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## **ANALYSIS OF COMPLIANCE WITH THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE) AMONG HIGH WORKERS ACCORDING TO HEALTH BELIEF MODEL THEORY**

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### **ABSTRAK**

Beberapa penelitian juga dilakukan di Amerika Serikat. Sebuah insiden yang terjadi di Amerika Serikat mempengaruhi pekerja dengan persentase 85% orang yang diperiksa yang jatuh, karena tidak menggunakan alat pelindung diri yang ditentukan. 70% dari semua insiden jatuh disebabkan oleh kurangnya penggunaan alat pelindung diri. Karyawan di industri konstruksi yang tidak mengenakan alat pelindung diri memiliki risiko cedera tiga kali lipat ganda. Untuk memeriksa bagaimana alat pelindung diri digunakan oleh pekerja dataran tinggi di kompleks apartemen yang dikenal sebagai The Savyavasa Luxury Residence. Penelitian ini menggunakan metodologi cross-sectional dan bersifat kuantitatif. Tujuh puluh responden berpartisipasi dalam penelitian ini. Menurut temuan penelitian, 42 (60%) karyawan berperilaku patuh saat mengenakan APD. Isyarat untuk bertindak (0,043), keuntungan yang dirasakan (0,00), kerentanan yang dirasakan ( $P = 0,005$ ), tingkat keparahan yang dirasakan (0,001), efikasi diri (0,007), faktor pengetahuan ( $P = 0,000$ ), dan variabel yang tidak terkait dengan variabel hambatan (0,808). Kesimpulan yang dapat ditarik adalah bahwa hampir semua variabel dari *model keyakinan kesehatan* dapat memprediksi perilaku kepatuhan dalam menggunakan alat pelindung diri Perusahaan dapat melakukan sosialisasi mengenai APD tentang kelebihan dan kekurangan tidak menggunakan APD. Berikan perhatian lebih kepada pekerja baru terkait kepatuhan penggunaan APD.

**Kata Kunci:** Model Keyakinan Kesehatan, APD, Perilaku

### **ABSTRACT**

Several studies were conducted in the United States as well. An incident that occurred in the United States affected workers with a percentage of 85% of people examined who fell, due to not using the prescribed personal protective equipment. 70% of all fall incidents are due to lack of use of personal protective equipment. Employees in the construction industry who do not wear personal protection equipment have a threefold increased risk of getting hurt. To examine how personal protective equipment is used by high-altitude workers in the apartment complex known as The Savyavasa Luxury Residence. This study employs a cross-sectional methodology and is quantitative in nature. Seventy respondents participated in this study. According to the study's findings, 42 (60%) of the employees behaved compliantly when wearing PPE. Cues to action (0.043), perceived advantages (0.00), perceived susceptibility ( $P=0.005$ ), perceived severity (0.001), self-efficacy (0.007), knowledge factors ( $P=0.000$ ), and variables unrelated to the obstacle variable (0.808). The conclusion that can be drawn is that almost all variables from the health belief model can predict compliance behavior in using personal protective equipment. Companies can conduct outreach regarding PPE about the advantages and disadvantages of not using PPE. Give more attention to new workers regarding compliance with the use of PPE.

**Keywords:** Health Belief Model, PPE, Behavior

### **INTRODUCTION**

Construction project work wants to be completed within a predetermined time, however, construction project activities can experience delays in the completion time. The cause of delays or disruption of construction project work is work accidents. An accident is an event that is clear and undesirable and often unexpected which can later cause many losses ranging from completion time,

and property, even to causing casualties which can occur in an industrial work process or similar (Wahyuningsih, 2018).

According to International Labor Organization (ILO) estimates, there were 60,000 fatal accidents annually in 2015. In the construction sector alone, around 1 in 6 fatal accidents are reported. Falling from a height is the main cause of death with a total of 142 deaths with a percentage of 45%, other causes are direct contact with machinery or electricity and also falling materials with the presentation of each cause of accident being 7% (Widowati, 2022).

The primary cause of accidents at heights is a failure to apply K3, which exposes workers to risks such as falling, slipping, tripping, and materials falling from above when working at heights (falling objects). Regarding further factors contributing to work accidents resulting from falls from heights, it was discovered that improper work equipment and platforms accounted for 19.6% of the incidents, a lack of supervision for 25.5%, and improper procedures in place for 33.3% of the incidents (Adhwa Umniyyah Danur Irkas, 2020).

Similarly, according to data from the International Labor Organization, 2.78 people are thought to lose their lives each year as a result of accidents or illnesses related to their jobs, with over 380,000 (13.7%) of those deaths occurring as a result of work-related accidents. It is estimated that up to 375 million workers have non-fatal work-related incidents annually, surpassing the number of fatal accidents (Noratira Abd Samad, 2023).

Researchers in the United States found that the percentage of accidents falling from heights is the largest percentage of fatal accidents in the construction sector. The cause of construction-related deaths in the United States between 2009 and 2018 was falls from heights which accounted for 36.76% of fatal accidents (Ahmed Jalil Al-Bayati, 2023).

Some studies were conducted in the United States as well. An incident that occurred in the United States affected workers with a percentage of 85% of people examined who fell, due to not using the prescribed personal protective equipment. 70% of all fall incidents are due to a lack of use of personal protective equipment. The risk of injury for construction workers who do not wear personal protective equipment is three times higher than that of those who do not wear it (Erwandi, 2023).

The Employment Social Security Administering Agency, an institution whose task is to provide occupational health insurance services, recorded that in the last five years in 2021, it reached 234,270 cases, which is an increase of 5.65% compared to the previous year. Working at heights is one of the causes of fatal accidents (Morgen Ekaputra Pangaila, 2021).

Working at height is defined as any activity performed by employees at a workplace on land or in water that has varying heights and the potential for falls, as per the Regulation of the Minister of Manpower of the Republic of Indonesia (Permenaker) NO.9 of 2016 concerning Work Safety. causes harm or death to employees or other workers, or results in losses for employees (Muhammad Akbar Salcha, 2023).

Perceptions of vulnerability, severity, benefits, losses, cues to action, and self-efficacy are all linked to compliance with PPE use, according to the Health Belief Theory. If it is related to the use of PPE, each construct can provide different influences according to the workers' views (Alghofiqy, 2018).

The level of education, understanding, motivation, and training in the use of personal protective equipment (PPE) must all be increased to achieve efficient and effective use of PPE. This will alter worker behavior about PPE & compliance (Ariyanto, 2023). Therefore, in areas where there is a high risk of fatal accidents from working at heights, an analysis can be conducted to promote compliance with the usage of personal protective equipment to avoid and also minimize the frequency of work accidents among workers at heights. Additionally, observe how crucial it is for high-altitude workers to wear personal protective equipment. Researchers used this as the foundation to examine how PPE was applied to high-altitude workers in the apartment complex known as The Savyavasa Luxury Residence.

## **METHOD**

This study employs a cross-sectional methodology and is quantitative in nature. In January 2024, this study was carried out at the apartment complex known as The Savyavasa Luxury Residence. High-rise employees of The Savyavasa Luxury Residence Project served as the research sample. Using the 1997 Lameshow formula, the population size in this study was calculated to be 250 workers. The number of samples collected to support the study was lowered to 70 respondents based on the findings of computations made using the Lameshow formula.

To ascertain the frequency distribution of the dependent variable (the use of personal protective equipment) and independent variables (knowledge, perception of perceived vulnerability, perception of seriousness, perception of benefits, perception of barriers/losses, action signals, and own ability), statistical software was used in two stages of the analysis. The first stage was univariate analysis, which was followed by bivariate analysis to ascertain the relationship between the independent and dependent variables. The chi-square test ( $X^2$ ) was used to conduct this investigation. This was done using a questionnaire and grouped using an exception normality test on the knowledge variable using Arikunto's theory with three groups, namely good, sufficient, and poor. This research has received approval from the Ethics Commission of the Faculty of Public Health Universitas Muhammadiyah Jakarta with the number No.10.014.B/KEPK-FKMUMJ/I/2024.

## **RESULTS AND DISCUSSION**

42 height workers (60%) have complying PPE use behavior, whereas 28 height workers (40%) have non-compliant PPE use behavior, according to Table 1's data.

In terms of knowledge, the results showed that 33 high-level workers (47.1%) had good knowledge, while 23 high-level workers (32.9%) had poor knowledge, and 14 high-altitude workers (20%) had sufficient knowledge.

The results of Perceived Susceptibility showed that 45 height workers (64.3%) felt less vulnerable when not using PPE, while 25 height workers (35.7%) felt vulnerable and chose to use PPE.

Regarding the Perceived Severity, the results showed that 37 high-altitude workers (52.9%) were not serious, while 33 high-altitude workers (47.1%) indicated that they felt serious about work-related accidents resulting from work.

Regarding the Perceived Benefit, the results show that 36 height workers (51.4%) feel there are disadvantages when using PPE and 34 height workers (48.6%) feel there are many advantages when using PPE

Regarding the Perceived Barrier, 35 height workers (50%) felt there were no disadvantages when working using PPE, while 35 height workers (50%) felt disadvantages when working using PPE.

In terms of Cues of action, 44 high-level workers (62.9%) felt little motivation as a signal to act, while 26 high-level workers (37.1%) felt a lot of motivation as a signal to act.

Regarding Self-efficacy, 49 high-level workers (70%) were less confident in their abilities, while 21 high-altitude workers (30%) were very confident in their abilities.

**Table 1. Univariate Analysis**

Variable	N	%
<b>PPE Usage Behavior</b>		
Obedient	42	60.0
Not obey	28	40.0
<b>Knowledge</b>		
Good	33	47.1
Enough	14	20.0
Not enough	23	32.9
<b>Perceived Severity</b>		
Prone to	25	35.7
Not Vulnerable	45	64.3
<b>Perceived Seriousness</b>		
Are you serious	33	47.1
Not serious	37	52.9
<b>Perceived Benefit</b>		
Profit	34	48.6
Make a loss	36	51.4
<b>Perceived Barrier</b>		
Hampered	35	50.0
Not hampered	35	50.0
<b>Cues of Action</b>		
Lots	26	37.1
A little	44	62.9
<b>Self Efficacy</b>		
Very confident	21	49.0
Not sure	49	70.0

**Table 2. The Relationship between Behavioral Variables and Use of PPE**

Variable	P value	OR	CI (95%)
Knowledge	0,000	-	-
Perceived Susceptibility	0.005	6.000	1.773 – 20.305
Perceived Severity	0.001	6.600	2.194 – 19.857
Perceived Benefit	0,000	10.262	3.193 – 32.983
Perceived Barriers	0.808	-	-
Cue of Action	0.043	3.333	1.124 – 9.884
Self-Efficacy	0.007	6.250	1.629 – 23.976

According to statistical findings from the chi-square test, the p-value was 0.000, indicating a substantial relationship between high-altitude workers' knowledge and their use of personal protection equipment in the 2024 Savyavasa Luxury Residence apartment complex. The findings of this study are consistent with three earlier studies (Alghofiqy, 2018) that found a link between knowledge and compliance behavior when it came to wearing personal protective equipment. This further supports the findings of this study. Contrary to studies by Wright et al. (2019), there is no relationship between compliance behavior and knowledge when it comes to wearing personal protection equipment (Tamara Wright, 2019):

According to the results of the chi-square test, there is a significant relationship between the use of personal protective equipment and the impression of vulnerability ( $P = 0.005$ ). Additionally, an OR value of 6,000 was obtained, indicating that employees who perceived themselves to be at risk from potential threats at work were 6,000 times more likely to comply with the use of personal protective equipment than employees who believed they were not at risk. This research is in line with research conducted by (Dewi, Rahardjo, and Murti 2019; Tessema and Sema 2022; Wright et al. 2019; Zahra 2023) of the 4 studies conducted, all studies show a relationship between perceived vulnerability and behavior in using protective equipment Self (Ristamaya Danar Dewi, 2019).

There is a substantial relationship between perceived vulnerability and the use of personal protection equipment, according to the results of the Chi-Square test, which also showed a P value of 0.001, where the P value is less than 0.05. With an OR value of = 6.600, this study indicates that employees who take workplace hazards seriously are 6,600 times more likely to use personal protective equipment (PPE) in a complying manner than employees who do not take such threats seriously. The findings of this study are consistent with those of studies by (Tessema and Sema 2022; Pangalaila, Fatimawali, and Kaunang 2021). Perceptions of seriousness and compliance behavior about wearing personal protection equipment were found to be related in two earlier research (Sema, 2022).

Perceived benefits and compliance behavior about wearing personal protection equipment are significantly correlated, as indicated by the square test's  $P=0.000$  result. From the results of the analysis, the value obtained was  $OR=10.262$ , which means that workers who felt a gain when using PPE had a 10.262 times higher chance of complying with using personal protective equipment properly compared to workers who felt a loss (Ferlina Rizky Indah Nugroho, 2023). This study supports research by 13–

15 based on findings from three earlier studies that also demonstrated a connection between behavior in utilizing personal protection equipment and perceived benefits (Indarjo, 2023).

The findings of the Chi-square test used in this study showed a P value of 1.000, where the P value is more than 0.05, indicating that there is no significant relationship between the use of personal protective equipment and perceptions of losses or impediments. However, the results obtained are still logical because it was found that respondents who felt the benefits of using personal protective equipment would be more obedient in using personal protective equipment. This study is consistent with studies by Pangaila, Fatimawali, and Kaunang (2021) and Ghanbari et al. (2014). Perceptions of losses or difficulties and compliance behavior with personal protection equipment were found to be unrelated in two earlier investigations (Morgen Ekaputra Pangaila, 2021). This is in contrast to research by Kim et al. (2014), which found a substantial relationship between self-protective behavior and perceived barriers (Seul A. Kim, 2014).

Action cues and compliance behavior when using personal protective equipment (PPE) are significantly correlated, according to the Chi Square test results, which showed a value of  $P=0.043$ , where the value of  $p<0.05$ . The analysis's findings yielded an  $OR=3.333$  value, meaning that employees with a high number of action cues are 3.333 times more likely to use personal protection equipment in a compliant manner than employees with a low number of action cues.

This study is consistent with studies by Sakinah (2018) and Dewi, Rahardjo, and Murti (2019). Action cues and behavior when wearing personal protection equipment were found to be significantly correlated in earlier studies (Sakinah, 2017). This contrasts with studies by Wright et al. (2019), which found no connection between action cues and behavior when wearing PPE (Tamara Wright, 2019).

$P=0.007$  was the result of the Chi-square test, and a value of  $P<0.05$  indicates a substantial association between personal ability and compliance behavior when it comes to wearing personal protection equipment. With an OR value of 6.250, employees who are very confident in their skills are 6.250 times more likely to use personal protection equipment in a complying manner than employees who are less confidence in their skills. This study is consistent with studies by Kim et al. (2014) and Tessema and Sema (2022), which found a link between an individual's capabilities and their use of personal protective equipment (Seul A. Kim, 2014).

## **CONCLUSION AND SUGGESTIONS**

The following conclusions can be drawn from the research findings on the analysis of high-altitude workers' compliance with the use of personal protective equipment (PPE) at The Savyavasa Luxury Apartment Project: Knowledge and compliance behavior in the use of PPE are significantly correlated, and the chi-square test yielded a value of  $P = 0.000$ . According to the results of the chi-square test, which had a value of  $P=0.005$ , there is a strong relationship between perceived vulnerability and compliance behavior when it comes to wearing personal protection equipment.

The findings of the chi-square test showed a strong relationship between the behavior of wearing personal protection equipment and the perception of seriousness, with a value of  $P = 0.001$ . According to the results of the chi-square test, which had a value of  $P=0.000$ , there is a substantial relationship between the perceived benefits and compliance behavior when it comes to wearing personal protective equipment. According to the results of the chi-square test, which showed a value of  $P=0.808$ , there is no relationship between compliance behavior when wearing personal protective equipment and perceptions of barriers or disadvantages. With a chi-square test result of  $P = 0.049$ , there is a strong relationship between action cues and compliance behavior when it comes to wearing personal protective equipment. With a chi-square test result of  $0.009$ , there is a substantial relationship between one's own skill and compliance behavior when utilizing personal protective equipment.

On the basis of the conducted research, recommendations can be made. Businesses can conduct PPE outreach by discussing the benefits and drawbacks of not employing PPE. Pay closer attention to new hires' adherence to PPE use guidelines. boosting employees' self-awareness.

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