Volume 3, No. 10 October 2024 - (2297-2306)
p-ISSN 2980-4868 | e-ISSN 2980-4841
https://ajesh.ph/index.php/gp

Construction Project Performance Based on Occupational Safety, Occupational Health and Work Motivation

Daniel Kurniawan Sunarjo[1*], Mawardi Amin[2]
Universitas Mercu Buana, Indonesia
E-mail: daniel.kurniawan.sunarjo@gmail.com[1], mawardi@mercubuana.ac.id[2]

ABSTRACT
Many construction organizations still employ workers without regard to the application of accident risk, although a focus on safety is predicted to improve worker performance. This study aims to examine the effect of occupational safety and health and incentive factors on worker performance in housing construction projects. This study used a quantitative approach and was tested using the SEM-PLS method with a sample of 72 respondents. The results showed that well-implemented occupational safety and health significantly improved worker performance, by reducing the risk of injury and improving worker welfare. In addition, high work motivation plays a role in increasing project productivity and efficiency. Emphasis on safety, health, and work motivation was shown to have a positive impact on achieving better project performance. The implications of this research provide important insights for construction managers and policy makers in optimizing project success through the implementation of effective safety protocols, wellness programs, and appropriate motivation strategies. Thus, this study highlights the importance of integrating occupational safety and motivation as key factors in achieving superior project performance.

Keywords: Occupational Safety, Health, Motivation, Performance.

INTRODUCTION

Optimal performance enhances operational efficiency, allowing the project to be completed on schedule and within budget. This contributes to reducing unforeseen costs and minimizing the risk of delays, which are often caused by quality or management issues. Conversely, poor project performance can lead to additional costs due to repairs or rework, extend project duration, and decrease operational efficiency. The negative impact of poor project performance not only affects financial aspects but also has broader implications for the economy and society. Delays in project completion can lead to reduced economic productivity and inconvenience for the community waiting for promised facilities or infrastructure (Wang et al., 2024). Additionally, the extra costs incurred due to poor performance can divert resources from other important projects, hindering economic growth and diminishing the quality of life for the community.

Effective project management is necessary. According to (Darmawan et al., 2023), project management is the application of information, expertise, and skills, as well as the best technological

approaches, with limited resources, to achieve predefined targets and objectives in terms of time and money. Human effort is always required for construction work on a small, medium, or big size, regardless of the technical intricacies. Craft workers are the primary players in construction projects, and they are at danger of workplace accidents (Hasanudin, 2022). According to BPJS Employment data (2016), at least 30% of all work accidents in various industries are caused by construction workers. According to the Ministry of Manpower's data, while the number of work accidents decreased in 2017, the number of workers killed in work accidents surged by 349.4%. In 2015, 530 workers died, a figure that rose to 2,382 in 2016. Of these accidents, 50% occurred in the building business or injured construction workers, with the majority of instances involving falls from heights (Deny, 2017). Workplace accidents in the construction sector include various types of incidents such as falls from height (26%), impacts (12%), and material crushing (9%) (Safitri & Widowati, 2017).

The application of OHS for construction workers is important in order to guarantee their safety and health so that if they feel safe because of this guarantee, it will increase their motivation and performance (Othman et al., 2017). Occupational health and worker productivity on construction projects are closely linked, with good health playing a crucial role in enhancing efficiency and work outcomes. Work in the construction sector often involves physically and mentally demanding conditions, such as exposure to hazardous materials, long working hours, and job stress. When workers' health is well-maintained, they are likely to have more energy, experience less fatigue, and remain more focused on completing tasks. This directly impacts productivity by reducing work errors, speeding up project completion, and decreasing absenteeism. Conversely, unmanaged health issues can lead to increased injuries, health disruptions, and decreased morale, which can ultimately hinder project progress and increase costs.

Unfortunately, the OHS culture on residential construction projects is usually still not well implemented. This is often due to a lack of attention to adequate safety standards, limited resources, and insufficient understanding of the importance of safety and health practices at the smaller project level. As a result, although housing projects have significant safety challenges, the attention and effort given is often disproportionate to the risks involved, leading to a higher potential for accidents and injuries in the field (Harnawati, 2024).

Construction workers play an important role in the success of a construction project because of their enormous numbers and the large amount of money spent on daily wages. As a result, this issue must be carefully evaluated throughout the course of the project. In this instance, builders must have strong field abilities so that their performance can contribute to project success. Motivation influences good performance. Differences in worker backgrounds can influence work motivation levels, as well as differences in elements that can boost work motivation (Setiawan & Soekiman, 2023). (Obaied & Fawzy, 2022) research found that wages are the primary motivator for builders. This is consistent with studies by (Azeez et al., 2019). Workplace safety is usually not the major motive for construction workers. The scenario is ironic. Many construction companies continue to hire workers despite the risk of accidents. This condition is troubling, especially given the building industry's present rapid expansion. Awareness of the importance of incorporating K3 into their work processes (Widaningsih, 2020).

The purpose of this study is to evaluate how occupational safety, occupational health, and work motivation affect construction project performance. The research seeks to provide insights into how effective occupational safety and health practices, coupled with high worker motivation, contribute to improved project performance. Ultimately, this research aims to provide recommendations for improving project management practices to achieve better results in optimising safety, health, and motivation in the construction industry.

According to (Suma'mur, 2017) Occupational health refers to efforts to maintain and improve the physical and mental well-being of workers in the workplace, with the aim of creating a safe and supportive work environment. This includes implementing strict safety standards, providing adequate health facilities, and developing wellness and mental health programmes. Occupational health also involves identifying and managing health risks associated with the work environment, such as exposure to hazardous materials or occupational stress.

According to (Divya et al., 2017), factors influencing work safety in construction projects can be divided into three categories, as seen in Figure 1.

Figure 1. Factors Affecting Work Safety

Source: (Divya et al., 2017)

Employee performance is defined as the outcome of their labor based on specific job-related criteria. According to Keith Davis (Hamali, 2016), elements that determine employee performance achievement include ability and motivation factors. Work motivation is something that gives encouragement or passion for a person to undertake things linked to work activities in order to attain organizational goals (Hasibuan, 2016). Herzberg's Two Factors Motivational Theory includes both motivational and hygienic components. People seek two types of need factors: motivational factors and hygienic considerations. Figure 3 illustrates Herzberg's motivation theory.

Figure 2. Herzberg's Motivation Theory Framework

Source: (Obaied & Fawzy, 2022)

Ensured workplace safety can reduce the risk of accidents and disruptions, enabling workers to perform more efficiently. Good occupational health ensures that workers are in optimal physical and mental condition, which supports productivity and work quality. Meanwhile, high work motivation can enhance workers' commitment and dedication to completing tasks, ultimately contributing to improved overall project performance. Therefore, this hypothesis suggests that construction projects that prioritize safety, health, and work motivation will demonstrate better performance compared to projects that do not consider these factors. The proposed hypothesis is shown in Figure 4 below:

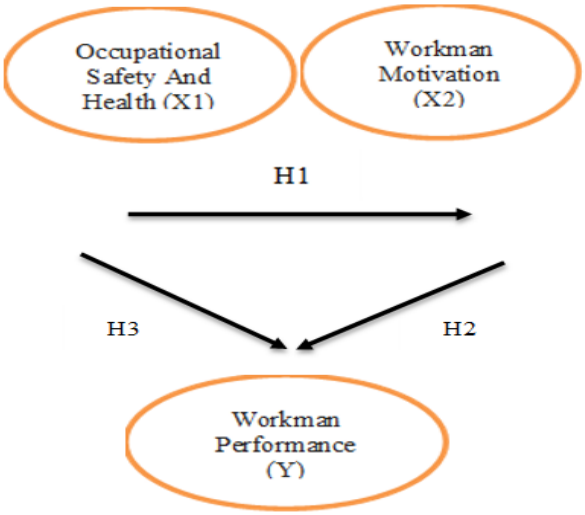

Figure 3. Hypothesis Model

This study is novel in its approach of integrating occupational safety and health (OSH) with work motivation factors to assess worker performance in residential construction projects. Most previous studies tend to focus on only one aspect, such as occupational safety or employee motivation separately. This research combines both factors holistically, providing a new perspective on how the interaction between OHS and work motivation can directly affect performance. In addition, this research also utilizes the SEM-PLS method, which is relatively rarely applied in the context of safety and work motivation studies in the construction industry. This makes a significant contribution to the literature related to construction project management, especially in the context of residential projects that are often neglected in terms of OHS implementation.

Based on the background description above, the purpose of this study is to examine the effect of occupational safety and health and incentive factors on worker performance in housing

construction projects. so that the benefits in this study are so that the benefits in this study are to provide deeper insight into the importance of implementing effective occupational safety and health (OHS) and appropriate motivation strategies in improving worker performance on housing construction projects. This research is expected to be a practical guide for project managers and policy makers in designing comprehensive OHS policies and incentive programs that are able to encourage work motivation, thus not only reducing the risk of work accidents but also increasing project productivity and efficiency. The contribution of this research to project management practice is to provide guidance for construction managers and policy makers to design more effective strategies to improve project performance.

RESEARCH METHOD

Materials

This study employs a quantitative method; data analysis is quantitative or statistical in nature, with the goal of testing the established hypothesis. This study's research approach is a survey of respondents administered via questionnaire distribution. Figure 5 depicts the research process at this point.

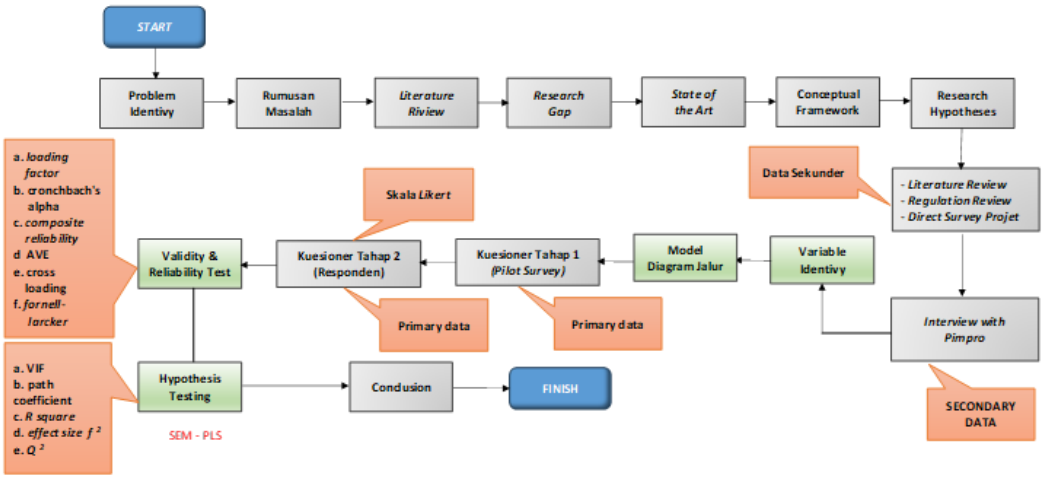

Figure 4. Research Stages

Data Analysis

The sample used in this study is a saturated sample, meaning that all members of the population, totaling 72 individuals, were taken as respondents. The use of a saturated sample ensures that every individual in the population is involved in the study, making the results more representative and reflective of the overall population. (Sugiyono, 2016) describes saturated sampling as a sampling technique where every member of the population is included as part of the sample. For data analysis, the Structural Equation Modeling (SEM) method based on Partial Least Squares (PLS) was utilized. SEM PLS was chosen for its ability to analyze complex relationships between latent variables and observed variables, and it can be effectively used even with a relatively small sample size. This method also allows for the simultaneous and efficient testing of

the model, providing robust results in assessing the relationships between the factors being studied.

RESULT AND DISCUSSION

From the questionnaire distribution to craftsmen involved in residential projects, responses were collected from 72 participants. The educational background of the respondents is detailed in Table 1, showing that 9 respondents (12%) have completed elementary school, 33 respondents (46%) have finished junior high school, and 30 respondents (42%) have attained high school or vocational education. Regarding work experience, 44 respondents (61%) have less than 5 years of experience in construction projects, 21 respondents (29%) have between 5 and 10 years of experience, and 7 respondents (10%) have over 10 years of experience. This is illustrated in Figure 4.2, which indicates that the majority of respondents have less than 5 years of experience. Additionally, the figure reveals that most of the respondent craftsmen are between 31 and 35 years old.

Table 1. Profile of Participants

Profile	Amount	Percentage
Age		
18 – 25 years	7	10
26 – 30 years	19	26
31 – 35 years	27	38
36 – 40 years	13	18
≥ 40 years	6	8
Education		
High School/Equivalent	30	42
Junior high school	33	46
Elementary school	9	12
Job Experience		
< 5 years	44	61
6 – 10 years	21	29
> 10 years	7	10

Outer model

The results of the outer model testing are presented in Table 2, which shows that each variable yields Composite Reliability (CR) and Cronbach's Alpha (CA) values exceeding 0.7, demonstrating their dependability. Additionally, all variables have Average Variance Extracted (AVE) values greater than 0.5, indicating their validity. These results confirm that the variables used in the model are both reliable and valid, ensuring robust and credible findings for the research (Hair & Alamer, 2022).

Table 2. Result of the Outer Model

Construct	CA	CR	AVE
Safety And Health (X_1)	0.914	0.929	0.594
Workman Motivation (X_2)	0.912	0.928	0.588
Workman Performance (Y)	0.716	0.841	0.639

Hypothesis Testing

Hypothesis testing in research examines the impact of occupational safety and health, motivation, and performance. Figure 4 shows the findings of the t value of the path coefficient and the structural model, which are described in Table 3. All hypotheses (H1-H3) were significantly supported, with t-values exceeding critical values for α = 0.05 and 0.01. Additionally, the support for the hypothesis in this study is evidenced by the fact that the t-statistic value for each variable exceeds the t-table value (1.994).

Table 3. Hypothesis Testing Result

Hypothesis	Original sample (O)	Tstatistics (|O/STDEV)	P values	Information
Safety and health on motivation	0.713	12.131	0.000	Supported
Motivation on performance	0.507	4.342	0.000	Supported
Safety and health on performance	0.263	2.049	0.041	Supported

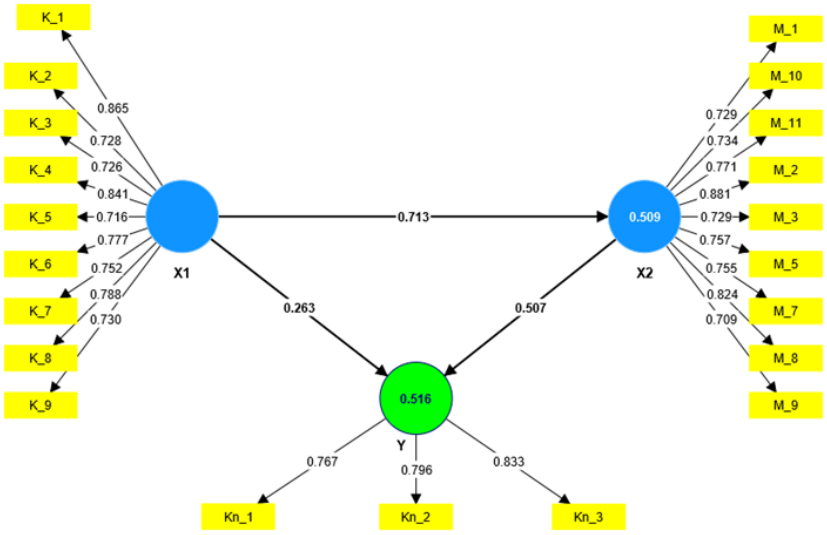

Figure 5. SemPLS Models

Occupational Safety and Health on Worker Motivation

The study found that Occupational Safety and Health (X_1) had a significant effect on Worker Motivation (X_2). Occupational Safety and Health (OSH) is a crucial aspect that directly influences worker motivation. When workers feel safe from accident risks and have their health secured at the workplace, they tend to be more focused and enthusiastic in performing their tasks. A safe and healthy work environment creates a sense of comfort, reduces stress, and enhances workers' mental well-being. This, in turn, encourages them to work more productively and show higher dedication to their work.

Moreover, good safety and health policies demonstrate that the company cares about the well-being of its employees (Friebel et al., 2024). This increases workers' confidence and loyalty toward the company. When employees feel valued and well-treated, their motivation to contribute more to the projects or tasks at hand also rises. The awareness that the company prioritizes their

safety and health drives workers to maintain high work standards and avoid absenteeism due to illness or injury.

Furthermore, the presence of a well-structured and consistent occupational safety and health program can also create a positive work culture. Workers who are motivated by a safe and supportive work environment tend to be more proactive in completing tasks and more innovative in finding solutions to problems they encounter. Thus, occupational safety and health not only affect productivity but also build intrinsic worker motivation, which ultimately contributes to the overall achievement of organizational goals.

Motivation on Performance

The study found that Builder Motivation (X_2) has a significant positive effect on Builder Performance (Y) in residential construction projects. The findings of this study are consistent with research conducted by (Van Tam, 2021) and (Obaied & Fawzy, 2022)

When builders are well-motivated, both intrinsically and extrinsically, they tend to work more efficiently and with higher quality. Strong motivation drives them to meet project deadlines, maintain high standards of work, and stay enthusiastic despite facing challenges on-site. This is especially important in residential construction projects, where every detail of the work affects the overall quality and competitiveness of the project.

Additionally, high motivation among builders can enhance their initiative and creativity in solving problems that arise during the construction process. Motivated builders not only follow instructions but also seek ways to improve efficiency and overcome obstacles that could delay the project. For example, they might explore faster work methods or utilize the latest technology to expedite processes without compromising quality. Therefore, high motivation directly contributes to improved performance, both in terms of productivity and innovation.

Furthermore, the positive effects of motivation on builder performance are also reflected in reduced error rates and absenteeism. Motivated builders tend to be more focused and careful in their tasks, reducing the likelihood of mistakes that could cause delays or additional costs. Additionally, they are likely to take fewer days off, as they feel satisfied with their work and are eager to continue contributing to the project's success. As a result, high motivation significantly enhances builder performance in residential construction projects, ultimately contributing to the overall success of the project.

Occupational Safety and Health on Performance

The study found that occupational safety and health (X_1) has a significant positive effect on craftsman performance (Y) in residential construction projects. The findings of this study are consistent with those of (Othman et al., 2017), who found that training and introduction to K3 are important factors in determining the success of safety management in construction projects. Effective management leads to improved performance.

When safety and health aspects are well-managed, craftsmen feel safer and more comfortable at work. This reduces the risk of injuries and illnesses that can hinder their ability to work effectively. A safe work environment also helps reduce stress and anxiety, which can affect craftsmen's concentration and motivation (Toniolo-Barrios & ten Brummelhuis, 2023). With better

physical and mental conditions, craftsmen can work more efficiently and maintain the quality of their work.

Furthermore, attention to safety and health can enhance job satisfaction and loyalty among craftsmen towards the project. When a company demonstrates its commitment to the well-being of its craftsmen, they feel valued and are more motivated to deliver their best performance. Good safety practices and adequate health facilities instill confidence in craftsmen, positively impacting their dedication and productivity. Craftsmen who feel cared for are more likely to work enthusiastically and remain committed to completing the project to high standards.

Additionally, effective safety and health programs can foster a positive and collaborative work culture among craftsmen. When craftsmen see that their safety and health are priorities, they become more proactive in following safety procedures and adhering to work standards. This not only reduces the number of workplace accidents but also improves communication and cooperation on-site, ultimately enhancing overall project performance. Therefore, investing in occupational safety and health directly contributes to achieving better outcomes in residential construction projects.

CONCLUSION

The conclusions of this study underscore the critical role that safety, health, and motivation play in improving construction project performance. The study finds that robust occupational safety measures and effective health programs significantly improve worker efficiency, reduce costs, and ensure timely project completion. Additionally, high levels of work motivation are strongly associated with increased productivity and better project outcomes. These findings highlight the importance of integrating comprehensive safety and health practices with strategies to boost worker motivation in achieving superior project performance. By adopting these practices, construction managers can enhance overall project success and contribute to a more productive and safe working environment.

REFERENCES

Azeez, M., Gambatese, J., & Hernandez, S. (2019). What do construction workers really want? A study about representation, importance, and perception of US construction occupational rewards. *Journal of Construction Engineering and Management*, *145*(7), 4019040.

Darmawan, D., Tinambunan, A. P., Hidayat, A. C., Sriharyati, S., Hamid, H., Estiana, R., Sono, M. G., Ramli, A., Sondeng, S., & Mareta, S. (2023). *Manajemen Sumber Daya Manusia Era Digital*. PT. Sonpedia Publishing Indonesia.

Deny, S. (2017). *Pekerja yang meninggal di 2016 naik lebih dari 300 persen*. Www.Liputan6.Com. https://www.liputan6.com/bisnis/read/2825144/pekerja-yang-meninggal-di-2016-naik-lebih-dari-300-persen

Divya, P., Bhavsar, P. J. J., & Pitroda, J. (2017). A Critical Review on Safety Management in Construction Projects. *Int. J. Constr. Res. Civ. Eng.*, *3*, 148–154.

Friebel, A. G., Potter, R. E., & Dollard, M. (2024). Health and safety representatives' perceptions of occupational health and safety policy developments to improve work-related psychological

health: Applying the theory of planned behaviour. *Safety Science*, *172*, 106410. https://doi.org/https://doi.org/10.1016/j.ssci.2023.106410

Hair, J., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, *1*(3), 100027.

Hamali, A. Y. (2016). Pemahaman sumber daya manusia. *Yogyakarta: Caps*.

Harnawati, R. A. (2024). *Manajemen Risiko dengan Pendekatan Keselamatan, Kesehatan, Keamanan, dan Lingkungan (K3L)*. Penerbit NEM.

Hasanudin. (2022). *Konstruksi penyumbang terbesar kecelakaan kerja di Indonesia*. Www.Konstruksimedia.Com. https://www.konstruksimedia.com/konstruksi-penyumbang-terbesar-kecelakaan-kerja-di-indonesia/infrastruktur/

Obaied, F. A., & Fawzy, M. F. (2022). *Motivation Factors'impact On Construction Employees'performance At A Saudi Company*.

Othman, I., Shafiq, N., & Nuruddin, M. F. (2017). Effective safety management in construction project. *IOP Conference Series: Materials Science and Engineering*, *291*(1), 12018.

Safitri, N., & Widowati, E. (2017). Penerapan risk management pada pekerjaan di ketinggian berdasar SNI ISO 31000: 2011. *HIGEIA (Journal of Public Health Research and Development)*, *1*(2), 77–88.

Setiawan, A. P., & Soekiman, A. (2023). Faktor-Faktor yang Mempengaruhi Motivasi Pekerja pada Proyek Konstruksi Berdasarkan Latar Belakang Pekerja. *Rekayasa Sipil*, *17*(2), 130–139.

Sugiyono. (2016). Metode Penelitian Kunatitatif Kualitatif dan R&D. *Alfabeta, Bandung*.

Suma'mur, P. K. (2017). *Higiene perusahaan dan kesehatan kerja (HIPERKES)*.

Toniolo-Barrios, M., & ten Brummelhuis, L. L. (2023). How does mindfulness reduce stress at work? A two-study examination using a stress appraisal perspective. *Personality and Individual Differences*, *215*, 112392. https://doi.org/https://doi.org/10.1016/j.paid.2023.112392

Van Tam, N. (2021). Motivational factors affecting construction labor productivity: a review. *Management Science and Business Decisions*, *1*(2), 5–22.

Wang, H., Wang, W., & Jin, Z. (2024). Mechanism for allocating delay to constituent activities in project management. *Computers & Industrial Engineering*, *197*, 110603. https://doi.org/https://doi.org/10.1016/j.cie.2024.110603

Widaningsih, L. (2020). *Tukang Bangunan: pewarisan keterampilan vokasional* (Vol. 1). UPI Press.