



Effectiveness of Occupational Safety and Health Training on the Knowledge and Attitudes of Health Officers at the Pasangkayu 2 Community Health Center in Pasangkayu District

Nurhidayah^{1*}, Lusia Salmawati², Muthia Aryuni³

¹Master's Program Students, Public Health Study Program, Master's Program, Faculty of Public Health, Tadulako University

²Public Health Study Program. Faculty of Public Health, Tadulako University

³Faculty of Public Medicine, Tadulako University

Corresponding Author: Nurhidayah nurhidayahnurhidayah900@gmail.com

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ABSTRACT

According to the National Safety Council, the incidence of accidents in the healthcare sector is 41% higher than in other industries. Furthermore, Nuruddin stated that 80-85% of workplace accidents are generally caused by unsafe behavior. Globally, of the 39 million healthcare workers, approximately 3 million are exposed to blood-borne pathogens, with over 90% of cases occurring in developing countries. This study aims to determine the effectiveness of Occupational Safety and Health (K3) training on the knowledge, attitudes, and behavior of health workers at the Pasangkayu 2 Community Health Center (UPT Puskesmas) in Pasangkayu Regency. This type of research is quantitative with a quasi-experimental design using the Untreated Control Group Design with Pretest and Posttest. The sample in this study amounted to 30 health workers selected by purposive sampling. Data collection was carried out through questionnaires before and after training. The results of the study showed a significant increase between before and after training in the knowledge ($p = 0.000$) and attitude ($p = 0.001$) variables. This indicates that K3 training is effective in improving cognitive abilities, forming positive attitudes, and improving safe work behavior of health workers at the Pasangkayu 2 Community Health Center (UPT Puskesmas). It is hoped that the results of this study can be a basis for the management of the Community Health Center and the Health Office to carry out K3 training on an ongoing basis as a form of preventive effort against work accidents and improving safety culture in the workplace

INTRODUCTION

The International Labour Organization (ILO) estimates that around 2.3 million women and men worldwide die each year from work-related accidents or diseases. This is equivalent to more than 6,000 deaths every day. It is also estimated that there are approximately 340 million work-related accidents and 160 million cases of work-related diseases annually worldwide (Situngkir et al., 2021). ILO data shows that global cases of occupational accidents and diseases amount to 430 million per year, consisting of 270 million work-related accidents (62.8%) and 160 million work-related diseases (37.2%), with 40% involving young workers. Fatalities from work-related accidents account for 14%, while fatalities from work-related diseases account for 86%, resulting in economic losses of up to 4% of GDP. According to global ILO data on the cost of compensation for work accidents and work-related illnesses, these include musculoskeletal diseases (40%), heart and vascular diseases (16%), accidents (14%), respiratory diseases (9%), central nervous system disorders (8%), mental disorders (7%), tumors (3%), and skin diseases (3%). (Aisah Amini & Susilawati, 2023) BPJS Ketenagakerjaan (2022) recorded an increase in the number of work-related deaths in Indonesia, from 30,094 in 2020 to 104,769 in 2021, while work accident claims rose from 221,740 (2020) to 234,370. Meanwhile, according to the 2022 Indonesian OSH Profile report (Kemnaker, 2022), the fatality rate for work accidents and work-related deaths reached 21.37% per 100,000 workers in 2021, up from the previous year's 11.12% (2020) and 13.07% (2019). (Susanti et al., 2024). In 2023, BPJS Ketenagakerjaan Riau reported that the number of work accident claims increased from 7,900 people in 2022 to 11,200 people in 2023 (Susanti et al., 2024). Occupational Health and Safety (OHS) is one of the important aspects in the workplace aimed at ensuring safe, healthy, and comfortable working conditions for employees. In healthcare settings, especially at primary healthcare facilities such as Community Health Centers (Puskesmas), the implementation of OHS principles is very important considering the high potential exposure to risks that can have adverse effects on healthcare workers, patients, and the surrounding environment (Manurung, 2020).

Community health centers have potential hazards that significantly affect healthcare workers, patients, visitors, and the surrounding community. Hazard potentials include physical, chemical, biological, ergonomic, and psychosocial factors. Biological hazards are one of the most common hazards that can cause health disorders in community health centers (Salsamila et al., 2024). Occupational Health and Safety (OHS) training is one of the strategic efforts to improve the competence of healthcare workers in terms of understanding, attitudes, and behaviors related to workplace safety. This training aims not only to transfer knowledge but also to shape a mindset and work habits that are safe and responsible (Ruddin, 2023). This aligns with research findings (Cakraningrum et al., 2023) which show that there is a relationship between occupational health and safety knowledge and attitudes with unsafe actions, or actions taken by workers that can lead to accidents.

However, it was found that the implementation of occupational health and safety (OHS) has not been running optimally. Most healthcare workers reported having experienced or nearly experienced work-related accidents, such as needle sticks, slipping, or exposure to blood, with incident rates reaching more than half of the respondents at both community health centers. In addition, there are still staff members who do not fully understand OHS procedures, and compliance with the use of personal protective equipment (PPE) is also inconsistent. This situation is exacerbated by the limited availability of OHS facilities, such as safety boxes, handwashing stations, and PPE, which are not always available. Observations also show that the majority of staff have not attended OHS training in the past two years, although almost all respondents stated that training would help them work more safely and efficiently, and they would receive full support from community health center leaders. These facts indicate a gap between the needs and the implementation of OHS. It also emphasizes the urgency of conducting occupational health and safety (OHS) training to improve the knowledge and attitudes of health workers in Pasangkayu Regency. Research conducted by Yunus (2019) in his thesis at Dr. Sardjito General Hospital found that participation in OHS training, work duration, and the relevance of training materials contributed 16.1% to nurses' awareness in identifying workplace hazards. Cakraningrum et al. (2023) confirmed a strong correlation between OHS knowledge and attitudes and unsafe actions among workshop mechanics ($p = 0.000$), indicating the importance of cognitive aspects in shaping a safety culture.

Thus, this study is important to conduct as an initial step in strengthening the OSH culture in primary healthcare facilities, as well as a preventive effort to reduce occupational accidents, improve service quality, and protect the safety of healthcare workers as the main asset in the national health system.

Problem Formulation

1. Is there a difference in the knowledge and attitude scores regarding Occupational Safety and Health (OSH) between the experimental group and the control group?
2. Is there a difference between the pretest and posttest scores of knowledge and attitude regarding Occupational Safety and Health (OSH) in the experimental group?

General Research Objective

The specific objectives of this research are as follows:

Research Objective

To analyze the effectiveness of Occupational Health and Safety Training on the knowledge and attitudes of health workers in the experimental and control groups.

Specific Objectives

The specific objectives of this research are as follows:

1. To analyze the effect of differences in Occupational Health and Safety (OHS) knowledge and attitude scores between the experimental and control groups.

2. To analyze the effect of differences between pretest and posttest scores of Occupational Health and Safety (OHS) knowledge and attitudes in the experimental group.

Theoretical Benefits

This research is expected to add to the scientific knowledge in the field of Occupational Health and Safety (OHS), particularly in the primary healthcare service sector such as community health centers. In addition, the results of this study can also contribute to the development of behavioral intervention theory in the context of occupational safety promotion, especially those focusing on changes in the knowledge, attitudes, and behaviors of healthcare workers.

LITERATURE RIVIEW

Theoretical Review

Knowledge Measurement Knowledge can be measured through interviews or questionnaires that ask about the content of the material to be measured from the research subjects or respondents (Notoadmodjo, 2010). The questions that can be used to measure knowledge generally can be divided into two types: subjective questions, such as essay-type questions, and objective questions, such as multiple-choice questions, true-false questions, and matching questions. One way to measure knowledge is by providing The questions are then evaluated with a score of 1 for correct answers and 0 for incorrect answers. The assessment is carried out by comparing the expected score (highest) and then multiplying it by 100% to obtain a percentage, which is then categorized into 3 categories. According to Notoadmojo (2018), the measurement of a person's knowledge level is divided into three levels based on the percentage score as follows:

- a) Good knowledge level, if the score is $> 76 - 100\%$
- b) Sufficient knowledge level, if the score is $56 - 75\%$
- c) Poor knowledge level, if the score is $< 56\%$

Occupational Health and Safety Knowledge

K3 knowledge is the ability to know and obtain information related to occupational health and safety acquired through visual and auditory experiences. In general, knowledge about K3 is very broad, but there are several K3 components considered important to serve as a benchmark for K3 understanding. These components are the Definition and Initiation of K3, K3 Management System (SMK3), Personal Protective Equipment (PPE), K3 Facilities and Infrastructure, and K3 Risks (Suartana et al., 2021).

Knowledge of Occupational Safety and Health (OSH) for healthcare workers is a comprehensive understanding of the principles, procedures, and practices designed to protect the safety and health of medical personnel while working in a high-risk environment. (Alfidyani & Lestantyo, 2020) explain that OSH knowledge includes recognition of potential hazards, the use of personal protective equipment (PPE), as well as preventive measures that must be taken to avoid workplace accidents and occupational diseases. This knowledge is an important foundation in building a strong safety culture within healthcare institutions.

OSH Attitude

Attitudes in the realm of Occupational Safety and Health (OSH) are psychological and behavioral reactions of a person towards safety aspects, which include beliefs, feelings, and tendencies to act in work situations. OSH attitudes reflect workers' concern for the importance of safety in the workplace as well as their level of commitment in consistently following OSH procedures and regulations. (Nurcahyono & Hartono, 2021) stated that OSH attitudes are mental dispositions formed from knowledge, experience, and individual values related to workplace safety, which serve as the main drivers of safe work behavior. This attitude is very crucial because it influences compliance and the effectiveness of OSH implementation in the work environment.

K3 attitudes generally consist of three main components, namely cognitive, affective, and conative. The cognitive component relates to a person's knowledge and beliefs about K3, such as understanding the risks and the importance of preventive actions. The affective element involves feelings or emotions related to workplace safety, for example, fear of hazards or concern for one's own well-being and that of colleagues. Meanwhile, the conative element is related to the tendency of behavior or the intention to act according to K3 principles, such as consistently using personal protective equipment and adhering to safety procedures (Setiawan et al., 2020).

Research by (Wulandari & Putra, 2022) found that a positive attitude towards OHS (Occupational Health and Safety) is correlated with a decrease in workplace accidents and an increase in productivity. The study highlighted the importance of educational and training interventions that not only provide technical knowledge but also foster a proactive mental attitude towards workplace safety. A good attitude encourages workers to actively identify potential hazards and report unsafe working conditions. Conversely, a negative or apathetic attitude towards OHS can increase the risk of accidents and the failure to implement OHS measures.

Occupational Health and Safety (OHS) Training

Occupational Health and Safety (OHS) training is an activity in which workers gain knowledge about workplace hazards, acquire new skills, and are educated to face potential dangers so that they behave safely and are aware of safety conditions at work, as well as being able to maintain safe behavior in the work environment (Alayyannur, 2018).

Occupational Health and Safety (OHS) training is an activity in which workers gain knowledge about workplace hazards, acquire new skills, and are educated to face potential dangers so that they behave safely and are aware of safety conditions at work, as well as being able to maintain safe behavior in the work environment (Ayu et al., 2019).

Purpose and Benefits of OHS Training for Health Officers

Occupational Safety and Health (OSH) is a very important aspect of healthcare services, especially in primary healthcare facilities such as community health centers (puskesmas). OSH in puskesmas aims to protect healthcare workers, patients, and the community from various work-related risks that can compromise safety and health. The importance of regular OSH training and in-

depth knowledge of occupational risks in the health sector is a key factor in ensuring the safety of healthcare workers. Better management of medical waste as well as the provision of adequate facilities for the storage of hazardous materials should also be a primary focus to reduce the potential for accidents or exposure to hazardous substances that could harm healthcare workers (Amanda & Ayu, 2025).

The Role of Training in Enhancing Knowledge and Attitudes

Training is an effective method to enhance a person's knowledge, attitude, and behavior in various situations, including in the workplace. Through training, participants not only gain theory and information but also the opportunity to develop the necessary skills, resulting in tangible changes in these three aspects. (Wibowo & Utami, 2023) state that the increase in knowledge from training becomes an important foundation in shaping a positive attitude towards tasks or policies, which then encourages desired behavior changes in the work environment. Behavioral changes as a result of training become an indicator of the program's success. (Hasanah et al., 2022) explain that training with interactive methods, such as simulations and case studies, able to internalize knowledge and attitudes into consistent and responsible behavior. Training evaluation, which includes direct observation and feedback from participants, is important to ensure the effectiveness of learning transfer and support continuous training. Additionally, integrating training with the reinforcement of organizational culture and management support will accelerate the formation of positive behavioral changes collectively.

Research Conceptual Framework

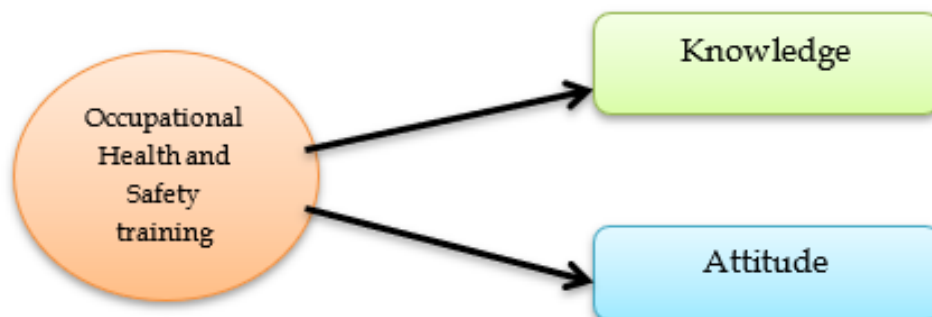


Figure 1. Research Hypothesis

1. There is an effect of Occupational Health and Safety training on the Occupational Health and Safety knowledge of healthcare workers at Pasangkayu 2 Health Center, Pasangkayu Regency.
2. There is an effect of Occupational Health and Safety training on the OHS attitude of healthcare workers at Pasangkayu 2 Health Center, Pasangkayu Regency.

METHODOLOGY

Research Design

This study used a quasi-experimental design with the Untreated Control Group Design with Pretest and Posttest model. This design was chosen to examine the effectiveness of the treatment given by comparing the changes that occur in the experimental group and the control group. In this study, the experimental group consisted of participants who underwent Occupational Health and Safety (OHS) training, while the control group did not receive any treatment. The use of a control group is important so that the researcher can ensure that changes in the dependent variable are truly caused by the treatment given, not by other factors outside the study (Shaughnessy, Zechmeister, & Zechmeister, 2007). Before the treatment was administered, both groups were first measured for their initial ability through an OHS knowledge test and an OHS attitude scale. The same measurements were conducted again after the treatment was given to the experimental group. Thus, the researcher can observe the differences in scores before and after the treatment within each group, as well as compare these changes between the experimental group and the control group.

Research Location and Time

This study was conducted at Pasangkayu 2 Health Center as the experimental group and Bambalamotu Health Center as the control group in August 2025. The research period was measured from the administration of the pre-test (before the experiment was conducted) to the post-test (after the experiment was conducted). This study was carried out over 4 weeks from August to September 2025.

Population and Sample

Population

Population is the entirety of objects or individuals that are the focus of the research. In this study, the population consisted of all healthcare workers working at Bambalamotu and Pasangkayu 2 Health Centers, Pasangkayu Regency, totaling 135 workers, consisting of 79 workers at Bambalamotu Health Center and 56 workers at Pasangkayu 2 Health Center.

Sample

The sampling in this study is based on the K3 training module in Health Facilities (Ministry of Health RI and GERMAS, 2019), with the training materials to be provided according to Ministry of Health Regulation No. 52 of 2018 regarding K3 in Health Facilities, totaling 30 people.

Sampling Technique

The sampling technique in this study used the Non-Probability Sampling method, specifically Purposive Sampling. One form of non-probability sampling is purposive sampling, which is a method of selecting samples based on certain considerations or objectives determined by the researcher. In other words, respondents are deliberately chosen because they possess characteristics or information that are most relevant to the focus of the study. The sample criteria used in this study are determined by inclusion and exclusion criteria. Inclusion Criteria a) Health workers who are actively serving at Bambalamotu Health

Center and Pasangkayu 2 Health Center in Pasangkayu Regency. b) Have held a position or placement in the health center for at least 1 month before the intervention. c) Willing to follow the entire series of occupational health and safety (OHS) training and willing to be respondents in this study. Exclusion Criteria a) Health workers who are not actively working during the study period (for example long leave, illness, or work). a) Officers who refuse or are unwilling to attend occupational health and safety (K3) training or to fill out the research instruments. Research Variables This study consists of two types of variables, namely independent (free) and dependent (bound) variables. The determination of variables is based on the quasi-experimental research design used, namely the Pretest-Posttest Control Group Design, with the main focus on assessing the effectiveness of Occupational Health and Safety (K3) training on changes in knowledge and attitudes of health workers at the Community Health Center.

Independent Variable

The independent variable in this study is Occupational Health and Safety (OHS) Training, which is the treatment (intervention) given to the experimental group. The training is conducted using lectures, discussions, and simulations, as explained in the research design and training instruments. The treatment is only given to Pasangkayu 2 Health Center as the experimental group, while Bambalamotu Health Center does not receive the treatment as the control group. The OHS training functions as a stimulus expected to enhance cognitive understanding and shape positive attitudes towards OHS implementation.

Dependent Variables

The dependent variables in this study consist of two main variables that are impacted by the OHS training treatment, namely:

1. Occupational Health and Safety (OHS) Knowledge

OHS knowledge is the level of understanding of health workers regarding concepts, risks, safety procedures, use of personal protective equipment (PPE), standard precautions, and accident prevention actions.

Sikap Kesehatan dan Keselamatan Kerja (K3)

K3 attitude is the tendency of feelings, judgments, and readiness to act of healthcare workers towards the implementation of K3 principles in the work environment. This attitude includes aspects of belief, awareness, willingness to comply with procedures, and readiness to behave safely.

Data Analysis Method

Data analysis in this study was carried out in stages in accordance with the research objectives and the type of quasi-experimental design used. The initial stage of analysis was conducted using descriptive analysis, which aims to describe the characteristics of respondents and the distribution of research variable data. Descriptive analysis includes calculating means, standard deviations, minimum and maximum values for the variables of knowledge and Occupational Health and Safety (K3) attitudes, both in the experimental group and

control group, as well as in the pretest and posttest measurements.

Furthermore, to address the research objective related to the difference in scores before and after the intervention in the experimental group, a Paired Sample t-test was used. This test was chosen because the data came from the same group

measured twice, namely before (pretest) and after (posttest) the occupational safety and health (K3) training. The use of the Paired Sample t-test aims to determine whether there is a statistically significant difference between pretest and posttest scores on K3 knowledge and attitude variables. The basis for decision making is done by comparing the significance value (p-value) with the significance level of 0.05. If the Sig. value < 0.05, it can be concluded that there is a significant difference.

RESULT

The following table presents the frequency distribution and percentage of respondents in the experimental group and the control group based on age, gender, participation in K3 Training, Work Accidents, and Work-Related Diseases.

Table 1. Description of the Experimental Group Respondents Based on Age

Category	Index	Frequency	Percentage (%)
Age	21-31	15	50
	32-45	15	50
Total		30	100

Source: Primary Data, 2025

Based on the results of the frequency distribution analysis, the respondents in the experimental group by age in this study were equally divided between men and women, with 15 (50%) people aged 21-31 and 15 (50%) people aged 32-45.

The data analysis in this study was carried out in stages according to the research objectives and the type of quasi-experimental design used. The initial stage of analysis was conducted using descriptive analysis, which aimed to describe the characteristics of the respondents and the distribution of the research variable data. Descriptive analysis included calculations of the mean, standard deviation, minimum and maximum values for the variables of knowledge and attitudes toward Occupational Health and Safety (OHS), both in the experimental and control groups, as well as in pretest and posttest

Table 2. Distribution of Respondents in the Experimental Group Based on Participation in OHS Training

Category	index	Frequency	percentage (%)
Occupational Health and Safety Training	Ever	12	40
	Never	18	60
Total		30	100

Source: Primary Data, 2025

Based on the analysis of respondent distribution in the Control group according to Participation in Occupational Health and Safety (OHS) Training, this study is dominated by participants who have never attended OHS training. Out of a total of 30 respondents, 18 people (60%) have never attended OHS training, while only 12 people (40%) have attended OHS Training.

Table 3. Distribution of Respondents in the Experimental Group Based on Work Accidents

Category	index	Frequency	Percentage (%)
Work Accident	Ever	3	10
	never	27	90
Total		30	100

Source: Primary Data, 2025

Based on the analysis results of respondent distribution in the Control group based on Work Accidents in this study, 27 people (90%) never experienced a work accident, while only 3 people (10%) had experienced a work accident.

Table 4. Distribution of Control Group Respondents Based on Work-Related Illnesses

Category	index	Frequency	Percentage (%)
Occupational Diseases	Ever	3	10
	Never	27	90
Total		30	100

Source: Primary Data, 2025

Based on the results of the respondent distribution analysis in the Control group based on Occupational Diseases in this study, it is dominated by participants who have never had an occupational disease. Out of a total of 30 respondents, 27 people (90%) have never had an occupational disease, while only 3 people (10%) have.

Table 5. Description of Control Group Variables Based on OHS Attitudes

variable	Descriptive Statistics	N	Mean	Standard Deviation	Minimum Value	maximum Value
Sikap K3	Pretest	30	34,17	2,730	30	40
	Posttest	30	36,60	3,328	31	40

Source: Primary Data, 2025

In Table 4.2.3.4., for the OHS Attitude variable, the Control group had a pretest mean of 34.17 with a standard deviation of 2.730, a minimum value of 30, and a maximum value of 40. After the posttest measurement, the mean increased to 36.60 with a much smaller standard deviation of 3.328, and a narrower range of values with a minimum of 31 and a maximum of 40.

1. 4.2.4 Pretest and Posttest Scores of Occupational Health and Safety Knowledge and Attitudes in the Experimental Group

Table 6. Paired T-Test of Pretest and Posttest Scores for the OHS Knowledge Variable in the Experimental Group

Test	N	Mean	t Hitung	Sig	Desc	Conclusion
Pretest	30	16,37	-4,266	0,000	Sig. < 0,05	Significantly Different
Posttest	30	19,87				

Source: Primary Data, 2025

Based on Table 4.4, the results of the Paired Sample t-test on the experimental group show that for the OHS knowledge variable, the pretest mean score is 16.37. The t-test result is -4.266 with a significance value (Sig) of 0.000, which is less than 0.05 (Sig. < 0.05). Based on the testing criteria, a significance value less than 0.05 indicates that there is a statistically significant difference between the pretest and posttest scores of OHS knowledge in the experimental group.

Table 7. Paired T-Test of Pretest and Posttest OHS Attitude Variables in the Experimental Group

Test	N	Mean	t Hitung	Sig	Desc	Conclusion
Pretest	30	38,40	-0,296	0,000	Sig. < 0,05	Significantly Different
Posttest	30	38,63				

Source: Primary Data, 2025

Based on Table 4.2.4.2, the results of the Paired Sample t-test on the experimental group for the occupational health and safety (K3) attitude variable show that the average pretest score was 38.40, while the average posttest score was 38.63. The calculated t-value obtained was -0.296 with a significance value (Sig.) of 0.000, which is also less than 0.05. This indicates that there is a statistically significant difference between the pretest and posttest scores of K3 attitudes in the experimental group.

DISCUSSION

According to Dewi et al. (2024), training is defined as a strategic effort to develop human resource potential, with a particular emphasis on enhancing intellectual abilities as well as fostering a more mature and adaptive personality. This training aims to enrich critical thinking skills, strengthen individual character, and prepare the workforce to be more competent in facing everyday work challenges. The training process not only focuses on technical aspects but also on holistic development, which includes ethical values and emotional abilities to support optimal performance in the workplace.

The results of this study indicate a significant change in the variables of Occupational Health and Safety (OHS) knowledge and attitude after the implementation of training, particularly in the experimental group. These findings suggest that a module-based OHS training intervention has the potential to positively contribute to the enhancement of cognitive and affective capacity of healthcare workers in the context of occupational safety application in healthcare facilities. Furthermore, the descriptive analysis results show that the average OHS knowledge scores in both the experimental and control groups were at the same level during the pretest (mean = 16.37) and also showed the same average score in the posttest (mean = 19.87). These findings indicate that, descriptively, there is no difference in average knowledge between the two groups at the same measurement time. However, for the OHS attitude variable, differences in averages were found between the experimental and control groups on both the pretest phase (36.77 vs 34.17) as well as the posttest (38.63 vs 36.60). However, since the available data does not show the results of comparative statistical tests between groups (such as an independent sample t-test), this difference can only be interpreted at a descriptive level and cannot yet be concluded as statistically significant.

These findings are in line with the literature which states that baseline differences are often found in quasi-experimental studies and can affect the interpretation of results if not statistically controlled (de Vocht et al., 2021; Shadish; Cook; Campbell, 2002). Therefore, the interpretation of results between groups in this study is carried out cautiously and is based on the evidence available in the results table.

Based on the results of the paired sample t-test in the experimental group, there was a significant difference between the pretest and posttest scores for both variables studied. For the occupational safety and health (K3) knowledge variable, the mean increase from 16.37 to 19.87 was accompanied by a t-value of -4.266 and a significance value of $p = 0.000$ ($p < 0.05$). This indicates that K3 training had a significant impact on improving respondents' knowledge. This finding supports adult learning theory, which states that structured training relevant to the work context can significantly enhance conceptual understanding (Quratulain et al., 2021). For the K3 attitude variable, although the mean difference between the pretest (38.40) and posttest (38.63) was relatively small, the statistical test results showed a significance value below the conventional threshold ($p = 0.000$), which indicates the presence of a statistically significant difference. This shows that training not only contributes to cognitive aspects but

also impacts the affective dimension related to attitudes towards the implementation of occupational health and safety (OHS). These findings are consistent with previous research reporting that OHS training interventions can strengthen positive attitudes and workers' commitment to workplace safety practices (Barati Jozan et al., 2023; Pham et al., 2023) (Burke et al., 2006; Robson et al., 2012).

Overall, the results of this study confirm that OHS training has potential as an effective intervention strategy in enhancing knowledge and modifying healthcare workers' attitudes regarding workplace safety. These findings align with national regulatory recommendations emphasizing the importance of training as part of the OHS management system in healthcare facilities (Ministry of Health of the Republic of Indonesia, 2019).

1. Effectiveness of OHS Training on Knowledge

Knowledge is the result of an individual's sensory process towards an object through the five senses they possess, where this process is greatly influenced by the level of attention and personal perception of the object. Knowledge functions as a predispositional factor that affects a person's behavior, so the better the knowledge one has, the better the individual's behavior, and the more sound the decisions and actions taken. (Londok et al., 2020) Research results show that Occupational Health and Safety (OHS) training has a significant effect on improving the knowledge of healthcare workers, especially in the experimental group at UPT Puskesmas Pasangkayu 2. In general, these findings are consistent with the theory that knowledge is the result of the 'knowing' process obtained through sensing, particularly through hearing and sight when a person receives information (Notoadmodjo in Hastutik, 2020). The Occupational Health and Safety (K3) training provided in this study serves as a stimulus that allows participants to gain direct learning experiences through exposure to material, discussions, and demonstrations, thereby enhancing their ability to understand K3 concepts before applying them in daily work activities. At UPT Puskesmas Pasangkayu 2, a clearer change was observed based on the data distribution results. Before the training was provided, it was found that 3 respondents (10%) were still in the 'do not know' category, while 27 respondents (90%) were already in the 'know' category. However, after the training was conducted, all respondents (100%) were in the 'know' category, resulting in a 10% increase in knowledge from the initial condition. This change in categorization indicates that the K3 training was able to reach respondents who previously did not understand the material well and move them to a higher level of knowledge. This is in line with the knowledge indicators according to Notoatmodjo (Rais, 2020), as the training provided was able to improve the aspects of knowing (recalling material), understanding (comprehension), and partially applying, which is evident when participants begin to relate the material to work practice. The delivery of material in this training can also influence respondents' ability to analyze risks and understand the cause-and-effect relationships of workplace hazards, thereby helping them move to a higher level of knowledge according to these indicators. Even for participants with low initial knowledge, the training

proved to help enhance the internalization process of the material, enabling them to reach the 'knowing' category in the posttest.

The increase in knowledge that occurred can also be explained through factors that influence knowledge, such as exposure to information, level of education, and work experience (Harefa et al., 2024). The training provided in this study has served as a strong medium of information, where participants gained new knowledge while reinforcing previously acquired knowledge. The relevance of the material to work conditions also became a factor that accelerated understanding, as healthcare workers directly face occupational risks in their daily activities. This aligns with the opinion of Alfidyani & Lestantyo (2020) that occupational health and safety knowledge includes the ability to recognize hazards, use personal protective equipment (PPE), and take preventive measures, all of which are learned in the training..

In addition, the effectiveness of training is also influenced by the delivery method and the quality of the instructor. Rahman et al. (2022) stated that relevant training materials and communicative instructors can accelerate participants' understanding. The training in this study used interactive methods such as discussions, case studies, and demonstrations, thus supporting the theoretical finding that training involving active participation is more effective in enhancing knowledge (Hasanah, Wibowo et al., 2022). The increase in post-training knowledge also aligns with training effectiveness theory according to Wibowo & Utami (2023), which explains that training can improve a person's cognitive abilities, attitudes, and behaviors through a structured learning process. Thus, all research results, both descriptive and inferential data, consistently indicate that OHS training has proven effective in increasing the knowledge of healthcare workers, especially in groups with initially less optimal knowledge. This confirms that training is an important strategy in strengthening human resource competencies in healthcare facilities, while also supporting efforts to prevent occupational accidents and improve workplace safety. Such training needs to be conducted periodically so that knowledge not only increases but is also retained and consistently applied in work practice.

2. Effectiveness of OHS Training on Attitudes

Attitude refers to a person's consistent pattern of responding or tendency to act, behave, and react emotionally to a particular object or situation. This response is greatly influenced by the knowledge they possess, past experiences, and personal emotions that shape how an individual perceives and interacts with the object. Attitude is essentially a form of evaluative reaction that reflects either a positive attitude in the form of support or a negative attitude in the form of disagreement toward something. This attitude serves as an important bridge between cognitive knowledge and actual behavior, as it forms internal motivation to support or reject certain actions. In the context of workplace safety, a positive attitude toward OHS protocols encourages consistent and sustainable compliance at the workplace (Azwar 2021).

The research results indicate that Occupational Health and Safety (OHS) training not only improves cognitive aspects such as knowledge but also has a significant impact on changes in the attitudes of healthcare workers, particularly

in the experimental group at UPT Puskesmas Pasangkayu 2. Attitude, as stated by Azwar, is an evaluative response formed from three main components: cognitive, affective, and conative, which can change through learning processes, direct experience, and value internalization (Azwar in Juwita & Prabasari, 2018). Attitude change occurs when individuals acquire new information that is considered relevant and meaningful to their tasks or experiences. In the context of this study, OHS training serves as a strong stimulus to influence the formation and reinforcement of positive attitudes toward workplace safety.

UPT Puskesmas Pasangkayu 2 showed a stronger and more significant attitude change. At the pretest stage, 80% of respondents were in the strongly agree category and 20% were in the agree category. After the K3 training was provided, the proportion of the strongly agree category increased to 93.33%, while respondents who stated agree decreased to 6.67%. This increase indicates a positive change in the affective and conative domains, which strengthened along with the material and training methods delivered. This aligns with the concept of attitude change presented by Azwar in Setiowati (2022), that training can influence all three components of attitude simultaneously: reinforcing individual beliefs or convictions (cognitive), fostering emotional awareness in the form of concern for safety issues (affective), and shaping the tendency or intention to act more safely (conative). Occupational Health and Safety (OHS) training generally provides hands-on experience, exposure to real-life situations, demonstration of safety procedures, and delivery of material relevant to daily work, making safety values easier to instill and understand (S. Rahman et al., 2021). Overall, the results of this study are consistent with theories stating that individual attitudes can change through interventions in the form of effective, relevant education and training supported by hands-on experience (Azwar, 2016). The OHS training in this study fulfilled all these elements, resulting in significant changes in the experimental group. Meanwhile, the control group showed that attitudes tend to remain stable if there is no intensive and structured intervention. Thus, this study provides empirical evidence that OHS (Occupational Health and Safety) training is an effective strategy for improving healthcare workers' attitudes towards workplace safety and has the potential to produce safer behavioral changes in the future.

CONCLUSIONS

Based on the results of the study entitled "The Effectiveness of OHS Training on Knowledge and Attitudes of Healthcare Workers at UPT Puskesmas Bambalamotu and UPT Puskesmas Pasangkayu 2 in Pasangkayu Regency," several conclusions can be drawn as follows:

- a. There is an effect on the pretest and posttest scores of knowledge and attitudes toward occupational health and safety in both the experimental and control groups.
- b. There is an effect on the differences in paired sample t-test scores of knowledge and attitudes toward occupational health and safety in both the experimental and control groups.
- c. OHS training has an effect on both the experimental and control groups.

RECOMMENDATIONS

Based on the results of the research and the conclusions obtained, the researcher provides several suggestions directed to various parties as follows: 1. 5.2.1. For Health Centers a. It is recommended that occupational health and safety (OHS) training be made a regular and continuous program, especially at Pasangkayu 2 Health Center, which showed the most significant improvement in knowledge and attitude. This is important to ensure that competency improvements are consistently maintained. b. Health centers need to establish or strengthen an internal OHS team responsible for monitoring compliance with safety procedures, identifying potential hazards, and providing periodic follow-ups. c. There is a need to improve occupational safety infrastructure, including the availability of complete personal protective equipment (PPE), adequate sanitation facilities, and OHS educational media that are informative and easy to understand for all healthcare workers. Bambalamotu Health Center, which only received light socialization, is advised to conduct OHS training more intensively to improve knowledge and the officers' attitude improved significantly

FURTHER STUDY

This research still has limitations so that further research is needed on the topic of Effectiveness of Occupational Safety and Health Training on the Knowledge and Attitudes of Health Officers at the Pasangkayu 2 Community Health Center to perfect this research and increase insight for the author and readers.

REFERENCES

- Aisah Amini, & Susilawati, S. (2023). Analisis Resiko Terkait Kecelakaan Kerja di Tambang Batubara dan Faktor Risiko Terkait. *SEHATMAS: Jurnal Ilmiah Kesehatan Masyarakat*, 2(4), 772-779. <https://doi.org/10.55123/sehatmas.v2i4.2103>
- Alayyannur, P. A. (2018). KORELASI KOMITMEN MANAJEMEN DAN PELATIHAN K3 Universitas Airlangga CORRELATION OF MANAGEMENT COMMITMENT AND K3 TRAINING WITH KNOWLEDGE IN HOSPITAL " X " RS , maupun masyarakat di lingkungan RS berbagai pekerja kebersihan sebuah RS di Jakarta mengalami der. 2(2).
- Alfidyani, R., & Lestantyo, A. (2020). Pengetahuan Keselamatan dan Kesehatan Kerja (K3) bagi Tenaga Kesehatan di Fasilitas Pelayanan. *Jurnal Kesehatan Masyarakat*, 16(1), 34-45.
- Amanda, M. F., & Ayu, M. (2025). Tantangan Tenaga Kesehatan dalam Mengelola Risiko K3 di Puskesmas Blang Geulumpang. 5(2022), 10-14.
- Ayu, S., Jayadipraja, E. A., & Harun, A. A. (2019). Hubungan Penerapan Standar Operasional Prosedur Dan Pelatihan Dengan Kejadian Kecelakaan Kerja Pada Karyawan Di PT. PLN Unit Pelaksana Pelayanan Pelanggan Kota Kendari. *PROMOTIF: Jurnal Kesehatan Masyarakat*, 9(2), 170-177.

- Barati Jozan, M. M., Ghorbani, B. D., Khalid, M. S., Lotfata, A., & Tabesh, H. (2023). Impact assessment of e-trainings in occupational safety and health: A literature review. *BMC Public Health*. <https://doi.org/10.1186/s12889-023-16114-8>
- Cakraningrum, S. A., Rinawati, S., & Wardani, T. L. (2023). Hubungan Pengetahuan K3 dan Sikap dengan Unsafe Action pada Mekanik Bengkel di Pulogebang Jakarta Timur. *Journal of Applied Agriculture, Health, and Technology*, 2(2), 30–40. <https://doi.org/10.20961/jaht.v2i2.941>
- de Vocht, F., Katikireddi, S. V., McQuire, C., Tilling, K., Hickman, M., & Craig, P. (2021). Conceptualising natural and quasi experiments in public health. *BMC Medical Research Methodology*. <https://doi.org/10.1186/s12874-021-01224-x>
- Hasanah, N., Wibowo, A., & Sari, D. (2022). Evaluasi Metode Pelatihan Interaktif dalam Menginternalisasi Perilaku Keselamatan Kerja. *Jurnal Manajemen Dan Organisasi*, 14(3), 100–114.
- Manurung, E. H. (2020). Perencanaan K3 Pekerjaan Bidang Konstruksi. *Jurnal Rekayasa Konstruksi Mekanika Sipil (JRKMS)*, 3(1), 49–54. <https://doi.org/10.54367/jrkms.v3i1.703>
- Nurchayono, E., & Hartono, B. (2021). Peran Sikap dalam Meningkatkan Kepatuhan Keselamatan dan Kesehatan Kerja. *Jurnal Keselamatan Dan Kesehatan Kerja*, 12(2), 30–45.
- Pham, T. T., Lingard, H., & Zhang, R. P. (2023). Factors influencing construction workers' intention to transfer occupational health and safety training. *Safety Science*. <https://doi.org/10.1016/j.ssci.2023.106288>
- Quratulain, Basit, I., Bakhsh, K., & Hafeez, M. (2021). Adult learning theories and their role in instructional design, curriculum development and educational technology. *WSEAS Transactions on Environment and Development*. <https://doi.org/10.37394/232015.2021.17.106>
- Salsamila, V. D., Hubaybah, H., & Sari, R. E. (2024). Determinan Pencegahan Kecelakaan Kerja di Puskesmas Putri Ayu Kota Jambi Tahun 2023 (Doctoral dissertation, UNIVERSITAS JAMBI). In Doctoral dissertation, UNIVERSITAS JAMBI.
- Setiawan, R., Santoso, A., & Wibowo, F. (2020). Analisis Komponen Sikap dalam Keselamatan dan Kesehatan Kerja. *Jurnal Psikologi Industri*, 8(1), 50–65.
- Shadish; Cook; Campbell. (2002). Quasi-Experimental Designs That Either Lack a Control Group or Lack Pretest Observations on the Outcome. In *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*.
- Situngkir, D., Rusdy, M. D. R., Ayu, I. M., & Nitami, M. (2021). Sosialisasi Keselamatan Dan Kesehatan Kerja (K3) Sebagai Upaya Antisipasi Kecelakaan Kerja Dan Penyakit Akibat Kerja (Pak). *JPKM: Jurnal Pengabdian Kesehatan Masyarakat*, 2(1), 64–72. <https://doi.org/10.37905/jpkm.v2i1.10242>

- Suartana, P., Mandagi, R. J. M., & Wilar, D. (2021). Pengaruh Pengetahuan Keselamatan dan Kesehatan Kerja (K3) Terhadap Perilaku Pekerja dan Kecelakaan Kerja Pada Proyek di DS LNG Kabupaten Banggai Propinsi Sulawesi Tengah. *REKONSTRUKSI TADULAKO: Civil Engineering Journal on Research and Development*, 15–22. <https://doi.org/10.22487/renstra.v2i1.234>
- Susanti, N. W., Taruna, J., & Puteri, A. D. (2024). KECELAKAAN KERJA PADA KARYAWAN DI PT. VIRAJAYA RIAU PUTRA KEC . 1(3), 954–960.
- Wibowo, A., & Utami, R. (2023). Peran Pelatihan dalam Meningkatkan Pengetahuan, Sikap, dan Perilaku di Tempat Kerja. *Jurnal Pengembangan Sumber Daya Manusia*, 12(1), 10–22.
- Wulandari, F., & Putra, T. (2022). Hubungan Sikap Positif terhadap Keselamatan Kerja dengan Produktivitas Tenaga Kerja. *Jurnal Manajemen Keselamatan*, 10(3), 100–115.