



The Effectiveness of Earthquake Disaster Training on Employee Preparedness at Maxima Clinical Laboratory in Palu City, Central Sulawesi

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ABSTRACT

This study aims to assess the effectiveness of earthquake disaster training in improving the preparedness of employees at Maxima Clinical Laboratory in Palu City, Central Sulawesi. The preparedness aspects analyzed include knowledge, attitude, and behavior. The study uses a pretest-posttest design with Wilcoxon Signed Rank Test analysis because the data are not normally distributed. The results show a significant improvement in all variables after the training. For the knowledge aspect, a value of $Z = -5.116$; $p = 0.000$ was obtained, indicating an increase in employee understanding. For the attitude aspect, Z value = -4.868 ; $p = 0.000$ indicates a positive change in attitudes toward disaster preparedness. Meanwhile, the behavioral aspect also showed a significant increase with a Z value = -4.633 ; $p = 0.000$, indicating that participants are more ready to implement safety actions. Overall, earthquake training has been proven effective in enhancing employee preparedness and plays an important role in creating a safe and responsive work environment to potential disasters

INTRODUCTION

Disasters are events that can occur suddenly or gradually, which can be triggered by natural factors or human activities, and have the potential to cause damage to life, infrastructure, and the environment (National Disaster Management Agency, 2023). Indonesia itself is among the countries with very high disaster risk, even ranking second out of 193 countries according to the World Risk Report 2024. This high risk is due to Indonesia's complex geographical location and geological conditions, as well as its high exposure to various natural disasters such as earthquakes, tsunamis, floods, landslides, volcanic eruptions, droughts, and forest fires. BNPB data in 2024 recorded a total of 3,472 disaster events occurring in Indonesia, affecting more than 8 million people and causing severe damage to over 81 thousand infrastructures (BNPB, 2024).

Earthquakes are one of the most destructive natural disasters, with widespread impacts on human safety, infrastructure damage, and the livelihoods of communities worldwide (UNDRR CRED, 2022). Data from The Emergency Events Database (EM-DAT) indicate that between 2000 and 2020, earthquakes claimed more than 800,000 lives and affected over 125 million people globally. Countries such as Japan, Nepal, Turkey, and Indonesia are recorded as regions with the highest levels of earthquake vulnerability and impact worldwide (EM-DAT, 2025).

Indonesia is one of the countries with a high level of earthquake disaster vulnerability in the world. Its location in the Ring of Fire region causes various areas in Indonesia, including urban areas and public facilities, to have the potential to be exposed to seismic shocks at any time without warning. These three plates continue to move and collide in the Indonesian region, creating subduction zones and active faults that are the main sources of earthquakes and volcanic activity. Data from the National Disaster Management Agency (BNPB) in 2024 shows that more than 60% of Indonesia's territory is at risk of experiencing earthquakes, ranging from mild to destructive scales (BNPB, 2024). The history of natural disasters in Indonesia records various major events, such as the earthquake and tsunami in Aceh in 2004 that killed more than 165,000 people, as well as the major earthquake in Yogyakarta and Central Java in 2006 which resulted in thousands of casualties and significant losses (BPS, 2021; Syed Zakaria et al., 2020). Initial observations indicate that to date, there has been no integrated training program systematically organized by the management of Maxima Clinical Laboratory to enhance employees' capacity in dealing with disaster situations, particularly earthquakes. In fact, preparedness at both the individual and organizational levels heavily depends on the level of knowledge, attitudes, and skills acquired through disaster education and training processes. Without effective training, the potential risk to the safety of healthcare workers and patients will remain high if an earthquake occurs in the future.

Maxima Clinical Laboratory has been operating in the city of Palu since 2017, and thus directly experienced the impact of the major earthquake that occurred on September 28, 2018. This event was certainly an important experience and served as a strong foundation for realizing the necessity of

conducting comprehensive and continuous disaster training. This empirical experience should encourage the enhancement of preparedness for all laboratory personnel so they can respond to disasters quickly, accurately, and safely.

Therefore, this research is very important to conduct in order to measure the extent to which earthquake disaster training can improve employee preparedness at Maxima Clinical Laboratory. In addition, this study is expected to provide evidence-based recommendations for laboratory management and relevant agencies to design policies and continuous training programs to enhance institutional resilience to disasters. Furthermore, preparedness in healthcare facilities, such as clinical laboratories, is crucial to maintaining the continuity of medical services and patient safety during disasters. Organized training in a clinical environment can strengthen an internal emergency response system so that the services provided to earthquake victims can be more optimal (Diandra & Hafizhi, 2021). Considering the importance of enhancing disaster preparedness capacity in healthcare facilities, this study aims to evaluate the effectiveness of disaster training and earthquake preparedness for employees of Maxima Clinical Laboratory in Palu City, Central Sulawesi. As a researcher, I hope that the results of this study can contribute to the development of a more effective, efficient disaster training program that aligns with the characteristics and needs of healthcare facilities, thereby enabling disaster preparedness and response capabilities within healthcare environments to be achieved more optimally.

Problem Formulation

Based on this background, the problem formulation in this study is: Is earthquake disaster training effective in improving the preparedness of employees at Maxima Clinical Laboratory in Palu City, Central Sulawesi?

Research Objectives

To determine the effectiveness of earthquake disaster training on the preparedness of employees at Maxima Clinical Laboratory in Palu City, Central Sulawesi

Specific Research Objectives

1. To analyze the effect of earthquake disaster preparedness training on the improvement of disaster knowledge among employees at Maxima Clinical Laboratory in Palu City, Central Sulawesi
2. To analyze the effect of earthquake disaster preparedness training on changes in attitudes of employees at Maxima Clinical Laboratory in Palu City, Central Sulawesi
3. To analyze the effect of earthquake disaster preparedness training on changes in behavior of employees at Maxima Clinical Laboratory in Palu City, Central Sulawesi

Theoretical Benefits

This research is expected to contribute to the development of knowledge in the field of occupational health and safety (OHS), particularly in the context of healthcare facilities such as Clinical Laboratories. The results of this study reinforce learning and behavior change theories, such as the Theory of Planned Behavior and the Health Belief Model, which explain that training can increase knowledge, shape positive attitudes, and encourage safe work behavior changes.

These findings can serve as a theoretical reference for developing more effective OHS training models and provide a basis for further research in the field of OHS in the healthcare sector.

Practical Benefits

This research is expected to provide practical benefits in the form of providing information and useful recommendations for the management of Maxima Clinical Laboratory in designing, improving, and implementing an effective earthquake disaster preparedness training program for all employees. With proper training, employees are expected to have better knowledge, attitudes, and skills in taking appropriate actions before, during, and after an earthquake occurs. This aims to minimize the risk of material losses and prevent casualties in the workplace.

LITERATURE RIVIEW

Theoretical Review

In this section, a number of previous studies related to the effectiveness of earthquake disaster training on the preparedness of employees at Maxima Clinical Laboratory in Palu City, Central Sulawesi, will be presented. The results of these studies are expected to provide a theoretical basis as well as serve as a comparison in the analysis of the current research.

A study by Lusia Salmawati, Pertiwi, and Marselina (2025) on the Effectiveness of Earthquake Disaster Management Training on the Preparedness Knowledge of Elementary School Teachers in Palu City aims to evaluate the effectiveness of earthquake disaster management training in improving the preparedness knowledge of elementary school teachers in Palu City. The method used is a quantitative approach with a quasi-experimental one-group pretest-posttest design, which involves providing disaster training as an intervention. The research was conducted in 9 elementary schools in Palu City, with a total population of 170 teachers selected using purposive non-random sampling, based on areas with high earthquake risk. Data were collected through questionnaires filled out before and after the training and analyzed using a paired sample t-test. The results of the study showed a significant increase in preparedness knowledge scores in all districts (East Palu, West Palu, South Palu, and North Palu) after the training, with a significance value of $p = 0.000 (< 0.05)$ across all areas. The highest average increase occurred in North Palu at 5.2 points, followed by West Palu (2.14 points), East Palu (2.13 points), and South Palu (1.06 points).

Research by Muhammad Ryman Napirah, Vidyanto, and Asmawati (2023) on Disaster Preparedness Analysis among Regional Disaster Management Agency (BPBD) Officers in Palu City indicated that this study aimed to analyze disaster preparedness among BPBD officers in Palu City, focusing on three main aspects: attitude, emergency response plans, and resource mobilization. This research used a qualitative approach with a case study design and was conducted in October 2023. The emergency response plans have also been well-prepared through clear preparedness stages, as well as the ability to coordinate across agencies in emergency situations. Resource mobilization was deemed effective, both internally through the operational control center (pusdalok), as well as in

the form of a rapid response team involving 20 related agencies. The study concluded that disaster preparedness among BPBD personnel in Palu City is considered good in all aspects studied. It is recommended that BPBD continue to raise awareness, strengthen planning, and expand training for all personnel regularly in order to optimally respond to potential disasters. (Napirah et al., 2023)

Definition of an Earthquake

An earthquake is one form of geological disaster that has significant impacts on human safety, infrastructure damage, and disruption of public services, including health facilities such as clinical laboratories. Geologically, earthquakes occur due to the release of energy produced by tectonic activity within the Earth's crust. This energy is released in the form of seismic waves that travel to the Earth's surface and cause destructive shaking (Wijaya et al., 2018). The scientific concept underlying this phenomenon comes from Plate Tectonics Theory, which explains that the Earth's surface is composed of large plates that are constantly moving. When two plates push against or slide past each other, the pressure accumulated between them is released in the form of seismic vibrations. These vibrations can cause physical damage, economic losses, and even casualties, especially in densely populated areas (National Disaster Management Agency, 2023). Disaster preparedness involves a comprehensive understanding of potential risks, sources of hazards, as well as the steps that need to be taken in facing emergency situations (Nafiati, 2021a). In this context, knowledge plays an important role as a fundamental element in Bloom's Taxonomy, as it serves as the starting point in a structured learning process. This process allows a person to develop thinking abilities, from basic levels such as remembrance, up to higher-level thinking higher levels such as creating. (Anderson and Krathwohl, 2001)

In summary, knowledge serves as the main foundation in Bloom's Taxonomy, as it becomes the starting point for a structured and tiered learning process (Anderson and Krathwohl, 2001). This allows individuals to develop from simple thinking skills such as remembering, to complex abilities such as creating. Therefore, in the design of training or curriculum, strengthening knowledge in a directed and systematic way is very important to support the effectiveness of learning and the achievement of educational goals (Nafiati, 2021a).

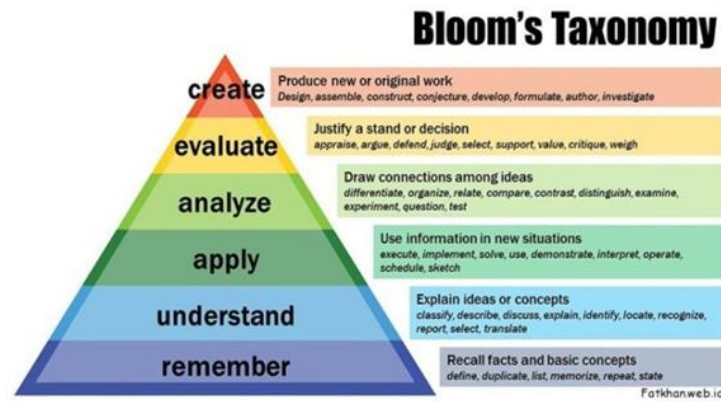


Fig 1. .Diagram Taksonomy Bloom

Source : <https://pendidikan-fisika.fmipa.unesa.ac.id>

Next, in 2001, Bloom's Taxonomy was refined by Anderson and Krathwohl, who revised the cognitive structure into a more dynamic form that aligns with contemporary times (Anderson and Krathwohl, 2001). This revision is known as the Revised Bloom's Taxonomy, which adopts verb forms and organizes thinking categories.

Geographical and Tectonic Location of Palu City

Palu City is located in Central Sulawesi, Indonesia, situated in the Palu Bay area, which is a low coastal plain surrounded by mountains, geographically positioned between $0^{\circ}54'-1^{\circ}18' \text{ S}$ and $119^{\circ}45'-121^{\circ}45' \text{ E}$. This geographical location places Palu at the convergence of three active tectonic plates, namely the Indo-Australian Plate, the Eurasian Plate, and the Pacific Plate, making this area highly susceptible to tectonic activity. Tectonically, Palu City lies directly on the Palu-Koro Fault, one of the longest active onshore faults in Indonesia, stretching approximately 300 km from Palu Bay to Matano. This fault is a highly dangerous strike-slip fault and is the main trigger of various major earthquakes in the region (Wiwin C Nuraedah, 2022).

Characteristics of Earthquake and Tsunami Risks in Palu

The city of Palu has a high risk level for earthquakes and tsunamis. This is due to the presence of the active Palu-Koro Fault and the potential for tsunamis originating from earthquake activity along this fault. Based on disaster risk assessments, the city of Palu is included in a high-risk zone for earthquakes, tsunamis, liquefaction, landslides, and other hydrometeorological disasters (Wiwin & Nuraedah, 2022).

Case Study of the 2018 Palu Earthquake and its Impacts

A 7.5 Mw earthquake struck the Palu and Donggala regions on September 28, 2018, followed by a tsunami that hit the coast of Palu Bay. This earthquake occurred due to strike-slip fault activity along the Palu-Koro Fault. The fault movement mechanism caused the upper fault block to move downward to the north, while the lower block moved upward.

Research Conceptual Framework

The conceptual framework in this study is designed to determine the effectiveness of earthquake disaster training on knowledge & attitudes, behavior, and length of service of employees at Maxima Clinical Laboratory in Palu City, Central Sulawesi Province, which can be described as follows:

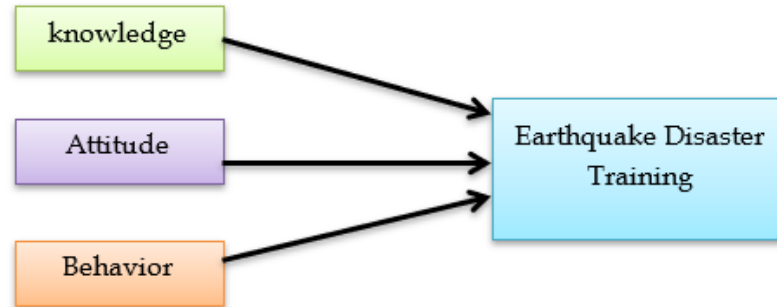


Figure 2. Conceptual Framework

METHODOLOGY

Primary Data

Primary data is data obtained directly from the first source through direct interaction with respondents. In this study, primary data was obtained from employees of Maxima Clinical Laboratory in Palu City who participated in earthquake disaster training. The data collection technique was carried out by distributing pretest and posttest questionnaires to measure the employees' level of preparedness before and after the training. In addition, data were also collected through semi-structured interviews to explore employees' perceptions and attitudes toward the training provided.

Secondary Data

Secondary data is data obtained from sources that are already available. In this study, secondary data was obtained from internal documents of Maxima Clinical Laboratory, such as the number of employees, organizational structure, and reports of previous training activities. In addition, secondary data was also obtained from scientific literature, journals, textbooks, government regulations related to disaster management and Occupational Health and Safety (OHS), as well as other relevant sources to support the analysis and discussion of the research.

Population

The population in this study includes all employees working at Maxima Clinical Laboratory in Palu City, Central Sulawesi. This population includes healthcare personnel such as laboratory analysts, nurses, radiographers, administrative staff, and other supporting staff who were actively working during the research period, from August to November 2025. The total number of registered population was 34 people. (Maxima, 2024)

Research Sample

The samples in this study were taken using the total sampling technique, meaning that all members of the population were used as samples due to their relatively small number and the feasibility of studying them comprehensively.

Thus, the number of samples in this study was 34 employees of Maxima Clinical Laboratory who met the inclusion criteria. (Maxima, 2024)

Data Analysis Method

Univariate Data

Univariate analysis was used to determine the frequency distribution of the independent variables, namely knowledge, attitude, and behavior of Maxima Clinical Laboratory employees before and after training, while the dependent variable observed was the effectiveness of the earthquake disaster training itself.

Statistical Test Procedure

Initial Data Processing

The data collected in this study include the knowledge, attitude, and behavior scores of healthcare workers before (pre-test) and after (post-test) earthquake disaster training. Furthermore, the data were coded, entered into a statistical program, and went through a cleaning process to ensure there were no duplicates or missing data.

Assumption Testing/Statistical Prerequisite Testing

Normality tests were used to determine whether the pre-test and post-test data followed a normal distribution pattern.

If the sample size is less than 50 respondents, the Shapiro-Wilk test is used.

If the sample size reaches 50 respondents or more, the Kolmogorov-Smirnov test is used.

Data are considered normally distributed if the Significance (Sig.) value > 0.05 .

RESULT AND DISCUSSION

Normality Test

Knowledge

Table 2. Results of the Behavior Normality Test

	Test Of Normality		
	Spahiro-Wilk		
	Statistic	Df	Sig.
Pretest Pengetahuan	.965	34	.339
Posttest Pengetahuan	.877	34	.001

Sumber : Data Primer,2025.

The results of the normality test for the Pretest Knowledge variable showed a p-value of 0.339. This value is greater than the significance level $\alpha = 0.05$. Therefore, it can be concluded that the Pretest Knowledge data is normally distributed. This means there is no significant deviation between the pretest data distribution and the theoretical normal distribution. The normality of the pretest data indicates that before the intervention was given, the participants' knowledge data had a homogeneous distribution and was within a reasonable range.

Attitude

The results of the normality test for behavior can be seen in Table 4.11 below.

Table 3. Normality Test for Attitude
Spahiro-Wilk

	Statistic	Df	Sig.
Pretest Sikap	.941	34	.068
Posttest Sikap	.762	34	.000

The Results of the Normality Test for the Pretest

Knowledge variable showed a p-value of 0.339. This value is greater than the significance level $\alpha = 0.05$. Therefore, it can be concluded that the Pretest Knowledge data is normally distributed. This means there is no significant deviation between the pretest data distribution and the theoretical normal distribution. The normality of the pretest data indicates that before the intervention was given, the participants' knowledge data had a homogeneous distribution and was within a reasonable range.

Attitude The results of the normality test for behavior can be seen in Table 4.11 below.

Table 4. Normality Test for Attitude

No	variable	Statistic	DF	Sig
1	Behavior Pretest	.823	34	.00
2	Behavior Posttest	.781	34	.00

Based on the results of the normality test using the Shapiro-Wilk test, the significance value (Sig.) for the Pretest behavior variable was 0.000, and for the Posttest behavior variable was 0.000. Based on these results, it is known that the significance values for both variables (pretest and posttest) are less than 0.05, namely 0.000 and 0.000. Thus, it can be concluded that the pretest and posttest knowledge data are not normally distributed.

Discussion of Characteristics

Gender

Research data shows that the number of respondents in this study was 34 people, with a gender composition dominated by females, totaling 22 people (64.7%), while male respondents numbered 12 (35.3%). This proportion confirms that women constitute the largest group in the study sample.

Age Group

Based on age categories, the distribution of respondents shows that most of the study participants are in the young age group. Out of the total 34 respondents, the 20-28 years age group is the dominant group, totaling 24 people with a percentage of 71%. This indicates that the majority of the workforce in the clinical laboratory involved in the study is in the early productive age phase,

which generally has a good level of adaptability and responsiveness to training as well as learning related to disaster preparedness.

The age group of 29-37 years consists of 9 people, representing 26%, indicating that some of the respondents are in the early to mid-adulthood period, which usually have more established work experience compared to younger age groups. This age group contributes to the diversity of experience and understanding in handling safety and occupational health (K3) aspects in the laboratory environment.

Furthermore, for the age groups of 38-46 years, 47-55 years, and 56-64 years, there were no respondents at all in this study. The absence of respondents in these age groups may reflect the characteristics of the workforce distribution in the Maxima clinical laboratory, which tends to recruit younger or early productive-age workers.

Overall, this age distribution pattern indicates that the laboratory workforce who participated in the study is dominated by the young to early adult age group. This composition has the potential to influence research outcomes, particularly regarding adaptability, the speed of understanding training materials, and preparedness in facing earthquake disasters, considering that younger individuals are generally more responsive to intensive and practical-based training.

Last Education

The distribution of respondents' educational levels in this study shows a fairly diverse range of educational backgrounds among the participants. Out of a total of 34 respondents, the majority had a Diploma 3 (D3) level, amounting to 12 people (35%). This proportion indicates that healthcare workers with D3 qualifications are the largest group involved in the study, reflecting a common pattern in the structure of clinical laboratory personnel in Indonesia, where D3 graduates in Health Analysis or Medical Laboratory Technology often occupy operational technical positions in healthcare facilities.

Overall, this variation in education levels indicates that the clinical laboratory has a heterogeneous workforce, ranging from personnel with secondary education to postgraduate degrees. This diversity can contribute to the operational dynamics and the quality of disaster preparedness training implementation, as each level of education brings different perspectives, experiences, and capacities for information absorption. This distribution of education is also important to consider in training effectiveness analysis, given that education level can influence how individuals understand the material, respond to instructions, and implement occupational health and safety procedures and disaster preparedness in the laboratory.

Length of Service

Length of service or tenure refers to the duration an employee has worked at a company. The longer the tenure, the greater the experience, practical knowledge, and adaptation to the work environment (Adiwijaya, 2020). In the context of disaster preparedness in clinical laboratories, the duration of work allows employees to have mastered Safety SOPs, evacuation routes, the use of emergency tools, as well as disaster response knowledge, which can distinguish between new and experienced employees (Adiwijaya, 2020; Gagliardi et al.,

2021). Overall, the distribution results show that the majority of respondents have sufficient work experience to understand the context of disaster preparedness training. This has the potential to support improving training effectiveness, as more experienced participants usually have better mental readiness, technical skills, and situational understanding in facing potential emergencies such as earthquakes.

Education Field

Based on the research results, the majority of respondents have an educational background in health. Out of a total of 34 respondents, 23 people (67.6%) come from health education. This finding indicates that most of the training participants are personnel with basic knowledge related to health services, laboratory work procedures, and fundamental principles of workplace safety. This provides an advantage in the context of disaster preparedness training, as participants with a health education background generally already have an initial understanding of risks, hazard control, and the importance of implementing occupational health and safety in laboratory activities.

Overall, these findings indicate that the majority of training participants come from disciplines relevant to healthcare services. This condition supports the expectation that earthquake disaster preparedness training can be more effective, considering that most participants already have a sufficient knowledge base regarding safety procedures and risk management in laboratory settings.

Earthquake Disaster Training

Based on the history of participation in disaster preparedness training, most respondents were found to have never attended such training before. Out of a total of 34 respondents, 22 people (64.7%) stated that they had never attended earthquake disaster-related training. Meanwhile, only 12 respondents (35.3%) reported that they had previously participated in similar training.

These findings indicate that most training participants neither have experience nor formal knowledge related to disaster preparedness. This condition shows a capacity gap in terms of basic understanding and skills to face earthquakes in the workplace. The effectiveness of earthquake disaster training on knowledge is the result of the human sensing process of an object through the senses, thereby generating understanding, information, and memory stored in a person's cognition (Notoatmodjo, 2012). A negative Z value indicates that score improvements consistently occurred among the majority of respondents. This suggests that the training material is easy to understand, relevant, and effective in enhancing participants' understanding (BNPB, 2017). These findings are also in line with behavior change theory, which states that an increase in knowledge is the first step in developing a person's disaster preparedness. (Notoatmodjo, 2014).

Overall, the research results indicate that earthquake disaster training at the Clinical Laboratory is effective in increasing participants' knowledge, both statistically and in terms of material content, thus it can be stated that the training interventions successfully achieved their goals.

Effectiveness of Earthquake Disaster Training on Attitudes

Attitude is one of the important components in disaster preparedness because it reflects an individual's tendency to accept, reject, support, or oppose a particular object or situation. In the context of earthquake preparedness, attitude includes beliefs, motivation, concern, and the individual's psychological readiness to act according to safety procedures when facing an emergency. Therefore, enhancing positive attitudes becomes one of the main objectives of earthquake disaster training.

Thus, it can be concluded that the earthquake disaster training provided at the Clinical Laboratory is effective in improving participants' preparedness attitudes. This improvement not only demonstrates the success of the intervention in increasing knowledge, but also reflects important psychological changes that support readiness to act when facing earthquake risks.

Effectiveness of Earthquake Disaster Training on Behavior

Behavior is a form of response or observable action of a person that can be measured as a result of the learning process, both in terms of knowledge and attitude (Notoatmodjo, 2012). In the context of earthquake disaster preparedness, behavior reflects an individual's ability to apply safety actions, follow evacuation procedures, and demonstrate readiness to face emergency situations. According to Bloom (1956), behavior falls within the psychomotor domain, which is the ability of a person to apply knowledge and attitudes into action real actions. The results of the normality test using the Shapiro-Wilk test showed that the significance value for both the Behavioral Pretest and the Behavioral Posttest was 0.000, which is less than $\alpha = 0.05$. Based on these criteria, the behavioral data at both measurement stages are considered not normally distributed. This abnormality may occur due to a significant increase in behavioral scores after the intervention, causing the scores to cluster at the upper values (ceiling effect), resulting in an asymmetrical distribution (Sugiyono, 2019).

Because the data are not normally distributed, the analysis of behavioral differences before and after training was conducted using a non-parametric approach. The Wilcoxon test showed a Z value = -4.633 with $p = 0.000$, which means there is a significant difference between pretest and posttest behaviors. The p-value being far below the significance threshold of $\alpha = 0.05$ indicates that the training has a strong effect on improving participants' behavior. The negative sign on the Z value indicates that most respondents experienced an increase in behavior scores after attending the training.

Thus, the improvement in behavior after training shows that the program provided is effective in enhancing action-based preparedness, which is the main goal of disaster training.

Overall, the analysis results show that behavioral variables experienced a significant increase after the intervention. Earthquake disaster training at the Clinical Laboratory was proven effective in improving participants' preparedness behavior, in accordance with learning theory and applicable disaster preparedness guidelines (BNPB, 2017; WHO, 2013).

CONCLUSIONS

Based on the research results entitled "The Effectiveness of Earthquake Disaster Training on the Preparedness of Maxima Clinical Laboratory Employees in Palu City, Central Sulawesi," several conclusions can be drawn as follows:

a. The Effectiveness of Earthquake Disaster Training on the Knowledge of Maxima Clinical Laboratory Employees

Since the posttest data were not normally distributed, the analysis of differences between pretest and posttest was conducted using the non-parametric Wilcoxon Signed Rank Test. The test results showed a Z value of -5.116 with $p = 0.000$, which means there is a significant difference between the knowledge scores before and after the earthquake disaster training.

A very small p-value ($p < 0.05$) confirms that the training provided had a real impact on improving the knowledge of Maxima Clinical Laboratory staff. The negative sign on the Z value indicates that posttest knowledge scores were consistently higher compared to pretest scores.

Overall, earthquake disaster training has proven effective in increasing the knowledge of Maxima Clinical Laboratory staff. This improvement is demonstrated by the significant difference between pretest and posttest scores as well as the consistent score increase among most participants. This increased knowledge serves as a crucial initial foundation for developing the preparedness attitudes and behaviors of staff when facing potential earthquake disasters in the workplace.

b. Effectiveness of Earthquake Disaster Training on the Attitudes of Maxima Clinical Laboratory Employees

The analysis of the training's effectiveness on attitudes was conducted using the Wilcoxon Signed Rank Test because the attitude data were not normally distributed and paired measurements (pretest-posttest) were used. The test results showed a Z value of -4.868 with $p = 0.000$. A p-value much smaller than $\alpha = 0.05$ indicates that there is a significant difference between attitudes before and after the training.

The negative sign on the Z value indicates that the attitude score on the posttest is higher compared to the pretest. Thus, the earthquake disaster training significantly succeeded in increasing the positive attitudes of Maxima Clinical Laboratory employees toward disaster preparedness. The improvement in positive attitudes is an important indicator of the success of training. This is because attitudes form the basis of respondents' motivation to behave according to safety procedures. In health behavior theory, attitude is an important predictor of action (Notoatmodjo, 2014). A person's attitude will shape their intention to act and ultimately determine their actual actions in facing disaster risks.

Earthquake disaster training at Maxima Clinical Laboratory has been proven to provide understanding that not only enhances knowledge but also influences employees' emotional and evaluative responses toward the importance of workplace safety preparedness. Based on the results of statistical tests and theoretical interpretation, it can be concluded that earthquake disaster training is effective in improving the attitudes of Maxima Clinical Laboratory employees. The increased positive attitude after the training shows that

participants not only receive information but also believe in the importance of preparedness and are willing to apply safety principles in their daily work.

c. The Effectiveness of Earthquake Disaster Training on the Behavior of Maxima Clinical Laboratory Employees

To test the differences in behavior before and after training, the Wilcoxon Signed Rank Test was used. The test results showed a Z value of -4.633 with $p = 0.000$, which means there is a significant difference between employees' behavior before and after the training. The very small p value indicates the strong effect of the intervention on behavior change. The negative sign on the Z value indicates that the behavior scores in the posttest were consistently higher than those in the pretest. In other words, most respondents experienced an increase in positive behavior after participating in earthquake disaster training. This significant improvement in behavior indicates that earthquake disaster training not only enhances employees' knowledge and attitudes, but also successfully promoted changes in the psychomotor domain, namely real actions and practical skills. Participants became more disciplined in following safety protocols, better understood evacuation steps, and demonstrated readiness to face emergency situations at the workplace.

Based on the results of statistical analysis and theoretical interpretation, it can be concluded that earthquake disaster training is highly effective in improving the behavior of employees at Maxima Clinical Laboratory. This improvement in behavior is evident from:

- Significant differences between pretest and posttest behavior
- Consistently higher posttest scores
- Better implementation of safety measures after training
- Increased preparedness of employees in facing potential earthquakes

Thus, the training successfully achieved its main objective, which is to enhance employees' ability to respond to disasters quickly, accurately, and safely.

RECOMMENDATIONS

Based on research results showing that earthquake disaster training has a significant impact on improving the knowledge, attitudes, and behaviors of Maxima Clinical Laboratory employees, the researcher offers the following suggestions: Conduct earthquake preparedness training regularly, at least once a year, to ensure employees' skills remain sharp and aligned with the latest safety standards. Integrate disaster preparedness materials into the orientation program for new employees, so that all employees have a basic understanding from the start of joining.

FURTHER STUDY

This research still has limitations so that further research is needed on the topic of The Effectiveness of Earthquake Disaster Training on Employee Preparedness in order to perfect the research and increase insight for readers and writers.

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