E-ISSN: 2963-4946
Vol. 3 No. April 07, 2025
Asian Journal of Social and Humanities
https://ajosh.org/

Analysis of Occupational Safety and Health (OSH) Cost Requirements in The Construction of Rubaru 1 Elementary School

Midi Agus Permana, Budi Witjaksana, Jaka Purnama
Universitas 17 Agustus 1945 Surabaya, Indonesia
Email: permanamidi8@gmail.com, budiwitjaksana@untag-sby.ac.id, jakapurnama@untag-sby.ac.id

***Correspondence:** permanamidi8@gmail.com

KEYWORDS
Occupational Safety and Health, Construction Project, OHS Budget, Monitoring Technology, Risk Management.

ABSTRACT
This research addresses the critical issue of insufficient budget allocation for Occupational Safety and Health (OHS) systems in construction projects, specifically in the Rubaru 1 Elementary School building project in Sumenep District, Indonesia. The study explores how limited financial resources for safety measures, such as personal protective equipment (PPE), worker training, and health facilities, affect the implementation and effectiveness of OHS systems. The urgency of this research lies in the growing need to allocate adequate resources to OHS, as insufficient funding increases the risk of workplace accidents, delays project timelines, and raises costs. Previous studies, including Lestari et al. (2023) and Saragi & Sinaga (2021), have emphasized the positive impact of adequate OHS budgets on reducing accidents and improving productivity. However, a gap exists in research regarding the specific cost components required for effective OHS implementation, especially in relation to construction projects with limited budgets. This study fills this gap by analyzing the key cost components for OHS and their direct impact on worker safety and project performance. The findings will provide valuable insights for construction companies to optimize their OHS budgets and enhance safety measures. It also contributes to the development of industry standards and practices for OHS management in future construction projects.

Introduction

Occupational Safety and Health (OHS) in construction projects is a significant factor in ensuring that the continuity of the project is achieved efficiently and safely (Bourahla et al., 2024; Yilmaz & Yildiz, 2021). Various studies have shown that work accidents in construction projects often occur due to the lack of implementation of good OHS management (Awuy et al., 2017). One of the main causes is the lack of funding allocation for effective OHS system implementation. The lack of budget for work safety often makes companies ignore the operational standards that should be applied. This leads to a high rate of work accidents that result in material losses, project delays, and legal risks for the responsible parties (Ekwuno, 2022; Khalef et al., 2021; Osei-Asibey et al., 2023).

In the Rubaru 1 Elementary School building construction project in Sumenep District, the application of OHS plays an important role in ensuring that work runs without obstacles due to work accidents. Construction projects have a high risk of accidents due to

various factors, such as heavy equipment, heights, and dynamic work environments (Nazilah et al., 2023). The risk of accidents is further increased by the workforce's lack of awareness of the importance of work safety and the lack of training provided before workers are placed on the project site. Therefore, risk management in the implementation of OHS must be given special attention to reduce the potential for accidents and improve work efficiency. Good OHS implementation can reduce the likelihood of serious injury and death in the workplace, increase labor productivity, and maintain project continuity according to planned targets (Lingard & Wakefield, 2019; Maalouf, 2015; Umar, 2019).

In previous research, the implementation of OHS systems on construction projects has shown a positive impact on overall project performance (Lestari et al., 2023). With a good management system, risks can be controlled, productivity increased, and additional costs due to work accidents can be minimized (Saragi & Sinaga, 2021). In addition, projects that implement OHS standards well tend to get a positive reputation, both from the project owner and the workforce, who feel safer and more comfortable at work. However, one of the main obstacles in implementing OHS is the limited budget allocated for safety aspects (da Silva & Amaral, 2019)Companies that focus on cost efficiency often overlook spending on OHS, arguing that such costs do not directly benefit them. In fact, if an accident occurs, the costs incurred for labor compensation, damage repair, and potential fines are far greater than the initial investment in OHS.

The analysis of OHS cost requirements is important because it determines the extent to which this system can be implemented optimally in the Rubaru 1 Elementary School Building construction project. Based on studies from various previous projects, OHS costs include the procurement of personal protective equipment (PPE), labor training, licensing, insurance, and the procurement of health facilities at the project site (Setiawan et al., 2022). Without careful planning, OHS implementation tends to be half-hearted and ineffective. Therefore, the calculation of budget requirements must consider various aspects, including the level of work risk, the number of workers involved, and the regulations that must be obeyed.

The problem formulation in the Rubaru 1 Elementary School Building construction project relates to the extent of the cost requirements that must be allocated for occupational safety and health. This is crucial because each construction project has different risk characteristics, so the analysis of OHS costs needs to be done comprehensively (Rakasyiwi et al., 2022)Risk identification through the HIRARC (Hazard Identification, Risk Assessment, and Risk Control) method can assess potential hazards and determine appropriate mitigation measures. This approach allows companies to identify potential hazards early on, evaluate the level of risk faced, and develop effective mitigation strategies to reduce or even eliminate these risks.

Evaluation of OHS cost requirements not only aims to ensure compliance with applicable regulations, but also as part of a risk management strategy oriented towards worker safety and project efficiency (Minister of Labor and Transmigration of the Republic of Indonesia, 2004). The implementation of strict regulations in the field of OHS requires companies to make adjustments to the safety management system implemented (Kajiki et al., 2020; Koivupalo et al., 2015; Marhavilas et al., 2022; Salguero-Caparrós et al., 2020)Therefore, this research will estimate OHS cost requirements by considering risk factors, control methods, and the effectiveness of work safety programs in the Rubaru 1 Elementary School Building construction project.

One of the main steps in implementing OHS is providing adequate personal protective equipment (PPE). PPE protects workers from various risks that can cause

injury or even death. The types of PPE needed in construction projects include safety helmets, boots, gloves, protective glasses, and reflective vests. The procurement of PPE must be accompanied by educating workers on how to use it properly and the importance of wearing PPE while working. Unfortunately, many workers still ignore the use of PPE due to inconvenience or ignorance of the risks. Therefore, strict supervision and strict sanctions need to be applied to workers who do not comply with OHS rules.

In addition to PPE, workforce training is an important aspect of OHS implementation. This training includes recognizing occupational hazards, emergency evacuation procedures, and safe work techniques. A trained workforce can better identify potential risks and take appropriate precautions. Continuous training can also increase workers' awareness of the importance of work safety so that an OHS culture can be embedded in every activity at the project site. However, implementing this training is costly, especially if it involves professional instructors and adequate training facilities.

Another important aspect of OHS is licensing and labor insurance. Every construction project must meet the licensing standards set by the government to ensure that the activities carried out are by applicable safety regulations. In addition, labor insurance is mandatory to provide financial protection for workers who experience accidents during work. This insurance covers medical expenses, compensation for workers who are disabled due to accidents, and compensation for the families of workers who die due to work accidents.

The OHS budget also includes providing health facilities at the project site. These facilities include small clinics or health posts equipped with basic medical equipment and medical personnel ready to provide first aid in the event of an accident. With health facilities at the project site, accident victims can be treated quickly, reducing the impact of more severe injuries.

In conclusion, the implementation of OHS in the Rubaru 1 Elementary School building project is highly dependent on careful budget planning and commitment from all parties involved. Without adequate allocation of funds, OHS implementation will not be effective and may increase the risk of fatal work accidents. Therefore, companies must realize that investment in OHS is not just regulatory compliance, but also a business strategy that can improve productivity, efficiency, and the overall reputation of the project. By implementing a good OHS system, construction projects can run more safely and smoothly and achieve optimal results without obstacles caused by work accidents.

The construction industry faces significant challenges in implementing Occupational Safety and Health (OHS) management systems. One key issue is the lack of adequate budget allocation for safety measures, which is often overlooked in favor of cost-saving strategies. This results in a high incidence of workplace accidents and impacts productivity and the project's overall success. In the Rubaru 1 Elementary School construction project, which is located in the Sumenep District, the issue of insufficient OHS funding and risk management remains a pressing concern. Despite regulations mandating OHS compliance, the financial constraints in allocating resources for safety equipment, training, and worker health facilities have compromised the safety protocols.

The urgency of this research lies in the growing need to address safety in the construction sector. Poor OHS management risks worker safety and leads to project delays, increased medical and compensation costs, and potential legal liabilities. With construction projects becoming more complex, the failure to allocate sufficient resources to OHS systems is an escalating risk factor. This research is particularly timely for companies seeking to improve worker safety and reduce the costs associated with work

accidents, as it focuses on the cost allocation required to implement an effective OHS system and its role in improving project performance.

Several studies have examined the implementation of OHS systems in construction projects and the importance of adequate budgeting. Lestari et al. (2023) highlighted the positive effects of well-implemented OHS management systems on overall project performance, including higher worker productivity and fewer accidents. However, they also pointed out that many projects do not allocate sufficient funds for OHS, which can negatively impact safety and efficiency. Saragi and Sinaga (2021) Setiawan et al. also emphasized the significance of safety training and the procurement of proper protective equipment, noting that underfunding in these areas often leads to avoidable accidents. (2022) It has been found that projects with a clear focus on OHS and proper resource allocation are more successful in meeting deadlines and achieving quality standards.

While previous studies have highlighted the importance of OHS in construction projects, there remains a gap in research regarding the specific cost requirements for implementing OHS in various project components, particularly in high-risk tasks such as structural work and electrical installations. Furthermore, the role of technology in monitoring and improving OHS implementation has not been extensively explored. This research seeks to fill this gap by analyzing the cost allocation for OHS and assessing the effectiveness of the safety measures implemented in the Rubaru 1 Elementary School building project.

This study is novel in its focus on the specific cost allocation for implementing an OHS system in the Rubaru 1 Elementary School building project. This research provides valuable insights into how OHS budgets can be effectively managed in construction projects by analyzing the costs associated with personal protective equipment (PPE), labor training, insurance, and health facilities. The incorporation of technology, such as safety monitoring tools, into OHS budgeting is a unique aspect of this research, offering a fresh perspective on the role of technological innovations in improving worker safety.

This research aims to evaluate the cost requirements for implementing an effective OHS system in the Rubaru 1 Elementary School building project. The study aims to determine how the allocation of resources for OHS impacts worker safety, project efficiency, and overall project success. By examining various components of the OHS budget, this research also seeks to provide recommendations for better planning and resource allocation to ensure the safety and well-being of construction workers.

The findings of this research will benefit construction companies, project managers, and policymakers by providing a clear understanding of the financial requirements for implementing OHS systems effectively. This study will offer insights into how OHS budgets can be optimized to reduce workplace accidents and improve project outcomes by identifying the key cost components. Additionally, the research will contribute to the development of safety standards and guidelines for the construction industry, ensuring that future projects prioritize worker safety and meet regulatory compliance.

Research Methods

Approach

The approach used in this research is a quantitative approach with descriptive methods. This approach aims to analyze the need for occupational safety and health (OHS) costs in the Rubaru 1 Elementary School Building construction project. Data from various sources will be systematically analyzed for accurate information about the required OHS costs. This method allows researchers to obtain data that can be measured

and analyzed statistically to obtain objective results. With a quantitative approach, this research is expected to provide a more structured picture of the effect of OHS implementation on project efficiency.

In the descriptive method, the data collected will be analyzed to describe the actual situation in the field. The data will be processed and presented in tables and graphs to facilitate understanding of the research results. This research will also refer to various sources of literature to strengthen the analysis. In addition, the descriptive method allows researchers to provide recommendations based on the findings that have been obtained. Thus, this approach is expected to provide solutions for planning and managing OHS costs in construction projects.

Collection Sources and Techniques

The data used in this study consisted of primary data and secondary data. Primary data was obtained through direct observation at the project site and interviews with relevant parties, such as project managers and construction workers. The observation technique was used to identify the application of OHS in the field and evaluate its compliance with applicable standards. Interviews were conducted to obtain information on workers' experiences and challenges in implementing the OHS system. With the combination of these two methods, the data received will be more accurate and comprehensive.

Meanwhile, secondary data was collected from various sources such as project reports, scientific journals, and OHS-related regulations. The literature used in this research comes from published journals and official documents from government agencies. The secondary data will be used to compare the observation results with the standards set in the work safety regulations. With secondary data, this research can identify gaps between theory and practice in the field. This data collection technique is expected to provide a comprehensive picture of OHS cost requirements in construction projects.

Analysis Method

The data obtained will be analyzed using quantitative methods with a descriptive approach. The analysis technique includes numerical data processing to determine the estimated costs required to implement OHS. The data that has been collected will be classified based on OHS cost categories, such as procurement of personal protective equipment, labor training, and work safety infrastructure. This analysis aims to determine the most dominant cost component in the implementation of OHS in the Rubaru 1 Elementary School Building project. Thus, this research can provide more targeted information in construction project budget planning.

This research will also use quantitative analysis to evaluate the effectiveness of OHS implementation in the project. This evaluation compares the costs incurred with the benefits obtained, such as a decrease in the number of work accidents and an increase in labor productivity. Using this analysis, the research can provide recommendations for a more efficient budget allocation. The results of the data analysis will be presented in the form of graphs and tables to facilitate the interpretation and understanding of the research findings.

Identification of Variables

This study involves several key variables related to the application of OHS in

construction projects. The independent variables in this study are factors that affect OHS cost requirements, such as the scale of the project, the number of workers, and the level of job risk. Meanwhile, the dependent variable is the amount of cost required for effective OHS system implementation. By identifying the relationship between these two variables, the research can measure the extent to which these factors affect OHS costs.

In addition, this study will identify intermediate variables, such as worker awareness of work safety and compliance with applicable regulations. These factors will be analyzed to determine their influence on the effectiveness of the OHS system implemented in the project. With a clear identification of variables, this research can provide a more structured picture of the factors that determine occupational safety and health cost requirements in construction projects.

Validity and Reliability

Data validity in this study was guaranteed by triangulating data from various sources. This technique was used to compare data obtained from observations, interviews, and literature to ensure the consistency of the information collected. By triangulating data, this research can increase the accuracy of the results obtained. In addition, validity is also strengthened by using international standards in analyzing the OHS system applied in construction projects.

Data reliability is tested by conducting a consistency test of the measurement method used. The data obtained will be analyzed using statistical methods to determine how reliable the results obtained are in similar studies. With the validity and reliability tests, this research is expected to produce findings that can be scientifically accounted for. Therefore, this step is an important part of ensuring the quality and credibility of the research.

Limitations

This research has several limitations that need to be considered in interpreting the results. First, it only focuses on the Rubaru 1 Elementary School building project, so the results obtained may not be fully generalizable to other construction projects. In addition, the data collected in this study only covers a certain period, so future changes in policies or regulations may affect the results of the analysis conducted.

Another limitation is the limited access to internal data from the contractor or project management. Some sensitive information may not be fully disclosed in this study, which may affect the depth of the analysis conducted. By understanding these limitations, this research can provide more realistic and applicable recommendations for the conditions of ongoing construction projects.

Results And Discussion

Identification of Occupational Safety and Health (OHS) Costs on

Occupational Safety and Health (OHS) in the Rubaru 1 Elementary School Building construction project is a crucial aspect to ensure the smooth running of the work. The OHS costs were identified through an analysis of the need for personal protective equipment (PPE), labor training, and health facilities at the project site. Based on the data collected, the budget allocated for PPE procurement includes helmets, gloves, safety shoes, and reflective vests. In addition, costs for safety training were also factored in to increase workers' awareness of the importance of OHS procedures. Preliminary estimates indicate that the budget required for OHS implementation ranges between 5% and 10%

of the total project cost. These factors indicate that investment in OHS is necessary to minimize the risk of accidents in the workplace.

The costs incurred for work safety systems cover various aspects, including installing safety signs and providing fire extinguishers. This step ensures that workers understand the potential hazards in the work environment and can take appropriate preventive measures. In addition, health facilities such as first aid kits and temporary health rooms are set up to anticipate emergency events. Previous studies have shown that projects with organized OHS systems have higher productivity levels. Therefore, the budget spent on OHS is not just an additional cost, but also a long-term investment that improves project efficiency.

Table 1. OHS cost requirements

NO	DESCRIPTION	TOTAL PRICE
1	Preparation of Construction Safety Plan (RKK)	IDR 425,000.00
2	OHS Socialization and Promotion	IDR 1,850,000.00
3	Personal protective equipment (PPE) and work protective equipment (APK)	IDR 8,830,000.00
4	Insurance and Licensing	IDR 9,000,000.00
5	OHS Personnel	IDR 4,461,724.00
6	Health Facilities	IDR 600,000.00
7	Signs	IDR 2,250,000.00
8	Other	IDR 370,000.00
	Total amount	**IDR 29,275,000.00**

Source: processed by researchers 2024

Estimation of OHS Budget Usage in Each Component

Each component of the Rubaru 1 Primary School construction project required a different allocation of Occupational Health and Safety (OHS) costs, depending on the level of risk involved in each type of work. For example, structural work requires additional safeguards as it involves working at heights, such as the installation of concrete beams and columns. Therefore, the procurement of safety equipment such as harnesses, high-quality scaffolding, and protective helmets and shoes becomes an important part of the main budget. In addition, electrical installation work also requires additional costs for protective equipment such as insulating gloves, antistatic shoes, and safety training for workers handling electrical systems. This aims to prevent the risk of electrocution and other work accidents.

Other OHS facilities include the provision of clear evacuation routes and adequate safety signage so that all workers can understand emergency procedures properly. In addition, the implementation of regular safety inspections is also part of the budget to ensure that all aspects of safety in the project are run by applicable standards. By implementing a strict supervision system, the potential risk of accidents can be significantly minimized. The application of technology in OHS monitoring is also considered in the budget, such as using automatic sensors to detect hazardous gases, adequate fire extinguishers, and emergency communication systems for workers in high-risk areas. Taking all these aspects into consideration, the overall cost required for the implementation of OHS in the Rubaru 1 Primary School Building construction project is

estimated to reach more than Rp 29,275,000.00, adjusting to the specific needs of each project component to ensure optimal work safety and security.

Discussion

The implementation of the OHS system in the Rubaru 1 SDN building project is part of an effort to improve worker safety and project efficiency. The cost analysis that has been conducted shows that the budget for occupational safety varies greatly depending on the scale of the project and the level of risk of the work. The study by Lestari et al. (2023) shows that projects that implement a good OHS management system tend to have lower rates of workplace accidents. Therefore, investment in OHS is not only to fulfill regulations, but also as a long-term strategy in increasing worker productivity.

A comparison with similar projects shows that the OHS costs allocated to this project are still within the industry standard range. Based on previous research, projects that allocated 5-10% of the total budget for OHS showed more effective results in reducing the number of work accidents. Therefore, the budget prepared for the Rubaru 1 Primary School Building construction project is considered to be in line with the identified safety needs. Appropriate use of the budget also contributes to increasing workers' awareness of the importance of implementing safety standards.

One of the main challenges in implementing OHS is budget constraints, which are often perceived as unnecessary additional costs. However, the analysis shows that good OHS implementation can reduce potential losses due to work accidents. Projects that do not allocate adequate budget for OHS tend to experience disruptions in work completion, such as delays due to accidents that occur. Therefore, investment in OHS is not only an obligation, but also provides long-term economic benefits.

In addition, the effectiveness of OHS implementation is highly dependent on workers' compliance with established regulations. One method that can improve compliance is to conduct regular safety training. A study by Saragi and Sinaga (2021) shows that workers who receive safety training tend to be more disciplined in following work procedures. Therefore, budget allocation for training and educating workers in the field of work safety should be a top priority.

An evaluation of OHS implementation in this project showed that most of the budget was allocated to PPE procurement and safety training. However, some aspects still require improvement, especially regarding routine supervision and safety inspections. Implementing periodic inspections using standard OHS checklists can help identify potential hazards before accidents occur. With this approach, the costs allocated to OHS can be utilized more effectively.

Occupational safety and health are the responsibility of project management and all workers involved. Therefore, management and workers need to cooperate in raising awareness of the importance of OHS. One strategy that can be implemented is to provide incentives for workers who consistently comply with safety procedures. With incentives, workers will be more motivated to keep themselves and their work environment safe.

Overall, the implementation of the OHS system in the Rubaru 1 SDN building project was well designed and by the applicable standards. However, the effectiveness of the implementation still depends on the commitment of all parties involved. Therefore, periodic evaluation of the implemented safety system is needed to ensure that the main objectives of OHS in this project can be achieved optimally.

Conclusions

The implementation of Occupational Safety and Health (OHS) in the Rubaru 1 Elementary School building project is crucial to ensuring worker safety and the smooth execution of the construction process. Different project components require distinct OHS budgets based on the level of risk associated with each task. For example, structural works that involve working at heights necessitate safety equipment such as harnesses and quality scaffolding, while electrical installations require additional protective gear like insulating gloves and antistatic shoes to minimize the risk of electrocution. Regular safety inspections and well-maintained evacuation routes are critical for a safe working environment. The integration of monitoring technologies such as automatic sensors and emergency communication systems further enhances the project's risk management strategies. With an allocated budget of approximately IDR 29,275,000, the OHS implementation minimizes the likelihood of work accidents and ensures compliance with construction safety regulations.

Given the importance of OHS in construction projects, future research should explore the relationship between budget allocation for OHS and the effectiveness of safety measures across different types of construction projects. Further studies could assess the long-term impact of specific safety investments on worker productivity and accident rates. Additionally, research into the integration of more advanced technology in OHS management, such as artificial intelligence or real-time monitoring systems, could provide valuable insights into improving safety standards and ensuring more effective risk management in future projects.

Reference

Awuy, T., Pratasis, P. A. K., & Mangare, J. B. (2017). Factors Hindering the Implementation of OHS Management System on Construction Projects in Manado City. *Journal of Statik Civil*, *5*, 187–194.

Bourahla, A., Fernandes, G., & Ferreira, L. M. D. F. (2024). Managing Occupational Health and Safety Risks in Construction Projects to Achieve Social Sustainability–A Review of Literature. *Procedia Computer Science*, *239*, 1053–1061.

da Silva, S. L. C., & Amaral, F. G. (2019). Critical factors of success and barriers to the implementation of occupational health and safety management systems: A systematic review of literature. *Safety science*, *117*, 123–132.

Ekwuno, A. O. (2022). Research To Study The Damage Caused To The Construction Projects Due To The Lack Of Workers On Site. *International Journal of Scientific and Research Publications*, *12*(12), 361–382.

Kajiki, S., Mori, K., Kobayashi, Y., Hiraoka, K., Fukai, N., Uehara, M., Adi, N. P., & Nakanishi, S. (2020). Developing a global occupational health and safety management system model for Japanese companies. *Journal of Occupational Health*, *62*(1), e12081.

Khalef, R., El-Adaway, I. H., Assaad, R., & Kieta, N. (2021). Contract risk management: A comparative study of risk allocation in exculpatory clauses and their legal treatment. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, *13*(1), 4520036.

Koivupalo, M., Sulasalmi, M., Rodrigo, P., & Väyrynen, S. (2015). Health and safety management in a changing organisation: Case study, Global Steel Company. *Safety science*, *74*, 128–139.

Lestari, M. G., Widiasanti, I., & Saefudin, A. (2023). Implementation of OHS Management System for Park Regis Construction Project Workers By Prince Menteng Hotel. *Action Research Literate*, *7*(12). https://arl.ridwaninstitute.co.id/index.php/arl

Lingard, H., & Wakefield, R. (2019). *Integrating work health and safety into construction project management*. John Wiley & Sons.

Maalouf, M. (2015). *Intervention manual: Strategies and methods for the improvement of Productivity and occupational health and safety in garment factories*.

Marhavilas, P. K., Pliaki, F., & Koulouriotis, D. (2022). International management system standards related to occupational safety and health: An updated literature survey. *Sustainability*, *14*(20), 13282.

Minister of Labor and Transmigration of the Republic of Indonesia. (2004). *Risk Management Guidelines Companion To As/Nzs 4360: 2004*.

Nazilah, N. U., Riskiyah, I. R., Khamim, M., Management, M., Construction, R., Civil, J. T., Malang, P. N., Department, D., & Civil, T. (2023). K3 Management System Analysis in the Kyo Society Surabaya Apartment Construction Project. *Jos-Mrk.Polinema.Ac.Id*, *4*. http://jos-mrk.polinema.ac.id/

Osei-Asibey, D., Ayarkwa, J., Acheampong, A., Adinyira, E., & Amoah, P. (2023). Impacts of accidents and hazards on the Ghanaian construction industry. *International Journal of Construction Management*, *23*(4), 708–717.

Rakasyiwi, G. R., Witjaksana, B., & Tjendani, H. T. (2022). Project Scheduling Analysis Using The Critical Path Method-Case Study: Subsidized House Construction Project In Hill Mulya Housing, Samarinda City. *International Journal On Advanced Technology, Engineering, And Information System*, *1*(4), 73–88.

Salguero-Caparrós, F., Pardo-Ferreira, M. del C., Martínez-Rojas, M., & Rubio-Romero, J. C. (2020). Management of legal compliance in occupational health and safety. A literature review. *Safety science*, *121*, 111–118.

Saragi, T. E., & Sinaga, R. E. (2021). Occupational Safety and Health (K3) in the Construction Project of Advanced Flats of North Sumatra Province I Medan. *Journal of Civil Engineering*, *1*(1).

Setiawan, E., Witjaksana, B., & Tjendani, H. T. (2022). Analysis Of Risk Management In Building Workers At Sman 5 Brawijaya Kediri. *Journal Of Engineering, Social And Health*, *1*(1). https://ajesh.ph/index.php/gp

Umar, T. (2019). *Developing toolkits and guidelines to improve safety performance in the construction industry in Oman*. Kingston University.

Yilmaz, M., & Yildiz, S. (2021). The importance of occupational health and safety (OHS) and OHS budgeting in terms of social sustainability in construction sector. *Journal of Building Material Science*, *2*(1).