# OHS Compliance and Motivation in Enhancing Productivity Through Competence: An Empirical Study on Low Cost Apartment Construction Projects in Aceh Province

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## Abstrak

Produktivitas tenaga kerja di sektor konstruksi merupakan isu strategis mengingat kompleksitas tugas, tingginya risiko keselamatan, dan kebutuhan akan sumber daya manusia yang kompeten. Pelaksanaan program Keselamatan dan Kesehatan Kerja (K3) serta motivasi kerja dipandang sebagai faktor utama yang memengaruhi produktivitas. Penelitian ini merupakan studi empiris dengan pendekatan kuantitatif-eksplanatori yang bertujuan untuk menganalisis peran kepatuhan terhadap program Keselamatan dan Kesehatan Kerja (K3) serta motivasi kerja dalam meningkatkan produktivitas pekerja, baik secara langsung maupun tidak langsung melalui kompetensi kerja sebagai variabel intervening. Objek penelitian difokuskan pada proyek pembangunan rumah susun di Provinsi Aceh yang berlangsung selama periode Oktober hingga Desember 2024. Data dikumpulkan melalui metode survei menggunakan kuesioner tertutup kepada 170 responden pekerja konstruksi, dengan pengukuran variabel menggunakan skala Likert 5 poin. Analisis data dilakukan dengan teknik Structural Equation Modeling (SEM) berbantuan perangkat lunak AMOS versi 22.0. Hasil penelitian menunjukkan bahwa kepatuhan terhadap pelaksanaan K3 memiliki pengaruh langsung yang signifikan positif terhadap produktivitas (CR = 2,222; p = 0,042), demikian pula motivasi kerja menunjukkan pengaruh langsung yang signifikan terhadap produktivitas (CR = 2,188; p = 0,043). Selain itu, kepatuhan terhadap K3 juga berpengaruh signifikan terhadap kompetensi kerja (CR = 2,619; p = 0,035), begitu pula motivasi kerja terhadap kompetensi kerja (CR = 2,041; p = 0,038). Kompetensi kerja terbukti berpengaruh signifikan terhadap produktivitas (CR = 2,000; p = 0,048) dan berperan sebagai variabel intervening dalam hubungan antara kepatuhan K3 dan motivasi terhadap produktivitas. Temuan ini mempertegas pentingnya integrasi program OHS dan peningkatan motivasi kerja dalam membentuk kompetensi yang mendukung produktivitas pekerja, khususnya dalam konteks proyek konstruksi di Aceh.

**Kata kunci:** Kepatuhan K3, Motivasi Kerja, Kompetensi, Produktifitas Kerja

## *Abstract*

*Worker productivity in the construction sector is a strategic issue due to the complexity of tasks, high safety risks, and the need for competent human resources. The implementation of Occupational Safety and Health (OSH) programs and work motivation are considered key factors influencing productivity. This study is an empirical quantitative-explanatory research that aims to examine the role of compliance with Occupational Health and Safety (OHS) regulations and work motivation in improving worker productivity, both directly and indirectly through work competence as an intervening variable. The research was conducted on a low-cost apartment construction project in Aceh Province between October and December 2024. Data were gathered using a structured questionnaire administered to 170 construction workers, with each respondent assessing latent variable indicators on a five-point Likert scale. The data were analyzed using the Structural Equation Modeling (SEM) approach with AMOS version 22.0. The results showed that compliance with OSH implementation had a significant positive direct effect on productivity (CR = 2.222; p = 0.042), and work motivation also had a significant direct effect on productivity (CR = 2.188; p = 0.043). Furthermore, OSH compliance significantly influenced job competence (CR = 2.619; p = 0.035), as did work motivation (CR = 2.041; p = 0.038). Job competence, in turn, had a positive effect on productivity (CR = 2.000; p = 0.048), serving as an intervening variable in the relationship between both OSH compliance and motivation with productivity. These results underscore the critical importance of OHS program implementation and motivation enhancement strategies in driving worker productivity, particularly in the construction sector.*

*Keywords: OHS Compliance, Work Motivation, Competence, Work Productivity*

## I. INTRODUCTION

The world's population continues to increase, including in Indonesia. According to Statistics Indonesia (BPS), the population of Indonesia in mid-2023 reached 278.69 million people, an increase of 1.05 percent from the previous year. Between 2015 and 2023, the population growth reached 9.04 percent [1]. This increase has led to a rise in basic needs, including the need for housing. Unfortunately, the availability of housing has not been able to meet this demand. According to the 2023 National Socio-Economic Survey (SUSENAS), the housing ownership backlog still stands at 9.9 million units [2][3]. Although there has been a decrease compared to previous years, this figure remains high and poses a significant challenge. In this context, the concepts of housing need and housing demand become important. Housing need refers to households that require adequate housing, while housing demand refers to the number of households actively seeking and financially capable of purchasing a home [4].

The high housing demand presents both an opportunity and a challenge for property developers. In Indonesia, housing demand is projected to increase by 2.80% in 2024 [5]. To address land limitations, especially in densely populated cities, the government is promoting the development of apartment buildings as a vertical housing solution [6]. This policy is intended for low-income communities (MBR) to ensure they still have access to housing. However, apartment living also presents new challenges, particularly in terms of management and cultural adaptation. Communities accustomed to living in landed houses must adjust to shared facilities, such as elevators, communal halls, or waste disposal systems. Issues also arise in the selection and sustainability of residents, as apartment units are sometimes resold to individuals outside the intended target group—often driven by economic pressure [7].

For example, the Ministry of Public Works and Housing (PUPR) has built 30 apartment towers in Aceh by 2024; however, two of them remain unoccupied due to building quality issues and low work motivation during construction [8]. This indicates that physical construction must be supported by effective project management, including quality control and human resource management. Apartment housing must also take into account social, cultural, and environmental aspects, as it is not merely a technical solution but part of a broader shift in residential culture [9][10]. In this context, the motivation and job satisfaction of construction workers play a crucial role in ensuring the quality and sustainability of housing [11].

The construction sector is known to have high risks related to occupational safety and health (OHS). Development projects, including apartment buildings, involve many hazards that can cause accidents ranging from minor to fatal [12][13]. The OHS challenges in this project are quite complex due to the involvement of many workers, work at heights, and the use of heavy machinery. These issues need to be addressed with good OHS management, organizational policy support, and worker awareness of the importance of safety. In 2023, BPJS Ketenagakerjaan recorded 370,747 occupational accident cases, including 2,263 fatalities and thousands of cases of partial or total disability. Most victims were males aged 21–40 years[14]. Data also shows an increasing trend in the number of accidents since 2019. This condition emphasizes the need to pay attention to various causes of accidents, both direct causes such as unsafe acts and hazardous working conditions, and indirect causes such as workers' health conditions, project management, and organizational policies[15].

Based on this background, this study raises the theme "Compliance with Occupational Safety and Health (OHS) and Motivation in Increasing Productivity Through Competence: An Empirical Study on Apartment Projects in Aceh Province." The study aims to examine how compliance with OHS and work motivation can influence the productivity of construction workers, with competence as an intervening variable that strengthens this relationship. This research is expected to contribute to the formulation of more effective, efficient, and sustainable management strategies for apartment construction projects.

Occupational Safety and Health (OHS) is an important part of construction project management to maintain workforce productivity. Compliance with OHS regulations not only reduces accident risks but also enhances workers' satisfaction and motivation [16][17][18][19][20]. When workers feel safe and the work system supports their safety, their focus and motivation in performing tasks increase [21][22][43].

Several studies indicate that OHS compliance directly affects work productivity through increased motivation and competence of workers. A good OHS system encourages the creation of a conducive work environment so that workers are motivated to improve skills and work efficiency [3][23]. Compliance with safety procedures also forms a

culture of discipline that is important to increase productivity in the construction sector [24][25][42]. Work motivation is a key driver influencing worker behavior and performance. A sense of safety, recognition, and job satisfaction are motivational factors that make workers work harder and more efficiently[26]. In construction projects, high motivation strengthens workers' commitment to completing tasks on time and with good quality [27]. Moreover, work competence acts as a linking variable between OHS compliance, motivation, and productivity. Competence includes technical knowledge, practical skills, and professional attitudes. Competent workers are better able to follow safety standards and complete tasks effectively [28][29]. Systematic training also helps improve competence so that workers become more productive and adaptive to changes in construction projects [30][31].

Overall, the relationship between OHS compliance, motivation, and competence creates a synergy that increases work productivity. When companies consistently implement OHS systems, support work motivation, and develop worker competence sustainably, labor productivity can improve significantly. This aligns with findings that state the combination of safety factors, motivation, and work capability strengthens project target achievement[32].

## II. RESEARCH METHOD

This study uses an explanatory approach to explain the influence of compliance with Occupational Safety and Health (OHS) implementation and work motivation on the productivity of project execution workers in apartment construction projects in Aceh Province, both directly and indirectly through work competence as a mediating variable. Data were collected through the distribution of questionnaires to 170 project supervisor respondents. The perceptions of the respondents were used to measure the variables studied, namely compliance with OHS, work motivation, work competence, and work productivity.

The analytical tool used in this study is Structural Equation Modeling (SEM). The SEM model consists of two main parts: the measurement model and the structural model. The measurement model aims to test the validity and reliability of the indicators for each variable. Indicator validity is tested using standardized loading factor (SLF) values which must be greater than 0.60 and significant (CR > 1.96), while reliability is tested using construct reliability (CR > 0.60) and variance extracted (VE > 0.50). Indicators that do not meet these criteria will be removed from the model.

Next, the structural model is designed to examine the causal relationships among latent variables. In this model, the variables of compliance with OHS (X1) and work motivation (X2) are hypothesized to affect work competence (Z), which in turn influences work productivity (Y). The SEM analysis is complemented by a model fit test (goodness of fit) using various indicators such as Chi-square, GFI, AGFI, CMIN/DF, RMSEA, RMR, TLI, and NFI. Each indicator has specific criteria to determine whether the model is acceptable.
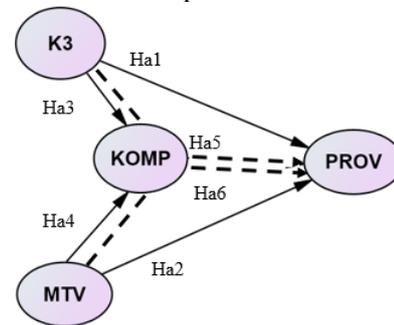


Notes:
K3      = OHS Complience; MTV   = Motivation;
KOMP   = Competency; PROV       = Productivity

**Figure 1. Constellation of Influences Among Research Variables**

Before running the SEM analysis, several basic assumptions must be met. These assumptions include the absence of outliers (assessed by Mahalanobis distance), data normality (evaluated through skewness and kurtosis values), and no multicollinearity (ensured by checking that the determinant of the sample moment matrix is greater than 0). If all assumptions are fulfilled and the model fits well, SEM can then be used to test the research hypotheses.

The hypotheses formulated in this study are as follows:

- H1: Compliance with OHS implementation has a significant effect on worker productivity in apartment construction projects in Aceh Province.
- H2: Work motivation has a significant effect on worker productivity in apartment construction projects in Aceh Province.
- H3: Compliance with OHS implementation has a significant effect on work competence in apartment construction projects in Aceh Province.
- H4: Work motivation has a significant effect on work competence in apartment construction projects in Aceh Province.
- H5: Work competence has a significant effect on worker productivity in apartment construction projects in Aceh Province.
- H6: Work competence significantly mediates the influence of compliance with OHS

implementation and work motivation on worker productivity in apartment construction projects in Aceh Province.

The research process began with identifying problems based on phenomena observed in the field, which was then reinforced through relevant literature studies and theories. Through the literature review and previous research, a research gap was identified that underlies the formulation of the research questions. These questions were developed into research problems that needed to be answered through the research objectives.

Based on these objectives, research hypotheses were formulated to be tested empirically. This study examines four main variables: compliance with OHS, work motivation, work competence, and work productivity. Primary data were collected through questionnaires distributed to worker respondents, while secondary data were obtained from project planning documents and implementation reports.

Initial analysis was conducted on the measurement model to ensure that the indicators used were valid and reliable. Subsequently, the structural model was tested to examine the relationships among variables. The results of this analysis were then discussed by also considering findings from field studies, enabling the formulation of applicable conclusions and recommendations.
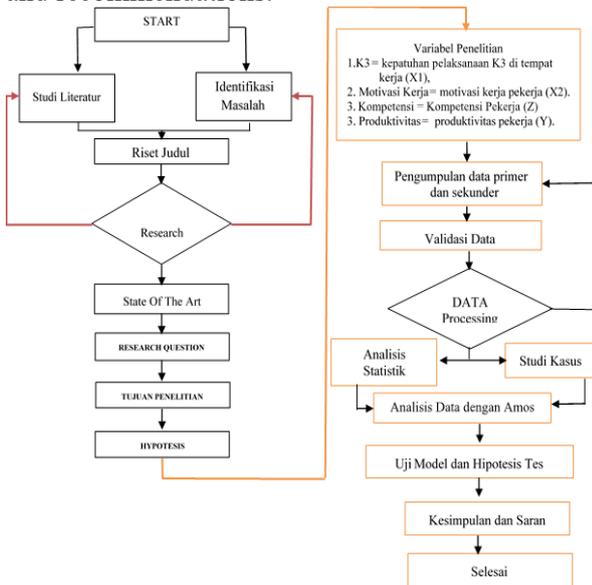


**Figure 2. Research Flowchart**

## III. RESULT AND DISCUSSION

### Descriptive Analysis

This study uses descriptive analysis to depict the perceptions of 170 respondents who are construction workers involved in a housing complex project in Aceh Province. Data were collected through questionnaires and processed using SPSS. Since the entire population was used as respondents, a saturated sampling technique was employed. To examine the relationships among variables, Structural Equation Modeling (SEM) analysis was conducted using AMOS software, which also utilized bootstrapping techniques to enhance the reliability of estimates, considering the relatively small sample size.

**Table 1. Descriptive Analysis of Occupational Health and Safety (OHS) Compliance**

|  | Ind.1 OHS | Ind.2 OHS | Ind.3 OHS | Ind.4 OHS | Ind.5 OHS |
|---|---|---|---|---|---|
| N | 170 | 170 | 170 | 170 | 170 |
| Mean | 3,51 | 3,54 | 3,63 | 3,54 | 3,72 |
| Mode | 4 | 4 | 3 | 4 | 4 |
| Std. Dev | 0,696 | 0,748 | 0,807 | 0,741 | 0,847 |
| Variance | 0,485 | 0,559 | 0,652 | 0,548 | 0,717 |
| Min | 2 | 2 | 2 | 3 | 2 |
| Max | 5 | 5 | 5 | 5 | 5 |

Based on the descriptive analysis, the Occupational Health and Safety (K3) Compliance variable shows that most respondents agree with the statements presented, especially regarding workplace comfort and safety, regular safety briefings, as well as the proper use and maintenance of personal protective equipment (PPE). However, on the indicators related to the continuity of OHS counseling and training, some respondents remain doubtful about its benefits.

**Table 2. Descriptive Analysis of Motivation**

|  | Ind.1 Motivation | Ind.2 Motivation | Ind.3 Motivation | Ind.4 Motivation |
|---|---|---|---|---|
| N | 170 | 170 | 170 | 170 |
| Mean | 3,87 | 3,59 | 3,70 | 3,71 |
| Mode | 4 | 3 | 4 | 4 |
| Std. Dev | 0,867 | 0,860 | 0,890 | 0,870 |
| Variance | 0,752 | 0,740 | 0,792 | 0,757 |
| Min | 2 | 2 | 2 | 2 |
| Max | 5 | 5 | 5 | 5 |

For the Motivation variable, most respondents stated that the work climate is supportive; however, there is still some doubt regarding the clarity of work planning and adherence to SOPs. Meanwhile, the indicator related to discipline in enforcing regulations received positive feedback.

**Table 3. Descriptive Analysis of Competency**

|  | Ind.1 Comp. | Ind.2 Comp. | Ind.3 Comp. | Ind.4 Comp. |
|---|---|---|---|---|
| N | 170 | 170 | 170 | 170 |
| Mean | 3,46 | 3,90 | 3,61 | 3,89 |
| Mode | 3 | 4 | 4 | 4 |
| Std. Dev | 0,829 | 0,887 | 0,873 | 0,790 |
| Variance | 0,687 | 0,787 | 0,762 | 0,624 |
| Min | 2 | 2 | 2 | 3 |
| Max | 5 | 5 | 5 | 5 |

The Competency variable showed mixed results; most respondents doubted their understanding of job functions but agreed that they possess the expertise, technical skills, and awareness to work meticulously.

**Table 4. Descriptive Analysis of Productivity**

|  | Ind.1 Prod. | Ind.2 Prod. | Ind.3 Prod. | Ind.4 Prod. |
|---|---|---|---|---|
| N | 170 | 170 | 170 | 170 |

|  | Ind.1 Prod. | Ind.2 Prod. | Ind.3 Prod. | Ind.4 Prod. |
|---|---|---|---|---|
| Mean | 3,69 | 3,77 | 3,43 | 3,87 |
| Mode | 4 | 4 | 4 | 4 |
| Std. Dev | 0,826 | 0,820 | 0,827 | 0,833 |
| Variance | 0,682 | 0,672 | 0,684 | 0,694 |
| Min | 2 | 2 | 2 | 2 |
| Max | 5 | 5 | 5 | 5 |

Finally, the Work Productivity variable showed that the majority of respondents agreed there is a good match between tasks and workers' abilities, compliance with SOPs and schedules, as well as teamwork that supports achieving targets. Overall, respondents' perceptions of the four variables fall into the fairly good category. However, to understand the relationships between variables in more depth, the analysis continued using the SEM approach.

## SEM Analysis

The Structural Equation Modeling (SEM) analysis in this study was conducted in two stages: the measurement model (outer model) and the structural equation model (inner model). The first stage, the measurement model, aims to test the validity and reliability of indicators in reflecting latent variables. Reliability testing measures the consistency of indicators in measuring their respective latent variables. Based on the calculation results of Construct Reliability (CR) and Variance Extracted (VE), all research variables show CR values above 0.70 and VE values above 0.50. The OHS compliance variable has a CR of 0.76 and VE of 0.55; motivation has a CR of 0.72 and VE of 0.60; competence has a CR of 0.77 and VE of 0.58; and work productivity has a CR of 0.75 and VE of 0.62. Therefore, all indicators are considered reliable in measuring their respective variables.

### Table 5. Outer Model Result

| Variable | Indicator | SLV | Construct's Reliability | Variance Extracted |
|---|---|---|---|---|
| OHS Complience | x15 | 0,692 |  |  |
|  | x14 | 0,671 |  |  |
|  | x13 | 0,651 | 0,76 | 0,55 |
|  | x12 | 0,631 |  |  |
|  | x11 | 0,612 |  |  |
| Motivation | x24 | 0,600 |  |  |
|  | x23 | 0,606 | 0,72 | 0,60 |
|  | x22 | 0,612 |  |  |
| Competency | z1 | 0,708 |  |  |
|  | z2 | 0,666 | 0,77 | 0,58 |
|  | z3 | 0,633 |  |  |
|  | z4 | 0,760 |  |  |
| Productivity | y1 | 0,632 |  |  |
|  | y2 | 0,626 | 0,75 | 0,62 |
|  | y3 | 0,632 |  |  |
|  | y4 | 0,638 |  |  |

The validity test results show that all indicators of the four variables: OHS compliance, motivation, competence, and work productivity, have met the validity criteria. This is evident from the standardized loading factor (SLF) values of each indicator, all of which are above 0.60, as well as the critical ratio (CR) values that exceed the minimum threshold of 1.96. For example, indicators x15 to x11 for the OHS compliance variable have SLF values ranging from 0.612 to 0.692, all with CR values above 1.96. Similarly, the motivation indicators (x24 to x22), competence indicators (z1 to z4), and work productivity indicators (y1 to y4) are all proven valid with SLF and CR values meeting the criteria.

The second stage, the structural equation model, aims to test the influence between variables in the model. Based on the estimation of path coefficients, it is found that the OHS compliance variable has a positive and significant effect on competence, with an estimated value of 0.584, a CR of 2.619 (>1.96), and a p-value of 0.035 (<0.05). OHS compliance also has a direct positive effect on work productivity, with an estimate of 0.020, CR of 2.222, and p = 0.042. The motivation variable also shows a positive and significant effect on competence (estimate = 0.151; CR = 2.041; p = 0.038) and on work productivity (estimate = 0.007; CR = 2.188; p = 0.043). On the other hand, competence shows a direct positive and significant effect on work productivity with an estimate of 0.001, CR of 2.000, and p = 0.048. This means that all paths in the structural model are statistically significant.

### Table 6. Inner Model Test - Direct Effects

|  |  |  | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| KOMP | ← | K3 | 0,584 | 0,223 | 2,619 | 0,035 |
| KOMP | ← | MTV | 0,151 | 0,074 | 2,041 | 0,038 |
| PROV | ← | KOMP | 0,001 | 0,001 | 2,000 | 0,048 |
| PROV | ← | K3 | 0,020 | 0,009 | 2,222 | 0,042 |
| PROV | ← | MTV | 0,007 | 0,003 | 2,188 | 0,043 |

Notes:
K3        = OHS Complience; MTV        = Motivation;
KOMP   = Competency; PROV        = Productivity

In addition to the direct effects, an analysis of indirect effects was also conducted. The indirect effect of OHS compliance on work productivity through competence was 0.001 (0.584 × 0.001), while the indirect effect of motivation on work productivity through competence was 0.000 (0.151

× 0.001). These results indicate that although the indirect paths through competence exist, their magnitude is very small.

**Table 7. Indirect Effect**

|  | MTV | K3 | KOMP | PROV |
|---|---|---|---|---|
| PROV | 0,000 | 0,001 | 0,000 | 0,000 |

Notes:
K3　　　　= OHS Complience; MTV　　= Motivation;
KOMP　　= Competency; PROV　　= Productivity

Adapun total pengaruh dihitung dengan menjumlahkan pengaruh langsung dan tidak langsung.

Thus, the total effect of OHS compliance on work productivity is 0.021, and the total effect of motivation on work productivity is 0.007.

The explicit SEM model resulting from this analysis also visualizes the relationships among all variables within the estimated model structure.
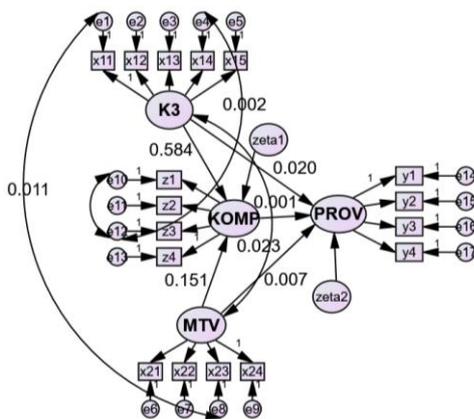


**Figure 3. Explicite Model**

**SEM Assumption Test**

In Structural Equation Modeling (SEM) analysis, there are three basic assumptions that must be met for the model to be validly interpreted: data normality, outliers, and multicollinearity.

First, the normality test is conducted by examining the skewness and kurtosis values of the indicator data. Based on the analysis results, all critical ratio (CR) values for skewness and kurtosis are below the threshold of ±1.96, indicating no significant deviation from a normal distribution. Therefore, there is no violation of the data normality assumption.

Second, the outlier test is performed using the Mahalanobis distance. In this test, an observation is considered not an outlier if its Mahalanobis probability value is greater than the significance level α = 0.05. The highest Mahalanobis probability obtained was 0.304, which is still below the threshold of 0.402 at 338 degrees of freedom. This means no outliers were found in the observations.

Third, the multicollinearity test is conducted by examining the determinant value of the sample moment matrix. If the determinant value is greater than zero, multicollinearity is not present. The

analysis showed a determinant value of 0.231, indicating no violation of the multicollinearity assumption.

With all three assumptions met, the SEM model is declared suitable for further analysis.

**GoF Model**

After the basic assumption tests are fulfilled, the next step is to evaluate the model's fit to the data using various Goodness of Fit (GoF) indices.

**Table 8. GoF Result**

| No. | GoF | Criteria | Analysis Result | Model Fit Status |
|---|---|---|---|---|
| 1 | Chi-square Statistic (χ²) or CMIN | The smaller, the better | 383.193 | Marginal |
| 2 | Goodness of Fit Index (GFI) | GFI > 0.90 | 0.934 | Good |
| 3 | Adjusted Goodness of Fit Index (AGFI) | AGFI > 0.90 | 0.911 | Good |
| 4 | Normed Chi-Square (CMIN/DF) | 1.00 < CMIN/DF < 3.00 | 1.134 | Good |
| 5 | Root Mean Square Error of Approximation (RMSEA) | 0.05 < RMSEA < 0.08 | 0.065 | Good |
| 6 | Root Mean Square Residual (RMR) | RMR < 0.50 | 0.447 | Good |
| 7 | Tucker-Lewis Index (TLI) | TLI > 0.90 | 0.916 | Good |
| 8 | Normed Fit Index (NFI) | NFI > 0.90 | 0.904 | Good |

The measurement results indicate that almost all indicators fall within the good category. The Goodness of Fit Index (GFI) value is 0.934, Adjusted GFI is 0.911, Normed Chi-Square (CMIN/DF) is 1.134, RMSEA is 0.065, RMR is 0.447, Tucker-Lewis Index (TLI) is 0.916, and Normed Fit Index (NFI) is 0.904, all of which meet the criteria set by [33]. Although the Chi-Square statistic (CMIN) value of 383.193 is categorized as marginal due to being relatively high, this measure is sensitive to sample size. Therefore, the Normed Chi-Square (CMIN/DF) value is considered more relevant as a reference, and the obtained value of 1.134 remains within the expected range (1.00 < CMIN/DF < 3.00). Overall, the constructed model demonstrates a good fit with the empirical data and is suitable for hypothesis testing.

**Discussion**

This study aims to examine the influence of Occupational Health and Safety (OHS) implementation, work motivation, and work competence on worker productivity in the construction projects of apartment buildings in Aceh Province. The main findings indicate that the implementation of OHS has a positive and significant effect on worker productivity, where better OHS implementation corresponds to higher

productivity. This finding is reinforced by previous studies such as those by Supriyan and Ayomi and Afan et al. [34][35], which state that a well-designed OHS management system can significantly improve productivity because OHS is not merely seen as a technical obligation but has become an essential part of driving work efficiency and safety. Furthermore, Apalem also shows a very strong correlation between the application of OHS and increased productivity, further clarifying that risk management and the use of personal protective equipment have tangible impacts on the performance of construction workers[36].

Additionally, work motivation was also found to have a positive influence on productivity, where workers with higher motivation levels demonstrate better work effectiveness. This result aligns with the findings of Wibowo and Hartati as well as Mufida, who emphasize that motivation is closely related to performance and, in some cases, is influenced by perceptions of OHS implementation [37][38]. Therefore, improving work motivation becomes an essential part of human resource management strategies in the construction sector. The reciprocal relationship between OHS implementation and motivation creates a mutually supportive synergy in achieving optimal productivity.

Other findings show that OHS implementation and work motivation also contribute to improving work competence, where workers who feel safe and motivated are more likely to develop technical skills and professional attitudes. This finding is supported by research from Raharja et al. and Aurellegi et al., which stress that competence is a crucial component in supporting the successful implementation of OHS and directly contributes to productivity improvement [39][40]. In this context, competence not only reflects technical skills but also encompasses knowledge and work attitudes that support a safety culture and work effectiveness in the field.

However, in this study, work competence plays only a minor role as a mediating variable in the relationship between OHS implementation and motivation toward productivity, thus categorized as a quasi-intervening variable. This means that although competence contributes to productivity improvement, the main strength of influence remains with OHS implementation and work motivation. This finding differentiates this study from Aurellegi et al. and Rodhi, which position competence as the primary mediator affecting productivity [40][41], but aligns more closely with Manaya et al., who found that mediation through occupational accident risk has a more prominent effect than competence in the relationship among OHS, motivation, and performance[17].

The novelty of this study lies in the position of work competence as an intervening variable in the relationship between OHS implementation and motivation toward productivity, albeit with a weak effect. Competence is influenced by workers' perceptions of their technical skills, which in turn can reduce work errors and increase efficiency. Although its contribution is small, placing competence as an intervening variable is still considered relevant.

The results of this study have implications for the development of knowledge, particularly in reinforcing the understanding that work competence is an important aspect of productivity enhancement. Competence does not arise spontaneously but is formed through training and work experience, driven by motivation. Therefore, work competence should not be positioned purely as an exogenous variable in research models but rather its indicators should be detailed so that the mediating contribution can be more measurable and meaningful.

## IV. CONCLUSION

The implementation of OHS and work motivation have a positive and significant impact on worker productivity in apartment construction projects in Aceh Province. Furthermore, both also significantly contribute to improving work competence. Work competence acts as a mediator in the relationship between OHS implementation and work motivation on productivity; however, this mediating effect is small, so competence can be categorized as a quasi-intervening variable. Therefore, the primary focus for increasing productivity should remain on enhancing OHS implementation and work motivation, with competence development serving as a complementary factor that needs to be strengthened.

## REFERENCE

[1] C. M. Annur, "Penduduk Indonesia Tembus 278 Juta Jiwa hingga Pertengahan 2023," *Databoks*, Jul. 13, 2023. [Online]. Available: https://databoks.katadata.co.id/datapublish/2023/07/13/pendudukindonesia-tembus-278-juta-jiwa-hingga-pertengahan-2023

[2] BPS, "Profil Migran Hasil Survei Sosial Ekonomi Nasional 2023," 2024.

[3] M. F. Mubarok and F. K. Andini, "Pengaruh Keselamatan Dan Kesehatan Kerja (K3) Dan Kompensasi Terhadap Produktivitas Kerja Karyawan Bagian Produksi Pada PT Peputra Masterindo Kecamatan Tapung Kabupaten Kampar," *J. Daya Saing*, vol. 11, no. 1, pp. 98–106, 2025.

[4] E. Gruber, C. Obermayr, and S. Obkircher, "Meeting housing demands , needs or desires ? Conceptual considerations for

designing housing policies," *Cult. Pract. Eur.*, vol. 9, no. 1, pp. 49–65, 2024, doi: 10.5771/2566-7742-2024-1-49.

[5] A. P. Brilian, "Permintaan Rumah Tapak di Jabodetabek pada 2024 Diramal Naik, Ini Penyebabnya," *Detik.com*, Dec. 08, 2023. [Online]. Available: https://www.detik.com/properti/berita/d-7078657/permintaan-rumahtapak-di-jabodetabek-pada-2024-diramal-naik-ini-penyebabnya

[6] Menteri Negara Perumahan dan Permukiman, "Keputusan Menteri Negara Perumahan dan Permukiman No. 10/KPTS/M/1999 tentang Pedoman Penyelenggaraan Rumah Susun." 1999.

[7] J. J. Pinca and R. Sesung, "Tinjauan Yuridis Perjanjian Pengikatan Jual Beli Sebelum Dan Saat Proses Pembangunan Satuan Rumah Susun," *Istinbath J. Huk.*, vol. 20, no. 1, pp. 94–103, 2023.

[8] Direktorat Rumah Susun, "Data Lakip Direktorat Rumah Susun 2024," 2024.

[9] F. I. Aprianto, D. P. E. Laksmiyanti, E. Poedjioetami, and S. H. Laksono, "Tatanan lahan rumah susun untuk masyarakat berpenghasilan rendah melalui pendekatan sustainable architecture," *Tekstur J. Arsit.*, vol. 5, no. 1, 2024, [Online]. Available: https://ejurnal.itats.ac.id/tekstur/article/view/5035

[10] I. B. Sucipto, "Spektrum ruang komunal sebagai wadah interaksi sosial bagi penghuni pada rumah susun sederhana sewa di Jakarta," *J. Lingkung. Binaan Indones.*, vol. 10, no. 3, 2021, doi: 10.32315/jlbi.v10i03.53.

[11] S. D. Andri and R. Kuswati, "Pengaruh motivasi dan lingkungan kerja terhadap kinerja pegawai yang dimediasi oleh kepuasan kerja pada karyawan UPTD Puskesmas Giriwoyo 1 dan 2," *Innov. J. Soc. Sci. Res.*, vol. 4, no. 1, pp. 15–25, 2023, doi: 10.31004/innovative.v4i1.8090.

[12] Nirmalawati, S. Rahmadhani, and Yuningsih, "Analisis Faktor Keselamatan dan Kesehatan Kerja pada Proyek Konstruksi Gedung BRI di Palu," *J. Konstr. Tek. Sipil*, vol. 1, no. 2, 2024, doi: 10.24002/jkts.v1i2.9650.

[13] I. Y. Sari, "Analisis Penyebab Kecelakaan Kerja pada Pekerja Konstruksi," *J. Ind. Hyg. Occup. Heal.*, vol. 9, no. 1, 2023, doi: 10.21111/jihoh.v9i1.11185.

[14] BPJS Ketenagakerjaan, "Laporan Tahunan Terintegrasi 2023." 2023. [Online]. Available: https://www.bpjsketenagakerjaan.go.id/asset

s/uploads/laporan_tahunan/Integrated_Report_2023.pdf

[15] A. Larasatie, M. Fauziah, D. Dihartawan, D. Herdiansyah, and E. Ernyasih, "Faktor-faktor yang berhubungan dengan tindakan tidak aman (unsafe action) pada pekerja produksi PT. X," *Environ. Occup. Heal. Saf. J.*, vol. 1, no. 1, pp. 15–22, 2021, [Online]. Available: https://jurnal.umj.ac.id/index.php/EOHSJ/article/view/12160

[16] D. Alqawi, H. Ali, and A. Fauzi, "Determinasi Produktivitas Kerja Melalui Motivasi: Analisis Lingkungan Kerja, Disiplin, Keselamatan dan Kesehatan Kerja (K3) Terhadap Tenaga Kesehatan RS. Satria Medika Bekasi," *J. Ekon. Manaj. Sist. Inf.*, vol. 5, no. 3, 2024.

[17] R. Manaya, M. Y. Saleh, and H. Abubakar, "Mediasi Risiko Kecelakaan Kerja: Pengaruh K3 dan Motivasi terhadap Kinerja," *Int. J. Bus. Manag.*, vol. 12, no. 1, pp. 101–110, 2024, [Online]. Available: https://journal.unibos.ac.id/jbm/article/view/5209

[18] Y. S. Soeroso, B. Kurniawan, and Q. Violinda, "Pengaruh Literasi K3, Persepsi Kecelakaan Kerja, dan Motivasi Kerja terhadap Produktivitas Kerja di PT. Sekawan Triasa Semarang," *J. Ilm. Manaj. Bisnis Dan Ekon. Kreat.*, vol. 2, no. 1, pp. 38–50, 2023.

[19] D. K. Sunarjo and M. Amin, "Construction Project Performance Based on Occupational Safety, Occupational Health and Work Motivation," *Asian J. Eng. Soc. Heal.*, vol. 3, no. 10, pp. 2297–2306, Oct. 2024, doi: 10.46799/ajesh.v3i10.

[20] A. Ali, M. Amin, and A. E. Husin, "Key success factors for safety programs implementation in Indonesian construction projects," *Int. J. Civ. Eng. Technol.*, vol. 10, no. 2, pp. 1385–1394, 2019.

[21] F. Farras, E. Jumhana, A. Fadilah, A. Adha, M. J. A. Novrio, and U. Haki, "Keselamatan Dan Kesehatan Kerja (K3): Pilar Utama Dalam Produktivitas Dan Keberlanjutan," *Bur. J. Indones. J. Law Soc. Gov.*, vol. 5, no. 1, pp. 619–633, 2025.

[22] B. A. Pradana, A. M. R. Firmansyah, and N. Kalbuana, "Pengaruh Disiplin Kerja dan Keselamatan Kerja Terhadap Efektivitas Kerja Personel Unit PKP-PK," *J. Ris. Ilmu Kesehat. Umum dan Farm.*, vol. 2, no. 3, pp. 47–61, 2024.

[23] Y. R. Kanaf, H. A. Manafe, S. S. Niha, and D. Manafe, "ANALISIS KINERJA DAN KEPUASAN KERJA TENAGA KERJA DI

PROYEK KONSTRUKSI BENDUNGAN TEMEF--NTT," *J. Ilm. Manajemen, Ekon. Akunt.*, vol. 9, no. 1, pp. 2003–2022, 2025.

[24] S. Gulo, E. Waruwu, E. K. Telaumbanua, and M. M. Bate'e, "Model Penilaian Kinerja Berbasis Lingkungan Kerja untuk Meningkatkan Produktivitas Aparatur Sipil Negara di Kabupaten Nias: Kajian Literatur," *Manag. Perspect. J. Penelit. Manaj.*, vol. 2, no. 1, pp. 22–36, 2025.

[25] N. N. Ramadhani, D. T. Syaifuddin, S. W. Maharani, and A. Putera, "Analisis Mediasi Kepuasan Kerja Pada Pengaruh Kesehatan Kerja, Keselamatan Kerja, Dan Lingkungan Kerja Terhadap Kinerja Karyawan," *HOMANIS J. Halu Oleo Manaj. dan Bisnis*, vol. 1, no. 1, pp. 14–31, 2024.

[26] Y. A. Paska, H. E. Atmaja, and S. Ratnawati, "Meningkatkan Kinerja Karyawan: Pengaruh Kompetensi, Kompensasi, Motivasi, Gaya Kepemimpinan, dan Lingkungan Kerja dalam Perspektif Tinjauan Literatur," *YUME J. Manag.*, vol. 7, no. 3, 2024.

[27] G. T. Ardiansyah, R. Bayuaji, A. Asmi, and B. Suswanto, "Penerapan Etika, Profesionalisme Dan Keselamatan, Kesehatan, Kerja (K3) Pada Pelaksanaan Proyek Konstruksi Proyek Gedung Bertingkat Pusat Data Studi Kasus Proyek Data Center di Jakarta Timur," *Inov. Pembang. J. Kelitbangan*, vol. 12, no. 03, 2024.

[28] B. Prasetyo and A. Nugraha, "Faktor-Faktor yang Mempengaruhi Keselamatan dan Kesehatan Kerja pada Industri Manufaktur," *J. Keselam. dan Kesehat. Kerja*, vol. 5, no. 1, pp. 25–33, 2023, doi: 10.3456/jkk.v5i1.2023.

[29] H. Rohmah, "Pengaruh Program Kesehatan Dan Keselamatan Kerja (K3) Terhadap Kompetensi Dan Produktivitas Kerja Karyawan Pada PT. Padasa Enam Utama Koto Kampar Hulu," Universitas Islam Riau, 2021.

[30] M. A. Darma Sabri, S. Utami, and H. Harmen, *Manajemen Sumber Daya Manusia Dalam Konteks Perencanaan Pembangunan*. Syiah Kuala University Press, 2024.

[31] I. A. Wibowo, "Program Kesehatan, Keselamatan Kerja (K3), Disiplin Kerja, dan Insentif Kerja Pengaruhnya Terhadap Produktivitas Kerja Karyawan," *J. Manaj. Modal Insa. dan Bisnis*, vol. 2, no. 1, pp. 88–100, 2021.

[32] M. Alfaizi, V. Puspita, and M. N. Armi, "Pengaruh Pengembangan Karir Motivasi Kerja Dan Keselamatan Kesehatan Kerja (K3) Terhadap Produktivitas Karyawan Di PT. Tirtakencana," *Bisnis-Net J. Ekon. dan Bisnis*, vol. 6, no. 2, pp. 488–498, 2023.

[33] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to Use and How to Report the Rresults of PLS-SEM," *Eur. Bus. Rev.*, vol. 31, no. 1, pp. 2–24, 2019.

[34] D. Supriyan and R. Ayomi, "Pengaruh Sistem Manajemen K3 Terhadap Produktivitas Kerja Pada Proyek X," in *Prosiding Seminar Nasional Teknik Sipil*, 2023, pp. 62–74. [Online]. Available: https://prosiding.pnj.ac.id/snts/article/view/69

[35] M. M. Afan, "Analisis Penerapan Keselamatan dan Kesehatan Kerja (K3) Terhadap Kinerja Pekerja Proyek Konstruksi," *Device*, vol. 12, no. 2, pp. 94–103, 2022, [Online]. Available: https://ojs.unsiq.ac.id/index.php/device/article/view/3577

[36] D. R. Apalem, "Evaluasi Penerapan K3 pada Proyek Pengaman Pantai," *Hikamatzu J.*, vol. 5, no. 1, pp. 45–53, 2024, [Online]. Available: https://hikamatzu.ac.id/journal/hikamatzu/article/view/123

[37] R. Wibowo and S. Hartati, "Pengaruh Kesehatan dan Keselamatan Kerja Terhadap Motivasi dan Kepuasan Kerja Karyawan Proyek Konstruksi di Jakarta Selatan," *J. Tek. dan Manaj. Ind.*, vol. 9, no. 1, pp. 45–53, 2023, [Online]. Available: https://ejournal.unsa.ac.id/index.php/smj/article/view/767

[38] M. Mufida, "Motivasi Kerja Tukang dengan Kesehatan dan Keselamatan Kerja (K3)," *J. Cahaya Mandalika*, vol. 5, no. 2, pp. 1611–1620, 2024, [Online]. Available: https://sinta.kemdikbud.go.id/authors/profile/6716103/?view=googlescholar

[39] A. E. Raharja and others, "Analisa Kompetensi Beberapa Mandor pada Proyek Konstruksi di Surabaya," *J. Dimens. Pratama Tek. Sipil*, vol. 9, no. 2, pp. 70–78, 2022, [Online]. Available: https://publication.petra.ac.id/index.php/teknik-sipil/article/view/12899

[40] A. Aurellegi and others, "Pengaruh Kompensasi, Disiplin Kerja dan Kompetensi terhadap Kinerja Pekerja," *Konstruksia*, vol. 5, no. 2, pp. 89–98, 2024, [Online]. Available: https://jurnal.umj.ac.id/index.php/konstruksia/article/view/19346

[41] N. N. Rodhi, "Faktor yang Mempengaruhi

Kinerja SDM pada Proyek Konstruksi Gedung Bertingkat," *Innov. J. Soc. Sci. Res.*, vol. 6, no. 1, pp. 55–65, 2024, [Online]. Available: https://j-innovative.org/index.php/Innovative/article/view/17115

[42]    A. Ali, M. Amin, and A. E. Husin, "Key success factors for safety programs implementation in Indonesian construction projects," *Int. J. Civ. Eng. Technol.*, vol. 10, no. 2, pp. 1385–1394, 2019, [Online]. Available: https://doi.org/10.13140/RG.2.2.36301.49127

[43]    U. Soraya, A. Nuranto, P. S. Alam, H. H. Purba, and B. Susetyo, "Tinjauan Literatur Sistematis Identifikasi Risiko dalam Pembangunan Proyek Stadion," *J. Rekayasa Sipil dan Lingkungan*, vol. 5, no. 1, pp. 67–80, 2022.