

# RELATIONSHIP BETWEEN UNSAFE ACTION AND CONDITION WITH WORK ACCIDENT AMONG PRODUCTION UNIT WORKERS AT THE JAYA SENTRIKON INDONESIA COMPANY, PADANG, WEST SUMATRA

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## ABSTRACT

**Background:** Work accident is a significant burden to society. Multiple factors contribute to work accident. Previous studies have focused on identifying individual and workplace contributing factors. Unsafe action and unsafe worksite may contribute to injury among workers. This study aimed to determine the relationship between unsafe action and condition with work accident among production unit workers at the Jaya Sentrikon Indonesia Company, Padang, West Sumatra.

**Subjects and Method:** This was a cross sectional study conducted at Jaya Sentrikon Indonesia Company, Padang, West Sumatera from September 2016 to Februari 2017. A sample of 50 workers was selected for this study. The dependent variable was work accident. The dependent variables were unsafe action and unsafe condition. The data were collected by a set of questionnaire and observation. The data was analyzed by a multiple logistic regression.

**Results:** 60 % workers aged > 36 years old. 100% workers were male. As many as 62% workers had experienced work accident. 50% workers did unsafe action and 64% had unsafe condition. The risk of work accident increased with unsafe action (OR=24.43; 95% CI= 4.59 to 130.01; p= 0.001) and unsafe condition (OR=11.26; 95% CI= 2.88 to 43.93; p= 0.001).

**Conclusion:** The risk of work accident increases with unsafe action and unsafe condition.

**Keywords:** work accident, unsafe action, unsafe condition.

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## BACKGROUND

Progress in the industry in Indonesia has opened up jobs that can accommodate the workforce and to increase optimal work productivity, the industry must pay attention to occupational health and safety, especially for workers and society in general (Ministry of Manpower RI, 2003). Occupational health and safety is one aspect of labor protection that is regulated in Law Number 13 of 2003. Although the provisions regarding occupational health and safety have been regulated in such a way, but in practice it is not as expected. Many factors in the field that affect occupational health and safety such as human, environmental and psychological

factors that caused work accidents (Sucipto, 2014).

According to Heinrich, in 1953-196 accidents that occurred in various industries were caused by unsafe action (96%) with the highest percentage due to work position, work equipment, someone's actions and personal protective equipment as well as things originating from humans or workers themselves, Henrich also revealed that unsafe conditions also underlie and cause occupational accidents (Kuswana, 2014).

In addition, study by Nkem et al. (2016) states that there is a significant relationship between unsafe actions or conditions and workplace accidents with a positive corre-

lation of 0.887 (Nkem et al., 2015).

Data from the International Labor Organization (ILO) in 2013 noted that every year, there were more than 250 million workplace accidents and more than 160 million workers sick due to hazards at work (International Labor Organization, 2013). Supported by data from the International Labor Organization (ILO) in 2015 which states that every day, there are around 6,000 fatal work accidents in the world. In Indonesia, there are accident cases that are experienced every day by 100 thousand workers and 30% of them occur in the construction section (Social Security Administration Agency, 2015).

The Employment Insurance Agency (BPJS) noted that during 2014, there were 129,911 cases of work accidents in Indonesia, and 34.43% were caused by unsafe work positions, 32.21% were caused by workers who did not use safety equipment, 51.13% due to collisions and 32.25% is caused by working machinery. In 2015, there were 110,285 cases of work accident in Indonesia and in 2016, there were 105,182 cases of work accidents in Indonesia. For the Padang city, there was an increase in work accident cases in 2016 to 1,535 work accident cases (Social Security Organizing Agency, 2015; Padang City Social Security Organizing Agency, 2016).

One of the industries in Padang that still experiences work accidents every year is PT Jaya Sentrikon Indonesia Padang. In 2011, there were 6 cases of work accidents, in 2012, there were 7 cases of work accidents including 1 person died, in 2013 there were 4 cases of work accidents, in 2014 there were 3 cases of work accidents which caused by grinding machine, electrocuted, affected by broken tires and squeezed by poles and minor injuries due to tools and machines.

Based on a preliminary survey by conducting interviews with the Head of

Personnel at PT Jaya Sentrikon Indonesia, information was obtained that there were 3 cases of work accidents in 2015, and 3 cases of severe work accidents in 2016. From the results of interviews with researchers with 10 workers in the production department of PT Jaya Sentrikon Indonesia Padang found that 8 out of 10 workers (80%) had experienced work accidents ranging from minor work accidents to severe work accidents including wire rope, pinched conveyor, exposed to electric current, exposed to limpback sockets, chains to pinched machines that cause workers to lose their fingers.

From the observations in the field, 4 out of 10 workers in the production department perform unsafe actions such as not using PPE when working, smoking, working while talking and being unsafe to workers because of the unsafe machine layout and 4 workers were working by using inadequate safety shoes. From the results of the description above, the authors was interested in conducting a study to find out the relationship between unsafe action, unsafe condition and work accident at the workers in the production of PT Jaya Sentrikon Indonesia Padang in 2017.

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## SUBJECTS AND METHOD

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### 1. Study Design

This study was a quantitative study with a cross sectional approach, which was a study to find out the differences between unsafe actions, unsafe conditions of workplace accidents, by interviews, observations or data collection at one time (point time approach) to analyze the relationship of unsafe actions, unsafe condition with workplace accidents on PT Jaya Sentrikon Indonesia Padang Tahun 2017 among production division workers.

### 2. Population and Sample

The population in this study were all workers in the production section that were directly related to the production of concrete piles of

PT Jaya Sentrikon Indonesia Padang by workers, of whom 10 were respondents as respondents in conducting the initial survey. In this study, authors took all workers of the production of PT Jaya Sentrikon Indonesia Padang in 2017 as a sample in the study of 50 workers. The sampling technique used in this study was total sampling where the number of samples was equal to the population.

The data collected was primary data and secondary data with data processing in the form of editing, coding, entry, and cleaning. Data analysis used univariate analysis and bivariate analysis using Chi-square test with  $\alpha = 0.005$  and 95% confidence interval and multivariate analysis by using Multivariable Logistic Regression prediction models.

## RESULTS

Table 1. Distribution of Frequency of Occurrence and Type of Accidents in Production Workers of PT Jaya Sentrikon Indonesia Padang in 2017

Work Accident	Frequency (f)	Percentage (5)
Yes	31	62%
No	19	38%
Total	50	100
Type of Work Accident	Frequency (f)	Percentage (%)
Fell Down	1	3.2%
Hit by Objects	6	19.4%
Slip	2	6.5%
Pinched By Objects	3	9.7%
Crushed or hit by objects	19	61.2%
Total	31	100%

Based on Table 2, it showed that 25 workers (50%) worked with unsafe actions and 32 workers (64%) were in unsafe conditions. Types of unsafe actions taken by workers who have work accidents in this study were not using PPE (22.5%), chatting while working (9.6%), smoking while working (42%), carrying excessive loads

Based on the results compiled from 50 workers as the samples, all workers (100%) were male, all workers (100%) had a working period of > 2 years with a work shift from 08.00 - 16.00 WIB, workers aged <36 years were 20 people, and workers aged > 36 years old were 30 people. In addition, there was no meaningful relationship between age and work accident among PT Jaya Sentrikon Indonesia Padang workers in 2017.

Based on Table 1. it shows that more than half (62%) who were 31 production workers experienced work accidents. The most types of work accidents experienced by workers of PT Jaya Sentrikon Indonesia Padang in 2017 were crushed or hit by objects by 13 people (61.2%), and the other was hit by objects by 6 people (19.4%), pinched by objects by 3 people (9.7%), slipped by 2 people (6.5%) and 1 person (3.2%) fell while working.

(13%), not focus while working (9.6%), working while eating or drinking (3.3%) and unsafe conditions in this study were PPE that was not suitable (15%), PPE that was not provided (1.3%), PPE was not enough (32.5%), narrow location (1.3%), machines without safety (13.5%), unsafe machine layout (36.4%) (see table 3).

Table 2. Frequency Distribution of Unsafe Action and Unsafe Condition in Production Workers

of PT Jaya Sentrikon Indonesia Padang in 2017

Action	Frequency (f)	Percentage (%)
Not Safe	25	50%
Safe	25	50%
Total	50	100%

  

Condition	Frequency (f)	Percentage (%)
Not Safe	32	64%
Safe	18	36%
Total	50	100%

Table 3. Frequency Distribution of Unsafe Action and Unsafe Condition Types for Workers in Work Accidents in the Production Section of PT Jaya Sentrikon Indonesia Padang in 2017

No	Actions	Workers		Conditions	Workers	
		F	Percentage		F	Percentage
1	Not using (PPE)	7	22.5%	PPE is improper to use	11	15%
2	Talking while working	3	9.6%	PPE is not available	1	1.3%
3	Smoking while working	13	42%	PPE is not enough	24	32.5%
4	Excessive weight lifting	4	13%	Narrow location	1	1.3%
5	Not focus in working	3	9.6%	Machine without safety	10	13.5%
6	Eating or drinking while working	1	3.3%	Machine layout is not safe	27	36.4%
Total		31	100%	Total	31	100%

Based on Table 4, it showed that there was a significant relationship between the unsafe action variable (unsafe action) with the occurrence of work accidents among workers of PT Jaya Sentrikon Indonesia Padang in 2017 with a p-value of 0.001 (<0.05) and the value of OR = 24.5 can be interpreted that workers who take unsafe actions (unsafe actions) have 24 times greater risk of experiencing work accidents than workers who did not take unsafe

actions. It also showed that unsafe conditions have a significant relationship with the incidence of work accidents in workers of PT Jaya Sentrikon Indonesia Padang in 2017 with  $p = 0.001$  (<0.05) and the value of OR= 11.3, it can be interpreted that workers who were in an unsafe environment have a risk to experience work accidents by 11.3 times greater compared to workers who were in a safe environment.

Table 4. The Relationship between Unsafe Action and Unsafe Condition with Work Accidents in Production Workers of PT Jaya Sentrikon Indonesia Padang in 2017

Action	Work Accident						OR (95% CI)	p
	Yes		No		Total			
	F	%	F	%	F	%		
Not Safe	23	92	2	8	25	100	24.44	0.001
Aman	8	32	17	68	25	100	(4.59 – 130.01)	
Total	31	62	19	38	50	100		

  

Condition	Work Accident		Total	OR 95% CI	p
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	Yes		No					
	F	%	F	%	F	%		
Not Safe	26	81	6	19	32	100	11.27	0.001
Aman	5	27.8	13	72.2	18	100	(2.89 - 43.93)	
Total	31	62	19	38	50	100		

In this study, it was found that the unsafe action and unsafe condition have a relationship with the incidence of work accidents on workers in the production of PT

Jaya Sentrikon Indonesia Padang in 2017 as shown in table 5. The Exp.B value of the unsafe action variable was 17.2 (95%CI= 2.93 – 101.34).

Table 5. Multivariate Analysis Results of Unsafe Action Variables, Unsafe Conditions with Work Accidents in Production Workers of PT Jaya Sentrikon Indonesia in 2017  
Logit Y Work Accident = -3.0 + 2,846 unsafe action, 1.952 unsafe condition + e

Variables	B	OR (Exp.B)	95% CI	P
Unsafe Action	1.952	7.044	1.41 – 35.32	0.018
Unsafe Condition	2.846	17.226	2.91 – 101.34	0.002
Constant	-3.020	0.049		0.001

## DISCUSSIONS

The results of this study indicated that more than half of the workers have experienced work accidents. Study by Winarto et al. (2016) of oil and gas seismic survey workers at PT X West Papua, stated that half of the sample (50%) had a work accident. In addition, a study conducted by Lambogia (2018) of workers at PT Tropica Cocoprime stated that more than half (50.7%) of workers had a work accident. The results of this study were also supported by Khairani in 2015 on the part of production workers who stated that the majority of workers had work accidents (71.7%) (Khairani, 2015; Winarto et al., 2016; Lombogia et al., 2018).

The types of work accidents in this study were in line with Khairani (2015) which showed that the types of work accidents that often occur were contact with hazardous materials, pounding or being exposed to objects, slipping, falling on objects, pinched by objects, falling, exposed to electric current and burns (Khairani, 2015).

In addition, authors argued that the attitude of workers who did not pay attention to work safety such as not using PPE, in a

hurry and not careful when working was also a cause of work accidents, efforts that can be done was to uphold work discipline towards the use of PPE at each workers, raising workers' awareness and concern about work health and safety through training, continuous supervision and morning and evening apples conducted every day to remind workers to work carefully and pay attention to work safety. This was in line with the theory of Suma'mur (2013) which stated that the prevention of work accidents can be done by enforcing discipline and continuous supervision (Suma'ur, 2013).

The results of this study indicated that respondents who experienced work accidents were more than respondents who did unsafe actions (92%) compared to respondents who did safe actions (32%) in the last two years. Unsafe actions in this study were in line with Rudyarti (2017) which stated that the use of PPE determined the incidence of workplace accidents, workers who use PPE can avoid accidents at work than workers who did not use PPE (Rudyarti, 2017).

The results of this study also showed that respondents who had experienced work

accidents were more than respondents in unsafe conditions (unsafe conditions) compared to respondents who were in safe conditions in the last two years. Unsafe conditions that can cause accidents came from risky environments such as unsafe machine layout, poor PPE, improper PPE.

The results of this study were similar with other studies that there was a relationship between unsafe actions and unsafe conditions with the occurrence of workplace accidents, and several supportive analysis stated that unsafe actions and unsafe conditions was a factor causing work accidents. As stated by Lilian (2017) in the analysis of factors affecting work accidents in the operation of container cranes stated that the direct cause of an accident was the unsafe action of the operator of the crane operator and unsafe conditions in the working area, where the unsafe condition that was from the conditions of the tool was the container crane or the condition of the ship when loading and unloading, whereas the unsafe action came from the action of the container crane operator itself which resulted in an accident. Winarto et al. (2016) also suggested that an unsafe work environment was at risk of causing workplace accidents and there was a significant relationship between unsafe environment and workplace accidents at the PT X drilling unit and unsafe environment at risk of causing workplace accidents by 7,467 times higher compared to a safe environment (Winarto et al., 2016).

In this study, workers who did unsafe actions have higher risk of work accidents compared to workers who performed safe actions. This was in line with the case study conducted by Winarto et al. (2016) which stated that the results of multivariate analysis showed the significance of the action with the accident where p value was 0.0001 ( $<0.005$ ) with OR/Exp. (B) 11.914 which mean workers who commit unsafe actions have a risk of

occurrence of work accidents by 11.914 times higher compared to workers who take actions safely (Winarto et al., 2016). In line with Primadianto et al. (2018) which stated that unsafe action (unsafe action) was a dominant factor in influencing workplace accidents with the value of Exp.B = 1.170 (Primadianto et al., 2018).

This was in line with the theory of work accidents which stated that the factor of unsafe action and unsafe conditions was one of the dominant factors that cause work accidents, as in the Domino theory which stated that unsafe behavior was in the midst of dominoes others, if people want to prevent work accidents, the factors of unsafe actions and unsafe conditions must be eliminated (Sucipto, 2014). This result was also in accordance with the theory of Loss Causation Model that was put forward by Frank, which stated that unsafe actions and unsafe conditions were the direct causes of work accidents, where there were 2 things that cause unsafe conditions which were improper workplaces and hazardous equipment conditions (Frank, 1986).

According to the researchers, this can occur because of the lack of awareness of each worker of the importance of working safely in order to minimize the occurrence of work accidents. Efforts that can be made bearing in mind the behavioral factors difficult to intervene were increasing supervision of workers, increasing the insurance provided to workers who violate SOPs, providing safety work training to workers, and always instilling a culture of safety in working evenly in every part of the work. For example, by holding a safety meeting every day, distributing PPE that was still feasible and fulfill the requirements for use to all workers, and implementing a 5s system for spatial planning in the production division of PT Jaya Sentrikon Indonesia Padang in 2017. This was in line with several other studies which

also suggested efforts to prevent unsafe actions and unsafe conditions or to increase safe behaviors and actions by making SOPs about safe behavior and its implementation continuously, conducting OHS training, evaluating and monitoring worker behavior, implementing Behavior-Based Safety programs, refraining from haste in carrying out tasks, increasing worker participation to improve work safety and distribution of high-quality PPE (Pratama, 2015; Mousavipour et al., 2016; Istih et al., 2017; Sirait and Paskarini, 2017).

The results of this research were not in line with research conducted by Lombogia, in 2018 at PT Trpoica Cocopirma which stated that there was no relationship between unsafe worker behavior and work accident with a  $p = 1.00$ . Similar research conducted by Wiyonom et al. (2017) stated that there was no significant relationship between unsafe actions with workplace accidents at nurses with  $p = 0.231$ . Research conducted by Kawatu et al. (2018) showed that there was no relationship between unsafe action and work accidents with the  $p = 1.000$  (Bagas et al., 2014; Istih et al., 2017; Lombogia et al., 2018).

In several studies, age was one of the factors that can cause workplace accidents, where age has a significant relationship with workplace accidents ( $p < 0.05$ ), older workers were assumed to be more vulnerable to work accidents than younger workers (Afini et al., 2012; Aryantiningasih and Husmaryuli, 2017). However, this study did not justify the theory and stated that there was no relationship between age and work accident. According to researchers, this was because older workers were more dominant than younger workers, and based on field observations conducted by researchers, it showed that older and younger workers have no difference in how they work. The results of this study were in line with research conducted by Dornaria

in Community Health which stated that there was no meaningful relationship between age and work accident (Pinggian et al., 2018).

The conclusion of this study was that more than half (62%) of workers had work accidents with the largest type of work accident being crushed or exposed to objects (61.2%). Half of workers who experienced work accidents (50%) act unsafe and more than half (61.2%) of workers were in unsafe conditions.

There was a significant relationship between unsafe actions and unsafe conditions with work accident incidents in the workers of PT Jaya Sentrikon Indonesia Padang in 2017 and workers who commit unsafe actions have risk of work accident by 17 times higher than workers who take safe action. Suggestions for PT Jaya Sentrikon Indonesia Padang were to be more strict with no smoking regulations, provide a barrier between working tools, always maintain the neatness of the work environment, remind housekeeping inspections with the application of the 5s system, and it is expected that leaders and companies complete health and safety adequacy, one of them is a good personal protective equipment that is suitable for use.

Workers who work in the production division of PT Jaya Sentrikon Indonesia Padang are expected to apply and comply with applicable regulations such as not smoking at work, using complete PPE during work and reminding colleagues when there are unsafe actions or unsafe conditions when work. Further researchers are expected to be able to examine the monitoring variables and other variables that can cause workplace accidents.

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