


Factors Influencing Unsafe Work Behavior In Construction Work For The Construction Of The Upt Vertical Hospital In Surabaya By Pt Wijaya Karya, Building Division

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Article Info	ABSTRACT
Keywords: Knowledge, Supervision, Unsafe Behavior, Management Commitment	This research has the purpose to determine the influence of knowledge, supervision, facility availability, and management commitment as moderators on unsafe behavior among workers in the Construction Project of UPT Vertical Hospital Surabaya. The research used a Structural Equation Model (SEM) approach with the measurement model using the SmartPLS version 3.2.9 program. The research results indicate that knowledge, supervision, and facilities can influence the unsafe behavior of workers, and management commitment cannot influence knowledge, supervision, and facilities on the unsafe behavior of workers in the construction of the UPT Vertical Surabaya Hospital.
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INTRODUCTION

The construction project development process generally involves activities with many potential hazards. The situation at the project site reflects its rugged nature, and the activities involved appear to be very complex and challenging, requiring excellent stamina from those executing them. However, it cannot be denied that construction work contributes significantly to the high accident rates. The numerous workplace accidents and occupational diseases have detrimental effects on many parties, especially the workers themselves. Heinrich stated that the causes of accidents are unsafe actions and unsafe conditions. This can occur due to a lack of understanding of the importance of occupational health and safety (OHS) knowledge, leading to *unsafe actions* and conditions by the workers.

Workplace accidents occur due to the presence of contributing factors that collectively occur at a workplace or in a work process. Workplace accidents are indicated as events that do not happen by themselves but occur because of the many contributing factors that arise in a single incident (Tarwaka, 2016). Regarding the potential risk of workplace accidents in construction work, knowledge of occupational health and safety (K3) on a construction project has become a fundamental necessity. The aspect of K3 cannot function as it should without intervention from management in the form of planned

efforts to manage it (safety management), often referred to as the Occupational Safety and Health Management System (SMK3). Construction K3 is not something new, considering that there have been several regulations related to K3 since 1970, such as Law Number 1 of 1970 concerning Occupational Safety, and a few years ago, the government also issued Ministerial Regulation No. 9 of 2008 regarding SMK3. In general, knowledge about K3 is extensive, but certain components of K3 are considered essential to gauge understanding of K3. These components include the definition and initiation of K3, Occupational Safety and Health Management Systems (SMK3), Personal Protective Equipment (PPE), K3 facilities and infrastructure, and K3 risks.

The first factor is the knowledge or understanding of workers about health and safety in the workplace (K3), which will influence various factors in the workers' attitude to avoid or reduce the risk of accidents. Knowledge is the result of someone's awareness after they have sensed and perceived an object. Knowledge is necessary to build confidence, attitudes, and daily behaviors and can be applied in different situations. However, when the acquired knowledge cannot be applied due to limitations within oneself, workers may experience stress due to their lack of understanding of their limitations (Notoadmojo, 2012).

Dodoo & Al-Samarraie (2019), in their review of 70 empirical studies on workers engaging in unsafe actions, found that a lack of knowledge about health and safety in the workplace is a primary factor contributing to unsafe behavior (unsafe action). Insufficient knowledge can also lead to neglecting existing hazards and not following established safety protocols. Similarly, if workers have good occupational health and safety knowledge, they will be more aware of the risks associated with not following established procedures and will know how to stay safe while working. This aligns with research conducted by Utami (2021), which indicates a significant relationship between knowledge and unsafe behavior occurrences. The same results were shown by Annisa (2019) and Bancin (2017), both of whom found a significant relationship between knowledge and unsafe behavior.

In addition to occupational health and safety knowledge, workplace accidents can also be caused by inadequate occupational health and safety supervision, as indicated by the research of Zahiri Harsini et al. (2020). Their research found that poor safety management and supervision were mentioned as factors influencing unsafe behavior, consisting of two categories: ineffective safety systems and poor safety monitoring or supervision. Poor supervision can have consequences for the company, such as missed opportunities for referrals, safety, and learning. Workers may feel undervalued if the company lacks proper supervision, making it difficult to establish loyalty to the company. Lack of loyalty can lead to deviant work attitudes that are inconsistent with the organizational culture and company goals. These activities can include theft. According to a research by Uyun and Widiowati (2022), when supervision is not conducted, it can lead to the root causes of an incident that disrupts other activities in the company. The results of a research by Larasti et al. (2022) found that the relationship between supervision and unsafe actions was significant. The majority of respondents engaged in unsafe actions

when supervision by officers was poor, with 62 (83.8%) compared to 11 (22.4%) when supervision was good. From this data, it can be seen that there is a significant relationship between supervision and unsafe behavior in the workplace.

In addition to occupational health and safety knowledge and occupational health and safety supervision, another factor that can influence unsafe behavior is the availability of occupational health and safety facilities. The availability of good infrastructure and facilities supports workers in performing safe behaviors at work. Sangaji et al. (2018), based on their interviews, found that one of the factors leading to respondents having unsafe behavior is the difficulty in obtaining personal protective equipment (PPE) when their old PPE is damaged. The availability of PPE facilities provided by the company can support workers in working safely, and job supervision can guide workers toward safe behaviors (Heryawan et al., 2018). These results are consistent with the research by Sangaji et al. (2018), which states that the availability of occupational health and safety facilities significantly influences unsafe behavior. The same results were shown by Ernyasih et al. (2022), who found that the availability of occupational health and safety facilities significantly affects unsafe behavior. Furthermore, another factor that can influence unsafe behavior is management commitment. In an organization or company, an integrated occupational health and safety management system is needed to maintain safety programs and control incident and accident risks in order to create a productive, safe, and efficient workplace (Rachman et al., 2022). Commitment to safety is divided into three dimensions: safety commitment related to attitude/affective, safety commitment that follows applicable norms/normative, and sustainable safety commitment (Fruhen et al., 2019). Priyohadi and Achmadiansyah (2021) stated that good management commitment can influence unsafe behavior. In a research conducted by Riansyah (2021), it was found that a good occupational health and safety management system, including leadership and policies, has a negative impact on *unsafe actions*.

METHOD

Type and Data Source

This research follows a positivist paradigm. In quantitative/positivist research, which is based on the assumption that a phenomenon can be classified, and the relationships between phenomena are causal (cause and effect), the research can focus on a limited number of variables. The pattern of relationships among the variables under investigation is referred to as the research paradigm (Sugiyono, 2017). This research employs a quantitative approach with an explanatory or causal design, aiming to explain how one variable influences or is responsible for changes in other variables (Cooper & Schindler, 2017). The research respondents consist of 136 workers involved in the Vertical Surabaya UPT Hospital Construction Project under PT Wijaya Karya Building Division, selected using the Slovin formula.

Analysis Method

Data collection is the method used by researchers to obtain data in the field by distributing questionnaires. Subsequently, descriptive statistical analysis is performed using SPSS version 24, and statistical tests are conducted using SmartPLS version 3.2.9.

RESULT AND DISCUSSION

Request Cars in Indonesia as Sample Data

Descriptive statistical tests aim to determine the maximum, minimum, *mean*, and standard deviation values of each research variable. Based on the calculation results, it is found that:

Table 1: Descriptive Statistical Test Results

	N	Min	Max	Mean	Std. Deviation
Avr_PK3	136	1,60	5,00	3,7765	,70219
Avr_PN	136	2,20	5,00	3,8625	,56751
Avr_FK3	136	1,80	5,00	3,6691	,72424
Avr_PTA	136	1,90	5,00	3,8022	,63845
Avr_KM	136	1,60	5,00	3,7294	,68173
Valid N (listwise)	136				

Source: Data processing (2023)

The descriptive statistical results above indicate that the Occupational Health and Safety Knowledge variable has a minimum value of 1.60 and a maximum value of 5.00, with a mean score of 3.7765 and a standard deviation of 0.70219. Next, the Occupational Health and Safety Supervision variable has a minimum value of 2.20 and a maximum value of 5.00, with a mean score of 3.8625 and a standard deviation of 0.56751. Then, the Occupational Health and Safety Facilities variable has a minimum value of 1.80 and a maximum value of 5.00, with a mean score of 3.6691 and a standard deviation of 0.72424. Furthermore, the Unsafe Behavior variable has a minimum value of 1.90 and a maximum value of 5.00, with a mean score of 3.8022 and a standard deviation of 0.63845. Lastly, the Management Commitment variable has a minimum value of 1.60 and a maximum value of 5.00, with a mean score of 3.7294 and a standard deviation of 0.68173..

The convergent validity testing of the measurement model with reflexive indicators can be observed from the correlation between the item/indicator scores and their respective construct scores calculated using PLS. According to Ghozali & Latan (2015:123), an indicator is considered to have a high level of validity if it has a factor loading value greater than 0.70. However, factor loadings between 0.50 and 0.60 are still acceptable. The factor loading value used in this research is > 0.6, so if the *factor loading* value is < 0.6 in the calculation results of the measurement model (outer model), it will be removed from the model.

Table 2: Outer Loading Values

Variable	Item	Outer Loading	Syarat	Description
Occupational Health and Safety Knowledge	PK_1	0,905	> 0,6	Valid
	PK_2	0,873	> 0,6	Valid
	PK_3	0,873	> 0,6	Valid
	PK_4	0,878	> 0,6	Valid
	PK_5	0,886	> 0,6	Valid
	PK_6	0,776	> 0,6	Valid
	PK_7	0,902	> 0,6	Valid
	PK_8	0,857	> 0,6	Valid
	PK_9	0,881	> 0,6	Valid
	PK_10	0,777	> 0,6	Valid
	PK_11	0,846	> 0,6	Valid
	PK_12	0,855	> 0,6	Valid
Occupational Health and Safety Supervision	PN_1	0,767	> 0,6	Valid
	PN_2	0,755	> 0,6	Valid
	PN_3	0,754	> 0,6	Valid
	PN_4	0,728	> 0,6	Valid
	PN_5	0,852	> 0,6	Valid
	PN_6	0,758	> 0,6	Valid
	PN_7	0,798	> 0,6	Valid
	PN_8	0,804	> 0,6	Valid
	PN_9	0,806	> 0,6	Valid
	PN_10	0,864	> 0,6	Valid
Occupational Health and Safety Facilities	FK_1	0,823	> 0,6	Valid
	FK_2	0,854	> 0,6	Valid
	FK_3	0,852	> 0,6	Valid
	FK_4	0,807	> 0,6	Valid
	FK_5	0,819	> 0,6	Valid
	FK_6	0,884	> 0,6	Valid
	FK_7	0,787	> 0,6	Valid
	FK_8	0,864	> 0,6	Valid
	FK_9	0,82	> 0,6	Valid
	FK_10	0,798	> 0,6	Valid
Unsafe Behavior	PTA_1	0,807	> 0,6	Valid
	PTA_2	0,83	> 0,6	Valid
	PTA_3	0,862	> 0,6	Valid
	PTA_4	0,794	> 0,6	Valid
	PTA_5	0,783	> 0,6	Valid
	PTA_6	0,784	> 0,6	Valid

Variable	Item	Outer Loading	Syarat	Description
Management Commitment	PTA_7	0,845	> 0,6	Valid
	PTA_8	0,782	> 0,6	Valid
	KM_1	0,828	> 0,6	Valid
	KM_2	0,836	> 0,6	Valid
	KM_3	0,769	> 0,6	Valid
	KM_4	0,83	> 0,6	Valid
	KM_5	0,754	> 0,6	Valid
	KM_6	0,792	> 0,6	Valid
	KM_7	0,849	> 0,6	Valid
	KM_8	0,825	> 0,6	Valid
KM_9	0,747	> 0,6	Valid	
KM_10	0,745	> 0,6	Valid	

Source: Data processing (2023)

Table 3: Cross Loading Values

Variable	Item	PK3	PN K3	FK3	PTA	KM
Occul Hepationaalth and Safety Knowledge	PK_1	0,905	0,741	0,710	0,845	0,853
	PK_2	0,873	0,698	0,636	0,778	0,770
	PK_3	0,873	0,710	0,685	0,796	0,812
	PK_4	0,878	0,704	0,663	0,783	0,769
	PK_5	0,886	0,737	0,696	0,783	0,805
	PK_6	0,776	0,643	0,565	0,657	0,695
	PK_7	0,902	0,727	0,707	0,796	0,800
	PK_8	0,857	0,666	0,681	0,752	0,750
	PK_9	0,881	0,689	0,692	0,780	0,775
	PK_10	0,777	0,677	0,617	0,717	0,728
	PK_11	0,846	0,709	0,683	0,772	0,762
	PK_12	0,855	0,715	0,639	0,793	0,784
Occupational Health and Safety Supervision	PN_1	0,615	0,767	0,560	0,666	0,653
	PN_2	0,529	0,755	0,409	0,538	0,572
	PN_3	0,695	0,754	0,588	0,733	0,736
	PN_4	0,566	0,728	0,499	0,657	0,643
	PN_5	0,671	0,852	0,601	0,739	0,747
	PN_6	0,577	0,758	0,573	0,668	0,630
	PN_7	0,677	0,798	0,592	0,721	0,711
	PN_8	0,680	0,804	0,535	0,705	0,689
	PN_9	0,649	0,806	0,567	0,684	0,663
	PN_10	0,745	0,864	0,623	0,789	0,772
Occupational Health and Safety Facilities	FK_1	0,706	0,646	0,823	0,739	0,718
	FK_2	0,591	0,537	0,854	0,618	0,608

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	FK_3	0,663	0,595	0,852	0,682	0,681
	FK_4	0,602	0,566	0,807	0,644	0,661
	FK_5	0,609	0,586	0,819	0,641	0,650
	FK_6	0,615	0,548	0,884	0,654	0,622
	FK_7	0,637	0,610	0,787	0,718	0,630
	FK_8	0,704	0,597	0,864	0,727	0,686
	FK_9	0,649	0,580	0,820	0,684	0,644
	FK_10	0,634	0,598	0,798	0,686	0,667
Unsafe Behavior	PTA_1	0,759	0,709	0,689	0,751	0,807
	PTA_2	0,710	0,690	0,593	0,771	0,830
	PTA_3	0,754	0,767	0,636	0,797	0,862
	PTA_4	0,769	0,670	0,741	0,766	0,794
	PTA_5	0,676	0,699	0,574	0,699	0,783
	PTA_6	0,691	0,697	0,607	0,705	0,784
	PTA_7	0,761	0,730	0,650	0,782	0,845
	PTA_8	0,733	0,672	0,648	0,747	0,782
Management Commitment	KM_1	0,725	0,791	0,666	0,828	0,816
	KM_2	0,718	0,701	0,584	0,836	0,758
	KM_3	0,708	0,686	0,593	0,769	0,741
	KM_4	0,727	0,734	0,616	0,830	0,751
	KM_5	0,621	0,685	0,550	0,754	0,653
	KM_6	0,717	0,670	0,620	0,792	0,708
	KM_7	0,757	0,749	0,662	0,849	0,848
	KM_8	0,812	0,707	0,766	0,825	0,768
	KM_9	0,661	0,638	0,732	0,747	0,653
	KM_10	0,711	0,654	0,754	0,745	0,690

Source: Data processing (2023)

Table 4: AVE (Average Variance Extracted) Values

Variable	AVE
Occupational Health and Safety Knowledge	0,739
Occupational Health and Safety Supervision	0,624
Occupational Health and Safety Facilities	0,691
Unsafe Behavior	0,638
Management Commitment	0,658

Source: Data processing (2023)

Based on the test results, all variables have AVE values above 0.5. This indicates that the constructs meet the validity criteria based on the *Average Variance Extracted (AVE)*. Another test to evaluate the outer model is to assess the reliability of latent constructs measured by two measures, namely the *composite reliability* of the indicator blocks measuring the constructs. In the first stage, constructs are considered reliable if they have a *composite reliability* value above 0.70 (Ghozali and Latan, 2012). Below are the results of the outer model from the *composite reliability*:

Table 5: Composite Reliability Values

Variable	Composite Reliability	Requirements	Description
Occupational Health and Safety Knowledge	0,971	> 0,7	Reliable
Occupational Health and Safety Supervision	0,943	> 0,7	Reliable
Occupational Health and Safety Facilities	0,957	> 0,7	Reliable
Unsafe Behavior	0,946	> 0,7	Reliable
Management Commitment	0,939	> 0,7	Reliable

Source: Data processing (2023)

The table above shows that each variable has a *composite reliability* value above 0.7. From these results, it can be concluded that the research model is considered reliable because it meets the *composite reliability* threshold value.

Table 6: Cronbach's Alpha Values

Variable	Cronbach's Alpha	Conditions or Requirements	Description
Occupational Health and Safety Knowledge	0,971	> 0,6	Reliable
Occupational Health and Safety Supervision	0,943	> 0,6	Reliable
Occupational Health and Safety Facilities	0,957	> 0,6	Reliable
Unsafe Behavior	0,946	> 0,6	Reliable
Management Commitment	0,939	> 0,6	Reliable

Sumber: Olah data (2023)

The table above shows that each variable has a Cronbach's alpha value above 0.6. From these results, it can be concluded that the research model is considered reliable because it meets the Cronbach's alpha threshold value. The evaluation of the *inner model*

is carried out by examining the coefficients of determination. The coefficient of determination aims to measure the extent to which the model can explain the variance of endogenous latent variables. Changes in the R-Square values can be used to explain whether a particular exogenous latent variable has a *substantive* influence on the endogenous latent variable.

Table 7: R-Square (R²) Values

R Square	
Unsafe Behavior	0,919

Source: Data processing (2023)

Hypothesis testing between constructs is conducted using the *bootstrap resampling* method. The hypothesis testing calculations using SmartPLS version 3.2.9 can be observed from the *Path Coefficient* values, which are the t-statistic values representing the relationships between variables in the research. In the statistical table, the t-table value for 136 degrees of freedom is 1.96 with a significance level (α) of 0.05. The decision-making process is as follows:

- If P-Values > 0.05 or t observed < t table, Ho is rejected.
- If P-Values < 0.05 or t observed > t table, Ho is accepted.

The *output* of the structural model testing (*T-Values*) can be seen in the following figure.

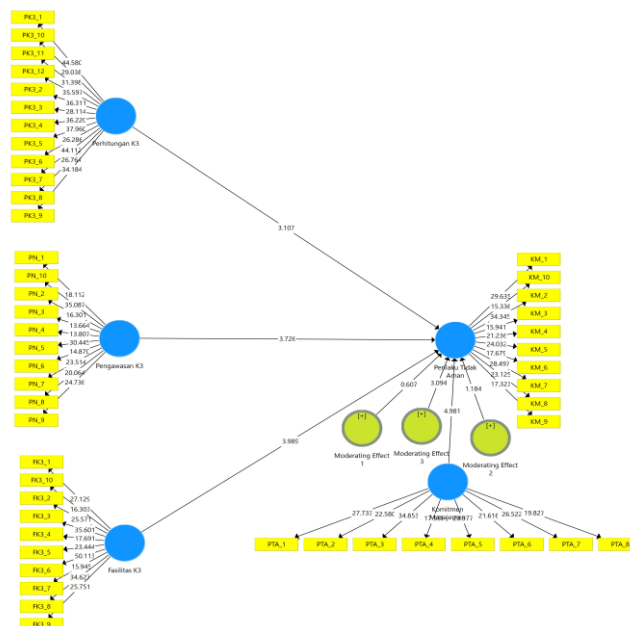


Figure 1: Structural Model Testing Output
 Source: Data Analysis (2023)

Next, the coefficient values between variables can be observed in the following paths as shown in the following figure:

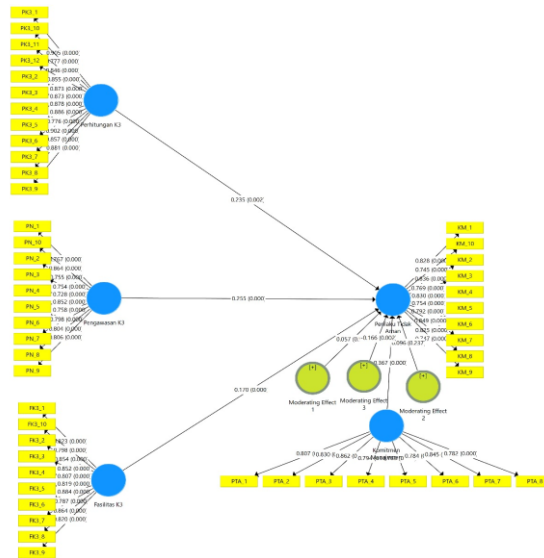


Figure 2: Coefficient Value Output
 Source: Data Analysis (2023)

The hypothesis results based on the two figures above are as follows:

Table 8: Path Coefficient Values, t-Statistics, and P-Values

	Original Sample (O)	T Statistics (O/STDEV)	P Values
PK-> PTA	0,235	3,045	0,002
PN -> PTA	0,255	3,612	0,000
FK -> PTA	0,170	3,814	0,000
KM -> PTA	0,367	4,666	0,000
Md Effect 1 -> PTA	0,057	0,648	0,517
Md Effect 2 -> PTA	0,096	1,208	0,228
Md Effect 3 -> PTA	-0,166	3,405	0,001

Source: Data analysis (2023)

The Influence of K3 Knowledge on Unsafe Behavior.

The results of the first hypothesis testing (H1) demonstrate that K3 Knowledge has an influence on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. The results indicate that the P-Value is $0.002 < 0.05$. K3 Knowledge affects Unsafe Behavior overall. With K3 knowledge, workers can understand the risks present in their work environment. They become more aware of potential hazards and the consequences of unsafe behavior. K3 knowledge can enhance self-awareness about the importance of workplace safety and health. This can motivate workers to prioritize safe behaviors. This is in line with Utami (2021), where it was found that there is a significant relationship between K3 knowledge variables and unsafe behavior (unsafe action).

The Influence of K3 Supervision on Unsafe Behavior

The results of the second hypothesis testing (H2) demonstrate that K3 Supervision has an influence on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. The results indicate that the P-Value is $0.000 < 0.05$. K3 Supervision includes providing feedback to workers regarding their safety-related behaviors. Effective K3 supervision can help build a safety culture in the workplace. When this culture is implemented successfully, workers will feel more accountable for their safety-related behaviors and are inclined to avoid unsafe behaviors. This is consistent with the outcomes of Widowati and Uyun (2022), who found a significant relationship between K3 supervision and unsafe behavior (unsafe action).

The Influence of K3 Facilities on Unsafe Behavior.

The results of the third hypothesis testing (H3) demonstrate that K3 Facilities have an influence on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. The results indicate that the P-Value is $0.000 < 0.05$. K3 facilities equipped with appropriate and easily accessible safety equipment can encourage workers to use such equipment. For example, the availability of safety helmets, protective eyewear, or other necessary personal protective equipment (PPE) can influence workers to use them consistently, reducing unsafe behavior. This is consistent with the outcomes of Jessica Sangaji, Sisiwi Jayanti, and Daru Lestantyo (2018), who found a significant relationship between K3 facilities and unsafe behavior (unsafe action).

Management commitment moderates the effect of K3 Knowledge on Unsafe Behavior

The results of the fourth hypothesis testing (H4) demonstrate that Management commitment cannot moderate the Influence of K3 Knowledge on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. The results indicate that the P-Value of $0.517 > 0.05$. Although management has a high commitment to safety, existing safety policies and practices may not align with the realities in the field. This can make it difficult for workers to effectively apply their K3 knowledge in everyday situations. When knowledge is not effectively applied, workers' awareness of hazards may increase.

Management commitment moderates the effect of K3 Supervision on Unsafe Behavior.

The results of the fourth hypothesis testing (H4) demonstrate that Management commitment cannot moderate the Influence of K3 Supervision on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. The results indicate that the P-Value of $0.228 > 0.05$. These results suggest that in certain work situations or environments, high or low management commitment does not have a significant impact on how K3 supervision influences safety behavior.

Management commitment moderates the effect of K3 Facilities on Unsafe Behavior.

The results of the fourth hypothesis testing (H4) demonstrate that Management commitment cannot moderate the Influence of K3 Facilities on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. The results indicate that the P-Value of $0.001 < 0.05$. When management has a high commitment to

safety and occupational health, they may be more inclined to provide adequate K3 facilities. This can include the provision of safety equipment, proper safety training, and a well-designed work environment. Adequate K3 facilities can help workers feel supported in carrying out their tasks safely.

CONCLUSION

Based on the statistical testing conducted, the following research conclusions can be drawn: Knowledge of occupational health and safety (K3) has an influence on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. Supervision of occupational health and safety (K3) has an influence on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. K3 facilities have an influence on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. Management commitment cannot moderate the Influence of K3 Knowledge on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. Management commitment cannot moderate the Influence of K3 Supervision on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital. Management commitment can moderate the Influence of K3 Facilities on Unsafe Behavior among construction workers in the construction of the Vertical Surabaya UPT Hospital.

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