

CORRELATION INDIVIDUAL CHARACTERISTIC AND SAFETY COMMUNICATION WITH COMPLIANCE OF STANDARD OPERATIONAL PROCEDURE AMONG WORKERS IN SHIPYARD INDUSTRIES

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CORRELATION INDIVIDUAL CHARACTERISTIC AND SAFETY COMMUNICATION WITH COMPLIANCE OF STANDARD OPERATIONAL PROCEDURE AMONG WORKERS IN SHIPYARD INDUSTRIES

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ABSTRACT

Background: Shipyards are one of the industries which have a high risk of hazard in the workplace. PT PAL Indonesia (Persero) is the largest shipyard in Indonesia that has a high risk potential of accidents caused by their activities. Attempts to control work accidents are administrative control, elimination, substitution, and personal protective equipment. Administrative control is done by standard operational procedure implementation. The compliance of standard operational procedure is one of the major factors which has a big impact on health and safety in the workplace. The aim of this study was to analyze the correlation between individual characteristics and safety supervision with compliance of standard operational procedure among workers at PT PAL Indonesia (Persero) Surabaya and to know the most variables which have a big correlation with compliance of standard operational procedure.

Materials and Methods : This study used an observational, cross-sectional design with a population of Maintenance and Repairing division workers who work at height, totaling 40 workers. The sample size was 40 workers because it used total population technique sampling. Data analysis was conducted by quantitative data using crosstabs and SPSS to determine correlation in each variable. The variables of this study were individual characteristics consisting of age, work period, education, safety knowledge, safety communication, and compliance of standard operational procedure.

Result : Results showed that most respondents were 20-30 years old, had worked for 5-10 years, last education was SMA and had good knowledge about safety. Safety communication was good. Most of the respondents were in compliance categories. From statistical tests, it showed that the value of $r_{\text{age}} = 0.28$, value of $r_{\text{work period}} = 0.082$, value of $r_{\text{education}} = 0.209$, value of $r_{\text{knowledge}} = 0.629$, value of $r_{\text{safety communication}} = 0.577$.

Conclusion : Correlation between individual characteristics (age, work period, education) with compliance of standard operational procedure were weak. Correlation between safety

knowledge and safety communication with compliance of standard operational procedure were strength. The main variables which have correlated to compliance of standard operational procedure was safety communication and safety knowledge. It is necessary to improve skill of worker through involved them on work at height certification and improve safety communication with giving recently news about how to work safely.

Keywords : Knowledge, Communication, Compliances, Standard Operational Procedure

1.0 Introduction

Industry accident was one of work accident that happened in workplace. According to International Labour Organization in Suma'mur (1996) said that there were 270 million people have non-fatal work accidents that resulting in a loss of working days of an average of 3 days and 160 million worker suffer from occupational diseases every year in the world. One of the example of work accident was happened in turki's shipyard industries. It was 117 workers died because of fallen at work accident from 2000 January until 2001 January. There were five causes of that work accident, they were falling from a height, exposed to electric or fire exposure, falling objects and squashed (Barlas,2013). Analysis of accident-causing factors on shipyards in Turkey showed that 80% of hundred accident was caused by unsafe action (Yilmaz,2015). Based on The health insurance provider organization's data showed that work accident value in Indonesia from 2014 until 2016 was 126.000. In 2015, it was 105.182 cases and 38% from that totally was fallen from high. Totally, amount of accident decreasing but kind of accident wasn't decreasing and still caused accident (Dyanita,2017).

Industry work accident caused by unsafe action and unsafe condition, but the most caution of accident was unsafe action. According to International Loss Control Institute (ILCI) by Frank E. Bird said that human factor was the one of the main causes of accidents after management. Efforts to minimize the occurrence of accidents in the industrial sector which hiring manpower was by established and implemented occupational health and safety. Attempts to control accidents can be done with attention to the hierarchy of control. It consist of administrative control, substitution, elimination, engineering control, and personal protection equipment. One of administrative control was application of standard operational procedure (ILO, 1986). The purpose of standard operational procedure was to provide understanding to workers to be able to perform the work process well. Standard operational procedure may indicate compliance with the organization (US EPA,2009), but sometimes workers still ignore such work procedures for various reasons and do unsafe work processes and the possibility of an accident will be greater.

PT PAL Indonesia (Persero) Surabaya is one of the large industries of shipyard in Indonesia which has high risk of work accident especially in maintenance and repairing division. This is evident from the process of shipbuilding using high-tech machines, hot working climate conditions, most of the work is utilizing heat which creates considerable potential hazards and done at height (Mandy,2016). Based on work accident value in 2016, there were 41 cases of work accident. It consist of falling from a height (14%), scratches (19%), electricity (5%), exposed to welding light (14%), gramm (52%), pinched (14%). In 2017, work accident value

was increased. There were 14 cases of work accident. It consist of falling from a height (7%), gramm (7%), stricken objects (21%), knocked (7%), scratced (7%), exposed to hot object (7%) and pinched (7%). According to the report the number of accidents for 2 (two) years, we can knew that accident because of falling and struck objects from a height still happened. This indicates that there is a need for special attention to work at height. From the early observation, showed that compliance usage of personal protection equipment was low. Rules about usage of personal protective equipment was include in standard operational procedure. It also showed that there were no restrictions on work areas with security lines. It was indicated that safety communication about hazard has not been running properly.

According to Geller (2001), compliance was one form of behavior that was influenced by internal and external factors. Research by Bates and Holroyd (20012) concluded that there were three factors that influence the worker's compliance to Standard Operational Procedure. That were individual factor, job factor, and organizational factor. The aim of this study was to analyzed compliance of standard operational procedure using individual factors and organizational factors approach. Individual factors was the characteristic of the workers and the organizational factor was safety communication. In this research, the researcher investigated the characteristics of the workers consist of age, working period, education, safety knowledge and safety communication. From analized that factors, the reseacher can concluded correlation between individual characteristic and safety communication with compliance of standard operational procedure. It also concluded which the most factors were correlated with compliance of standard operational procedure in work at height maintenance and repairing division PT PAL (Persero) Indonesia.

12

2.0 Materials and Methods

This study was conducted with observational and analytical study. The design of this study was cross sectional study where the reseacher do observation at one time. The population in this study was all of workers maintenance and repairing division which work at height. The number of working population was 40 people with inclusion criteria, work at height. The size of sample was same with the number of population (40 workers) because it used total population technique sampling. The studied variables were individual characteristic consist of age, work period, level of education, knowledge, safety communication and compliance of standard operational procedure.

Data collection was conducted in January until February 2018. Collecting data was done by observation and questionnaire. Data collection consist of primary data and secondary data. Primary data were age, working period, level of education, knowledge, safety communication and compliance of standard operational procedure. The secondary data were accident rate and company profile. Data processing was presented in the frequency distribution table. All of data were analized with descriptive analysis and assosiation analysis. The data were analyzed using quantitative data by cross tabulation to determine correlation between each variable with compliance of standard operational procedure. In this study, to define which the most factor that have strenght correlation with compliance of standard operational procedure by looking at the value of the contingency coefficients (r).

Table 1. Coefficients contingency interpretation

No.	Parameter	Coefficient	Interpretation
1.	Kekuatan korelasi (r)	0.00-0.199	Very weak
		0.20-0.399	Weak
		0.40-0.599	Medium
		0.60-0.799	Strong
		0.80-1.000	Very strong

(Source: Sugiyono (2010))

3.0 Result

8

3.1 Frequency Distribution of Study Variables

Table 2. Frequency Distribution of Study Variables

Variabel	Kategori	Jumlah	Persentase (%)
Age	20-30 years	17	42,5
	31-40 years	10	25
	>40 years	13	32,5
Working period	<5 years	6	15
	5-10 years	27	67,5
	>10 years	7	17,5
Level of education	Elementary School	0	0
	Junior High school	5	12,5
	High School	33	82,5
	College	2	5
Knowledge	Less	9	22,5
	Good	31	77,5
Compliance of standard operational procedure	Yes	32	80
	No	8	20
Safety communication	Less	10	25
	Good	30	75

(Source : Primary Data of Shipyard Industries Maintenance and Repairing Division Workers,2018)

Data collection used questionnaire to obtain age, work period, education, knowledge, safety communication and compliance of standard operational procedure. Based on table 1, it showed that the most respondent were in 20-30 years old (42.5%) with working period from 5-10 years (67.5%) and most of respondents level education was high school (82.5%). Safety knowledge of respondent was at good category (77.5%). Safety communication was at good category (75%). The most of respondent considered that safety communication was proper. The most of respondent have good category at compliance of standard operational procedure (80%) .

3.2 Individual Characteristics

a. Age

The age of respondent were categorized into 3, they were 20-30 years old, 31-40 years old and more than 40 years old. The data of respondents age were obtained from questionnaire.

Table 3. Frequency Distribution of Correlation between Workers Age and Compliance to standard operational procedure in Division of Maintenance and Repairing PT PAL Indonesia (Persero) Surabaya

Age	Compliance of SOP				Total	R	Conclusion
	Yes		No				
	n	%	n	%			
20-30	15	88,2	2	11,8	17	100	0,280 Weak
31-40	6	60	4	40	10	100	
>40	11	84,6	2	15,4	13	100	
TOTAL	32	80	8	20	40	100	

Based on **Table 3**, it showed that correlation between age with compliance of standard operational procedure was weak with $r = 0,280$. The result showed getting older, compliance of standard operational procedure getting lower than before.

b. Working Period

The working period of respondent were categorized into 3, they were less of 5 years, 5-10 years and more than 10 years. The data of respondent working period were obtained from questionnaire.

Table 4. Frequency Distribution of Correlation between work period and Compliance of standard operational procedure in Division of Maintenance and Repairing PT PAL Indonesia (Persero) Surabaya

Work period	Compliance of SOP				Total	R	Conclusion
	Yes		No				
	n	%	n	%			
<5	5	83,3	1	16,7	6	100	0,082 Very weak
5-10	21	77,8	6	22,2	27	100	
>10	5	71,4	2	28,6	7	100	
TOTAL	31	77,5	9	22,5	40	100	

Based on **table 4**. It showed that correlation between working period and compliance to standard operational procedure was very weak. The longer of working period, the compliance of standard operational procedure was lower than before.

c. Education

The education of respondent were categorized into 4, they were Elementary school, Secondary school, High School and University. The data of education were obtained from questionnaire.

Tabel 5. Frequency Distribution of Correlation between worker education with Compliance of Standard Operational Procedure in Division of Maintenance and Repairing PT PAL Indonesia (Persero) Surabaya

Level of Education	Compliance to SOP				Total		R	Conclusion
	Yes		No		N	%		
	n	%	n	%				
SMP	3	60	2	40	5	100	0,209	Weak
SMA	27	81,8	6	18,2	33	100		
PT	2	100	0	0	2	100		
TOTAL	32	80	8	20	40	100		

Based on **table 5**. It showed that correlation between worker education with compliance of standard operational procedure was weak. The Higher of education level, the compliance of standard operational procedure's worker getting better.

d. Knowledge

The knowledge about standard operational procedure were categorized into 2, they were good and less. The data of knowledge were obtained from questionnaire.

Table 6. Frequency Distribution of Correlation between safety knowledge with Compliance to Standard Operational Procedure in Division of Maintenance and Repairing PT PAL Indonesia (Persero) Surabaya

Knowledge	Compliance to SOP				Total		R	Conclusion
	Yes		No		N	%		
	n	%	n	%				
Less	3	33,3	6	66,7	9	100	0,629	Strenght
Good	29	93,5	2	6,5	31	100		
TOTAL	32	80	8	20	40	100		

Based on **table 6**, it showed that correlation between safety knowledge with compliance to standard operational procedure was strenght, with value of $r = 0,629$. It also showed that better of knowledge can make better of compliance to standard operational procedure.

2. Safety Communication

The Safety Communication were categorized into 2, they were good and less. The data of safety communication were obtained from questionnaire.

Tabel 6. Frequency Distribution of Correlation between Safety Communication with Compliance to SOP in Division of Maintenance and Repairing PT PAL Indonesia (Persero) Surabaya

Safety Communication	Compliance to SOP				Total		R	Conclusion
	Yes		No		N	%		
	n	%	n	%				
Less	4	40	6	60	10	100	0,577	Medium
Good	28	93,3	2	6,7	30	100		
TOTAL	32	80	8	20	40	100		

Based on **table 7**, it showed that Correlation between safety communication and compliance of standard operational procedure was medium. If safety communication getting better, compliance of standard operational procedure getting higher.

4.0 Discussion

4.1 Correlation between Individual characteristic with Compliance of Standard Operational Procedure

a. Age

Based on **Table 3** showed getting older, compliance of standard operational procedure getting lower than before. This result was different with result of early study which done by Dwiki (2017) which concluded that getting older, compliance of standard operational procedure better than before. Result study by Krocknick & Alwin in Azwar (2013) concluded that younger age (18-25 years old) was unstability fase so easy to persuate this age than the older age. Based on **table 2**, it showed that most of respondents were in 20-30 years old, so they were in unstability fase and can easier to influence them to apply standard operational procedure than the older respondent. Some physical capacity such as vision, hearing and reaction speed, decreases after the age of 40 years or more. It caused compliance of standard operational procedure in respondent more 40 years getting lower. Besides that, older respondent feel more senior than other and it was not necessary to obedient to standard operational procedure.

b. Work Period

Based on **table 4**. It showed that the longer of working period, the compliance of standard operational procedure was lower than before. Based on Robbins (2001) says that working period was about work experience. Work period had correlation with work experience. Worker who have a lot of experience has high value and capability to do his work. From the result, it knowed that the longer of work period, the compliance of standard operational procedure was lower than before. This result line with the result of study before by nurvita (2010) which concluded that respondent who have work period less than 5 years has compliance of standard operational procedure better than other respondent. Respondent who have shorter working period has compliance of standard operational procedure better than others because they wanted to increase their experience and their performance so they can avoid punishment. By increasing their performance, allowing worker to get a better point in their supervisor. Workers who have working period more than 5 years had the assumption that they have been working for a long time and they felt that companies were like their own homes. They thought that they knew their work place and its potensial hazard well so they didnot need to work according to standard operational procedures.

c. Education

Based on **table 5**. It showed that the higher of education level, the compliance of standard operational procedures worker getting better. This result line with others study before by Khairul (2016) which conclude that education has correlation with compliance of standard operational procedure. Based on **table 1** it showed that most of respondent have high school education. In this level, someone has capability to knowing and analysis all off information that we take. Education decides our skill and capabilty to accepted information and done the work perfectly. Education has correlation with our intelegence and influence our proficiency (Sumakmur,1994). From the result, it showed that higher of education, compliance of standard operational procedure better than before. Its because with higher level education, respondent have capability to knowing and determining standard operational procedure. Thats capability make them realized all of the consequence if they didn't work according to standart operational procedure and it was caused their compliance to standard operational procedure getting better.

d. Knowledge

Based on **table 6**, it showed that better of knowledge can make better of compliance to standard operational procedure. This result was different with result of study before by Nurvita (2010) which said that knowledge did not have correlation with compliance of standard operational procedure. This result study was line with result study before by dyanita (2017) which conclude that there were correlation between knowledge and compliance of standard operational procedure. Knowledge was people sensing or result of knowing someone about such things through with nose, ears and eyes. Most of knowledge obtained through hearing and sight (Notoatmodjo,2005). According to Bird (1990) said that level of experience someone persuaded by experience, orientation and training. Based on result observation, most of respondent don't have sertification of work at height, but they can work properly according to standard operational procedure. It caused by safety effort which always involved the workers to safet training about standard perational procedure of work at height and their knowledge about work procedure getting better. The Better of knowledge respondent make their understanding about standard operational procedure getting better and it can impact to their compliance of standard operational procedure level.

4.2 Correlation between ² safety communication with compliance of standard operational procedure

Based on **table 7**, it showed that the higher quality of safety communication can make compliance of standard operational procedure getting better. This result same with the result of others early study by Putra (2017) which conclude that communication strategy has big impact to health and safety application. Study by Dyanita (2017) also conclude that communication have correlation with compliance to using personal protective equipment. Communication was stimulant on verbal or non verbal form which influence the others (Notoatmodjo,2003). Based on Observation data, safety communication in PT PAL Indonesia (Persero) Surabaya consist of safety induction (for people who never entry to workplace), safety briefing (usually done every morning and evening), safety talk (once a week), safety inspection (once in a month). Safety communication given by safety officer. Otherwise,

There were a lot of safety sign in the workplace. Safety sign was usefull to give workers warning about potensial hazard which is can happened in there. Over all, based on observation result, safety communication in work at height maintenance and repairing division was good, but still some areas where was no limitation area that can't be entry. Depend on Permenakertrans no 09/2016 said that company must take safety sign especially in limited area such as work at height to avoid falling object from above. Its necessary to apply safety line to protect work place where unsafe area to entry. Many kind of safety communication in PT PAL (Persero) Indonesia give good impact to compliance of standard operational procedure. Workers can know their work steps, potensial hazard that can be happened, how to prevent accident and also gives a warning to workers so they work safely and according to standard operational procedure.

5.0 Conclusion and recommendation

Individual characteristic that include age, working period and education have weak correlation with compliance of standard operational procedure. Individual characteristic in form of knowledge has strong correlation with compliance of standard operational procedure. Correlation between safety communication with compliance of standard operational procedure were medium. It was important to improve safety knowledge of workers through work at height sertification and improve safety communication by giving workers about recently accident news in shipyard industries for increasing level of compliance worker to standard operational procedure in work at height PT PAL Indonesia (Persero) Surabaya.

1

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Declaration

I stated that I don't do any plagiarism in writing my thesis

Authors contribution

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PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10
