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Research Article

Analysis of Factors Affecting the Implementation of Occupational Safety and Health in the Ishk Tolaram Eye Clinic Construction Project in Batu City

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Abstract

This research investigates the elements impacting the application of Workplace Safety and Well-being (WSW) within the ISHK Tolaram Eye Clinic building endeavor located in Batu City. The objective is to determine the degree to which Personal Safety Gear (PSG) is used and to figure out what elements contribute to its use. A quantitative method that describes the situation was used, gathering information through surveys, discussions, and watching what happened. The data shows that people followed the rules for using PSG at a level that was neither high nor low (66%), and that the biggest things that had an effect were how people acted and how safety was handled. Suggestions are offered to make training and oversight better so that the workplace is safer.

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Introduction

Occupational safety and health has a crucial role in every construction project to protect workers from the dangers of accidents and health problems. A safe and comfortable environment not only contributes to increased work efficiency and quality, but can also lower the likelihood of injuries and illnesses arising from work activities. In every development project, the application of Occupational Safety and Health standards is a must considering the high risks that exist, caused by elements such as the physical condition of the site, the use of equipment and materials, and the behavior of workers in the field.

This study explores the construction project of the ISHK Tolaram Eye Clinic in Batu City as the object of study. This project is carried out with a systematic approach and involves various parties and resources. The implementation of Occupational Safety and Health is the main focus considering high risks, such as working at heights, the use of heavy equipment, and complex material management. Aspects of the work environment, such as the layout of the area, lighting, ventilation, and the availability and use of Personal Protective Equipment, greatly affect the safety and health of workers.

According to A. A. Made Alit Putra and Nengah Landra (2022), aspects of Occupational Safety and Health include the work environment, facilities and materials used, individual protective equipment, and education and training related to Occupational Safety and Health.

The International Labour Organization (ILO) reveals that workplace accidents are generally caused by unsafe behaviour and risky working conditions, often related to a lack of awareness and discipline from workers as well as ineffective managerial supervision. Therefore, it is crucial to conduct a thorough evaluation of the elements that affect the implementation of Occupational Safety and Health

with the aim of creating a safe and supportive work environment.

This study aims to investigate the elements that are essential for the effective implementation of Occupational Safety and Health in construction projects, such as worker behavior features, compliance with the use of PPE, safety instructions, safety supervision, and working conditions. Most often, a combination of dangerous behavior and a dangerous workplace leads to accidents. Most accidents between 80 and 85 percent are caused by human error, such as ignoring safety protocols and not wearing personal protective equipment regularly, according to some studies, with unsafe working conditions being the cause of the remaining accidents (Alfidyani et al., 2020, in Chiara Putri Nusantara et al., 2025). Because they can protect employees from a variety of hazards, including impacts, contact with hazardous substances, and mechanical accidents, personal protective equipment is essential. Nonetheless, many construction workers rarely use these items because they feel uncomfortable, forget, or believe that they will hinder their ability to do their jobs efficiently (Rizky et al., 2023; Suartana et al., 2021, in Chiara Putri Nusantara et al., 505).

Other studies, such as those conducted by Hakim et al. (2020) and Ariska (2019), emphasize that knowledge and supervision are essential in maintaining compliance with the use of PPE, which is effective in reducing the risk of accidents. Prabawati (2018) added that although the level of worker compliance in the Jakarta Light Rail Transit project is quite high, evaluation and increased supervision are still needed to maintain the Occupational Safety and Health culture. In general, education, training, supervision, and safety behavior play a major role in improving compliance with the use of PPE.

Rachman and his team (2020) found several risky behaviors that are often exhibited by workers in the construction sector, for example the use of improper personal protective equipment and inconsistencies in wearing uniforms or safety shoes for comfort. They also observed that there are fun habits at work that can threaten the safety of individuals as well as their peers. This situation may be caused by the attitude and trust of employees who feel experienced and have never experienced an incident, so there is less attention to the principle of safe work. The company is responsible for providing personal protective equipment (PPE) for construction workers, such as safety shoes, gloves, vests, and helmets. According to research by Herlina et al. (2020), workers' compliance with the use of PPE is significantly correlated with its availability. Even if such equipment is available, there are still cases of non-compliance and improper use; For example, gloves, masks, vests, and helmets are not always worn correctly. In addition, improper use of helmets can reduce their function, make them easier to come off, and affect workers' vision while working.

Occupational Safety and Health aims to protect workers with measures to prevent accidents and occupational diseases. This concept includes preventive, promotive, curative, and rehabilitative measures to maintain the physical, mental, and social health of workers. Effective implementation of Occupational Safety and Health requires risk assessment and implementation of appropriate preventive measures, one of which is the use of PPE. Although PPE is designed to protect, the risk of accidents cannot be completely eliminated.

The implementation of personal protective equipment (PPE) often faces a number of challenges, such as irregular monitoring and low worker compliance. The availability of PPE has been shown to have a major impact on employee compliance in using it. PPE is essential to protect employees from possible accidents and health problems due to their work (Alemu et al., 2020). Employees will be more vulnerable to workplace hazards if the company does not provide PPE that meets their needs. Given that employees are an important asset for the company, PPE must be provided according to their specific job and responsibilities (Gultom, 2018 in Pratiwi, 2024).

All construction workers are required to wear personal protection, including safety helmets equipped with cotton gloves, safety vests, and safety shoes. Personal Protective Equipment (PPE) must be designed in such a way that it is comfortable to use and does not hinder work (Mafra et al., 2021 in Pratiwi, 2024). Workers who do not comply with regulations tend to commit risky actions because they find the use of PPE troublesome or uncomfortable. Findings from Ernanda, Indah, and Iriyanti (2020) also show that the availability of PPE is related to the level of compliance with the use of these tools.

One of the most important aspects in reducing work accidents is employee compliance with the use of personal protective equipment (PPE). The majority of workers show strong adherence to the use of personal protective equipment (PPE), such as gloves,

safety goggles, protective footwear, and helmets, according to numerous studies (North et al., 2025). The success of the occupational safety education and training initiatives that have been implemented is demonstrated by this high level of awareness. According to Wahyuni (2020), increasing worker compliance involves awareness of the benefits of personal protective equipment (PPE). Therefore, to reduce the incidence of work accidents, efforts to improve discipline in the use of PPE must be updated regularly (Zahira & Lusida, 2025). Thus, it is anticipated that this research will improve occupational safety and health management in construction projects, lower the likelihood of accidents, and facilitate the smooth and effective implementation of construction.

Materials and Methods

With a descriptive and analytical approach, this study uses quantitative methods to provide an objective picture of how Occupational Safety and Health is implemented in the project area. This approach provides an opportunity for researchers to assess workers' compliance levels in wearing Personal Protective Equipment (PPE) and identify key influencing factors, such as the human element, Occupational Safety and Health training, and safety management. The data collection procedure was carried out during the research phase by utilizing purposive sampling techniques to select appropriate respondents, so that the results of statistical analysis can reflect the relationship between variables in the application of Occupational Safety and Health in this construction project. The data collected includes:

Direct Observation

The information collection method in this study was carried out through direct observation of objects or events at the project site without involving interaction or interviews with observed individuals. This approach was applied to the ISHK Tolaram Eye Clinic Project in Batu City with the aim of observing the implementation of the use of personal protective equipment and the implementation of occupational safety at the project site. Observations are carried out in a planned manner to obtain valid data related to the implementation of occupational safety procedures in accordance with applicable standards.

Interview

Through direct interaction between researchers and respondents in the form of questions and answers, either directly or through various communication media, interviews were used to collect data in this study. The purpose of the interview is to gather in-depth, detailed, and contextual information regarding the public's experiences, opinions, and understandings of various aspects of occupational safety and health. A number of project employees at the ISHK Tolaram Eye Clinic, Batu City, were interviewed to measure the level of understanding and application of Occupational Safety and Health principles at the project site.

Questionnaire/questionnaire

The questionnaire, which consists of a series of written questions aimed at evaluating employees' knowledge and habits about several aspects of Occupational Safety and Health, is the tool used to collect data for this study. The survey asked about workplace supervision, Occupational Safety and Health training that has been received, and the availability of personal protective equipment (PPE). To get a more complete picture of the application of Occupational Safety and Health in the workplace, a questionnaire was then given to project staff at the ISHK Tolaram Eye Clinic in Batu City.

Cotton gloves, safety shoes, safety helmets, and safety vests are some of the PPE that is the focus of this study. The purpose of this study is to assess the level of workers' compliance with this PPE.

Results and Discussion

The use of personal protective equipment (PPE) by plasterers in construction projects is the main topic of this study. Based on a Likert scale of 1 to 5, the average compliance rate for the use of personal protective equipment (PPE) reached 4.0, based on data collected from questionnaires given to employees at the ISHK Tolaram Eye Clinic construction project. These results show that the majority of employees use personal protective equipment (PPE) in accordance with the established protocols. The most commonly used types of Personal Protective Equipment include safety helmets, protective shoes, gloves, and safety vests. Observations in the field also support survey data, where workers appear to consistently wear PPE while carrying out their duties, especially in high-risk

locations. However, some workers appear to be inconsistent in using PPE completely or sometimes removing it while working, increasing the likelihood of accidents. The use of Personal Protective Equipment in accordance with standards is an important step to reduce work accidents and protect the health of workers from physical hazards in the field.

Although the implementation of PPE use has generally been good, the inconsistencies in use found indicate the need for increased supervision and stricter discipline enforcement. Factors such as the comfort of using PPE and workers' understanding of the importance of PPE also need to be strengthened through education and motivation.

The Relationship of Occupational Safety and Health Implementation with Influencing Factors

The Influence of Human Factors on the Implementation of Occupational Safety and Health

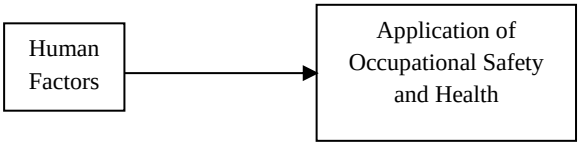

Figure 1. The Influence of Human Factors on the Implementation of Occupational Safety and Health

This study shows that the implementation of Occupational Safety and Health is greatly influenced by human factors. In other words, although a lack of awareness or discipline from employees can hinder the successful implementation of Occupational Safety and Health, good attitudes, knowledge, and behavior from employees will help in the optimal implementation of Occupational Safety and Health. An important component of the effective use of Occupational Safety and Health in development projects is the human aspect. It has been shown that this variable has a major impact on how Occupational Safety and Health is implemented in projects. The findings of this study show that factors including work discipline, safety knowledge, ability, and compliance with Occupational Safety and Health protocols are important in improving the implementation of safety regulations. Employees can lower possible risks and improve overall workplace safety by knowing high-risk locations, using personal protective equipment (PPE), and adhering to a structured supervision system.

The Effect of the Use of Personal Protective Equipment (PPE) on the Implementation of Occupational Safety and Health

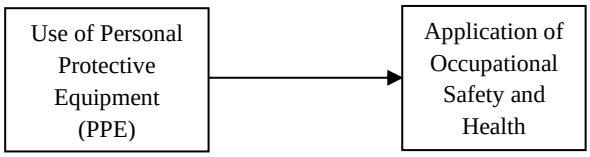

Figure 2. The Effect of the Use of Personal Protective Equipment (PPE) on the Implementation of Occupational Safety and Health

This study shows that the use of personal protective equipment (PPE) has an important impact on the implementation of Occupational Safety and Health. In other words, the correct and regular use of PPE will support the optimal implementation of Occupational Safety and Health, while the lack of PPE use can reduce the effectiveness of the implementation of Occupational Safety and Health in the workplace. The use of PPE is a crucial factor that determines the success of the implementation of Occupational Safety and Health in multi-storey building construction projects. This variable has been proven to significantly affect the implementation of Occupational Safety and Health in the project. The results of the study indicate that the availability and use of adequate PPE plays a role in increasing workers' compliance with Occupational Safety and Health standards. The appropriate use of PPE, such as safety helmets, protective shoes, and gloves, can minimize the risk of accidents and increase workers' awareness of the importance of maintaining personal safety while working.

The Influence of Occupational Safety and Health Training on the Implementation of Occupational Safety and Health

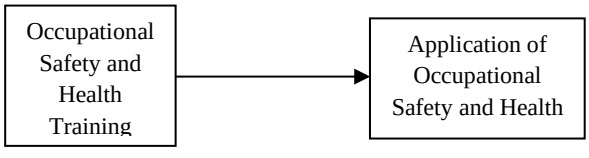

Figure 3. The Influence of Occupational Safety and Health Training on the Implementation of Occupational Safety and Health

Based on the findings of the study, Occupational Safety and Health training programs significantly affect the implementation of Occupational Safety and Health in the workplace. Therefore, the effectiveness of the implementation of Occupational Safety and Health in the workplace is greatly influenced by the quality of occupational safety and health training offered by the organization. Training that meets higher requirements tends to improve worker safety and compliance. Furthermore, Occupational Safety and Health training has been proven to strategically support the implementation of Occupational Safety and Health in construction projects. These results highlight the importance of implementing training that is designed in a methodical and consistent manner, from the planning stage to the assessment stage, to ensure the implementation of uniform safety protocols in the field.

The Influence of Safety Management on the Implementation of Occupational Safety and Health

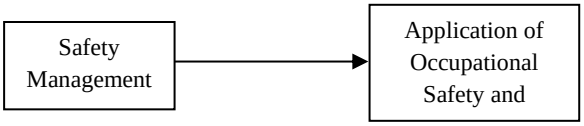

Figure 4. The Influence of Safety Management on the Implementation of Occupational Safety and Health

The implementation of Occupational Safety and Health in the workplace is strongly influenced by Safety Management factors, as shown by this study. This shows that the effectiveness of Occupational Safety and Health programs in the workplace is greatly influenced by the quality of occupational safety and health management implemented by a business. Employee safety measures will be more successful if the Occupational Safety and Health management system is implemented properly.

It has been proven that safety management factors are essential in the implementation of Occupational Safety and Health in high-rise building projects. Based on the findings of this study, the consistent implementation of safety procedures requires a well-organized management system, starting from the planning stage to the assessment stage. In addition to the provision of authorized equipment, effective safety management also includes timely and appropriate monitoring, incident reporting, and corrective action.

The Influence of the Work Environment on the Implementation of Occupational Safety and Health

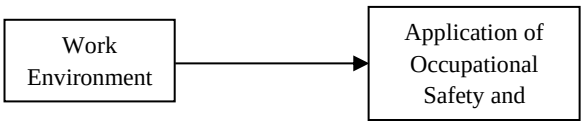

Figure 5. The Influence of the Work Environment on the Implementation of Occupational Safety and Health

This study reveals that workplace conditions have a significant impact on the implementation of Occupational Safety and Health. In other words, if the work environment is supportive, then the implementation of Occupational Safety and Health can be carried out optimally, on the other hand, if the environment is not supportive, it can hinder the effectiveness of the implementation of Occupational Safety and Health. Work environment factors are the main key to the successful implementation of Occupational Safety and Health in multi-storey building construction projects. This variable has been proven to significantly affect the implementation of Occupational Safety and Health in the project. The findings of the study show that the physical elements of the environment, the management of the work area, and the availability of supporting facilities on site have an important role in increasing compliance with Occupational Safety and Health standards. An orderly and well-organized work environment, such as the availability of personal protective equipment (PPE), the setting of high-risk areas, and a planned surveillance system, can minimize the possibility of hazards and increase workers' awareness of the importance of safety.

The relationship between the implementation of Safety and Health Work and the elements that affect it, it was revealed that the elements that contributed the most to the implementation of Occupational Safety and Health in the ISHK Tolaram Kota Batu Eye Clinic project were the elements of human resources and safety management.

Table 1. Compliance level Implementation of the use of PPE on the 1st Floor

Level of compliance Implementation of the use of PPE in stucco work 1st Floor Wall

Date	Helm (%)	Glove (%)	Shoe (%)	Mask (%)	Break (%)	Total (%)
01/01/2025	100	100	80	60	100	88
02/01/2025	100	100	100	60	60	84
03/01/2025	80	80	100	40	60	72
04/01/2025	100	80	60	60	80	76
05/01/2025	100	60	60	20	80	64
06/01/2025	80	60	80	40	60	64
07/01/2025	80	80	80	40	40	64
08/01/2025	80	60	80	40	80	68
09/01/2025	100	100	80	40	100	84

Table 1. displays data on the level of compliance with the use of Personal Protective Equipment (PPE) on the 1st Floor during the period from January 1 to January 9, 2025. Each row shows the percentage of use of the five main types of PPE, namely helmets, gloves, shoes, masks, and vests, on each date. The rightmost column displays the percentage of "Total" as an indicator of the level of compliance with the use of PPE in total for that day.

The general rate of PPE implementation on the 1st Floor, using the average value from the "Overall" column:

$$Average\ Overall\ 1st\ floor = \frac{88 + 84 + 72 + 76 + 64 + +64 + 64 + 68 + 84}{9}$$

$$= \frac{468}{9} = 74\%$$

This value shows that in general, the level of compliance of workers in using PPE on the 1st Floor is in the medium category.

Table 2. Compliance level Implementation of the use of PPE on the 2nd, 3rd, and 4th floors

Compliance Level of the Application of PPE in 2nd, 3rd, and 4th Floor Wall Stucco Work

Date	Helm (%)	Glove (%)	Mask (%)	Break (%)	Safety Strap (%)	Overall (%)	Total (%)	Floor
10/01/2025	83	67	83	67	83	33	69	
11/01/2025	67	50	67	50	83	17	56	
12/01/2025	83	67	83	33	50	33	58	2
13/01/2025	100	83	83	67	50	33	69	
14/01/2025	100	50	100	67	67	50	72	
15/01/2025	100	67	67	50	83	33	67	
16/01/2025	83	83	67	50	67	33	64	
17/01/2025	83	67	83	50	67	33	64	
18/01/2025	67	67	83	33	83	50	64	3
19/01/2025	83	67	67	17	67	17	53	
20/01/2025	83	83	100	17	83	17	64	
21/01/2025	67	83	100	0	83	17	58	
22/01/2025	80	80	80	40	80	20	63	
23/01/2025	80	60	60	60	80	40	63	4
24/01/2025	100	80	80	40	60	20	63	
25/01/2025	80	80	100	60	80	0	67	

Table 2. describes the level of compliance with the use of Personal Protective Equipment (PPE) in stucco work on the 2nd, 3rd, and 4th floors during the period from 10 to 25 January 2025. The monitored PPE includes helmets, gloves, shoes, masks, vests, and safety straps, the addition of safety straps is used at least on work with a height of 1.8 meters or more above ground level, in accordance with international and national occupational safety standards. Each type of PPE is recorded as a percentage of its use every day, then the overall average is calculated. The "Total" column shows the total compliance rate.

$$Average\ Overall\ 2nd\ floor = \frac{69 + 56 + 58 + 69 + 72 + 67}{6}$$

$$= \frac{391}{6} = 65\%$$

This value shows that in general, the level of compliance of workers in using PPE on the 2nd Floor is in the medium category.

$$Average\ Overall\ 3rd\ floor = \frac{64 + 64 + 64 + 53 + 64 + 58}{6}$$

$$= \frac{367}{6} = 61\%$$

This value shows that in general, the level of compliance of workers in using PPE on the 3rd Floor is in the medium category.

$$Average\ Overall\ 4th\ floor = \frac{63 + 63 + 63 + 67}{4}$$

$$= \frac{256}{4} = 64\%$$

This value indicates that overall, the level of compliance of workers in the use of PPE on the 4th Floor is classified as moderate.

1. Comprehensive Compliance Rate

One of the important components in the implementation of occupational health and safety measures in construction projects is the use of personal protective equipment (PPE). The level of understanding of the work safety culture is reflected in the employee's compliance with PPE. Therefore, to know employees' habits in the use of personal protective equipment (PPE) during the work process, continuous monitoring and assessment are essential.

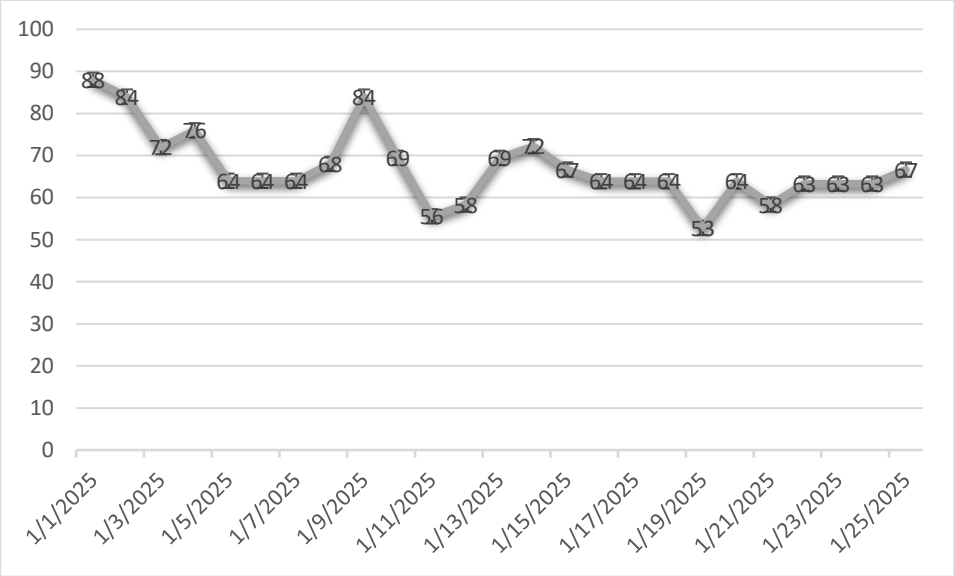

Figure 6. Daily Compliance Rate

Source: Primary data to be processed in 2025

Based on the data in the figure, there was a significant change in the daily compliance level of employees regarding the use of personal protective equipment (PPE) during plastering work between January 1 and 25, 2025. This graph shows the number of people who used personal protective equipment (PPE) between January 1 and 25, 2025. With a percentage of 88% on January 1 and 84% on January 3, the compliance rate was quite high at the beginning of the month. But on January 5, the percentage dropped to 64%, and stayed at that figure for several days.

There was another increase on January 9 by reaching 84%, but on January 11, the compliance rate dropped to 56%. After that, the chart shows variations with some ups and downs, for example reaching 72% on January 15, but then dropping back to the range of 64% to 53% on January 19. Towards the end of the period, the compliance rate reached 67% on January 25.

Table 3. Overall Application of PPE use

Time	Floor	Total	Average Deployment	Deployment categories
January 01-09, 2025	1st Floor	64-88	74%	Medium (60-85%)
January 10-15, 2025	2nd Floor	56-72	65%	Medium (60-85%)
January 16-21, 2025	3rd Floor	53-64	61%	Medium (60-85%)
January 22-25, 2025	4th Floor	63-67	64%	Medium (60-85%)
	Average total		**66%**	**Medium (60-85%)**

Based on the Regulation of the Minister of Public Works Number 09/Per/M/2008, the implementation of

the Occupational Safety and Health Management System in the construction industry is divided into three categories, namely:

a. Good, if the assessment score is more than 85%

b. Moderate, if the assessment score is between 60% to 85%

c. Less, if the assessment score is below 60%

With an assessment score of 66%, the implementation of Occupational Safety and Health of the ISHK Tolaram Eye Clinic project in Batu City is moderate. This shows that the use of personal protective equipment (PPE) in this project has gone well, but there is still much that needs to be done to create a safer and healthier work environment for employees.

Conclusion

The construction project of the ISHK Tolaram Eye Clinic in Batu City is included in the medium category for the implementation of Occupational Safety and Health standards related to the use of Personal Protective Equipment (PPE), with a coefficient value of 66%. While there is still room for improvement, these results show that the implementation of Occupational Safety and Health in this project is quite good. This figure is in line with the recommendations of the construction industry's Occupational Safety and Health management system, which classifies 66% of the score as moderate.

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