

# Factors Related to Workers' Behavior on the Use of Personal Protective Equipment

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**Keywords:** workers, behavior, personal protective equipment.

**Abstract:** Many workers think the use of safety equipment will reduce their productivity. In fact, it will make it difficult for them to work safely at the office if they do not use one. The use of safety equipment assigned by the management is often not complied with by the workers. The standard safety equipment provided by management, such as shoes, hats, gloves, and masks, is often worn incompletely. There are lots of factors that influence the behavior of workers to use the personal protective equipment that has been provided by the company. The purpose of this study was to determine the factors associated with workers' behavior on the use of personal protective equipment in the production section. The type of analysis carried out in this study has been a cross-sectional design. The sampling technique in this study was simple random sampling with a population of 395 and a sample size of 79 workers. The study used a statistical test of the chi-square. The results of the study showed that there was a correlation between supervision and the use of personal protective equipment (p-value = 0.009). However, there was no correlation between knowledge (p-value = 0.133), attitude (p-value = 0.099), action (p-value = 0.051), comfort (p-value = 0.193) and the use of personal protective equipment. It is recommended for the management team of the company to implement regular supervision to strengthen the use of personal protective equipment.

## 1 INTRODUCTION

The rubber plant (*Hevea Braziliensis*) was initially found in the Amazon river valleys and traditionally had the sap taken for use in various purposes. A rubber that is durable and anti-breaking causes the demand for rubber to continue to increase. Of natural rubber production, 46% is used for making tires, household needs, and other items (Djoehana, 2013). P.T. Bridgestone Sumatra Rubber Estate is a subsidiary of the Bridgestone Corporation based in Tokyo, Japan. P.T. Bridgestone Sumatra Rubber Estate is a company engaged in the field of plantation and crumb rubber processing. Around 85 percent of Indonesia's rubber production is still being exported in the form of raw rubber, and the remainder is for domestic use. Human needs to use goods that are resistant to breaking and elastic will continue to grow and increase in line with the growth of the automotive industry. It is estimated that rubber demand will continue to increase. Obviously, this is an excellent opportunity for Indonesia to export

rubber and Indonesian processed products to foreign countries. According to Indonesian Law number 13 of 2003 concerning the workforce, the government has regulated various matters for the protection of workers, including occupational safety and health in realizing labor welfare. Occupational Safety and Health (O.S.H.) is a work protection effort for workers to ensure safety and health before, during, and after work (Subing, 2018).

Personal protective equipment (P.P.E.), according to the regulations of the minister of labor and transmigration in 2010, is a tool that can protect someone from potential hazards in the workplace. Although P.P.E. is the last type of control in protecting workers, there are still workers who do not use P.P.E. for various reasons, including the discrepancy in P.P.E. size and comfort in use. (Rudyarti, 2015).

Workers consider the use of safety equipment to reduce productivity and make it difficult for them to work. The use of safety equipment such as those provided by management is often not complied with

by workers. The safety equipment that is usually provided by management, such as shoes, hats, gloves, and masks, is often worn incompletely (Raodhah and Gemely, 2014). The availability of complete P.P.E. in a company is not a guarantee for every worker to wear it. This condition is influenced by several other factors, such as behavior, comfort, and supervision. Knowledge affects a person's behavior; if the workers' knowledge is good, the practice of using P.P.E. is also excellent and vice versa. Meanwhile, if the attitude of the workers is right, the actions and behavior of using P.P.E. are also excellent and vice versa (Saputro, 2015).

There have been many kinds of research showing the factors that were correlated with the use of personal protective equipment. Research conducted by Asgedom, et al. (2019), Adiputro & Java (2019) and Hardy & Nurhasanah (2019) showed that a relationship exists between information and the usage of P.P.E. (Asgedom, Bråtveit, and Moen, 2019; Adiputro and Java, 2019; Hardy and Nurhasanah, 2019). Then, the study of Humau, et al. (2018) suggested that there was no relationship between attitude and the use of P.P.E.; while Yuliana's research (2018) showed a weak correlation between attitude and the use of P.P.E. (Humau, Rarindo and Roga, 2018; Yuliana, 2018).

The study of Tae, et al. (2017) showed there was a relationship between actions with the use of P.P.E., while Abukhelaif's research (2019) indicated that there was no relationship between actions with the use of P.P.E. (Tae et al., 2017; Abukhelaif, 2019). The study of Kalasuat, et al. (2019) showed that there was a relationship between the comfort of P.P.E. and the use of P.P.E. (Kalasuat et al., 2019). Furthermore, research conducted by Ayu, et al. (2018) and Rofifa, et al. (2019) suggested that there was a relationship between supervision and the use of P.P.E. (Ayu et al., 2018; Rofifa, Alayyannur and Haqi, 2019).

The research methods of Asgedom, et al. (2019) and Adiputro & Java (2019) were a cross-sectional design that determined the relationship between knowledge, attitudes, and actions. In comparison, Hardy & Nurhasanah (2019) took an approach of a one-group pretest-posttest design that showed differences before and after giving knowledge about P.P.E. (Asgedom, Bråtveit and Moen, 2019; Adiputro and Java, 2019; Hardy and Nurhasanah, 2019). Research of Humau, et al. (2018), and Yuliana (2018) were a cross-sectional design that showed the relationship between attitude, knowledge, and comfort (Humau, Rarindo and Roga, 2018; Yuliana, 2018).

On the other hand, research conducted by Tae, et al. (2017) was a one-group pretest-posttest that determined the differences before and after the administration of P.P.E., while the study of Abukhelaif (2019) was a cross-sectional study that looked at the relationship between supervision, action and the use of P.P.E. (Tae et al., 2017; Abukhelaif, 2019). The research of Kalasuat, et al. (2019) was cross-sectional, which looked at the relationship between knowledge, attitude, and comfort (Kalasuat et al., 2019). Research by Ayu, et al. (2018), and Rofifa, et al. (2019) was a cross-sectional study that looked at the relationship between supervision, knowledge, attitudes, etc. (Ayu et al., 2018; Rofifa, Alayyannur and Haqi, 2019).

Unlike the mentioned studies above, this research took a different approach from previous investigations by using an analytical observation method with a cross-sectional design on five variables, namely: knowledge, attitudes, actions, comfort, and supervision on the use of P.P.E. Therefore, based on the problem on the use of personal protective equipment and its correlation with its affecting factors above, this study aimed to determine the correlation between knowledge, attitudes, actions, comfort, supervision and the use of P.P.E.

## 2 METHOD

This type of research conducted in this study was an analytic survey. The design of this study was the cross-sectional design of independent and dependent variables examined at the same time. This study's location was performed at P.T. Bridgestone Sumatra Dolok Merangir Rubber Estate. The study population was all workers in a specific category, especially the factory department of P.T. Bridgestone Sumatera rubber estate as many as 395 workers. Simple random sampling using Slovin formula was the sampling technique in this study, obtaining a sample of 79 respondents with inclusion criteria: age ranged from 25 years to 50 years, working time was more than seven years. Conversely, the exclusion criteria: age was over 50 years, and the working period was under seven years.

The study was conducted from December 9 – 23, 2019. The research was carried out every morning shift (07:00 - 09:00) for ten days. The researcher gave the respondent's consent form to the production division workers who worked on those days. After that, they filled out the available questionnaire sheet as a method of collecting the data needed. The data

collected then were analyzed by using univariate analysis and bivariate analysis helped by S.P.S.S. (Hulu and Sinaga, 2019).

distribution of the majority of people aged 31-40 years was as many as 51 people and minority aged 20-30 years as many as five people. At the same time, the majority of the working period of 7-12 years was as many as 41 people, and the minority working for 13-18 years and 19-23 years were as many as 19 people, respectively.

### 3 RESULTS AND DISCUSSION

Based on the characteristics of the respondents (Table 1), the results obtained were the frequency

Table 1: The characteristics frequency distribution of respondents based on age and working period.

No	Characteristics	Total	Percentage (100%)
1	Age (years)	Person (s)	
	20 – 30	5	6,3
	31 – 40	51	64,6
	41 – 50	23	29,1
	Total	79	100
2	Working period (years)		
	7 – 12	41	51,8
	13 – 18	19	24,1
	19 – 23	19	24,1
	Total	79	100

Table 2: The frequency distribution of respondents based on knowledge, attitude, actions, comfort, supervision, and the use of P.P.E.

No	Variables	Total	Percentage (100%)
1	Knowledge	Person (s)	
	Bad	60	75,9
	Middle	15	19,0
	Good	4	5,1
	Total	79	100
2	Attitude		
	Positive	75	94,9
	Negative	4	5,1
	Total	79	100
3	Actions		
	Bad	65	82,3
	Middle	13	16,5
	Good	1	1,2
	Total	79	100
4.	Comfort		
	Comfort	71	89,9
	No comfort	8	10,1
	Total	79	100
5.	Supervision		
	With supervision	71	89,9
	Without supervision	8	10,1
	Total	79	100
6.	Personal Protective Equipment		
	Use	77	97,5
	No use	2	2,5
	Total	79	100

Table 3: The correlation between knowledge, attitude, actions, comfort, supervision and the use of P.P.E.

Variables	Personal protective equipment use		Total	P-value
	No use	Use		
	n	n	N	
Knowledge				
Bad	1	3	4	0,133
Middle	0	15	15	
Good	1	59	60	
Attitude				
Negative	1	3	4	0,099
Positive	1	74	75	
Actions				
Bad	0	1	1	0,051
Middle	2	11	13	
Good	0	65	65	
Comfort				
No comfort	1	7	8	0,193
Comfort	1	70	71	
Supervision				
Without supervision	2	6	8	0,009
With supervision	0	71	71	

Based on Table 2, the majority of workers with good knowledge was as many as 60 people. Meanwhile, the number of workers with bad knowledge was four people. The majority of workers with a positive attitude were as many as 75 people, and the negative one was as much as four people. The majority of workers with good action was as many as 65 people, and the minority one was only one person. On the comfort aspect, the majority of workers that showed comfort was 71 people, and the minority ones who showed uncomfortableness were as many as eight people. The majority of workers that work with supervision were 71 people, and the without supervision ones were eight people. Lastly, the workers with personal protective equipment use were 77 people, and the ones who did not use were as many as two people.

Based on the results of the bivariate analysis described in Table 3, according to the data of the production section at P.T. Bridgestone Sumatra Rubber Estate Dolok Merangir, it is known that the p-value for the correlation of knowledge and P.P.E. use is 0.133 ( $p\text{-value} > \alpha$ ). It can be concluded that  $H_0$  was accepted and  $H_a$  was rejected, which means there was no relationship between knowledge and the use of P.P.E. Then, it is clear that the p-value for the correlation of attitude and P.P.E. use is 0.099 ( $p\text{-value} > \alpha$ ). It can be concluded that  $H_0$  was accepted and  $H_a$  was rejected, which means there was no relationship between attitude with the use of P.P.E. For the correlation of action and P.P.E. use, it is known that the p-value = 0.051 ( $p\text{-value} > \alpha$ ). It

suggests that  $H_0$  was accepted and  $H_a$  was rejected, which indicated that there was no relationship between the action with the use of P.P.E. Also, for the correlation of comfort and the use of P.P.E., it shows p-value = 0.193 ( $p\text{-value} > \alpha$ ). It denotes that  $H_0$  was accepted and  $H_a$  was rejected, which bring to conclusion that there was no relationship between P.P.E. comfort and the use of P.P.E. Lastly, on supervision aspect, it denotes that the p-value = 0.009 ( $p\text{-value} > \alpha$ ), so it can be inferred that  $H_0$  was accepted and  $H_a$  was rejected, which means that there was a correlation between supervision with the use of P.P.E.

### 3.1 The Correlation of Knowledge and the Use of P.P.E.

This study proved that there is no correlation of knowledge and the use of P.P.E. The results of this study are not in line with the research of Asgedom, Brátveit and Moen, (2019), Gunawan, Priyatama and Setyanto (2016) and Saputro (2015). They showed that there was a relationship between knowledge and the use of personal protective equipment. According to the researcher, from the 60 well-informed respondents, the majority of respondents used P.P.E. as many as 59 respondents (98.3%). Still, there was one respondent who did not use P.P.E. This is because the production worker felt lazy and uncomfortable at work. Of the four respondents with poor knowledge, the majority of respondents who used P.P.E. were three respondents (75%). This fact

was there because production workers only followed company procedures without knowing the function of P.P.E. Thus, knowledge is one of the essential things that influences someone to act. Knowledge can occur after people sense certain things, which usually include sensing sight and hearing (Soekidjo, 2012). According to Bloom in Notoatmodjo (2012), behavior can be influenced by several factors, including predisposing factors (knowledge), supporting factors (presence of P.P.E.), and driving factors (regulations and supervision).

### **3.2 The Correlation of Attitude and the Use of P.P.E.**

This study proved that there is no correlation of attitude and the use of P.P.E. The result of this study are in line with Wijayanti's research, which shows that there is no relationship between attitudes and the use of personal protective equipment with a p-value = 0.109 (Wijayanti, 2016). Among the 75 respondents who were positive in their attitude, the majority of respondents used P.P.E. as many as 74 respondents (98.7%). Still, there was one respondent who did not use P.P.E. This is because production workers felt disturbed when carrying out work activities. Of the four respondents who had a negative attitude, the majority of respondents who used P.P.E. were three respondents (75%). This is because production workers only follow company procedures without knowing the function of P.P.E. Attitude is a person's response to a stimulus. Several things can influence individuals in their attitudes, including experience, interference from certain people, socio-culture, and sources of information. The attitude of employees who are reckless in carrying out work practices is more at risk in the occurrence of accidents and unsafe work practices compared to work equipment. Therefore, companies need to find a way that can minimize the number of work accidents or hazardous work practices by creating role models who are expert and accomplished as figures that can be emulated by other workers (Soekidjo, 2012).

### **3.3 The Correlation of Actions and the Use of P.P.E.**

This study proved that there is no correlation of actions and the use of P.P.E. The results of this study are not in line with the research of Tae et al. (2017), which shows that there is a relationship between actions and the use of personal protective equipment with a p-value = 0.0022. According to the

researchers' assumptions, the 65 respondents who acted in the good category have a good understanding of how things work in the company. It might be related to their knowledge and attitude. There was one respondent who fell in the bad category for action. However, the respondent agreed to use the P.P.E. Most workers obeyed to use P.P.E. in this aspect. This is mainly because production workers only follow company procedures. Action is a practice that is carried out against a particular stimulus. The lack of willingness of employees to use P.P.E. is influenced by two factors, namely the response factor (internal) that comes from the individual himself, and the stimulus factor (external) that is guilty from outside the individual himself, such as the surrounding environment (Soekidjo, 2012).

### **3.4 The Correlation of Comfort and the Use of P.P.E.**

This study proved that there is no correlation of comfort and the use of P.P.E. The results of this study are not in line with research by Kalasuat et al. (2019), which shows that there is a relationship between P.P.E. security and the use of personal protective equipment with a p-value = 0.001. Out of 71 respondents who were comfortable with P.P.E., the majority of respondents used P.P.E. as many as 70 respondents (98.6%). Still, there was one respondent who did not use P.P.E. This is because production workers feel lazy. Of the eight respondents who felt uncomfortable with P.P.E., the majority of respondents who used P.P.E. were seven respondents (87.5%). This is because production workers only follow company procedures. Personal protective equipment is equipment that workers must apply under the type of work that is intended to reduce the risk of work-related accidents, so that workers can have activities safely and comfortably while working (Budiono, 2003). Several reasons become the basis for a worker not wanting to use P.P.E., such as the lack of knowledge of workers regarding the importance of using P.P.E. properly during work. There is a sense of discomfort using P.P.E. while working, and there is no applicable sanction regarding the necessity to use P.P.E. (Santoso, 2004).

### **3.5 The Correlation of Supervision and the Use of P.P.E.**

The study proved that there is a correlation of knowledge and the use of P.P.E. The results of this



study are in line with the research of Ayu et al. (2018), which showed there was a correlation of supervision and the use of personal protective equipment with a p-value = 0.014. According to the researchers' assumptions, 71 respondents (100%) of the 71 respondents who supervised were using P.P.E. This is because production workers were always supervised; if they did not use P.P.E., they would be given sanctions. Of the eight respondents whose supervision was not available, the majority of respondents who used P.P.E. were six respondents (75 %). This is because production workers understood the function of personal protective equipment. To minimize the occurrence of work accidents, respondents always used personal protective equipment, even when there was no supervision. Supervision is an activity carried out to see the success of an existing procedure, whether it is running well or not. So that you can immediately look for a handling solution so that activities can run well. Supervision is carried out to minimize the occurrence of errors from the activities carried out. By implementing supervision, it is intended to ensure that every procedure made can be carried out appropriately and see the possibility of errors in the implementation of these procedures (Mappangara, 2018).

#### 4 CONCLUSIONS

Based on the findings of this study on factors related to the behavior of employees in the use of personal protective equipment, it is concluded that a connection exists between supervision and use of P.P.E. (p-value = 0.009). In contrast, there is no correlation between knowledge (p-value = 0.133), attitude (p-value = 0.099), measures (p-value = 0.051), comfort (p-value = 0.193) and the use of P.P.E.

It is expected that workers in the production department always understand good work behavior towards the use of personal protective equipment so that there is no risk of work accidents and increased insight into work safety in the workplace. At the same time, it is better if the foreman always affirms and imposes sanctions if the workers do not wear complete personal protective equipment.

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