



## Analysis of Factors that Influence the Work Accidents on Health Center Staff of Matang Pudeng

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### Abstract

*This study aims at investigating the effect of supervision, OHS training, availability of PPE, work units and standard operating procedures on work accidents of staff at Matang Pudeng Health Center. This research is a descriptive analytical study with a cross sectional approach. The population was all staff of Matang Pudeng Health Center amount 82 people and all was sampled by total sampling. Analysis of the data used univariate, bivariate and multivariate. The results of the chi square test showed that supervision has no effect on work accidents, OHS training has no effect on work accidents, the availability of PPE has no effect on work accidents, work units have no effect on work accidents and SOPs have no effect on work accidents. Logistic regression test showed that the most influential variable on work accidents was SOP. The conclusion of this study is that supervision, OHS training, availability of PPE and SOPs simultaneously affect work accidents. Scheduling its supervision, providing a special budget for the provision of PPE, and giving sanctions to workers who do not work according to procedures. Logistic regression test showed that the most influential variable on work accidents was SOP. The conclusion of this study is that supervision, OHS training, availability of PPE and SOPs simultaneously affect work accidents. It is suggested to the Health Center to do the OHS socialization, scheduling its supervision, providing a special budget for the provision of PPE, and giving sanctions to workers who do not work according to procedures.*

## Introduction

Manpower is an important asset of a business so it is important to protect it in terms of Occupational Safety and Health (K3) because of the potential threats and risks associated with the workplace.(Djarmiko, 2016). According to the latest estimates released by the International Labor Organization (ILO), every year 2.78 million workers die from occupational accidents and diseases.(ILO, 2016). According to data from the Ministry of Manpower, the number of work accidents in the first quarter of 2018 increased compared to the same period last year.

Work accidents are unexpected events that can cause loss of life and property. Accidents at work can cause harm to workers, the government and the surrounding community (Bae et al., 2021; Azwar, 2012).

Bird and Germain explain that losses are caused by a series of successive factors in the Loss causation models, including lack of control management (lack of management supervision) such as supervision and training, basic causes (basic causes) such as work units and immediate

causes (direct causes) such as tools, personal protective equipment that does not meet standards and does not comply with standard operating procedures (Bird, 1996).

Assessment of the impact of supervision and work procedures on work accidents by inpatient nurses at the Happy Makassar Hospital showed that supervision and work procedures had a positive and significant effect on the occurrence of work accidents (Angriani, 2020). Research at Salewangang General Hospital, Maros Regency, showed that K3 training affected work accidents with the results of the study that 100% of nurses did not have K3RS training and all nurses had occupational accidents up to 50.6% (Burhami, 2010). Research on workers in the production division of PT. Hilon Sumatra stated that there was a significant relationship between the availability of PPE and work accidents (Singarimbun, 2019).

The Matang Pudeng Health Center is a health center under the auspices of the East Aceh District Health Office with a non-inpatient type. The working area of the Matang Pudeng Health Center is 12 villages with a population of 11,425 people. Based on data obtained from the Information System for Health Human Resources (Si-SDMK) at the Matang Pudeng Health Center, there were 82 people.

From the results of initial observations, it is known that at the Matang Pudeng Health Center there are no posters for using PPE according to the hazards in the workplace. From the survey results, it was also found that there were still workers who did not use PPE when working such as not using gloves and masks when in direct contact with patients, not wearing protective clothing when examining patient samples and not using gloves when lifting medical waste, some were still incomplete in using PPE and some are still working not according to the SOP that has been set. Among the work accidents that occurred were being pricked by a needle while working, being exposed to splashes of patient's body fluids and estimated to be sick due to work,

Based on the description above, the researcher is interested in conducting research with the title "Analysis of Factors Influencing Work Accidents in Matang Pudeng Health Center Staff".

## Methods

This research is a descriptive analytic study with a cross sectional approach, namely the measurement or observation of variables is carried out at the same time. The research location is at the Matang Pudeng Health Center, East Aceh Regency. The study was carried out in October 2021. The population in this study was 82 people with a total sample of 82 people.

Analysis of the data used is univariate analysis to determine the frequency distribution under study. Bivariate analysis to see the effect of the independent variable with the dependent variable. Multivariate analysis to see the simultaneous effect of independent variables on the dependent variable, and the independent variable with the largest influence on the dependent variable used multiple logistic regression test with a significance level of 5%.

## Results and Discussion

### Univariate Analysis

The results of the univariate analysis in this study can be seen in the following table.

Table 1. Distribution of staff characteristics of the Matang Pudeng Health Center

Characteristics	f	%
<b>Age</b>		
21-30 Years	22	26.8
31-40 Years	34	41.5
41-50 Years	19	23.2
>51 Years	7	8.5

Gender		
Man	18	22.0
Woman	64	78.0
<b>Amount</b>	<b>82</b>	<b>100.0</b>

Table 1. shows the majority of respondents aged 31-40 years as many as 34 people (41.5%). While the gender of the majority of the respondents were 64 people (78.0%).

Table 2. Distribution of respondents based on control factors at the Matang Pudeng Health Center

<b>Supervision</b>	<b>f</b>	<b>%</b>
Not good	52	63.4
Well	30	36.6
<b>Amount</b>	<b>82</b>	<b>100.0</b>

Table 2. shows the supervision of the majority is not good as many as 52 respondents (63.4%).

Table 3. Distribution of respondents by training factor K3 at the Matang Pudeng Health Center

<b>K3 training</b>	<b>f</b>	<b>%</b>
Never	81	98.8
Once	1	1.2
<b>Amount</b>	<b>82</b>	<b>100.0</b>

Table 3. shows the majority of OSH training never as many as 81 respondents (98.8%).

Table 4. Distribution of respondents based on availability factor PPE at the Matang Pudeng Health Center

<b>Availability of PPE</b>	<b>f</b>	<b>%</b>
Incomplete	73	89.0
Complete	9	11.0
<b>Amount</b>	<b>82</b>	<b>100.0</b>

Table 4. shows the majority of incomplete PPE availability as many as 73 respondents (89%).

Table 5. Distribution of respondents based on work unit factors at the Matang Pudeng Health Center

<b>Work unit</b>	<b>f</b>	<b>%</b>
Cleaning Service	3	3.7
Pharmacy	4	4.9
emergency room	13	15.9
Immunization	4	4.9
Head of Health Center	1	1.2
KIA and KB	10	12.2
Laboratory	2	2.4
MTBS	3	3.7
Registration/RM	6	7.3
PI	1	1.2
Dental Clinic	3	3.7
General Poly	5	6.1
Poned	11	13.4
Receptionist	3	3.7
Administration	6	7.3
SMEs	7	8.5

Amount	82	100.0
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Table 5. shows the majority of the ER work units as many as 13 people (15.9%).

Table 6. Distribution of respondents based on standard operating procedures at the Matang Pudeng Health Center

SOUP	f	%
It is not in accordance with	50	51.0
In accordance	32	39.0
Amount	82	100.0

Table 6. shows the majority of the SOPs are not appropriate as many as 50 people (61.0%).

Table 7. Distribution of respondents based on work accidents at the Matang Pudeng Health Center

Work accident	f	%
Never	28	34.1
Once	54	65.9
Amount	82	100.0

Table 7. shows that the majority of work accidents had as many as 54 respondents (65.9%).

### Bivariate Analysis

The results of the bivariate analysis in this study can be seen in the following table.

Table 8. Effect of supervision on work accidents on staff Matang Pudeng Health Center

Supervision	Work accident				Total		p value
	Never		Once		f	%	
	F	%	f	%			
Not good	13	15.9	39	47.6	52	63.4	0.021
Well	15	18.3	15	18.3	30	36.6	
Total	28	34.1	54	65.9	82	100	

Table 8. shows that the control p value (0.021) < (0.05). It is concluded that supervision has an effect on work accidents.

Table 9. Effect of OSH training with work accidents on staff Matang Pudeng Health Center

K3 training	Work accident				Total		p value
	Never		Once		f	%	
	f	%	f	%			
Never	27	32.9	54	65.9	81	98.8	0.162
Once	1	1.2	0	0.0	1	1.2	
Total	28	34.1	54	65.9	82	100	

Table 9. shows that the control p value (0.162) > (0.05). It is concluded that K3 training has no effect on work accidents.

Table 10. Effect of PPE availability with work accidents on staff Matang Pudeng Health Center

Availability of PPE	Work accident				Total		p value
	Never		Once		f	%	
	F	%	f	%			
Incomplete	22	26.8	52	63.4	74	90.2	0.010

Complete	6	7.3	2	2.4	8	9.8	
Total	28	34.1	54	65.9	82	100	

Table 10. shows that the control p value (0.010) < (0.05). It is concluded that the availability of PPE has an effect on work accidents.

Table 11. The effect of work units with work accidents on staff at the Matang Pudeng Health Center

Work unit	Work accident				Total		p value
	Never		Once		f	%	
	f	%	f	%			
CS	0	0.0	3	3.7	3	3.7	0.101
Pharmacy	2	2.4	2	2.4	4	4.9	
emergency room	3	3.7	10	12.2	13	15.9	
Immunization	1	1.2	3	3.7	4	4.9	
Capus	1	1.2	0	0.0	1	1.2	
MCH/KB	3	3.7	7	8.5	10	12.2	
Labor	0	0.0	2	2.4	2	2.4	
MTBS	1	1.2	2	2.4	3	3.7	
Pdftrn/RM	4	4.9	2	2.4	6	7.3	
PI	0	0.0	1	1.2	1	1.2	
Dental Clinic	1	1.2	2	2.4	3	3.7	
General Poly	2	2.4	3	3.7	5	6.1	
Poned	6	7.3	5	6.1	11	13.4	
Reception	0	0.0	3	3.7	3	3.7	
Administration	0	0.0	6	7.3	6	7.3	
SMEs	4	4.9	3	3.7	7	8.5	
Total	28	34.1	54	65.9	82	100	

Table 11. shows that the work unit value is p (0.101) > (0.05). It is concluded that the work unit has no effect on work accidents.

Table 12. Effect of SOPs on work accidents on staff at the Matang Pudeng Health Center

SOUP	Work accident				Total		p value
	Never		Once		f	%	
	f	%	F	%			
It is not in accordance with	18	22.0	20	24.4	38	46.3	0.01
In accordance	10	12.2	34	41.5	44	53.7	9
Total	28	34.1	54	65.9	82	100	

Table 12. shows that the SOP p value (0.019) < (0.05). It is concluded that SOP has an effect on work accidents.

### Bivariate Selection

The requirement for independent variables that can enter logistic regression analysis is that if the results of the bivariate analysis have p < 0.25, then the independent variable is entered into the multivariate analysis stage.

Table 13. Bivariate selection

Variable	p value	Information
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Supervision	0.021	Candidate
K3 training	0.162	Candidate
Availability of PPE	0.010	Candidate
Work unit	0.101	Not Candidate
SOUP	0.019	Candidate

Table 13. shows the variables included in the analysis, namely supervision, OHS training, availability of PPE and SOPs.

### Multivariate Analysis

The results of the multivariate analysis in this study can be seen in the following table.

Table 14. Logistic regression test berganda

		B	df	Sig.	Exp (B)
Step 1a	Supervision	-1.130	1	0.039	0.323
	K3 training	-19.798	1	1,000	0.000
	Availability of PPE	-2,631	1	0.008	0.072
	SOUP	1,774	1	0.003	5.895
	Constant	22,367	1	1,000	51748

Then the regression equation can be formulated as follows:

$$Y = 22,367 - 1,130X_1 - 19,798X_2 - 2,631X_3 + 1,774X_4$$

Table 15. Omnibus test

		Chi-square	df	Sig.
Step 1	Step	21,509	4	0.000
	Block	21,509	4	0.000
	Model	21,509	4	0.000

Table 15. shows the value of sig (0.000) < (0.05). It is concluded that supervision, OHS training, availability of PPE and SOPs have a simultaneous effect on work accidents.

Table 16. d testtermination

Step	-2 Logs likelihood	Cox & Snell R Square	Nagelkerke R Square
1	83,780a	0.231	0.319

Table 16. shows that 31.9% of work accidents are influenced by supervision, OSH training, availability of PPE and SOPs

### The Effect of Supervision on Work Accidents

Based on the results of the study, it showed that supervision had an effect on work accidents on the staff of the Matang Pudeng Health Center. This study is in accordance with Angriani (2020) which shows that there is a significant positive effect between supervision and the occurrence of work accidents for inpatient nurses at the Happy Makassar Hospital with a sig. 0.004 (sig<0.05) (Angriani, 2020).

Maramis' research (2019) also shows that there is an influence between superior supervision and knowledge of the use of personal protective equipment (PPE) for nurses at the Maria Walanda Maramis Hospital, North Minahasa Regency (Maramis, 2019). K3 supervision carried out can be in the form of supervision of the process of managing facilities and infrastructure, supervision of the process of managing medical equipment and B3 waste, supervision of using PPE and supervision of work processes to minimize work accidents with SOPs (Nurriwanti & Widajati, 2019; Setiawan & Astutik, 2022).

From the results of research at the Matang Pudeng Health Center, although supervision has been carried out, one supervisor is assigned to supervise 1 Puskesmas, so that not all of them are monitored properly. Supervisors only supervise high-risk jobs so not all are supervised due to lack of manpower. This is why those stating good and bad supervision show a large percentage difference because the supervision is not comprehensive.

### **The Effect of OHS Training on Work Accidents**

Based on the results of the study, it showed that K3 training had no effect on work accidents on the staff of the Matang Pudeng Health Center. The results of this study are in line with research conducted by Siregar (2014) which states that there is no influence between K3 socialization and minor accidents. One form of K3 socialization carried out is training (Siregar, 2014). According to Wahyuni (2020) companies must pay attention to the implementation of OHS training and involve workers in setting the company's health and safety values to prevent the risk of work accidents (Wahyuni, 2020).

From the results of research at the Matang Pudeng Health Center, it was found that K3 training partially had no effect on work accidents. The OSH training has no partial effect because the indicators contained in the OHS training have been stated in the monitoring indicators, PPE and SOPs. So that although physically K3 training has no effect on work accidents, in its application it has been integrated with monitoring indicators, PPE and SOPs. So K3 training still has an effect on work accidents if it is carried out simultaneously with supervision, PPE and SOPs.

From the results of the study, it was also found that from 81 staff who had never had K3 training including 54 staff had experienced work accidents. So it was necessary to conduct K3 training for all staff so that the number of work accidents could be minimized.

### **The Influence of Availability of PPE on Work Accidents**

Based on the results of the study, it showed that the availability of PPE had an effect on work accidents on the staff of the Matang Pudeng Health Center. The results of this study are in line with those of Bara (2021) who stated that there was an influence between the availability of PPE and the risk of work accidents for firefighters at the City X Fire Department (Bara, 2021). Likewise, Zulyan's research (2017) shows that there is an influence between the provision of PPE for fishermen and the risk of work accidents (Zulyan, 2017).

The risk of work accidents for the staff of the Matang Pudeng Health Center is very high, so the availability and suitability of PPE is very important to prevent the danger of work accidents. Health centers are required to provide PPE for workers based on the Regulation of the Minister of Manpower No. 08 of 2010 (Permenakertrans RI, 2010).

The availability of PPE at the Matang Pudeng Health Center is still categorized as incomplete. Personal protective equipment such as gloves, masks, protective clothing, face shields, protective shoes and protective hats are limited so they cannot be used by all workers as a whole, there are some workers who provide the PPE needed for the work process themselves. In the workplace not all workers are provided with adequate PPE even though this PPE is a critical risk control in preventing work accidents. Availability of adequate PPE is one of the assistances that can be provided by Puskesmas to control risks in the work environment, both physical, biological and chemical in order to create a healthy, safe, and comfortable work environment.

### **Influence of Work Units on Work Accidents**

The results of statistical tests showed that the work unit had no effect on work accidents at the Matang Pudeng Health Center staff with the highest percentage of work units having work accidents, namely the Emergency Room. The results of Siregar's research (2014) state that

there is no influence between work units and minor accidents (Siregar, 2014). Similarly, that there is no influence between work units and the accident rate (Hola et al., 2017; Çelikkalp & Dilek, 2019).

A work unit is a division with a specific mission of an organization. The relationship between work units and work accidents is more related to the type of work where this type of work has a high accident risk. The number and types of work accidents vary between units of a process.

The Matang Pudeng Health Center consists of work units covering various types of work. Various occupational factors can affect the level of concentration of a worker. The work units at the Matang Pudeng Health Center are divided according to the needs and existing professions so that each profession does work in accordance with the field of competence. This is done because each profession has different competencies and the work unit has a different work system according to the service needs at the Puskesmas.

According to the Regulation of the Minister of Health of the Republic of Indonesia No. 75 of 2014, the number and types of work units at the Puskesmas are determined through an analysis of the needs of the work unit based on the services provided and the availability of natural resources (Permenkes RI, 2014). In this case, the work units at the Matang Pudeng Health Center are 16 work units including cleaning service, pharmacy, emergency department, immunization, head office, KIA/KB, laboratory, IMCI, registration and medical records, PI, dental poly, general poly, ponded. , receptionists, administration and SMEs. The work unit is only a factor that may affect the occurrence of work accidents, the work unit workers if they are not careful will also experience work accidents.

### **The Effect of SOPs on Work Accidents**

Based on the results of the study, it was shown that the SOP had an effect on work accidents on the staff of the Matang Pudeng Health Center. The results of data analysis show that the effect is not in the opposite direction, meaning that the higher the SOP discrepancy, the higher the work accident, and vice versa.

This research is in line with Angriani's research (2020) which states that the work process has a positive and significant effect on work accidents for nurses in the inpatient room of the Happy Makassar Hospital (Angriani, 2020). This is in line with Wijayanti's research (2014) which shows that the application of SOPs has an effect on the rate of work accidents in perinatology room nurses at Tugurejo Hospital. In the study it was found that SOPs are procedures that must be applied in a certain work process that can be accepted by someone who has the authority or responsibility to maintain a certain level of appearance so that activities can be carried out smoothly and efficiently. Therefore, it is necessary to make efforts to improve compliance with SOPs in the workplace, including prioritizing work safety based on existing SOPs. The conclusion from the research is that it is expected that the head nurse must motivate and socialize the application of SOP to all nurses in his unit (Wijayanti, 2014).

In the process of the Matang Pudeng Health Center, almost all of the workers on duty have not done their work or acted according to the standards set. Some workers forget or fail to follow procedures perhaps due to haste or unsanitary conditions. In practice, workers should be responsible for their own safety but above all pay attention to patient safety. However, there are still workers who do not respect the SOPs that have been set, there are still nurses who do not use PPE when performing medical behavior.

SOP in K3 is very important because it can guarantee the interests of every employee. Therefore, the success of implementing SOPs in Puskesmas cannot be separated from the individual compliance attitude of workers and management in implementing regulations on OSH policies.

K3 work procedures at the Puskesmas are needed so that there are standards in the work process to ensure safety and reduce the risk of accidents. However, the preparation of SOPs has not involved workers in each work unit so that the SOPs that are set are not entirely in accordance with the work process as a result there are still those who do not understand the objectives and benefits of implementing SOPs properly, including minimizing errors and failures in the work process. There are still some workers who have poor awareness in implementing SOPs, this can be because strict sanctions have not been imposed by the Puskesmas, the sanctions are only in the form of warnings, some workers find it difficult to carry out work procedures because they think work procedures make their work be slow.

### **Effect of Independent Variables on Dependent Variables Simultaneously**

Based on multiple logistic regression analysis, the coefficient of determination on the Nagelkerke R Square is 0.319. This means that work accidents are influenced by supervision, K3 training, the availability of PPE and SOPs by 31.9%. While 68.1% is influenced by other variables that are not included in this study.

Data analysis shows that the variables of supervision, K3 training, availability of PPE and SOP simultaneously have a positive and significant effect on work accidents as evidenced by  $X^2$  count 21,509 >  $X^2$  table 9,487 and a significance value of 0.000. This proves that supervision, K3 training, the availability of PPE and SOPs together affect work accidents on staff at the Matang Pudeng Health Center. However, individually (partial) K3 training has no effect on work accidents.

From the results of data analysis, it can be seen that the most dominant influential variable is seen based on the largest Exp (B) value, which is 5.895. So it can be concluded that the variable that has the biggest influence on work accidents is SOP.

### **Conclusion**

Based on the results of research from 82 staff of the Matang Pudeng Health Center contained in the previous chapter, the following conclusions can be drawn; (1) Supervision has a significant effect on work accidents on staff at the Matang Health Center; (2) K3 training has no effect on work accidents on staff at the Matang Pudeng Health Center; (3) The availability of PPE has a significant effect on work accidents on staff at the Matang Pudeng Health Center; (4) The work unit has no effect on work accidents on the staff of the Matang Pudeng Health Center; (5) SOP has a significant effect on work accidents on staff at the Matang Pudeng Health Center; (6) The most dominant factor influencing work accidents on staff at the Matang Pudeng Health Center is SOP.

### **Suggestion**

Based on the conclusions above, the following suggestions are submitted: (1) For Matang Pudeng Health Center; (a) Should socialize the importance of K3 in order to prevent work accidents to all staff by way of direction on the use of complete PPE according to work risks to work in accordance with applicable SOPs; (b) Create a well-structured K3-related supervision schedule so that every worker in the work unit gets the same supervision so that if a discrepancy is found, it can be addressed immediately; (c) Re-providing PPE for K3 continuity as needed by recording every PPE required in the work unit in accordance with work risks, as well as providing a special budget for the provision of PPE at the Puskesmas if the stock provided from the health office is not sufficient or fulfilled; (d) Involving each work unit in the preparation of standard operating procedures so that work procedures are made in accordance with the risks and work processes that exist in certain work units; (e) Should give sanctions to the officer if a discrepancy is found in carrying out work to avoid the risk of work accidents. (2) For the next researcher; (a) In order to complete this research by using different variables with more detailed aspects

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