

THE ANALYSIS OF PERSONAL FACTORS CAUSING SUBSTANDARD ACT IN USING SELF PROTECTIVE EQUIPMENT FOR WELDING

ANALISIS FAKTOR PERSONAL PENYEBAB SUBSTANDARD ACT PENGGUNAAN ALAT PELINDUNG DIRI PEKERJA PENGELASAN

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ABSTRACT

Welding is a job that has potential hazards and risks. An effort to reduce the risk of hazards in welding is by providing protection to workers in the form of Personal Protective Equipment (PPE) in accordance with the type of work. Substandard act is an action that can cause accidents. The purpose of this study was to analyze factors related to the incidence of substandard act done by welding workers in PT. INKA (Persero) in the use of PPE based on the ILCI Loss Causation Models theory. This study used observational technique with a cross sectional study design. The research respondents were 16 welding workers of assembling carbody division in PT. INKA (Persero). The data collections were done by using questionnaires and observation sheets with spearman correlation test analysis. The results of the statistical analysis in the study showed that age ($r = -0,180$), working period ($r = -0,041$), education level ($r = 0,123$), and knowledge ($r = -0,391$) had a weak relationship with substandard act of using PPE. The increase age, years of service, level of education and knowledge increased the tendency of workers to use PPE below the standard, while the higher level of education will increase the actions of workers in accordance with the standard use of PPE.

Keywords: personal factor, personal protective equipment, substandard act

ABSTRAK

Pengelasan merupakan pekerjaan yang memiliki potensi bahaya dan risiko terhadap keselamatan kerja. Upaya mengurangi risiko dari bahaya pengelasan dengan memberikan perlindungan kepada tenaga kerja berupa Alat Pelindung Diri (APD) sesuai dengan jenis pekerjaan. Substandard act merupakan salah satu tindakan yang dapat menjadi penyebab terjadinya kecelakaan. Tujuan penelitian ini adalah untuk menganalisis faktor yang berhubungan dengan kejadian substandard act pekerja pengelasan PT. INKA (Persero) dalam penggunaan APD berdasarkan teori ILCI Loss Causation Models. Studi penelitian ini menggunakan teknik observasional dengan rancang bangun cross sectional study. Responden penelitian adalah 16 orang pekerja pengelasan di bagian car body assembling PT. INKA (Persero). Pengumpulan data dilakukan menggunakan kuesioner dan lembar observasi dengan analisis uji korelasi spearman. Hasil analisis statistik pada penelitian menunjukkan bahwa umur ($r = -0,180$), masa kerja ($r = -0,041$), tingkat pendidikan ($r = 0,123$) dan pengetahuan ($r = -0,391$) memiliki hubungan yang lemah dengan substandard act penggunaan APD. Semakin meningkatnya umur, masa kerja, tingkat pendidikan dan pengetahuan akan meningkatkan kecenderungan pekerja untuk menggunakan APD dibawah standar, sedangkan semakin tingginya tingkat pendidikan akan meningkatkan tindakan pekerja sesuai dengan standar penggunaan APD.

Kata kunci: faktor personal, alat pelindung diri, substandard act

INTRODUCTION

Workplaces always have risks and potential dangers for accidents. Accident is an unwanted and unpredictable event that can cause human casualties and/or property (PER.03/MEN/1998). The work accidents in Indonesia are still quite large at the moment. According to the Ministry of Manpower

and Transmigration there were 80,393 cases of work accidents that occurred in 2017 with 21,631 cases occurred in East Java. In general, the International Labor Organization (ILO) estimated that in 2013 there were 2.3 million workers experiencing workplace accidents and work-related diseases each year.

The results of the research conducted by Aini (2016) showed that the causes of work accidents were 10% unsafe conditions, 88% unsafe actions, and 2% unknown causes. Unsafe act is an act of someone doing work that is deviant from safety procedures. Tarwaka (2016) explained that unsafe action is one of the direct causes of accidents. Unsafe action is caused by personal and work factors which are the basic causes of accidents.

Every work accident must cause loss and damage both to humans, property and production processes (Tarwaka, 2016). In general, considerable work accident losses can have an influence on increasing company productivity. According to Tarwaka (2016), in general, the losses caused by workplace accidents are grouped into direct costs and indirect costs. Losses due to accidents can be prevented by knowing and understanding the causes, so that monitoring and control of potential hazards can be carried out so as not to cause workplace accidents.

PT Industri Kereta Api (INKA) is a state-owned enterprise (BUMN) company engaged in designing and manufacturing of railways in Indonesia. As one of the modern industries, PT. INKA (Persero) in its production process involves the use of sophisticated machinery and various kinds of raw materials that contain potential hazards and risks which at any time can endanger the health and safety of its workers. One of the dominant types of work at PT. INKA (Persero) is welding. Welding is an act of bonding two or more metals by using heat energy which in the process has various types of potential hazards including potential fire, radiation, blasting, exposure to metal fumes, sparks, falls and electrical hazards (Wiryosumarto and Okumura, 2008). The high potential of hazards in welding process using argon gas requires workers to be equipped with PPE which can reduce the hazard exposure that includes radiation of emission while doing the work.

The main raw material from the manufacture of light rail or Light Rail Transit is aluminum alloy with the welding process using 100% argon gas concentration in the welding process. Welding with argon gas has a difference with other gases associated with potential hazards that can be caused. Argon gas is commonly used in welding process with several differences compared to other conventional techniques, that the weld beam produced is brighter; the result is cleaner and smoother. An effort to protect and reduce the risk of hazard exposure from the welding work process carried out by PT. INKA

(Persero) is by completing all people and workers who are in the work environment with Personal Protective Equipment (PPE) that has been adjusted to the types of hazards and risks.

The Regulation of the Minister of Manpower and Transmigration Number 8 of 2010 concerning Personal Protective Equipment in article 1 paragraph (1) states that, Personal Protective Equipment (PPE) is a device that has the ability to protect someone whose job is to isolate part or all of the body from potential hazards in workplace. Employers have an obligation to provide PPE for all workers and other people who are in the workplace. The available PPE must be in accordance with the Indonesian National Standard (SNI) or other applicable standards.

The use of PPE at PT. INKA (Persero) has been regulated in the procedure of Personal Protective Equipment (PK3-6-05) and the standard of company Personal Protective Equipment, but not all workers in the corporate environment use PPE in accordance with the standards set by the company. The type of PPE for welding that has been signed by PT. INKA (Persero) includes safety helmets, welding guards, ear plugs, welding respirators, arm aprons, chest aprons, foot aprons, leather gloves and safety shoes.

The problems related to the use of Personal Protective Equipment are problems experienced by almost all workplaces and various types of industries. According to Santoso (2004) one of the things that is a common problem in the use of personal protective equipment is a sense of discomfort and a sense of difficulty experienced by workers in completing work when using PPE. The inconvenience and feeling of difficulty in carrying out work make two of the reasons for workers to not use PPE that is available and required by the company, thus increasing the risk of severity of workers when accidents happen.

The use of PPE that is not in accordance with the standards specified in the company is one form of substandard action or substandard act in accordance with the theory of the ILCI Causation Model (1992). The cause of the action below the standard in the theory is caused by personal factors and work factors. The purpose of this research is to find out personal factors that cause substandard action or substandard act of welding in LRT train project in Carbody Assembling division in PT. INKA (Persero) in the use of Personal Protective Equipment when carrying out work.

METHODS

This research on the analysis of personal factors causing substandard act in using PPE for welding was carried out in PT. INKA (Persero) in the Carbody Assembling division of Light Rail Trainset (LRT) train project with 16 workers as the subject of this research. This research was an observational research. The researcher observed the research subject without giving a treatment related to the use of PPE that is in accordance with the company standard. Based on the type of data collection time, this research was conducted in one time period, namely in April 2018.

The personal factors variables in this research are respondents' individual characteristics which included age, years of service, level of education and knowledge related to PPE for welding. The personal factors in this research were obtained from the results of question and answer to the research respondents through questionnaires. The knowledge variables were expressed in the form of closed questions with 4 answer choices. The right answer gets a +1 score and the wrong answer is equal to 0. The results of the data obtained were grouped into three categories which include less, medium and high knowledge.

The assessment of action variables under the standard or substandard act in using PPE was obtained through the results of the observations made to research subjects with an observation sheet. The observations were made three times in one work shift which included observing the use of 9 types of PPE when carrying out work which included safety helmets, welding respirators, safety shoes, arm aprons, foot aprons, chest aprons, ear plugs, welding guards and leather gloves. The final results of the observations were calculated by looking for the average value of the observations carried out three times and classified into several groups. The classification of standard act was done when the respondents used all types of PPE according to standards, while the classified as substandard act was done when they did not use PPE and/or they used PPE but not in accordance with the standards set by the company. The substandard act in the use of PPE was classified into three levels included high standardized act if the workers did not use more than 6 types of PPE according to the standard, moderate substandard act if the workers used 2 to 4 types of PPE according to the standard, and low standard act if the workers did not use even 1 type of PPE according to the company's standard.

Table 1. The Strength and Direction of the Relationship between the Research Variables

	Correlation Coefficient Value	Intepretation
Relationship Strength	0,000 – 0,199	Very weak
	0,200 – 0,399	Weak
	0,400 – 0,599	Fair
	0,600 – 0,799	Strong
	0,800 – 1,000	Very strong
Relationship Direction	+ (positive)	In the same direction, the higher the xi value the higher the yi value, or vice versa
	- (negative)	In an opposite direction, the higher the xi value, the lower the yi value, or vice versa

Sources: Riduwan, 2013

The data collected from the research results was processed with several stages, included checking the completeness of the data, giving numeric codes to the results of the answers to facilitate the stages of data input for further analysis. The data collected in this study carried out statistical analysis to find out the strong relationship between the variables of age, years of service, level of education and knowledge on the substandard act in using PPE through the spearman correlation test. The strong relationships between research variables can be seen from the value of the correlation coefficient (r). The value of the correlation coefficient has a range between 1 and -1. The negative correlation coefficient showed the relationship of the opposite relationship that the increased in variable x decreased variable y and or vice versa. The correlation coefficient with the direction of a positive relationship showed the direction of the relationship which means that the increased in variable x would be accompanied by an increase in variable y.

RESULTS

A General Description of the Company

PT Industri Kereta Api (INKA) is one of the State-Owned Enterprises engaged in providing

railroad transportation facilities in Indonesia. PT. INKA (Persero) was established on May 18, 1981 and became the first railway manufacturing company in the Southeast Asia region. It is located at Jalan Yos Sodarso Number 71 Madiun City with an area of 22.5 hectares, PT. INKA (Persero) always develops by producing various kinds of superior products including locomotives, passenger trains, freight cars, movable trains, and other development products to meet the needs land transportation in Indonesia and the world.

PT. INKA (Persero) has five effective working days with a work system of 8 hours/day and a 60-minute break after 4 hours of work. For workers in the production division, PT. INKA (Persero) has a work shift policy that is divided into 3 groups with overtime work on Saturdays and Sundays.

The production stages in PT. INKA (Persero) are carried out in several divisions within the company. The production section of PT. INKA (Persero) consists of plate processing parts, assembly parts, painting parts, component heating parts, machinery parts, interior parts and supported by quality control, production planning and control parts and quality assurance. The main raw materials used in the production process of PT. INKA (Persero) consist of various kinds of metal plates and other supporting materials.

The production process is carried out in stages in all work units with excellent teamwork. one of the dominant types of work in the production process at the company is the work of grinding, cutting, welding, reforming and painting. Assembly or assembling work unit is among the various stages of production contained in a company with one of the most important types of work is connecting two or more metal plates through a welding process.

Welding workers have potential hazards and health and safety risks of workers, including the danger of beam rays, exposure to metal fumes, sparks, fires, explosions and falls when doing welding at high altitudes (Wiryosumarto and Okumura, 2008). The problem of light can be dangerous and cause interference with burns and damage to the eyes of workers. The danger of dust generated from the welding process can cause several lung diseases or disorders which include shortness of breath and lung cancer. The danger of welding sparks can cause minor to severe burns (Wiryosumarto and Okumura, 2008).

The effort to protect the workforce carried out by the company is by providing and requiring the use of PPE in accordance with the type of work and the potential hazards caused in carrying out the

work. The types of PPE required by PT. INKA for welding workers based on the company standards includes safety helmets, welding guards, ear plugs, welding respirators, arm aprons, chest aprons, foot aprons, leather gloves and safety shoes. Several types of PPE available in the company have been adjusted to the criteria of each worker.

Personal Factors of the Respondents

The variables in the study of substandard act cause in using PPE for welding in Light Rail Trainset (LRT) train project in PT. INKA (Persero)'s Carbody Assembling section is a personal factor that includes age, years of service, education level and knowledge of respondents related to Personal Protective Equipment in carbody assembly workers of LRT train in PT. INKA (Persero). The results of the recapitulation of the data regarding personal factors in the research are presented in Table 2.

Table 2 shows that from 16 respondents, 68.7% of the respondents were in the age range of 22-25 years with 87.5% or 14 people among respondents having a work period of less than 1 year. The working period of the research respondent was calculated from the initial day the respondents worked for the company until when the data was collected. All respondents in the study had a good level of knowledge of Personal Protective Equipment (PPE) for welding with 93.7% of them with an education background of high school level or equivalent. The high level of knowledge of the respondents in this study was got from the work experience in the field of welding in the workplace beforehand.

Table 2. The Distribution of Workers' Personal Factors for LRT Train Welding Project in Carbody Assembling Division in PT. INKA (Persero) in 2018

Variable	Category	Total	Percentage (%)
Age	22-25	11	68.7
	26-30	4	25
	31-34	1	6.3
Working Period	<1 year	14	87.5
	≥1 year	2	12.5
Education Level	Junior high school	1	6.3
	Senior high School	15	93.7
Knowledge	Good	16	100

Substandard Act in Using PPE

Substandard act the use of PPE is the action of research respondents who are not in accordance with the standards determined by the company in relation to the use of PPE. The substandard assessment of the acts or substandard actions in the use of PPE in the respondents of the study was carried out by direct observation or observation of the use of PPE on respondents while doing their work without giving certain treatment. The observations were made three times in one work shift the results of the assessment with the total final score was the average value obtained from observations classified into 3 groups in Table 3.

Table 3 shows the results that most of the research respondents are in the sub-standard category of actions or medium and low level act substandard. 12.5% of the respondents did substandard act in high category by not using more than 6 types of PPE determined by the company.

Age Relationships with Substandard Act in Using PPE

The age variable in this study was the age of the workers calculated from the year of birth to the year of the study. The recapitulation of the results

Table 3. The Substandard Act Distribution of Workers in LRT Train Welding Project in Carbody Assembling Division in PT. INKA (Persero) in 2018

Variable	Category	Total	Percentage (%)
Substandard Act	Low	6	37.5
	Fair	8	50
	High	2	12.5

Table 4. Cross Tabulation of Age with Substandard Act in Using PPE in LRT Train Welding Project in Carbody Assembling Division in PT. INKA (Persero) in 2018

Age (Year)	Substandard act						r
	High		Fair		Low		
	n	%	n	%	n	%	
22 – 25	2	18.2	4	36.4	5	45.5	-0.180
26 – 30	0	0	3	75	1	25	
31 – 34	0	0	1	100	0	0	

of the substandard act in the use of PPE in Table 4 shows the results that most substandard actions were carried out by respondents with the age category of 22-25 years with 2 people having a substandard act level in the high category. This was done by respondents with a age group of 22-25 years. 18.2% of respondents have a high level of standard act.

The results of the statistical analysis of the study in Table 4 showed that the correlation coefficient between the age variable with the substantive act of using PPE was -0.180, it can be said that there was a very weak relationship between the age variables and the substantive act of using PPE with a negative relationship direction. The direction of the negative relationship in the study can be interpreted that the increased age of respondents in the study would increase the tendency to act below the standard in using PPE.

The relationship of Work Period with Substandard Act in Using PPE

The tenure variable in the study is the length of work of the research respondents as from the first year in the company until the time this research was conducted. the cross tabulation between age variables with substandard act in using PPE in Table 5 showed that the workers in LRT train welding project in carbody assembling division faced substandard actions that occur mostly in the medium category and these actions were carried out by workers who have a service period of less than 1 year as many as 8 respondents, 57.1%.

The results of the statistical analysis in Table 5 showed that the correlation coefficient between the working period variable and the substandard act in using Personal Protective Equipment was -0.041, it can be said that there was a very weak relationship between the working period variable and the substantive act in using PPE had a very

Table 5. Working Period Tabulations with Substandard act in Using PPE in LRT Train Welding Project in Carbody Assembling Division in PT. INKA (Persero) in 2018

Working Period	Substandard Act						r
	High		Fair		Low		
	n	%	n	%	n	%	
< 1 year	1	7.1	8	57.1	5	35.6	-0.041
> 1 year	1	50	0	0	1	50	

weak relationship with the direction of a positive relationship. The direction of the relationship between variable showed that the increasing working period of the respondents in this research increased the substandard action in terms of using PPE in carrying out work and or the lower working period of a welding worker reduced the substandard action in using PPE.

The Relationship between Education Level and Substandard Act in Using PPE

The education level variable in this study is the achievement of educational strata in the research respondents at the time of the research. The results of cross tabulation between education level variable with substandard act in using PPE showed that the workers of the LRT train welding project in carbody assembling division committed sub-standard action that were mostly in the moderate category as many as 7 respondents and the high category as many as 6 respondents with the action carried out by workers with high school level or equivalent.

The actions done below the standard or substandard act in using PPE based on the level of education with a high category were carried out by 2 respondents. The results of the observations carried out in the field towards workers with sub-standard action in the high category found that the research respondents did the work without using more than 6 types of personal protective equipment that had been required according to the standards made by the company.

The result of the analysis of the study in Table 6 showed the correlation coefficient between the education level variable and substandard act variable in using PPE was 0.123, so that it can be said that there was a very weak relationship between working period variable and the substantive act in using PPE. The

Table 6. The Cross Tabulation of Education Level with Substandard Act in Using PPE in LRT Train Welding Project in Carbody Assembling Division in PT. INKA (Persero) in 2018

Education Level	Substandard Act						r
	High		Fair		Low		
	n	%	n	%	n	%	
Junior High School	0	0	1	100	0	0	0.123
Senior High School	2	13.3	7	46.7	6	40	

direction of a positive relationship in the study showed a positive value, therefore it can be concluded that the increasing level of education of the respondents in this study would further increase the actions of workers in using PPE in accordance with the existing standards set by the company and or vice versa.

The Relationship of Knowledge and Substandard Act in Using PPE

The knowledge variable meant in this study is everything that is known by the respondents related to PPE for welding. The analysis of the relationship between worker knowledge about PPE for welding with substandard act on the use of PPE in Table 7 showed the results that all respondents in this study had a good level of knowledge related to PPE on the type of welding work. 50% of the research respondents with a good level of knowledge were categorized in the medium standard act. The actions below high level standards were done by workers who did not use 2 to 4 types of 9 types of PPE that were required by the company.

The results of cross tabulation of knowledge variable with action under the standard in using PPE in Table 7 indicated that the value of the correlation coefficient between variables was -0,391. The correlation coefficient in the statistical analysis showed that there was a weak relationship between the knowledge variable and the substantive act in using PPE with the direction of the negative relationship. The direction of negative relationship in the study showed that the higher the level of knowledge owned by the research respondents the higher the tendency to act below the standard in using PPE and vice versa.

DISCUSSION

There were two common causes of workplace accidents according to Tarwaka (2016), among them are the basic causes or origins and the main

Table 7. Cross Tabulation of Knowledge with Substandard Act in Using PPE in LRT Train Welding Project in Carbody Assembling Division in PT. INKA (Persero) in 2018

Knowledge	Substandard Act						r
	High		Fair		Low		
	n	%	n	%	n	%	
Good	2	12.5	8	50	6	37.5	-0.391

causes. The basic causes are factors that underlie the existence of a work accident, while the main causes are factors and K3 requirements that have not been implemented correctly (substandard). The main causes of work accidents consist of two factors which include human factors (unsafe action) and environmental factors (unsafe conditions).

Human factors or unsafe actions constitute a dangerous action from workers who are motivated by certain causes (Tarwaka, 2016). Environmental factors or unsafe conditions are unsafe conditions of equipment, materials, work processes, work systems and the nature of work (Tarwaka, 2016). Environmental factors are in the broadest sense so that they are not limited to the physical environment.

Substandard action or substandard act in using PPE for LRT Carbody Assembling welding project in PT. INKA (Persero) is one of the human factors that include unsafe actions in relation to the use of PPE. This action is one form of direct cause or the main cause of workplace accidents in the theory of ILCI Loss Causation Model from Bird and Germain (1992).

Variables of age, years of service, level of education and knowledge are personal factors of the research respondents which are the basic causes of accidents. Basic cause is the underlying cause or factor in general for an accident or event (Tarwaka, 2016). According to Tarwaka (2016) there are two things that become the basic causes of accidents, namely personal factors that cause someone to take unsafe actions and work factors that result in unsafe conditions.

The Analysis of the Relationship between Age and Substandard Act in Using PPE

The age referred to in this study is the age of workers calculated from the year of birth to the year of the study. Table 3 shows that the age of workers has a very weak relationship with substandard act in using PPE. Workers who are getting older would have a tendency to act more below the standard in using PPE. The weak level of the relationship between age and substandard act in using PPE in this study was caused by the majority of respondents at a young age level with a minimum age of 22 years and a maximum age of 34 years, so that the observation and comparison of substandard action in the older age range could not be carried out.

The results of this study are in line with the study conducted by Septiana (2014) which showed

that there was no significant relationship between the age of workers and unsafe actions. Pratama (2015) also stated that there was a very flexible relationship between age and unsafe actions; this indicated that there were other factors that dominated the occurrence of unsafe actions done by the research respondents.

The research conducted by Mahardika (2017) supported the results of this study by stating that older workers have a tendency to take more actions that are not in accordance with the procedure. The results in this study contradict the theory of Suma'mur (2014) which stated that experience for accident awareness increased according to the increase in age, years of service in the company and the length of work of workers in the workplace concerned.

The Analysis of the Relationship between Working Period and Substandard Act in Using PPE

The period of work meant in this study is the length of work that is counted from the first year working in PT. INKA (Persero) until the time this research conducted. Table 4 shows that working period had a very weak relationship with the substandard act in using PPE. The relationship between those variables showed a negative relationship which means that the longer the workers work in the company the higher their tendency to do more non-standard act in using PPE, this is not in accordance with the study conducted by Suma'mur (2014) which stated that experience for accident awareness increased according to the increase of age, working period in the company and the length of work in the workplace concerned. The weak relationship between age and substandard act in using PPE in the study was due to the majority of respondents in the study having a working period of months or less than 1 year, so the research respondents did not know in depth the ins and outs of the work and safety (Suma'mur, 2014).

The results in this study are in line with the research conducted by Mahardika (2017) that stated that workers with longer working period do a lot of actions that are not in accordance with the procedure. Another study that supports the results in this study is the study done by Septiana (2014) which stated that there was no significant relationship between age and unsafe actions committed.

New workers do not yet have in-depth knowledge about the company along with its safety, besides

that new workers have a tendency to prioritize the completion of a job without regard to safety. In this regard, safety issues must be explained to new workers to increase awareness and attention to safety when carrying out work (Suma'mur, 2014).

The Analysis of the Relationship between Education Level and Substandard Act in Using PPE

The level of education meant in this study is the level of education achieved by workers at the time this study was conducted. Table 5 shows the results that there was a very weak relationship between the level of education and the substandard act in using PPE. The results of the analysis showed that the higher the level of education of the workers, the better the actions of workers in using PPE according to the standards set.

The results in this study are in accordance with the research conducted by Pratama (2015) which stated that there was a weak relationship between the level of education of workers and unsafe actions committed. The research that supported the analysis in this study is the research conducted by Rakhmawati (2017) which stated that there was no relationship between education and compliance with the use of PPE that is in accordance with the Standard Operating Procedure (SOP). The level of education of a person can influence the patterns of thinking and actions of that person in carrying out his/her job.

The Analysis of the Relationship between Knowledge Level and the Substandard Act in Using PPE

Knowledge is one of the important things in establishing one's behavior. The knowledge meant in this study included the level of knowledge of the respondents related to the definition, type and usefulness of the Personal Protective Equipment for welding. Knowledge is one of the important elements in forming a person's behavior. According to Notoadmodjo (2003) behavior is all activities or human activities, both of which can be observed directly or indirectly by others.

The results of this study indicated that there was a weak relationship between knowledge and substandard act in the use of PPE in LRT train welding projects with a negative relationship direction. Workers with an improved level of knowledge had a tendency to commit nonstandard act in using PPE.

The results showed that all research respondents had a good level of knowledge but committed nonstandard act in using PPE. In other words, the high level of knowledge of the workers did not make them take action according to the standard set. This is not in accordance with the study done by Suma'mur (2014) which stated that the increase in workers' knowledge about how to work and practice is expected to decrease the possibility of accidents or unsafe actions.

The results of the research conducted by Andriyanto (2017) supported the results of this research that knowledge has a strong weak relationship with the behavior of using PPE. The higher the level of knowledge of the workers, the better their behavior in using PPE. Mahardika's research (2017) also supported the results of this study which explained that although all respondents in the study had good knowledge, all of them took actions that were not in accordance with the procedures. The results of another study that supported the analysis of the level of knowledge with substandard actions in this study was the research conducted by Syamtingrum (2017) which stated that knowledge has a different or negative relationship direction with unsafe actions.

The results in this study are not in accordance with the theory put forward by Ady (2016) which stated that one's knowledge has a role in interpreting the stimulus obtained. The level of knowledge of respondents in the study can increase awareness of workplace accidents both for themselves and others in the work environment.

CONCLUSION

PT. INKA (Persero) is committed to provide protection to all workers related to safety and health with one of the efforts through the availability of PPE in all work units in accordance with the types of potential hazards and occupational risks. PT. INKA (Persero) has carried out good maintenance efforts on PPE that are available throughout the company environment by providing all supporting facilities and infrastructure.

Workers that did LRT train welding projects in Carbody Assembling division in PT. INKA (Persero) had an average age of 22-25 years with a work period of less than 1 year and has the education level of high school or equivalent. All workers in LRT train welding project in Carbody Assembling division in PT. INKA (Persero) had a good level of

knowledge related to Personal Protective Equipment for welding.

All workers in LRT train welding project in Carbody Assembling division in PT. INKA (Persero) performed substandard action in using PPE. However, 2 of them did not use more than 6 types of PPE in accordance with the company standard.

Factors of age, years of service, and the level of knowledge of the respondents had a weak relationship associated with the substandard action or substandard act they committed in using PPE with a negative relationship direction. The results of the statistical analysis showed that the increase in age, years of service and level of knowledge of the research respondents would increase the tendency to do action below the standard in using PPE. The education level of the workers had a weak relationship related to the substandard action in using PPE with a positive direction. This means that the higher level of education, the better the workers in using PPE according to the company-specified standard.

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