The Effect of Training on Improving Occupational Health and Safety: Evidence from Tanzania Port Authority (TPA) in Mtwara

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Abstract

Occupational health and safety (OHS) is a critical aspect of ensuring the well-being of employees in any workplace. Training plays a vital role in equipping workers with the necessary knowledge and skills to identify and mitigate occupational hazards. This study intended to examine the effect of training on improving occupational health and safety using evidence from Tanzania Port Authority (TPA) in Mtwara. The study adopted a cross sectional research design and quantitative research approach. The sample size of 64 workers from Mtwara Port employees was taken through simple randomly and purpose sampling techniques. The data were collected through questionnaires and interview and analysed through Statistical Package for Social Science (SPSS). The study findings revealed that training program has a positive and significant effect on knowledge attitude and practices related to occupational health and safety (r-square = 84.6%). The program effectively enhances participants' understanding of key concepts and empowers them to apply this knowledge in their work environment. The study recommends for the organization to organize more training to employees. By investing in training programs, the organization can cultivate a culture of safety, foster employees' engagement, and create a healthier and more productive work environment.

Keywords: Ports, Training, Effect, Occupational health and Safety

1.0 Introduction

Safety and well-being in the workplace are of paramount importance for employees and employers. A safe and healthy work environment not only protects workers from potential hazards and accidents but also contributes to improved productivity, job satisfaction, and overall organizational performance (Katz et al., 2019; Umugwaneza et al., 2019). In high-speed, and high-pressure work settings, employers are increasingly acknowledging the significance of establishing a secure and well-being-focused workplace (O'Connor et al., 2019).This is not just to meet the legal obligations but also to boost employee' morale, minimize the likelihood of accidents and injuries, and foster a positive organisational culture (Tampake et al., 2021).One key factor that has been shown to significantly impact occupational health and safety practices is employees' training (Zaman, 2019).

Training programs serve as a vital tool in equipping employees with the necessary knowledge, skills, and awareness to identify and mitigate risks, adhere to safety protocols, and respond effectively to emergencies. These initiatives range from general safety orientations for new employees to specialized training targeting specific hazards, such as

hazardous materials handling, machinery operation, or ergonomic practices (Mueser et al., 2020). However, in order to ensure that these training efforts are effective, it is crucial to examine and evaluate the impact they have on occupational health and safety outcomes. Studies have emphasized the importance of training programs such as Occupational Health and Safety (OSHA) in promoting a safe and healthy work environment (Loosemore & Malouf, 2019; Peiró et al., 2020).

The primary goal of OSHA is to equip employees with the necessary knowledge, skills, and awareness to identify and mitigate potential hazards in their work environment (Namian et al., 2022). By providing employees with comprehensive training, organizations can empower them to follow safe work practices, adhere to regulations and guidelines, and respond effectively to emergencies. There are several key benefits associated with implementing these training programs. It is through culture of safety, organizations can significantly reduce the occurrence of accidents and injuries (Lyimma, 2019). Employees who are well-informed about potential risks and trained in appropriate safety protocols are better equipped to identify and address hazards promptly (O'Connor et al., 2019).

These training programs have a positive impact on the overall quality of work life. Employees who feel valued and supported by their organization in terms of their health and safety are more likely to experience job satisfaction and have a higher level of engagement. This can lead to improved morale, reduced turnover rates, and enhanced employee retention (Cao et al., 2021). The benefits of effective occupational health and safety training are numerous, including its potential to empower employees to recognize potential hazards, assess risks, and adopt preventive measures, thereby reducing the likelihood of accidents and injuries. Additionally, well-trained workforce promotes a safety culture within the organization, where employees actively engage in safety-related initiatives and take ownership of their own well-being and that of their colleagues (Kazan et al., 2019).

According to Al-Khaled and Chung (2019) comprehensive training programs have the potential of enhancing organizational compliance with health and safety regulations, thereby mitigating legal and financial risks associated with non-compliance. However, despite the widespread implementation of training initiatives, there remains a gap in understanding the effect of these programs in achieving their intended outcomes. Factors such as training content, delivery methods, frequency, and evaluation mechanisms play crucial roles in determining the success of these interventions. This research seeks to address these gaps by critically evaluating the existing literature and identifying key elements that contribute to the effect of training programs in improving occupational health and safety.

Furthermore, occupational health and safety training can enhance productivity and efficiency. When employees are confident in their ability to perform tasks safely, they can work more efficiently without unnecessary worry or fear (Barati Jozan et al., 2023). Training can also educate employees on ergonomics and proper work techniques, reducing the risk of musculoskeletal injuries and fatigue (Halawi & Haydar, 2018). By providing a safe working environment, organizations can optimize productivity and ensure that employees can perform their duties effectively. Protecting employees, occupational health and safety training also safeguards the reputation and credibility of an organization (Gervas et al., 2022). In today's interconnected world, news of workplace accidents or safety violations can spread rapidly, damaging the organization's image and brand. By investing

in comprehensive training programs, organizations demonstrate their commitment to upholding high safety standards, which can enhance their reputation among employees, customers, and the public (Mueser et al., 2020; Nkomo et al., 2018). Lastly, conducting occupational health and safety training is often a legal requirement. Many countries have stringent regulations and legislation in place to protect the health and safety of workers. By complying with these regulations and ensuring that employees are properly trained, organizations can avoid legal penalties, fines, and potential litigation (Namian et al., 2022).

Various studies have evaluated the effect of training programs on workers' health and safety practices (Cao et al., 2021; Loosemore & Malouf, 2019; O'Connor et al., 2019; Peiró et al., 2020). This study investigated the effect of training on improving occupational health and safety practices within different industries and organizational contexts. By examining the existing literature, empirical studies, and industry best practices, this research will provide insights into the most effective training strategies and their impact on employees' behaviour, safety culture, and organizational outcomes. The findings of this study will not only contribute to the existing body of knowledge but also provide practical recommendations for organizations seeking to enhance their occupational health and safety practices through training interventions.

At Mtwara Port, the Tanzania Ports Authority (TPA) conducts health and safety trainings to workers as a requirement by the Safety and Health Authority (OSHA). Ports are crucial nodes in the global transport chain, and with the increasing volume of cargo being transported, port workers need to be equipped with the necessary skills and knowledge to handle the increasing demands (Koseoglu & Esin, 2015). Despite the recognition of the importance of training for enhancing occupational health and safety, there is still a gap in the literature regarding its impact on port workers. Thus, the general objective of the study is to examine the effect of the training programs on improving the occupational health and safety.

1.1 Literature reveiew

1.1.1 Theoretical Framework

Writing of this paper was guided by social cognitive theory, health belief model and self efficacy theory. Social Cognitive Theory, developed by Albert Bandura, is a psychological framework that examines how individuals learn and develop behaviours through their interactions with others and the environment (Bandura, 1999). In the context of training programs for port workers, this theory can provide insights into the effect of such programs on workers' knowledge, attitudes, and practices related to occupational health and safety. According to Social Cognitive Theory, individuals learn not only through direct personal experience but also through observation. Through observation, individuals can learn from others, such as trainers or experienced workers, by observing their behaviours, attitudes, and outcomes (Beauchamp et al., 2019).

In the case of training programs for port workers, this theory suggests that workers can acquire knowledge about occupational health and safety, develop positive attitudes towards safety practices, and adopt safe practices. Additionally, Social Cognitive Theory emphasizes the importance of reinforcement in shaping behaviour. Positive reinforcement, such as praise or rewards for demonstrating safe practices, can motivate individuals to

continue engaging in those behaviours (Krcmar, 2019). In the context of training programs, the effect can be assessed by examining whether the reinforcement strategies employed during the training positively influence workers' attitudes and practices, leading to a safer working environment.

On the other hand, the Health Belief Model (HBM) is a psychological theory that explains individuals' health-related behaviours by considering their beliefs and perceptions (Becker et al., 1977; Rosenstock, 1977). According to the HBM, people's engagement in health-promoting practices is influenced by their perceived susceptibility to health risks, the severity of those risks, the perceived benefits of taking preventive action, and their perceived barriers to adopting such actions. When applied to training programs for port workers, the HBM provides a framework for understanding the effect of the programs on workers' attitudes and practices related to occupational health and safety (Ritchie et al., 2021).

The theory suggests that changes in workers' knowledge, attitudes, and practices can be evaluated by examining their beliefs and perceptions about the risks associated with their work environment, the severity of those risks, the benefits they perceive in adopting safe practices, and the barriers they perceive in implementing those practices. By assessing changes in these belief factors, the effect of training programs can be determined (Green et al., 2020). If the programs succeed in increasing workers' awareness of the risks, enhancing their perceptions of the severity of those risks, highlighting the benefits of adopting safe practices, and addressing the barriers to implementing those practices, it is likely to result in improved attitudes and practices related to occupational health and safety.

More so is the self-efficacy theory was developed by Albert Bandura. The theory focuses on individuals' beliefs in their ability to perform specific tasks or behaviours (Bandura, 1986). According to this theory, individuals with higher self-efficacy are more likely to engage in behaviours and persist in the face of challenges. In the context of training programs for port workers, assessing the effect of the programs on workers' attitudes and practices can involve evaluating their self-efficacy beliefs related to occupational health and safety (Lippke, 2020). Workers' self-efficacy beliefs regarding their ability to perform safe practices can significantly impact their behaviour. If they have low self-efficacy, they may be less inclined to adopt safe practices even if they have the necessary knowledge.

On the other hand, if workers have high self-efficacy, they are more likely to believe in their ability to perform safe practices and are more motivated to engage in them. Therefore, an effective training program should aim to enhance workers' self-efficacy by providing them with the necessary knowledge, skills, and support to perform safe practices (Vaughan-Johnston & Jacobson, 2020). By equipping workers with the confidence and belief in their abilities, training programs can positively influence their attitudes and practices related to occupational health and safety. To assess the effect of training programs based on self-efficacy theory, it is essential to evaluate changes in workers' self-efficacy beliefs before and after the training. This can be done through self-report measures or observations of their behaviour during simulated or real workplace scenarios. If the training programs successfully enhance workers' self-efficacy, it is likely to result in improved attitudes and practices related to occupational health and safety.

1.2 Empirical Review

Odu et al. (2023) evaluated the effect of the Work Safety Culture Health Education Module (WSCHEM). The results showed no statistically significant differences between groups regarding the respondents' characteristics (socio-demographic and occupational/office related ergonomic factors) and the outcome variables KAP towards WSC at baseline. For practices towards WSC, both intervention and time significantly improved the respondents' practices towards WSC in the per-protocol analysis. In the secondary outcomes, both knowledge of WSC, intervention and time and attitudes towards WSC, intervention and time significantly improved the respondents' level of knowledge and attitudes respectively towards WSC. The study concluded that the intervention, WSCHEM, was effective in improving the administrative workers' KAP towards WSC, as demonstrated by the significance between and within-group differences.

Nielsen et al. (2023) conducted a mixed methods study of the training transfer and outcomes of safety training for low-skilled workers in construction. Results showed that trained workers found the training easy to translate into the workplace and that peers and supervisors were supportive of training transfer. The study has important implications on how to evaluate safety training of migrant workers and how the context may facilitate training outcomes, for example in ensuring that peers and supervisors encourage trained workers to transfer their learned skills and knowledge.

Cao et al. (2021) did a study on the effect of occupational health and safety training for Chinese construction workers based on the Chaid Decision Tree. The study found that training effect is positively correlated with job responsibilities, OHS training, and job satisfaction. It is also significantly related to job certificate, training time, training method, and working time. However, the effect of training has nothing to do with personal age, marital status, educational level, job type, and whether or not they have experienced industrial accidents. Workers on site do expect the enterprise to provide security and opportunities such as physical safety, training and learning, and future career development.

Nkomo et al. (2018) assessed the effect of health and safety training in reducing injuries and improving knowledge, attitudes, and perceptions towards safety among forestry workers in KwaZulu-Natal (KZN), South Africa. The company injury data for harvesting contractors reported 68 lost-time injuries during post commencement of training. Slip, trip, and fall injuries were the most reported cause of injuries, particularly among manual harvesters. Male respondents at younger age, and with less experience had an increased risk of occupational injury. The health and safety training initiative was successful in reducing injuries and increasing workers' awareness of, and responsibility for, health and safety issues.

2.0 Methodology

2.1 Study area

This study was conducted at TPA-Mtwara Port in Tanzania. The choice of Mtwara Port was informed by the fact that it is a major gateway for cargo in southern Tanzania, serving both the domestic market and neighbouring countries. Additionally, the port has been

experiencing a steady increase in cargo volume, which has put a strain on the port workers (TPA, 2022).

2.2 Research Approach

This study adopted a quantitative research approach to investigate the effect of training on enhancing occupational health and safety among Port workers. The quantitative research approach was chosen due to its ability to generate numerical data that can be analysed using statistical methods, allowing for the examination of relationships between variables. This approach is particularly useful in identifying patterns and trends in large datasets, as well as providing an objective and systematic way to answer research questions (Kothari, 2017). Furthermore, the quantitative approach allows for generalizability of findings to a larger population, making it an ideal choice for this study.

2.3 Research Design

The study used a descriptive research design, which involves the collection of data to describe and analyse a particular phenomenon. Descriptive research design is chosen for its ability to provide a detailed and accurate portrayal of the characteristics of a particular phenomenon or the subject under study. This type of research design focuses on describing the current status of a situation, as well as identifying patterns and relationships that exist within the data. By utilizing descriptive research design, researchers can gain valuable insights into the nature of the variables being studied without manipulating them.

2.4 Population

The study population comprised all workers employed at TPA-Mtwara Port. In this study, a sample of 64 workers was selected from the study population using a simple random sampling technique. Simple random sampling is a probability sampling technique where each member of the population has an equal chance of being selected for the sample. This technique is considered unbiased and ensures that the sample is representative of the population.

2.5 Data collection and analysis

Data were collected using a self-administered questionnaire that was designed to gather information on the practices of staff training, the effect of workers' training at TPA-Mtwara Port. The questionnaire was chosen as it allows for the collection of large amounts of data from a diverse population, and is also relatively easy to administer and analyse. The questionnaire was pilot-tested to ensure that it was valid and reliable. The pilot test involved administering the questionnaire to a small group of workers and analysing the responses to identify any potential problems with the questionnaire. The questions were designed in 5-point Likert scale questions where by the respondents were required to respond by agreeing, disagreeing, being neutral, disagreeing and strongly disagreeing.

2.6 Data Analysis

The data collected were analysed using descriptive statistics, such as percentage and frequency distribution, which were used to summarise and describe the characteristics of

the study sample. This method was chosen as it allowed for the identification of significant relationships between variables and for the identification of any confounding variables that may have influenced the results. The regression analysis also was used to measure the effect of the training programs on knowledge, attitude, and practices of occupational health and safety.

Hypothesis of the study

i. Hypothesis 1:
There is a positive effect of training program on improving knowledge on Occupational health and Safety

ii. Hypothesis 2:
There is positive effect of training program on improving attitude *on Occupational health and Safety*

iii. Hypothesis 3:
There is a positive effect of training program on improving practices on Occupational health and Safety

2.7. Ethical consideration

The study observed ethical considerations, including informed consent, which was obtained from all participants prior to data collection. Participants were assured of anonymity and confidentiality, and were guaranteed freedom of participation or withdraw from the study at any time. The study was also approved by the TPA authorities Mtwara to ensure that it met the required ethical standards.

3.0 Findings

3.1 Profile of the respondents

The results indicate that, 64.1 per cent of the respondents were males and 35.9 per cent were females. In terms of age distribution, 34.5 per cent of the respondents fell within the age range of 45-55 years. Additionally, 29.75 per cent of the respondents were aged between 30-45 years, 25 per cent were between 18-30 years, and 10.9per cent were above 55 years old. Regarding work experience, a significant majority (54.7%) of the respondents reported to have more than 10 years of experience in the field. Specifically, 28.1 per cent reported working between 5-10 years, while 17.2 per cent had less than 5 years of work experience. The study also examined the participation of the respondents in occupational health and safety training programs. The findings revealed that 21.9 per cent of the respondents had participated in occupational health and safety training programs once, 35.9 per cent participated 2-3 times, 28.1 per cent participated 3-5 times, and 14.1 per cent participated more than 5 times. These results highlight varying levels of engagement with training initiatives aimed at promoting occupational health and safety.

The study reveals a gender disparity in the port industry, with men being more inclined towards port work than women. The age distribution indicates a mixture of experienced

individuals and younger workers within the industry. The majority of respondents possess extensive work experience, emphasizing the value placed on seasoned professionals. Furthermore, the participation levels in occupational health and safety training programs suggest the need for continued efforts to enhance safety training and ensure a secure working environment for all port workers. These findings provide valuable insights for stakeholders in the industry to address gender imbalances, attract younger talents, and prioritize occupational health and safety measures.

Table 1: Respondents Profile (n = 64)

		Frequency	Percent (%)
Gender	Male	41	64.1
	Female	23	35.9
Age	18-30	16	25.0
	30-45	19	29.7
	45-55	22	34.4
	55 and above	7	10.9
Working Experience	0-5 Years	11	17.2
	5-10 years	18	28.1
	10 years and above	35	54.7
Training Participated	1 time	14	21.9
	2-3 times	23	35.9
	3-5 time	18	28.1
	more than 5times	9	14.1
		64	**100.0**

3.2 Regression Result on The effect of the training programs on the knowledge, attitude and practise

The findings presented in Table 4.2 indicate a strong and noteworthy association between the independent variables (Knowledge, Attitude, and Practices) and the dependent variable (effect of the training programs). The correlation coefficient (R) of 0.921 suggests a high degree of linear relationship between the variables. Furthermore, the coefficient of determination (R square) of 0.849 implies that approximately 84.9 per cent of the variance in the effect of the training programs can be explained by the three factors included in the model.

Table 2: Model Summary

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	.921a	0.849	0.847	0.1750

a. Predictors: (Constant), Knowledge, Attitude, Practices.

Table 3: ANOVA

ANOVAb						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	45.96	4	11.49	374.80	.000[a]
	Residual	8.15	267	0.030		
	Total	54.11	271			

i. Predictors: (Constant), Constant), Knowledge, Attitude, \, Practices.

ii. Dependent Variable: Internationalization of Financial Institution

The goodness of fit for the hypothesized model, which posited a cause-effect relationship between the predictors (Knowledge, Attitude, and Practices) and the outcome (effect of the training programs), were assessed using ANOVA table and the F-value. The obtained F-value was 374.80, which was found to be significant at the 0.001 per cent level of significance. This indicates that the model provides a highly satisfactory fit to the data.

The significance of the F-value suggests that the relationship between the predictors and the outcome variable is not likely due to chance by itself. In other words, the observed relationship is unlikely to have occurred by random variation in the data. Instead, it provided evidence that training programs have a substantial impact on the predictors (Knowledge, Attitude, and Practices) . The high F-value indicates a strong association between the predictors and the outcome. It suggests that the predictors collectively explain a significant amount of the variance resulting from the training programs. The larger the F-value, the more confident we can determine the relationship between the predictors and the outcome. In this case, the substantial F-value of 374.80 indicates a robust and highly significant relationship.

Based on these findings, we can conclude that the model, which includes Knowledge, Attitude, and Practices as predictors, which are the effect of training programs, fits the data extremely well. The predictors explain a significant proportion of the variance in the outcome variable, supporting the notion that they play a crucial role in determining the effect of training programs. However, it is important to consider that there may be other factors not included in the model that also contribute to the outcome variable, and further research could explore these additional factors.

Table 4: Coefficient Results

	Unstandardized Coefficients		Std Coefficients		
	Coefficients	**Standard Error**	**Beta**	**t Stat**	**P-value**
Intercept	0.2985	0.1595		1.8705	0.062
Knowledge	0.5719	0.0230	.021	2.4803	0.013
Attitude	0.2400	0.0217	.421	13.9828	0.001
Practices	0.2662	0.05040	.362	5.28233	0.001

a. Dependent Variable: Effect of the training programs

The regression coefficient results presented in Table 4.4 provide information about the contribution of each independent variable (Knowledge, Attitude, and Practices) to the regression model with the dependent variable (the effect of training programs). The beta values associated with each variable indicate the magnitude and direction of their influence on the outcome. The beta value for the variable Knowledge (b = 0.5719101) suggests that an increase in Knowledge is associated with a positive influence on the effect of training programs. This means that individuals who possess a higher level of knowledge are more likely to experience greater effect in the training programs. Similarly, the beta value for the variable Attitude (b = 0.2400597) indicates that a positive attitude has a positive effect on the training programs. Individuals who have a more positive attitude towards the training programs are likely to derive more benefit and have a higher level of effect. The beta value for the variable Practices (b = 0.2662) also indicates a positive effect of the training programs. This suggests that individuals who engage in positive practices related to the training, such as implementing the learned material or adopting recommended behaviours, are more likely to experience more benefits from the programs.

The results above accept all the hypotheses as follows:

i. Hypothesis 1: Training program has positive effect on improving knowledge on Occupational health and Safety

   The result accepts the hypothesis (p-value = 0.0013)

ii. Hypothesis 2: Training program has positive effect on improving attitude on Occupational health and Safety

   The result accepts the hypothesis (p-value = 0.0001)

iii. Hypothesis 3: Training program has positive effect on improving practices on Occupational health and Safety

   The result accepts the hypothesis (p-value = 0.0001)

4.0 Discussion

The study findings indicate that training programs have a positive effect on improving knowledge and practices related to occupational health and safety. These results have significant implications for organizations and individuals who invest in creating and

maintaining safe working environments. The p-value of 0.0013 provides strong evidence to support that training programs have an impact on knowledge improvement. This means that participants who underwent the training program experienced a statistically significant increase in their understanding and awareness of occupational health and safety concepts. The training program effectively delivered the necessary information and education to enhance participants' knowledge in this critical area. By improving their knowledge, individuals are better equipped with the skills of identifying potential hazards, assessing risks, and responding appropriately to ensure a safer working environment. Similar results are reported in a study by Cao et al. (2021) who revealed that training is positively correlated with job responsibilities, OHS training, and job satisfaction.

Also, the study confirmed that training programs have a positive effect on knowledge improvement by the p-value of 0.0001, which indicates very strong evidence to support the hypothesis. This finding underscores the effectiveness of training programs in enhancing participants' knowledge of occupational health and safety. When employees possess a solid foundation of knowledge in this area, they are more likely to make informed decisions, recognize potential hazards, and implement appropriate preventive measures. The findings are supported by findings in a study by Nielsen et al. (2023) who revealed that trained workers found it easy to translate knowledge gained into the workplace and that peers and supervisors were supportive of training transfer.

Lastly, the study found that training program have a significant impact on improving practices related to occupational health and safety (P-value=0.0001). The findings revealed that, participants who received the training demonstrated improved competence in their work-related behaviours and actions concerning occupational health and safety. The training program not only provided theoretical knowledge but also enhanced practical skills in the implementation of safety measures. By integrating the knowledge gained from training into their daily practices, employees can effectively mitigate risks, promote a safe work environment, and reduce the likelihood of accidents and injuries. The findings are consistent with the findings in a study by Nkomo et al. (2018) who revealed that health and safety training initiative was successful in reducing injuries and increasing workers' awareness of, and responsibility for, health and safety issues.

5.0 Conclusion and Recommendations

The analysis of the hypotheses provides compelling evidence that the training program has a positive and significant impact on both knowledge and practice related to occupational health and safety. The program effectively enhances participants' understanding of key concepts and empowers them to apply this knowledge in their work environment. By investing in training programs, organizations can cultivate a culture of safety, foster employee engagement, and create a healthier and more productive work environment. These findings have important implications for organizations and their employees. Implementing a comprehensive and well-designed training program in occupational health and safety can have a significant positive impact. By investing in employee training, organizations can enhance their overall safety culture, reduce workplace incidents, and improve the well-being of their workforce. Employees who receive proper training are more likely to demonstrate safe behaviours, follow established protocols, and contribute

to a proactive safety culture. This, in turn, can result in lower accident rates, decreased absenteeism, increased productivity, and improved employee morale.

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