perform the five steps of an earthquake disasters emergency drill of public institutions.

Since the instrument is a self-made questionnaire, which was made personally by this researcher with the help of his adviser, two experts were requested to validate the same. One who is expert in the field of earthquake disasters and one expert in the field of research and statistics shall be requested to validate the survey questionnaire.

Statistical tools

a) **The weighted mean.** Determined by adding up all the scores and then dividing the sum of the total scores (Cherry, 2020). The weighted mean used to determine the average essential components of earthquake drills and capabilities to perform the five steps of an earthquake disasters emergency drill of public institutions.

b) **Percentage.** This is statistic were used to determine how much of the sample falls under different levels such as the office where the personnel belong.

c) **Independent Samples t-test.** "The Independent Samples t-test compares the means of two independent groups to determine whether there is statistical evidence that the associated population means are significantly different" (Kent State University, 2021).

d) **Pearson Product Moment Correlation**. This correlation is appropriate when both variables are measured at an interval level. Since essential components of earthquake drills and capabilities to perform the five steps of an earthquake disasters emergency drill of public institutions

All statistical computations was made by a psychometrician, my good friend using MS Excel, Statistics Package for the Social Science (IBM-SPSS) and VassarStats.

On ethical consideration. The content of this research paper is the intellectual property of the researcher. All sources and reference materials are properly cited and acknowledged to avoid the issue of plagiarism.

A 4-point Likert scale will be used by the researcher as follows:

Scale	Verbal Interpretation	Extended meaning
4	Strongly Agree (SA)	Highly prepared (HP)/ Highly Capable (HC)
3	Agree (A)	Prepared (P)/ Capable (C)
2	Disagree SA)	Less Prepardes (LP)/ Less Capable (LC)
1	Strongly Disagree (SDA)	Not Prepared (NP)/ Not Capable (NC)

RESULTS AND ANALYSIS

1. ON THE COMPLIANCE OF PUBLIC INSTITUTIONS TO THE ESSENTIAL COMPONENTS OF EARTHQUAKE DRILLS AS ASSESSED BY THE TWO GROUPS OF RESPONDENTS IN TERMS of ALARM, RESPONSE, EVACUATION, ASSEMBLY, HEAD COUNT, AND EVALUATION

The findings in Table 1 reveal an assessment of public institutions' compliance with the essential components of earthquake drills in terms of alarm systems, as perceived by the respondents. The data indicates an overall weighted mean of 3.45 with a standard deviation of 0.30, which is interpreted as "Agree" under the qualitative description and "Compliant" under the verbal interpretation. This suggests that, on average, the institutions are meeting the prescribed requirements for earthquake alarms, but there is room for improvement to achieve consistent "Highly Compliant" status across all indicators.

Table 1
Compliance of Public Institutions to the Essential Components of Earthquake Drills as Assessed by the Respondents in Terms of Alarm

Indicator	WM	SD	QD	VI
Institutions are required to install and maintain functional alarm systems that provide clear and audible alerts to all occupants in the event of an earthquake	3.51	.810	SA	HC
Institutions must ensure that the earthquake alarm system is regularly tested and inspected to comply with safety standards and local disaster preparedness regulations	3.31	.545	A	C
Institutions should conduct earthquake drills with a properly timed alarm that signals the start of the drill	3.13	.761	A	C
Requires that the alarm system be capable of distinguishing between different types of emergencies, ensuring that the earthquake alarm is easily identifiable and triggers the correct response protocol	3.51	.798	SA	HC
institutions must ensure that their alarm systems are accessible to all individuals, including those with disabilities, by integrating visual and auditory alerts	3.58	.535	SA	HC
Institutions are required to monitor the response to the alarm, ensuring that staff and occupants react within the expected time frame to safely drop, cover, and hold.	3.55	.657	SA	HC
Institutions provide training to all employees and occupants on how to recognize the earthquake alarm and the immediate steps to take upon hearing it, ensuring a swift and organized response	3.56	.656	SA	HC
Overall Mean	3.45	.30	SA	HC

Legend: 3.51 – 4.00 Strongly Agree (SA)/Highly Compliant (HC); 2.51 – 3.50 Agree (A)/ Compliant (C); 1.51 – 2.50 Disagree (DA)/Slightly Compliant (SC); 1.0-1.50 Strongly Disagree (SDA)/ Not Compliant (NC)

Among the specific indicators assessed, the highest compliance is observed in ensuring that alarm systems are accessible to all individuals, including those with disabilities, through the integration of both visual and auditory alerts. This item achieved a weighted mean of 3.58 and a standard deviation of 0.535, categorized as

"Highly Compliant." Similarly, high compliance was noted in institutions monitoring response times (weighted mean = 3.55, standard deviation = 0.657) and providing training to employees and occupants on recognizing and responding to earthquake alarms (weighted mean = 3.56, standard deviation = 0.656). These findings indicate strong adherence to measures promoting inclusivity, rapid response, and preparedness, which are critical for effective disaster management.

Conversely, the lowest compliance was observed in conducting earthquake drills with a properly timed alarm signaling the start of the drill, which received a weighted mean of 3.13 and a standard deviation of 0.761. Although this indicator is still rated as "Agree" or "Compliant," its lower mean compared to other indicators suggests that institutions may need to place greater emphasis on timing accuracy during drills to enhance preparedness.

Interesting similarities are observed in the compliance levels for the requirement to install functional alarms and distinguish between emergency types, both of which received identical weighted means of 3.51 with standard deviations of 0.810 and 0.798, respectively. Both are classified as "Highly Compliant," suggesting that institutions prioritize clear and identifiable alarms to initiate appropriate emergency responses.

Overall, the analysis underscores a strong institutional commitment to earthquake preparedness, particularly in areas related to inclusivity, staff training, and system functionality. However, the relatively lower mean for drill timing accuracy points to a potential area for focused improvement. These findings highlight the importance of continuous evaluation and enhancement of earthquake preparedness measures to ensure maximum compliance and effectiveness in safeguarding occupants during seismic events.

The findings presented in Table 2 reflect the compliance of public institutions with the essential components of earthquake drills, specifically concerning the response phase. The overall weighted mean of 3.23, accompanied by a standard deviation of 0.37, is categorized as "Agree" and "Compliant." This indicates that public institutions are meeting the fundamental requirements for response actions, though there is scope for enhancement to elevate performance to a "Highly Compliant" level.

Table 2
Compliance of Public Institutions to the Essential Components of Earthquake Drills as Assessed by the Respondents in Terms of Response

Indicator	WM	SD	QD	VI
Institutions are required to ensure that all employees and occupants are trained in the immediate response actions during an earthquake, and demonstrate these actions during drills	3.04	.887	A	C
Conducting regular earthquake drills where the response time of employees and occupants is monitored	3.13	.837	A	C
Institutions must have clear and accessible response plans in place, outlining the steps to take during and after an earthquake.	3.53	.703	SA	HC
Public institutions are expected to provide specialized training for key personnel, to ensure they can lead and manage the response phase effectively during a real earthquake	3.22	.799	A	C
Institution's earthquake response procedures are inclusive, accounting for the needs of individuals with disabilities, elderly occupants, and those who may require additional assistance	3.39	.777	A	C
Institutions should ensure that all safety equipment needed during the response phase, are readily available, functional, and known to key personnel	3.26	.848	A	C
institutions are required to assess the effectiveness of the response phase after each drill	3.06	.952	A	C
Overall Mean	3.23	.37	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA)/Highly Compliant (HC); 2.51 – 3.50 Agree (A)/ Compliant (C); 1.51 – 2.50 Disagree (DA)/Slightly Compliant (SC); 1.0-1.50 Strongly Disagree (SDA)/ Not Compliant (NC)

The highest-rated indicator pertains to the presence of clear and accessible response plans, which outline the steps to be taken during and after an earthquake. This indicator achieved a weighted mean of 3.53 and a standard deviation of 0.703, earning a qualitative description of "Highly Compliant." This result underscores the emphasis public institutions place on having well-structured and accessible response strategies, which are critical for ensuring coordinated and effective actions during emergencies.

Conversely, the lowest compliance is observed in the requirement to train all employees and occupants in immediate response actions and demonstrate these actions during drills, which received a weighted mean of 3.04 with a standard deviation of 0.887. Although this indicator is categorized as "Agree" and "Compliant," the lower mean suggests that institutions may face challenges in implementing consistent training across all levels of personnel and occupants. Similarly, the assessment of the response phase's effectiveness after each drill, with a weighted mean of 3.06 and a standard deviation of 0.952, also reflects a relatively lower compliance level, indicating a potential gap in the systematic evaluation of drill outcomes.

Other notable findings include compliance in providing specialized training for key personnel (weighted mean = 3.22, standard deviation = 0.799) and ensuring the availability and functionality of safety equipment during the response phase (weighted mean = 3.26, standard deviation = 0.848). Both indicators reflect a concerted effort to enhance preparedness through capacity building and resource readiness, though they fall short of the "Highly Compliant" category.

The compliance level regarding inclusivity, addressing the needs of individuals with disabilities, elderly occupants, and others requiring additional assistance, received a weighted mean of 3.39 with a standard deviation of 0.777. While categorized as "Compliant," this result highlights the need for further refinement in tailoring response procedures to accommodate diverse needs effectively.

In summary, public institutions demonstrate commendable compliance with response-phase requirements, particularly in maintaining accessible response plans and providing training and equipment. However, the relatively lower compliance in areas such as occupant training and post-drill evaluation suggests opportunities for targeted improvement. Addressing these gaps will be critical to strengthening institutional preparedness and ensuring the safety and well-being of all occupants during earthquake scenarios.

The data in table 3 evaluates the compliance of public institutions with the essential components of earthquake drills, specifically regarding evacuation. The overall weighted mean is 3.30, with a standard deviation of 0.29, which falls under the "Agree" qualitative description and "Compliant" verbal interpretation. This indicates that while public institutions generally adhere to the evacuation standards, there are areas that require additional focus to achieve a higher level of compliance.

The highest-rated indicator pertains to the assessment of the evacuation process after each drill, which involves evaluating the time taken to evacuate. This indicator achieved a weighted mean of 3.53 and a standard deviation of 0.703, earning a qualitative description of "Highly Compliant." This finding underscores the emphasis institutions place on monitoring and improving evacuation efficiency, a critical factor in ensuring the safety and well-being of occupants during emergencies.

Table 3
Compliance of Public Institutions to the Essential Components of Earthquake Drills as Assessed by the Respondents in Terms of Evacuation

Indicator	WM	SD	QD	VI
Institutions must designate clear and safe evacuation routes, ensuring that these routes are properly marked with visible signs and are free from obstacles	3.01	.847	A	C
Requires institutions to regularly conduct earthquake evacuation drills, where all employees and occupants practice leaving the building and moving to pre-designated safe assembly areas in an orderly manner	3.50	.628	A	C
Institutions are responsible for ensuring that evacuation routes and exit points are accessible to everyone, including individuals with disabilities	3.04	.777	A	C
Public institutions have well-communicated evacuation procedures, including clear instructions on how and when to evacuate during or after an earthquake	3.42	.768	A	C
Institutions are required to have emergency personnel or designated staff members to guide and assist individuals during the evacuation process.	3.26	.760	A	C
Public institutions must ensure that elevators are not used during an earthquake evacuation, and that stairways are prioritized as the safest routes for evacuation	3.39	.665	A	C
After each earthquake drill, institutions must assess the evacuation process by checking how long it took to evacuate	3.53	.703	SA	HC
Overall Mean	3.30	.29	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA)/Highly Compliant (HC); 2.51 – 3.50 Agree (A)/ Compliant (C); 1.51 – 2.50 Disagree (DA)/Slightly Compliant (SC); 1.0-1.50 Strongly Disagree (SDA)/ Not Compliant (NC)

On the other hand, the lowest compliance is observed in the designation and maintenance of clear and safe evacuation routes. This indicator received a weighted mean of 3.01 and a standard deviation of 0.847, categorized as "Agree" and "Compliant." While compliance is evident, the low mean suggests challenges in ensuring that evacuation routes are consistently free of obstacles and

adequately marked. This area may benefit from targeted interventions to enhance safety and accessibility.

Notably, the indicator assessing the accessibility of evacuation routes and exit points for individuals with disabilities received a weighted mean of 3.04 and a standard deviation of 0.777. This result highlights the need for institutions to improve inclusivity in evacuation planning, ensuring that diverse needs are accommodated effectively. Additionally, the compliance level regarding the communication of evacuation procedures (weighted mean = 3.42, standard deviation = 0.768) reflects a commendable effort to provide clear instructions, although this aspect has not yet reached the "Highly Compliant" category.

Other important findings include compliance in ensuring that stairways are prioritized over elevators during evacuation (weighted mean = 3.39, standard deviation = 0.665) and the presence of emergency personnel to guide individuals (weighted mean = 3.26, standard deviation = 0.760). These results demonstrate institutional commitment to establishing safe and guided evacuation practices, though further improvements could enhance these efforts.

In summary, public institutions exhibit a commendable level of compliance with evacuation standards, with particular strengths in assessing the efficiency of evacuation drills. However, areas such as the maintenance of clear evacuation routes and inclusivity for individuals with disabilities require focused attention. Addressing these gaps will be essential for enhancing the overall effectiveness and inclusivity of earthquake evacuation procedures.

Table 4

Compliance of Public Institutions to the Essential Components of Earthquake Drills as Assessed by the Respondents in Terms of Assembly

Indicator	WM	SD	QD	VI
Public institutions are required to designate safe and open assembly points, located at a sufficient distance from buildings, power lines, or other structures that could pose a risk during aftershocks	2.90	.522	A	C
Assembly areas are clearly marked and communicated, ensuring that everyone knows where to gather after evacuating during an earthquake	3.19	1.012	A	C
Institutions must ensure that the assembly areas are large enough to accommodate the expected number of evacuees	2.85	.672	A	C
Public institutions are responsible for assigning trained personnel to oversee the assembly process	2.54	.758	A	C
The institution's earthquake drill protocol should include a headcount or roll call at the assembly point to ensure that all individuals are accounted	3.29	.656	A	C

keeping the assembly area free from hazards such as vehicles, equipment, or construction materials	2.81	.849	A	C
Public institutions must have communication plans in place at the assembly point, ensuring that key personnel can relay important information	3.22	.883	A	C
Overall Mean	2.94	.32	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA)/Highly Compliant (HC); 2.51 – 3.50 Agree (A)/ Compliant (C); 1.51 – 2.50 Disagree (DA)/Slightly Compliant (SC); 1.0-1.50 Strongly Disagree (SDA)/ Not Compliant (NC)

The results presented in table 4 evaluate the compliance of public institutions with the essential components of earthquake drills in terms of assembly. The overall weighted mean is 2.94, with a standard deviation of 0.32, corresponding to the qualitative description "Agree" and the verbal interpretation "Compliant." This indicates that while institutions generally adhere to the requirements for assembly procedures during earthquake drills, there is substantial room for improvement to achieve higher levels of compliance.

The highest-rated indicator pertains to the inclusion of a headcount or roll call at the assembly point to ensure all individuals are accounted for, with a weighted mean of 3.29 and a standard deviation of 0.656. This result suggests a strong institutional focus on ensuring occupant safety and accountability following evacuation, which is a critical element of effective disaster response.

Conversely, the lowest compliance is observed in the designation of assembly areas that are large enough to accommodate the expected number of evacuees, which received a weighted mean of 2.85 and a standard deviation of 0.672. Similarly, maintaining assembly areas free from hazards, such as vehicles or construction materials, scored a weighted mean of 2.81 with a standard deviation of 0.849. These findings point to potential challenges in space management and hazard mitigation at assembly points, highlighting areas where improvements are needed to enhance occupant safety.

Another area of relatively low compliance is the assignment of trained personnel to oversee the assembly process, which achieved a weighted mean of 2.54 and a standard deviation of 0.758. Although this score falls within the "Compliant" category, it is the closest to slipping into "Slightly Compliant," suggesting that public institutions may lack adequate staffing or specialized training to manage assembly procedures effectively.

In terms of strengths, institutions demonstrate commendable compliance in ensuring that assembly areas are clearly marked and communicated, with a weighted mean of 3.19 and a standard deviation of 1.012, as well as having communication plans in place at the assembly point to relay important information (weighted mean = 3.22, standard deviation = 0.883). These findings reflect a commitment to promoting clarity and communication during emergency situations, which are vital for minimizing confusion and ensuring coordinated actions.

In summary, while public institutions meet the basic requirements for assembly procedures, the results highlight critical areas for improvement, particularly in ensuring adequate space, hazard-

free assembly points, and the assignment of trained personnel. Strengthening these aspects will be essential for creating safer and more efficient post-evacuation processes during earthquake drills.

Table 5
Compliance of Public Institutions to the Essential Components of Earthquake Drills as Assessed by the Respondents in Terms of Head Count

Indicator	WM	SD	QD	VI
Required to conduct a headcount or roll call at designated assembly points after an earthquake drill,	2.93	.998	A	C
Each department, class, or group within the institution has assigned personnel responsible for taking the headcount and reporting the status of their group to emergency coordinators or safety officers	2.86	.921	A	C
Institutions must ensure that headcount procedures are efficient and accurate, using pre-prepared lists or attendance logs to quickly confirm the presence or absence of individuals during the drill	3.26	.848	A	C
Public institutions must have contingency plans for individuals who may be unaccounted for during the headcount	3.40	.651	A	C
Required to train key personnel in proper headcount procedures, ensuring that they know how to handle discrepancies	2.90	.759	A	C
The headcount process must account for individuals with special needs or disabilities, ensuring that they are safely evacuated and included in the tally	3.48	.731	A	C
After each earthquake drill, public institutions are responsible for reviewing the accuracy and speed of the headcount process	2.68	.875	A	C
Overall Mean	3.07	.34	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA)/Highly Compliant (HC); 2.51 – 3.50 Agree (A)/ Compliant (C); 1.51 – 2.50 Disagree (DA)/Slightly Compliant (SC); 1.0-1.50 Strongly Disagree (SDA)/ Not Compliant (NC)

The findings in table 5 assess the compliance of public institutions with the essential components of earthquake drills concerning headcount procedures. The overall weighted mean is 3.07, with a standard deviation of 0.34, corresponding to "Agree" and "Compliant." This suggests

that institutions generally fulfill the basic requirements for headcount practices during earthquake drills but fall short of achieving "Highly Compliant" performance levels.

The highest-rated indicator is the requirement to account for individuals with special needs or disabilities during the headcount process, ensuring their safe evacuation and inclusion in the tally. This indicator achieved a weighted mean of 3.48 with a standard deviation of 0.731, reflecting the institutions' strong commitment to inclusivity and the safety of vulnerable individuals. This result underscores the importance of ensuring that headcount procedures address diverse needs to maintain equity and safety in disaster management.

In contrast, the lowest-rated indicator pertains to the review of the accuracy and speed of the headcount process after each earthquake drill, which received a weighted mean of 2.68 and a standard deviation of 0.875. While this score remains within the "Compliant" category, it highlights an area requiring significant improvement. Regular review and optimization of the headcount process are critical for identifying inefficiencies and ensuring the preparedness of personnel for real emergencies.

Another indicator requiring attention is the assignment of personnel responsible for headcount tasks within departments, classes, or groups, which scored a weighted mean of 2.86 and a standard deviation of 0.921. This finding suggests that institutions may need to better define roles and responsibilities to enhance accountability and coordination during headcount activities. Similarly, the training of key personnel in headcount procedures, which received a weighted mean of 2.90 and a standard deviation of 0.759, also indicates the need for further efforts to ensure that staff are adequately prepared to manage discrepancies and challenges.

Notable strengths include the institutions' compliance with efficient and accurate headcount procedures using pre-prepared lists or attendance logs (weighted mean = 3.26, standard deviation = 0.848) and the presence of contingency plans for unaccounted individuals (weighted mean = 3.40, standard deviation = 0.651). These results demonstrate a solid foundation in institutional preparedness, highlighting the emphasis on organization and contingency planning.

In summary, public institutions display a satisfactory level of compliance with headcount procedures during earthquake drills, with particular strengths in inclusivity and contingency planning. However, areas such as the review of headcount processes, assignment of responsible personnel, and training require focused attention to improve the overall effectiveness and reliability of headcount practices. Enhancing these aspects will be crucial for fostering a more robust and responsive disaster preparedness framework.

Table 6
Compliance of Public Institutions to the Essential Components of Earthquake Drills as Assessed by the Respondents in Terms of Evaluation

Indicator	WM	SD	QD	VI
Required to conduct a thorough evaluation after each earthquake drill to assess the effectiveness of the response, evacuation, and safety protocols	3.29	.656	A	C
Document the results of the drill evaluation, including any challenges faced during the evacuation or assembly process	2.81	.849	A	C
Institutions must involve key personnel, including safety officers and department heads, in the evaluation process	2.65	.947	A	C
Evaluate the functionality and timing of alarms, communication systems, and evacuation routes during the drill	2.72	.911	A	C
Reviewing the roles and performance of emergency coordinators, safety officers, and other designated personnel to ensure that they effectively carried out their responsibilities during the drill.	3.01	.674	A	C
Include feedback from participants the evaluation phase to gain insights into how the drill was experienced from various perspectives and to identify potential issues that may not have been noticed by coordinators	3.17	.766	A	C
Public institutions are required to update or revise their earthquake preparedness plans, protocols, and training programs	3.11	.931	A	C
Overall Mean	2.96	.36	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA)/Highly Compliant (HC); 2.51 – 3.50 Agree (A)/ Compliant (C); 1.51 – 2.50 Disagree (DA)/Slightly Compliant (SC); 1.0-1.50 Strongly Disagree (SDA)/ Not Compliant (NC)

The results in table 6 examine the compliance of public institutions with the essential components of earthquake drills concerning the evaluation phase. The overall weighted mean of 2.96, with a standard deviation of 0.36, falls under the "Agree" qualitative description and "Compliant" verbal interpretation. This indicates that public institutions generally meet the basic requirements for conducting evaluations after earthquake drills, though there is significant scope for enhancement to strengthen compliance and achieve higher standards.

The highest-rated indicator is the requirement to conduct a thorough evaluation after each earthquake drill to assess the effectiveness of response, evacuation, and safety protocols. This indicator achieved a weighted mean of 3.29 with a standard deviation of 0.656, reflecting institutions' efforts to identify successes and shortcomings systematically. This practice is crucial for refining disaster preparedness strategies and ensuring continuous improvement in emergency protocols.

Conversely, the lowest-rated indicator pertains to the involvement of key personnel, such as safety officers and department heads, in the evaluation process. This item received a weighted mean of 2.65 with a standard deviation of 0.947. While this score remains in the "Compliant" category, it highlights a potential weakness in fostering collaboration among decision-makers and stakeholders during post-drill assessments. Strengthening the involvement of key personnel could enhance the comprehensiveness and credibility of evaluations.

Other relatively low-scoring areas include the documentation of drill evaluation results, such as challenges encountered during the evacuation or assembly process (weighted mean = 2.81, standard deviation = 0.849), and the evaluation of alarms, communication systems, and evacuation routes (weighted mean = 2.72, standard deviation = 0.911). These findings suggest gaps in recording and analyzing drill performance metrics, which could hinder the identification of actionable improvements.

Positive aspects include the review of roles and performance of emergency coordinators and safety officers, with a weighted mean of 3.01 and a standard deviation of 0.674, as well as the inclusion of participant feedback during the evaluation phase (weighted mean = 3.17, standard deviation = 0.766). These practices demonstrate an awareness of the value of diverse perspectives and accountability in assessing drill outcomes.

The institutions also exhibit compliance in updating earthquake preparedness plans, protocols, and training programs based on evaluation findings (weighted mean = 3.11, standard deviation = 0.931). This indicates a willingness to adapt and improve based on lessons learned, though this aspect has yet to reach the "Highly Compliant" threshold.

In summary, while public institutions demonstrate adequate compliance in evaluating earthquake drills, key areas for improvement include enhancing the involvement of key personnel, ensuring thorough documentation of results, and rigorously assessing technical systems and procedures. Strengthening these components will be essential to achieving more robust and effective disaster preparedness practices.

2. ON THE SIGNIFICANT DIFFERENCE IN THE ASSESSMENT OF THE TWO GROUPS OF RESPONDENTS ON THE COMPLIANCE OF PUBLIC INSTITUTIONS TO THE ESSENTIAL COMPONENTS OF EARTHQUAKE DRILLS

Table 7
Differences in the Compliance of Public Institutions to the Essential Components of Earthquake Drills as Assessed by the Respondents

Indicator	Type of Personnel	Mean	t	Sig.	Decision on Ho	Interpretation
Alarm	OCD Personnel HHSG Personnel	3.50 3.40	.392	.533	Accepted	Not Significant
Response	OCD Personnel HHSG Personnel	3.27 3.20	3.029	.085	Accepted	Not Significant
Evacuation	OCD Personnel HHSG Personnel	3.36 3.25	.606	.438	Accepted	Not Significant
Assembly	OCD Personnel HHSG Personnel	2.96 2.92	.829	.365	Accepted	Not Significant
Head count	OCD Personnel HHSG Personnel	3.08 3.06	1.025	.314	Accepted	Not Significant
Evaluation	OCD Personnel HHSG Personnel	2.87 3.06	3.796	.054	Accepted	Not Significant
Overall	OCD Personnel HHSG Personnel	3.18 3.15	.111	.739	Accepted	Not Significant

Table 7 compares the compliance of public institutions with the essential components of earthquake drills as assessed by two groups of respondents: OCD (Office of Civil Defense) Personnel and HHSG (Health and Human Services Group) Personnel. Across all components—

Alarm, Response, Evacuation, Assembly, Head Count, and Evaluation—the analysis reveals no significant differences in the mean scores of the two groups, as indicated by p-values greater than the standard significance threshold ($p > .05$). This leads to the acceptance of the null hypothesis (Ho) for all indicators, signifying that the assessments of compliance by the two respondent groups do not differ significantly.

For the "Alarm" component, the mean score of OCD Personnel is 3.50, slightly higher than the 3.40 mean score of HHSG Personnel, with a t-value of 0.392 and a p-value of 0.533. Similarly, in the "Response" component, OCD Personnel reported a mean of 3.27 compared to 3.20 for HHSG Personnel ($t = 3.029$, $p = 0.085$). Both scores reflect compliance, and the lack of significant difference suggests that both groups perceive institutions to be similarly effective in implementing measures related to alarm systems and response protocols.

The "Evacuation" component also shows no significant difference, with mean scores of 3.36 for OCD Personnel and 3.25 for HHSG Personnel ($t = 0.606$, $p = 0.438$). This indicates comparable perceptions of evacuation preparedness between the two respondent groups. Likewise, the "Assembly" component reflects close mean scores (2.96 for OCD Personnel and 2.92 for HHSG Personnel, $t = 0.829$, $p = 0.365$), further emphasizing uniformity in their assessments.

For "Head Count," OCD Personnel reported a mean of 3.08, slightly higher than the 3.06 mean of HHSG Personnel ($t = 1.025$, $p = 0.314$). Although minor discrepancies exist in the mean scores, the results are not statistically significant, reinforcing that both groups share similar views on headcount procedures.

The "Evaluation" component shows a slight variation, with OCD Personnel reporting a lower mean score of 2.87 compared to 3.06 from HHSG Personnel ($t = 3.796$, $p = 0.054$). Despite the marginally higher score from HHSG Personnel, the p-value indicates no statistically significant difference in perception between the groups.

Overall, the mean scores for compliance as assessed by OCD Personnel and HHSG Personnel are 3.18 and 3.15, respectively, with a t-value of 0.111 and a p-value of 0.739, demonstrating no significant difference. This overall finding confirms consistency in the evaluation of public institutions' compliance across all assessed components.

In summary, the lack of significant differences in the assessments of OCD and HHSG Personnel suggests a shared understanding and agreement regarding the level of compliance of public institutions with earthquake drill requirements. This uniformity highlights the reliability of the findings and underscores the comparable perspectives of these two respondent groups in evaluating institutional preparedness.

3. ON THE CAPABILITIES OF PUBLIC INSTITUTIONS TO PERFORM THE FIVE STEPS OF AN EARTHQUAKE DISASTERS EMERGENCY DRILL AS ASSESSED BY THE TWO GROUPS OF RESPONDENTS IN TERMS OF GETTING EVERYONE ON BOARD, COMMUNICATING THE PLAN, SETTING GOALS, RUNNING THE DRILL, AND ASSESSING THE RESULTS.

Table 8

Capabilities of Public Institutions to Perform the Five Steps of an Earthquake Disasters Emergency Drill as Assessed by the Respondents in Terms of Getting everyone on board

Indicator	WM	SD	QD	VI
Public institutions must have the capability to engage all employees, students, and stakeholders in earthquake drills by raising awareness of the importance of disaster preparedness	2.89	.751	A	C
Institutions demonstrate their capability by providing comprehensive disaster education, including clear instructions on roles and responsibilities	3.48	.731	A	C
The capability of public institutions to get everyone on board is enhanced through inclusive planning	2.94	.851	A	C
Institutions must show their capability by involving all departments, ensuring that they are well-informed and participates actively in disaster preparedness activities, including earthquake drills	2.96	.875	A	C
Public institutions in the Philippines, where earthquakes are a common threat, demonstrate their readiness by collaborating with local government units and disaster response agencies	3.17	.842	A	C
The capability to get everyone on board is also reflected in the institution's use of multiple communication channels, such as emails, posters, social media, and public announcements,	3.00	.725	A	C
Institutions show their capability through continuous engagement and feedback collection from participants after each drill	3.21	.769	A	C
Overall Mean	3.09	.33	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA) / Highly Capable (HC); 2.51 – 3.50 Agree (A)/ Capable (C); 1.51 – 2.50 Disagree (DA)/ Slightly Capable (SC); 1.0-1.50 Strongly Disagree (SDA)/Not Capable (NC)

Table 9 presents an evaluation of the capabilities of public institutions to perform the first critical step of an earthquake disaster emergency drill, "Getting Everyone on Board," as assessed by the respondents. The overall weighted mean is 3.09, with a standard deviation of 0.33, categorized as "Agree" and "Capable." This indicates that public institutions generally demonstrate the ability to engage stakeholders effectively in earthquake drills, although there remains potential for improvement to reach "Highly Capable" status.

The highest-rated indicator is the provision of comprehensive disaster education, including clear instructions on roles and responsibilities, which achieved a weighted mean of 3.48 and a standard deviation of 0.731. This result underscores the institutions' strong commitment to educating stakeholders, ensuring that all participants understand their roles during an earthquake drill. This focus on disaster education plays a vital role in fostering preparedness and cooperation during emergencies.

On the other hand, the lowest-rated indicator is the ability of public institutions to engage all employees, students, and stakeholders by raising awareness about the importance of disaster preparedness, with a weighted mean of 2.89 and a standard deviation of 0.751. While this score still falls under the "Capable" category, it highlights a relative weakness in creating widespread awareness and motivating full participation. Improving awareness campaigns could further enhance institutional readiness and ensure broader stakeholder involvement.

Other areas of capability include the use of inclusive planning (weighted mean = 2.94, standard deviation = 0.851) and the active involvement of all departments in preparedness activities (weighted mean = 2.96, standard deviation = 0.875). These findings suggest that institutions strive to integrate diverse groups into disaster planning, although their performance in these areas could be further optimized.

Notably, institutions received higher ratings for their collaboration with local government units and disaster response agencies, achieving a weighted mean of 3.17 with a standard deviation of 0.842. This result highlights the importance of external partnerships in strengthening preparedness and ensuring coordinated disaster responses. Additionally, the use of multiple communication channels, such as emails, posters, social media, and public announcements, scored a weighted mean of 3.00 (standard deviation = 0.725), reflecting a satisfactory level of communication strategies employed by institutions to engage stakeholders.

The capability to collect feedback and continuously engage participants after drills was rated at 3.21, with a standard deviation of 0.769. This practice demonstrates a commitment to improving earthquake drill processes by integrating insights from participants, contributing to the iterative refinement of preparedness measures.

In summary, public institutions exhibit a solid level of capability in getting stakeholders on board for earthquake drills, with particular strengths in disaster education, inter-agency collaboration, and feedback collection. However, areas such as raising awareness and ensuring the active participation of all departments require focused efforts to achieve higher levels of engagement and preparedness. Strengthening these aspects will be crucial for fostering a culture of safety and cooperation across all stakeholders.

Table 9
Capabilities of Public Institutions to Perform the Five Steps of an Earthquake Disasters Emergency Drill as Assessed by the Respondents in Terms of Communicating the Plan

Indicator	WM	SD	QD	VI
Public institutions must have the capability to effectively communicate their earthquake emergency plan to all employees, staff, and visitors, ensuring that everyone understands the procedures before, during, and after a drill	2.46	.915	DA	SC
Institutions demonstrate their communication capabilities by using a variety of methods, including email, public announcements, posters, and training sessions, to ensure that the earthquake drill plan reaches a wide audience and is understood by all	2.08	1.012	DA	SC
Public institutions must ensure that communication is clear and concise, providing simple and direct instructions on actions to take when an earthquake occurs	2.66	.945	A	C
Institutions are capable of tailoring their communication strategies to accommodate diverse groups, ensuring that people with disabilities, non-native speakers, and other vulnerable populations receive the information they need in accessible formats	2.68	.952	A	C
The capability of institutions is also seen in their ability to maintain open lines of communication with external agencies, such as local disaster response teams and emergency services,	3.01	.674	A	C
Public institutions must regularly update and review their earthquake response communication plans	3.17	.766	A	C
Institutions show their capability by encouraging two-way communication, allowing participants to ask questions, and provide feedback	2.66	.945	A	C
Overall Mean	2.67	.45	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA) / Highly Capable (HC); 2.51 – 3.50 Agree (A)/ Capable (C); 1.51 – 2.50 Disagree (DA)/ Slightly Capable (SC); 1.0-1.50 Strongly Disagree (SDA)/Not Capable (NC)

Table 9 evaluates the capabilities of public institutions to perform the second step of earthquake disaster emergency drills, "Communicating the Plan," based on respondents' assessments. The overall weighted mean is 2.67, with a standard deviation of 0.45, categorized as "Agree" and "Capable." This indicates that while institutions generally meet the baseline requirements for communication, there are notable weaknesses that limit their effectiveness, leaving significant room for improvement.

The highest-rated indicator is the regular updating and review of earthquake response communication plans, which achieved a weighted mean of 3.17 with a standard deviation of 0.766. This result suggests that institutions are proactive in refining their communication strategies, a critical practice for ensuring that plans remain relevant and effective in addressing evolving needs and challenges.

Conversely, the lowest-rated indicator pertains to the use of diverse communication methods—such as email, public announcements, posters, and training sessions—to ensure that earthquake drill plans are widely disseminated and understood. This indicator received a weighted mean of 2.08 and a standard deviation of 1.012, categorized as "Disagree" and "Slightly Capable." This score highlights a significant shortfall in employing varied and accessible channels to reach and educate stakeholders effectively. Improving this aspect is essential to enhance overall engagement and comprehension of emergency plans.

Another area of concern is the effectiveness of communicating the earthquake emergency plan to employees, staff, and visitors, which scored a weighted mean of 2.46 with a standard deviation of 0.915, also categorized as "Disagree" and "Slightly Capable." This finding underscores challenges in ensuring that key stakeholders fully understand their roles and responsibilities before, during, and after an earthquake drill.

On a more positive note, institutions demonstrate better capabilities in tailoring communication strategies to accommodate diverse groups, including individuals with disabilities, non-native speakers, and other vulnerable populations, with a weighted mean of 2.68 and a standard deviation of 0.952. Similarly, the ability to provide clear and concise instructions on actions to take during an earthquake achieved a weighted mean of 2.66 and a standard deviation of 0.945. These results reflect some level of competence in addressing inclusivity and clarity, though improvements are needed to achieve higher ratings.

The capability to maintain open communication with external agencies, such as local disaster response teams and emergency services, scored a weighted mean of 3.01 and a standard deviation of 0.674, indicating a satisfactory level of collaboration with external stakeholders. Encouraging two-way communication, where participants can ask questions and provide feedback, also received a score of 2.66 with a standard deviation of 0.945, reflecting a moderate effort in fostering interactive communication.

In summary, while public institutions are capable of communicating earthquake emergency plans at a basic level, significant deficiencies are evident in the diversity and effectiveness of communication methods and the clarity of conveyed information. Strengthening these areas, particularly in disseminating information through multiple channels and ensuring comprehensive stakeholder understanding, will be crucial for enhancing the overall capability to communicate emergency plans effectively.

Table 10 evaluates the capabilities of public institutions in performing the third step of earthquake disaster emergency drills, "Setting Goals," as assessed by respondents. The overall weighted mean is 3.00, with a standard deviation of 0.35, which falls under the "Agree" qualitative description and "Capable" verbal interpretation. This indicates that while institutions exhibit sufficient capability in setting goals for earthquake preparedness, there is room for further improvement to reach the "Highly Capable" category.

Table 10
Capabilities of Public Institutions to Perform the Five Steps of an Earthquake Disasters Emergency Drill as Assessed by the Respondents in Terms of Setting goals

Indicator	WM	SD	QD	VI
Institutions must demonstrate the capability to set clear, measurable goals for earthquake drills	3.21	.988	A	C
Institutions are capable of setting goals that align with national or local disaster preparedness standards.	2.76	.726	A	C
The ability to set realistic and achievable goals, such as improving response times or minimizing confusion during evacuation	2.78	1.011	A	C
Public institutions should set goals that address specific challenges identified in previous drills or assessments	3.05	.609	A	C
Institutions demonstrate their capability by setting long-term goals for earthquake preparedness	3.20	.791	A	C
The capability to set inclusive goals ensures that all departments, employees and other stakeholders are involved in earthquake preparedness	3.12	.868	A	C
Public institutions must also set evaluation goals, ensuring that after each drill, a comprehensive review takes place to assess performance against set targets and to identify areas for further improvement	2.94	.851	A	C
Overall Mean	3.00	.35	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA) / Highly Capable (HC); 2.51 – 3.50 Agree (A)/ Capable (C); 1.51 – 2.50 Disagree (DA)/ Slightly Capable (SC); 1.0-1.50 Strongly Disagree (SDA)/Not Capable (NC)

The highest-rated indicator is the ability of institutions to set clear, measurable goals for earthquake drills, which achieved a weighted mean of 3.21 with a standard deviation of 0.988. This

result reflects a strong foundational capability to establish specific objectives, a critical step for ensuring the success and relevance of disaster preparedness efforts. Similarly, the ability to set long-term goals for earthquake preparedness received a high score of 3.20 (standard deviation = 0.791), underscoring a forward-looking approach in institutional planning.

The capability to set inclusive goals that involve all departments, employees, and stakeholders was also rated favorably, with a weighted mean of 3.12 and a standard deviation of 0.868. This result highlights an institutional effort to promote collaboration and ensure comprehensive engagement in disaster preparedness activities.

Conversely, the lowest-rated indicator pertains to setting goals that align with national or local disaster preparedness standards, which scored a weighted mean of 2.76 with a standard deviation of 0.726. Similarly, the ability to set realistic and achievable goals, such as improving response times or minimizing confusion during evacuation, received a weighted mean of 2.78 with a standard deviation of 1.011. These scores suggest challenges in aligning institutional objectives with broader disaster preparedness benchmarks and in tailoring goals to address specific operational needs effectively.

Institutions scored moderately on their capability to set evaluation goals for post-drill reviews, achieving a weighted mean of 2.94 with a standard deviation of 0.851. While categorized as "Capable," this finding indicates room for improvement in linking drill evaluations to predefined objectives to ensure systematic assessment and iterative improvements.

Notably, the indicator assessing the setting of goals to address specific challenges identified in previous drills or assessments received a weighted mean of 3.05 with a standard deviation of 0.609. This demonstrates an institutional effort to learn from past experiences and integrate these insights into future planning, though further enhancements in specificity and focus could strengthen this aspect.

In summary, public institutions display adequate capabilities in setting goals for earthquake disaster preparedness, with particular strengths in establishing measurable and long-term objectives and promoting inclusivity. However, areas such as aligning goals with national standards and ensuring their realism and achievability require targeted improvements. Strengthening these areas will help institutions develop more robust and effective preparedness frameworks that address both immediate and strategic needs.

Table 11
Capabilities of Public Institutions to Perform the Five Steps of an Earthquake Disasters Emergency Drill as Assessed by the Respondents in Terms of Running the drill

Indicator	WM	SD	QD	VI
Public institutions must have the capability to effectively plan and organize earthquake drills, ensuring all logistical aspects—such as timing, locations, and participant roles—are clearly defined and communicated to all involved	3.00	1.035	A	C
Institutions should demonstrate their ability to simulate realistic earthquake scenarios during drills	2.86	.975	A	C
The capability to train designated personnel to lead and coordinate drills is essential, ensuring that they can guide participants through each phase	2.89	.790	A	C
Public institutions must ensure that all participants are aware of their specific roles during the drill, creating a structured environment where everyone knows what actions to take	2.91	.712	A	C
Institutions should demonstrate the ability to monitor the drill in real time, collecting data on participant performance, response times, and overall effectiveness	3.18	.770	A	C
Public institutions must have the capability to debrief participants after the drill, facilitating discussions on what went well and identifying areas for improvement	2.91	.740	A	C
Institutions should ensure that each drill builds on past experiences and enhances overall preparedness	2.74	.691	A	C
Overall Mean	2.92	.38	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA) / Highly Capable (HC); 2.51 – 3.50 Agree (A)/ Capable (C); 1.51 – 2.50 Disagree (DA)/ Slightly Capable (SC); 1.0-1.50 Strongly Disagree (SDA)/Not Capable (NC)

Table 11 evaluates the capabilities of public institutions to execute the fourth step of earthquake disaster emergency drills, "Running the Drill," based on respondents' assessments. The overall weighted mean of 2.92, with a standard deviation of 0.38, falls within the "Agree" qualitative description and "Capable" verbal interpretation. This indicates that while institutions demonstrate a

functional capability to organize and conduct earthquake drills, several aspects require refinement to achieve a higher level of competence.

The highest-rated indicator is the ability of institutions to monitor drills in real time, collecting data on participant performance, response times, and overall effectiveness, which received a weighted mean of 3.18 with a standard deviation of 0.770. This suggests a strength in observing and evaluating drill execution to identify strengths and weaknesses systematically, which is critical for improving future preparedness.

Conversely, the lowest-rated indicator pertains to ensuring that each drill builds on past experiences and enhances overall preparedness, which achieved a weighted mean of 2.74 with a standard deviation of 0.691. This score highlights a potential weakness in leveraging lessons learned from previous drills to inform and improve subsequent exercises, an essential practice for continuous improvement in disaster readiness.

Institutions show moderate capability in simulating realistic earthquake scenarios, with a weighted mean of 2.86 and a standard deviation of 0.975. Although this score reflects a basic level of competency, it also indicates that institutions may face challenges in creating drills that closely mimic actual emergency conditions, which are vital for fostering genuine preparedness.

The capability to train designated personnel to lead and coordinate drills was rated at 2.89 (standard deviation = 0.790), suggesting moderate proficiency in preparing leaders to effectively guide participants. Similarly, ensuring that all participants understand their roles during the drill achieved a weighted mean of 2.91 with a standard deviation of 0.712, indicating that institutions are adequately structured but not yet highly effective in role assignment and communication.

Institutions also demonstrate moderate capability in debriefing participants after drills, facilitating discussions on successes and areas for improvement, with a weighted mean of 2.91 and a standard deviation of 0.740. While categorized as "Capable," this finding points to a need for more robust debriefing practices to maximize the learning outcomes of each drill.

The capability to plan and organize drills, ensuring that logistical aspects like timing, location, and participant roles are well-defined and communicated, received a weighted mean of 3.00 with a standard deviation of 1.035. This indicates a basic level of organizational competence, though the relatively high standard deviation suggests variability in performance across institutions.

In summary, public institutions demonstrate satisfactory capabilities in running earthquake drills, particularly in real-time monitoring and data collection. However, areas such as building on past experiences, simulating realistic scenarios, and strengthening participant engagement require significant improvement. Addressing these gaps will enhance the effectiveness of drill execution and contribute to a more resilient approach to earthquake preparedness.

Table 12
Capabilities of Public Institutions to Perform the Five Steps of an Earthquake Disasters Emergency Drill as Assessed by the Respondents in Terms of Assessing the results

Indicator	WM	SD	QD	VI
Public institutions must have the capability to systematically evaluate the outcomes of earthquake drills	3.24	.683	A	C
Institutions should demonstrate the ability to utilize feedback from participants, to assess the perceived strengths and weaknesses of the drill,	3.25	.796	A	C
The capability to conduct post-drill evaluations involves comparing the results against pre-established goals and benchmarks	3.14	.792	A	C
Public institutions must ensure that a diverse team of evaluators including safety officers, department heads, and external expert participates in the assessment process	3.12	.700	A	C
Institutions should be capable of documenting assessment findings in a structured manner, creating comprehensive reports that outline performance metrics	3.06	.851	A	C
Public institutions must integrate assessment results into their disaster preparedness planning, using the insights gained to update training programs	2.99	.718	A	C
Institutions should demonstrate the capability to communicate the results of the assessment to all stakeholders	2.70	1.078	A	C
Overall Mean	3.07	.31	A	C

Legend: 3.51 – 4.00 Strongly Agree (SA) / Highly Capable (HC); 2.51 – 3.50 Agree (A)/ Capable (C); 1.51 – 2.50 Disagree (DA)/ Slightly Capable (SC); 1.0-1.50 Strongly Disagree (SDA)/Not Capable (NC)

Table 12 evaluates the capabilities of public institutions to perform the fifth and final step of earthquake disaster emergency drills, "Assessing the Results," based on respondents' assessments. The overall weighted mean is 3.07, with a standard deviation of 0.31, categorized as "Agree" and "Capable."

This indicates that institutions generally possess adequate capabilities to evaluate earthquake drills effectively, though there are opportunities for enhancement to achieve a higher level of competence.

The highest-rated indicator is the utilization of participant feedback to assess the perceived strengths and weaknesses of the drill, which achieved a weighted mean of 3.25 with a standard deviation of 0.796. This reflects the institutions' strong commitment to incorporating diverse perspectives, which is essential for identifying practical areas for improvement and fostering a culture of continuous learning.

The capability to systematically evaluate the outcomes of earthquake drills received a similarly high rating, with a weighted mean of 3.24 and a standard deviation of 0.683. This finding highlights an institutional emphasis on structured assessments to determine the effectiveness of drill components and readiness measures.

In contrast, the lowest-rated indicator pertains to the ability to communicate the results of assessments to all stakeholders, which scored a weighted mean of 2.70 with a standard deviation of 1.078. While categorized as "Capable," the relatively low mean and high standard deviation suggest inconsistencies in sharing evaluation results, which may hinder transparency and collaborative improvement efforts. Enhancing communication strategies in this area is critical to ensuring that all stakeholders are informed and engaged in preparedness planning.

Moderate capabilities were observed in the ability to conduct post-drill evaluations against pre-established goals and benchmarks (weighted mean = 3.14, standard deviation = 0.792) and involving a diverse team of evaluators, including safety officers, department heads, and external experts (weighted mean = 3.12, standard deviation = 0.700). These findings indicate a foundational ability to evaluate drills comprehensively, though greater emphasis on benchmarking and multidisciplinary participation could further enhance assessment quality.

The documentation of assessment findings in structured reports outlining performance metrics received a weighted mean of 3.06 with a standard deviation of 0.851. While this demonstrates a basic level of capability, refining reporting practices could improve the clarity and utility of evaluation outputs. Similarly, integrating assessment results into disaster preparedness planning to update training programs scored a weighted mean of 2.99 (standard deviation = 0.718), highlighting a need for stronger feedback loops to ensure that evaluation insights directly inform preparedness strategies.

In summary, public institutions exhibit satisfactory capabilities in assessing the results of earthquake drills, particularly in utilizing participant feedback and conducting systematic evaluations. However, the relatively lower performance in communicating results to stakeholders and fully integrating assessment findings into disaster preparedness planning highlights critical areas for improvement. Addressing these gaps will enhance the effectiveness of assessments and ensure that evaluations contribute meaningfully to institutional resilience and readiness.

4. ON THE SIGNIFICANT DIFFERENCE IN THE ASSESSMENT OF THE TWO GROUPS OF RESPONDENTS ON THE CAPABILITIES OF PUBLIC INSTITUTIONS TO PERFORM THE FIVE STEPS OF AN EARTHQUAKE DISASTERS EMERGENCY DRILL

Table 13

Differences in the Capabilities of Public Institutions to Perform the Five Steps of an Earthquake Disasters Emergency Drill as Assessed by the Respondents

Indicator	Type of Personnel	Mean	t	Sig.	Decision on Ho	Interpretation
Getting everyone on board	OCD Personnel HHSG Personnel	3.08 3.11	.208	.650	Accepted	Not Significant
Communicating the plan	OCD Personnel HHSG Personnel	2.59 2.75	.887	.349	Accepted	Not Significant
Setting goals	OCD Personnel HHSG Personnel	2.87 3.15	.048	.827	Accepted	Not Significant
Running the drill	OCD Personnel HHSG Personnel	2.92 2.94	1.458	.230	Accepted	Not Significant
Assessing the results	OCD Personnel HHSG Personnel	3.00 3.14	1.017	.316	Accepted	Not Significant
Overall	OCD Personnel HHSG Personnel	2.89 3.02	3.247	.075	Accepted	Not Significant

Table 13 examines the differences in the capabilities of public institutions to perform the five steps of an earthquake disaster emergency drill as assessed by OCD (Office of Civil Defense) Personnel and HHSG (Health and Human Services Group) Personnel. Across all indicators, the results show no statistically significant differences between the two groups' assessments, as all p-values are greater than the standard significance threshold of 0.05. Consequently, the null hypothesis (Ho) is accepted for all comparisons, indicating that the perceptions of OCD and HHSG Personnel are consistent.

For the "Getting Everyone on Board" indicator, the mean score reported by OCD Personnel is 3.08, compared to 3.11 from HHSG Personnel, with a t-value of 0.208 and a p-value of 0.650. This reflects a shared perception of institutional capability in engaging stakeholders during earthquake drills. Similarly, for "Communicating the Plan," the mean scores are 2.59 for OCD Personnel and 2.75 for HHSG Personnel ($t = 0.887$, $p = 0.349$), indicating alignment in their views on communication effectiveness.

The "Setting Goals" indicator also shows no significant difference, with mean scores of 2.87 for OCD Personnel and 3.15 for HHSG Personnel ($t = 0.048$, $p = 0.827$). Both groups agree that institutions are capable of defining and pursuing objectives, though there is room for improvement in this area. For "Running the Drill," OCD Personnel reported a mean of 2.92, slightly lower than the 2.94 mean of HHSG Personnel ($t = 1.458$, $p = 0.230$), again demonstrating a consistent assessment.

In "Assessing the Results," the mean scores are 3.00 for OCD Personnel and 3.14 for HHSG Personnel, with a t-value of 1.017 and a p-value of 0.316. Both groups agree on the institutions' capability to evaluate earthquake drills effectively, reflecting similar perspectives on post-drill assessment practices.

The overall mean scores are 2.89 for OCD Personnel and 3.02 for HHSG Personnel, with a t-value of 3.247 and a p-value of 0.075. While HHSG Personnel's overall assessment is slightly higher, the difference is not statistically significant, reinforcing the conclusion that the two groups hold comparable views on the capabilities of public institutions in performing the five steps of earthquake disaster emergency drills.

In summary, the analysis indicates that OCD and HHSG Personnel perceive the capabilities of public institutions in earthquake drill implementation similarly, with no significant differences in their assessments across all indicators. This consistency suggests a shared understanding of institutional strengths and areas for improvement, providing a unified basis for recommendations aimed at enhancing earthquake preparedness.

5. ON THE SIGNIFICANT RELATIONSHIP BETWEEN THE COMPLIANCE OF PUBLIC INSTITUTIONS ON THE ESSENTIAL COMPONENTS OF EARTHQUAKE DRILLS AND THEIR CAPABILITIES TO PERFORM EARTHQUAKE DISASTERS EMERGENCY DRILLS

Table 14

Correlation Between Compliance of Public Institutions on the Essential Components of Earthquake Drills and their Capabilities to Perform Earthquake Disasters Emergency Drills

Compliance of Public Institutions on the Essential Components of Earthquake Drills	Capabilities to Perform Earthquake Disasters Emergency Drills	Computed r	Sig.	Decision	Interpretation
Alarm	Getting everyone on board	-.144	.153	Accepted	Not Significant
	Communicating the plan	-.241*	.016	Rejected	Significant
	Setting goals	-.186	.064	Accepted	Not Significant
	Running the drill	.115	.254	Accepted	Not Significant
	Assessing the results	-.056	.583	Accepted	Not Significant
Response	Getting everyone on board	-.144	.152	Accepted	Not Significant
	Communicating the plan	-.160	.111	Accepted	Not Significant
	Setting goals	.003	.973	Accepted	Not Significant
	Running the drill	.276**	.005		
	Assessing the results	.185	.065	Accepted	Not Significant
Evacuation	Getting everyone on board	.129	.203	Accepted	Not Significant
	Communicating the plan	.058	.568	Accepted	Not Significant

	Setting goals	-.099	.328	Accepted	Not Significant
	Running the drill	.063	.531	Accepted	Not Significant
	Assessing the results	-.167	.097	Accepted	Not Significant
Assembly	Getting everyone on board	-.229*	.022	Rejected	Significant
	Communicating the plan	.027	.787	Accepted	Not Significant
	Setting goals	.148	.141	Accepted	Not Significant
	Running the drill	.037	.711	Accepted	Not Significant
	Assessing the results	.062	.541	Accepted	Not Significant
Head count	Getting everyone on board	.231*	.021	Rejected	Significant
	Communicating the plan	.509**	.000	Rejected	Significant
	Setting goals	.082	.417	Accepted	Not Significant
	Running the drill	-.120	.236	Accepted	Not Significant
	Assessing the results	.098	.331	Accepted	Not Significant
Evaluation	Getting everyone on board	-.044	.662	Accepted	Not Significant
	Communicating the plan	.631**	.000	Rejected	Significant
	Setting goals	.555**	.000	Rejected	Significant
	Running the drill	-.035	.729	Accepted	Not Significant
	Assessing the results	.101	.319	Accepted	Not Significant
Overall Compliance of Public Institutions on the Essential Components of	**Overall Capabilities to Perform Earthquake Disasters Emergency Drills**	**.314****	**.001**	**Rejected**	**Significant**

Earthquake Drills					

Table 15 provides an analysis of the correlation between the compliance of public institutions with the essential components of earthquake drills and their capabilities to perform earthquake disaster emergency drills. The results reveal a combination of significant and non-significant relationships, reflecting varying degrees of alignment between compliance and institutional capabilities.

One significant finding is the negative correlation between compliance with alarm-related protocols and the capability to communicate the plan ($r = -0.241$, $p = 0.016$). This suggests that higher compliance with alarm requirements may not necessarily enhance communication capabilities. This result highlights potential gaps in integrating alarm systems effectively into communication strategies, possibly due to insufficient emphasis on aligning technical systems with clear and accessible messaging for stakeholders. Institutions may need to focus on harmonizing these aspects to ensure alarms contribute meaningfully to communication efforts.

Another notable result is the significant negative correlation between compliance with assembly-related protocols and the capability to engage stakeholders ($r = -0.229$, $p = 0.022$). This indicates that compliance with technical aspects of assembly procedures, such as marking safe zones and maintaining hazard-free areas, does not always translate into improved engagement. This may point to a need for more inclusive and participatory approaches when designing assembly protocols, ensuring that stakeholders are both informed and actively involved in these processes.

Conversely, compliance with head count protocols shows a significant positive correlation with the capability to engage stakeholders ($r = 0.231$, $p = 0.021$). This finding underscores the importance of accountability measures, such as thorough headcounts, in fostering stakeholder trust and engagement. Institutions that prioritize systematic head count procedures appear better equipped to involve and reassure participants, emphasizing the role of organization and accountability in building effective engagement strategies.

Significant positive correlations were also found between compliance with evaluation-related protocols and several capability areas. For instance, evaluation compliance positively correlates with capabilities in communicating the plan ($r = 0.631$, $p = 0.000$) and setting goals ($r = 0.555$, $p = 0.000$). These findings suggest that institutions that rigorously evaluate their drills are better positioned to communicate effectively and establish clear, measurable objectives. This alignment highlights the critical role of evaluation processes in driving improvements across other dimensions of disaster preparedness.

At an overall level, the compliance of public institutions with the essential components of earthquake drills positively and significantly correlates with their overall capabilities to perform emergency drills ($r = 0.314$, $p = 0.001$). This result reinforces the broader conclusion that higher compliance contributes to enhanced institutional readiness, though specific areas, such as alarms and assemblies, require targeted improvements to ensure that compliance translates into practical capabilities.

In summary, the analysis demonstrates that compliance with earthquake drill protocols generally supports institutional capabilities, particularly in evaluation and accountability-related areas. However, gaps remain in areas like alarm integration and assembly protocols, where compliance does not consistently align with enhanced capabilities. Addressing these discrepancies will be essential for public institutions to maximize the effectiveness of their disaster preparedness efforts.

DISCUSSIONS

Summary of Findings

1. Profile of Respondents. The study involved a balanced sample of respondents, with equal representation from OCD (Office of Civil Defense) Personnel and HHSG (Health and Human Services Group) Personnel. Each group constituted 50 respondents, accounting for 50% of the total sample. This parity ensured that perspectives from both organizational contexts were equitably represented. The sample's distribution reflects deliberate efforts to minimize bias and create a comprehensive basis for evaluating earthquake preparedness. Such representation provides a reliable foundation for assessing institutional compliance and capabilities in disaster preparedness and response. The insights drawn from this balanced profile underscore a well-rounded understanding of public institutions' preparedness across different organizational roles.

2. Compliance of Public Institutions to the Essential Components of Earthquake Drills. Public institutions demonstrated varying levels of compliance across the essential components of earthquake drills. In terms of alarms, the institutions scored highly on ensuring inclusivity and functionality but showed relatively lower compliance in timing drills accurately. Compliance in response protocols reflected strong training and preparedness efforts but highlighted challenges in evaluating response effectiveness systematically. For evacuation, while institutions showed adequate compliance in marking routes and communicating procedures, there was a need for better accessibility and inclusivity. Assembly compliance revealed a strong emphasis on monitoring and safety but gaps in hazard-free assembly points. Head count compliance was satisfactory, with particular strengths in inclusivity for vulnerable groups, though post-drill evaluations needed refinement. Lastly, evaluation compliance showed robust documentation and feedback integration, but inconsistencies in involving diverse evaluators were noted.

3. Differences in Compliance of Public Institutions to the Essential Components of Earthquake Drills. The comparison between OCD and HHSG Personnel revealed no statistically significant differences in the assessed compliance levels for any component of earthquake drills. Both groups consistently rated institutional compliance similarly, indicating shared perceptions of public institutions' strengths and areas for improvement. Mean scores for compliance indicators, such as alarms, response, evacuation, assembly, head count, and evaluation, were closely aligned across the two groups. This uniformity suggests that institutional compliance is perceived to be

consistent, regardless of the organizational context of the respondents, reinforcing the reliability of the findings.

4. Capabilities of Public Institutions to Perform the Five Steps of an Earthquake Disasters Emergency Drill. Public institutions displayed moderate capabilities across the five steps of earthquake disaster emergency drills. For "Getting Everyone on Board," strengths were observed in disaster education and inter-agency collaboration, though awareness campaigns needed improvement. In "Communicating the Plan," the use of multiple communication channels was effective, but clarity and inclusivity required enhancement. "Setting Goals" highlighted strengths in defining long-term objectives and promoting inclusivity, yet alignment with national standards needed focus. The "Running the Drill" step showed strengths in real-time monitoring but revealed weaknesses in simulating realistic scenarios and building on past drills. Finally, for "Assessing the Results," institutions effectively used participant feedback but faced challenges in communicating assessment outcomes and integrating findings into preparedness strategies.

5. Differences in Capabilities of Public Institutions to Perform the Five Steps of an Earthquake Disasters Emergency Drill. No significant differences were found between OCD and HHSG Personnel in their assessment of public institutions' capabilities to perform the five steps of earthquake drills. Mean scores for each step—getting everyone on board, communicating the plan, setting goals, running the drill, and assessing results—were closely aligned across the two groups. This lack of statistical significance suggests that both groups hold similar perceptions of institutional capabilities. The findings highlight a consistent understanding of preparedness levels, indicating that improvements or deficiencies are recognized uniformly across organizational contexts.

6. Correlation Between Compliance and Capabilities. A significant positive overall correlation ($r = 0.314$, $p = 0.001$) was found between compliance with earthquake drill components and the capabilities to perform drills, indicating that higher compliance enhances overall capabilities. Specific significant correlations included the relationship between head count compliance and capabilities in "Getting Everyone on Board" ($r = 0.231$, $p = 0.021$) and "Communicating the Plan" ($r = 0.509$, $p = 0.000$). Evaluation compliance was strongly correlated with capabilities in communication ($r = 0.631$, $p = 0.000$) and goal-setting ($r = 0.555$, $p = 0.000$). However, negative correlations were observed in areas like alarm compliance and communication, suggesting gaps in aligning technical compliance with communication effectiveness. These findings underline the critical role of compliance in enhancing institutional preparedness while identifying areas where alignment is needed to maximize capabilities.

Conclusion

1. The study provided valuable insights into the preparedness of public institutions for earthquake disaster drills by examining compliance with essential components and their corresponding capabilities. A balanced representation of

respondents from OCD and HHSG ensured a comprehensive evaluation, reflecting perspectives from two critical organizational contexts involved in disaster preparedness.

2. Public institutions demonstrated varying levels of compliance across different components of earthquake drills. Strengths were observed in inclusivity, functionality, and documentation, while areas such as timing, accessibility, and systematic evaluations require improvement. These findings highlight the need for a more consistent and comprehensive approach to compliance across all aspects of disaster preparedness.

3. The comparison of assessments between OCD and HHSG Personnel revealed no statistically significant differences in perceived compliance levels. This uniformity suggests a shared understanding of public institutions' strengths and deficiencies, providing a reliable basis for developing targeted interventions to address identified gaps.

4. Institutional capabilities to perform the five steps of earthquake disaster drills were rated as moderate. Strengths included real-time monitoring, feedback integration, and disaster education efforts. However, challenges remain in areas such as communication clarity, scenario realism, and effectively building on past drills. These findings underscore the importance of enhancing institutional capacities to ensure sustained improvements in disaster preparedness.

5. No significant differences were found between OCD and HHSG Personnel in their assessment of institutional capabilities. This consistency reflects a unified perspective on the preparedness levels of public institutions and highlights the shared recognition of areas requiring strategic focus and resource allocation.

6. The correlation analysis confirmed a positive relationship between compliance and capabilities, indicating that higher adherence to essential drill components enhances overall preparedness. However, gaps in aligning specific compliance areas, such as alarm systems, with practical capabilities like communication effectiveness, emphasize the need for integrated approaches to optimize institutional readiness for earthquake emergencies.

Recommendations

Based on the findings, the following recommendations are proposed to enhance the preparedness of public institutions for earthquake disaster emergency drills:

1. Public institutions should prioritize ensuring that all components of earthquake drills are inclusive and accessible to all individuals, including those with disabilities and vulnerable groups. Efforts should focus on improving evacuation routes, assembly areas, and communication strategies to accommodate diverse needs effectively.

2. Institutions should invest in comprehensive awareness campaigns to better engage stakeholders and emphasize the importance of disaster preparedness. Communication plans should utilize multiple accessible channels, such as social media, posters, and public announcements, while ensuring clarity and inclusivity in messaging.

Tailored communication strategies for diverse populations, including non-native speakers and individuals with disabilities, should be prioritized.

3. To better prepare participants for real-life scenarios, earthquake drills should incorporate more realistic simulations. This can include variable scenarios and conditions that mimic actual emergencies. Post-drill feedback mechanisms should be strengthened to gather participant insights and systematically integrate them into future planning and training programs.

4. Institutions should enhance partnerships with local government units, disaster response agencies, and external experts to improve planning, execution, and assessment of earthquake drills. Training programs should also focus on equipping designated personnel with the necessary skills to lead and coordinate drills effectively.

5. Post-drill evaluations should be made more systematic, with clear benchmarks and structured documentation of findings. Assessment results should be widely communicated to stakeholders to ensure transparency and foster collaborative improvements. Regular updates to preparedness plans based on these evaluations should be institutionalized.

6. Public institutions should work to better integrate compliance measures with practical capabilities. For instance, alarm systems should be seamlessly connected with effective communication strategies to ensure their practical utility during emergencies. Institutions should also address any negative correlations between compliance and capability by conducting regular reviews and adjustments to align protocols with real-world application.

OUTPUT OF THE STUDY

INPUTS FOR ENHANCING THE DISASTER RESPONSE PLAN OF PUBLIC INSTITUTIONS IN CONFRONTING WITH EARTHQUAKE DISASTERS

Rationale

Earthquake disasters pose significant risks to public safety, infrastructure, and institutional functionality, necessitating robust disaster response plans. The findings of this study underscore the need for public institutions to enhance their preparedness and response capabilities by addressing identified gaps in compliance and practical implementation of earthquake drills. While institutions demonstrate moderate levels of compliance and capability, critical areas such as inclusivity, communication, realism in drills, systematic evaluation, and the alignment of compliance with practical capabilities require immediate attention.

Strengthening disaster response plans is essential to ensure that all individuals, including vulnerable populations, are adequately protected during emergencies. This involves fostering stakeholder awareness, enhancing inter-agency collaboration, and improving institutional capacity to perform disaster drills effectively. Additionally, the

integration of feedback and post-drill evaluations into preparedness planning is crucial for iterative improvement, enabling institutions to adapt to evolving risks and challenges.

By focusing on these key areas, public institutions can build a culture of preparedness that promotes safety, minimizes confusion, and ensures coordinated and effective responses during earthquakes. The proposed framework provides actionable inputs aligned with the findings, ensuring that disaster response plans are comprehensive, inclusive, and resilient. This approach not only mitigates risks but also enhances public trust and confidence in institutional disaster preparedness efforts.

Key Result Areas (KRA)	Objectives	Activities	Persons Involved	Performance Indicators	Timeframe	Budget (IN PESO)
Inclusivity and Accessibility	Ensure inclusivity and accessibility in all aspects of earthquake drills	- Improve evacuation routes and assembly areas to accommodate diverse needs - Integrate visual and auditory alarms for inclusivity	Safety officers, facilities managers	Evacuation routes and assembly areas rated fully accessible	6 months	500,000
Awareness and Communication	Enhance stakeholder awareness and engagement in disaster preparedness	- Launch multi-channel awareness campaigns (social media, posters, announcements) - Conduct training sessions on disaster response protocols	Public information officers, trainers	Increase in stakeholder awareness levels measured via surveys	3 months	300,000
Realism in Drills	Improve the realism and	- Incorporate realistic scenarios in drills	Disaster coordinators,	Post-drill reports indicating improved	4 months	400,000

	effectiveness of earthquake drill simulations	- Conduct feedback sessions post-drill - Use data from drills to revise procedures	emergency trainers	participant performance and engagement		
Collaboration and Capacity	Strengthen inter-agency collaboration and build institutional capacity	- Partner with local government units and disaster response agencies - Provide advanced training for designated personnel	Local government officials, disaster experts	Increased number of collaborative activities Personnel certified in advanced disaster training	Ongoing	600,000/ year
Evaluation and Reporting	Enhance systematic evaluation and feedback integration	- Develop standardized evaluation templates - Require structured post-drill reports - Share findings with all stakeholders	Evaluators, safety officers, department heads	Comprehensive reports submitted and used for updating preparedness plans	3 months post-drill	200,000
Alignment of Compliance and Capability	Ensure alignment of technical compliance with practical disaster response capabilities	- Review and revise compliance protocols to better align with real-world application - Conduct regular review meetings with disaster response teams	Compliance officers, emergency coordinators	Reduction in gaps between compliance and capability as assessed in evaluations	Semi-annually	250,000

REFERENCES

1. Alireza Azarbakht, Archie Rudman, John Douglas, (2021).A decision-making approach for operational earthquake forecasting, International Journal of Disaster Risk Reduction.
2. Bolletino, V., Alcayna, T., Enriquez, K., & Vinc, P. (2018). Perceptions of Disaster Resilience and Preparedness in the Philippines. Program on Resilient Communities. Harvard Humanitarian Initiative.
3. Changyang Li, Wei Liang, Chris Quigley, Yibiao Zhao, Lap-Fai Yu, (2017).Earthquake Safety Training through Virtual Drills, IEEE Transactions on Visualization and Computer Graphics
4. Civil Service Commission. (2020). Occupational Safety and Health Standards for the Public Sector.
5. Creswell, J.W., & Creswell, J.D., (2018). Research design: qualitative, quantitative, and mixed methods approaches. Fifth edition. Los Angeles: SAGE.
6. Creswell, J,W., & Poth, C.N. (2018). Qualitative inquiry and researcher design: Choosing among five approaches (4th ed.), Thousand Oaks, CA: Sage.
7. Cubero, L. (2016). The importance of school preparedness during earthquakes.
8. Denzin, N.K., & Lincoln, Y.S. (Eds.). (2018). The SAGE handbook of qualitative (5th ed.), Los Angeles, CA: Sage
9. Dikmenli, Y.; Yakar, H.; Konca, A. (2018). Development of Disaster Awareness Scale: A Validity and Reliability Study. Review of International Geographical Education Online
10. Earthquake Impact Reduction Study for Metropolitan Manila, Republic of the Philippines.
11. Flores, H. (2017). 'Prepare for the Big One'. Philippine Star.
12. Gubalane, Z. (2015). Disaster Risk Management - Awareness and Preparedness: A Term Paper. Polytechnic University of the Philippines.
13. Helene Joffe, Gabriela Perez-Fuentes, Henry W. W. Potts, Tiziana Rossetto, How to increase earthquake and home fire preparedness: the fix-it intervention, Natural Hazards,
14. Huey Wen Lim, Dongping Fang, Role of hazard information in the adoption of seismic hazard adjustments: Information treatment experiment in Beijing, International Journal of Disaster Risk Reduction, 10.1016/j.ijdrr.2022.103182, **79**, (103182), (2022)
15. Hyun Jeong Seo, Minjie Son, Ah Jeong Hong, (2021).Trends in Civic Engagement Disaster Safety Education Research: Systematic Literature Review and Keyword Network Analysis, Sustainability.
16. Ivankova, N.V., & Stick, S.L. (2017). Mixed methods applications in action research: From methods to community action. Thousand Oaks, CA: Sage.
17. Malahay, R. (2018, September). Correlation of Secondary School Personnel's Extent of Agreement of the Physical Vulnerabilities and Their Level of Disaster

Preparedness in the Congressional District I of Negros Oriental, Philippines. Negros Oriental State University.
18. Malicdem, E. (2017). Barangays and Buildings Traversed by the Valley Fault System. Shadow 1 Expeditions.
19. Maminta, L. (2019). Level of Awareness on Disaster Preparedness. Journal of Physics: Conference Series.
20. Mamon, M.A., Suba, R.A., & Son, A. (2017). Disaster Risk Reduction Knowledge of Grade 11 Students: Impact of Senior High School Disaster Education in the Philippines. International Journal of Health System and Disaster Management.
21. Mojica, K.C. & Malenab, M.C.T. (2016). Educational Vulnerability Assessment of Youth on Natural Disasters: The Case of Brgy. Paciano Rizal, Bay, Laguna.
22. Mohammad Sadra Rajabi, Hosein Taghaddos, Seyed Mehdi Zahrai, (2022).Improving Emergency Training for Earthquakes through Immersive Virtual Environments and Anxiety Tests: A Case Study, Buildings
23. National Disaster Risk Reduction and Management Council. (2011). National Disaster Risk Reduction and Management Plan (NDRRMP) 2011-2028
24. Nazanin Abrishami Shirazi, Babak Omidvar, Ahmad Nohegar, (2023).
25. Introduction to decision-making and disaster management systems, Crises in Oil, Gas and Petrochemical Industries,
26. Ogania, L. (2020). Assessing the Level of DRRM Preparedness of DepEd Biñan City: Basis for Division DRRM Plan.
27. Papp, B. (2020). Myths And Misconceptions About Disasters: Do Students In The Field Know Better?
28. Peter Liuwandy, undefined Suryasari, undefined Wella, Affordable Mobile Virtual Reality Earthquake Simulation, 2020 Fifth International Conference on Informatics and Computing.
29. Philippine Institute of Volcanology and Seismology [PHIVOLCS] (2020). Recent Earthquakes Near Biñan, Calabarzon, Philippines.
30. Tapeceria, A. I. (2018, April). Big One Earthquake: Orientation on Cavite's Contingency Plan Formulation. Humanitarian Leadership Academy.
31. Wenjing Li, Guofang Zhai, Manting Hu, Shutian Zhou, (2023). Perceptions of living environment among the elderly based on an assumed earthquake scenario: case of Hefei, China, Journal of Housing and the Built Environment,
32. Yusuke Toyoda, Akio Muranaka, Dowon Kim, Hidehiko Kanegae, (2021). Framework for utilizing disaster learning tools classified by real and virtual aspects of community space and social networks: Application to community-based disaster risk reduction and school disaster education on earthquakes in Japan for during- and post-COVID-19 periods, Progress in Disaster Science