Scientific Journal Impact Factor (SJIF) : 5.278
International Journal of Modern Trends in Engineering and Research
IJMTER
ISSN (ONLINE) : 2349 - 9745
ISSN (PRINT) : 2393 - 8161

THE INFLUENCE OF PERSONAL FACTORS AND JOB FACTORS TO SUBSTANDARD PRACTICE OF USING PERSONAL PROTECTIVE EQUIPMENT (PPE) ON MAINTENANCE WORKERS AT CEMENT INDUSTRY

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Abstract-Substandard practice is the biggest support in accident. The result of inspection was done by Safety Department at Juli 2017, they found 13 substandard practice of using personal protective equipment (PPE) which done by maintenance workers. Substandard practice of using PPE by workers that uncontrolled can increased severity of work accident. This research was an observational research with cross-sectional approach with 54 maintenance workers as a sample. Primary data was collected by conducting interviews to fill out questionnaires to know about work experience and knowledge of PPE as a personal factors and training of PPE and supervision of PPE as job factors. In addition, observations were made to determine the behavior of using PPE. There was significant influence between training of PPE (p=0.000) and there were no significant influence between work experience (p=0,118), knowledge of PPE (p=0,018), and supervision of PPE (p=0,022) to substandard practice of using PPE. It is necessary to make an improvement of feedback system (reward and punishment) by supervisor and increasing supervision intensity regularly and scheduled. Supervisor also needs to note and report PPE's inspection regularly as evaluation material.

Keywords-Personal Protective Equipment, Substandard Practice, Personal Factors, Job Factors

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I. INTRODUCTION

Based on data from BPJS Employment in Indonesia, there were 123,000 cases of occupational accidents occurring during the year 2017. This number increased 20% of the number of occupational accidents cases in the previous year. Occurrence of occupational accidents will certainly result in losses of either process losses, property damage or life-threatening damages such as injury, disability, or death (Bird and Germain, 1986).

The magnitude of losses due to accidents encourage companies to make efforts to suppress and control all potential risks and hazards in the workplace. Technically-administrative control measures are the principal control measures that are absolutely strived until the level of risk can be reduced to the maximum extent possible to the extent permitted. While such controls are still not effective in reducing the likelihood of hazards and causing residual risks, the PPE should be used in accordance with standard safe work procedures. The use of PPE is so important that PPE is chosen as the final stage of control as a tool that can protect the worker's body from the severity of workplace accidents. (Tarwaka, 2014).

The great advantage of PPE will not be optimal if the worker fails to use PPE properly and not in accordance with the safe working procedure standard (substandard practice use of PPE). The basic factors that lead the workers to using PPE improperly at work including lack of policy, training, facility of PEE, and personal aspect/factors of the worker such as age, motivation, work experience and workers knowledge (Agustine, 2015)

APD should be provided by the company and used by workers while they were working, used according to appropriate procedures and with continuous supervision so that the use of PPE becomes optimal to reduce the severity of work accidents. Although the effort to control hazard exposure has been done as a top priority, it is estimated that human negligence is a contributing factor in the occurrence of occupational accidents that is 84% -94% (Salminen, 1996). Bird and Germain (1992) revealed that the immediate cause of occupational accidents is dominated by unsafe behavior (substandard practice). The emergence of substandard practice is a series of causal reasons behind the basic causes of personal factors and job factors and lack of control management such as the policy, standard working procedures, coaching program, supervision and understanding of the workforce of the procedure. Basically, the behavior of PPE usage can be studied and improved by identifying and controlling the management factor as the main causal factor and personal factor and job factor as the basic cause of the behavior of using PPE (Bird and Germain, 1992).

The company has a safety commitment by applying the zero accident mission. Thus, various preventive measures to control risks and reduce the incidence of occupational accidents are carried out, such as engineering control, administrative control, and the provision of PPE as well as the regulation of liability for the use of PPE as the controller for the severity of occupational accidents. The existence of rules and risk control efforts that have been executed by companies and the benefits of the use of PPE is important,it does not guarantee all workers are able and confident to use PPE because of the fact there are still many workers who have not been consistent and ignore the use of PPE. Therefore it is necessary to do research on the factors causing substandard practice of using PPE by identifying management control, personal factors and job factors. This research aimed to analyze influence of personal factors (work experience and knowledge of PPE) and job factors (training and supervision of PPE) with substandard practice of using PPE by maintenance workers.

II. MATERIALS AND METHODS

This research is an observational research with cross-sectional approach. The study population was all maintenance workers (N=63). The sampling technique was determined by simple random sampling. The sample in this study were 54 people. Data collection was conducted in March 2018.

Data collection of personal factors (work experience and knowledge of PPE) and job factors (training and supervision of PPE) used questionnaires and direct interviews to respondents. Substandard practice of PPE usage measured by observation to respondent's behavior on using personal protective equipment. Secondary data was obtained through document and record which documented by the company's Health and Safety Department.

Objectives and benefits of the study were explained to respondents orally and in awritten format attached to the questionnaire. A written consent was obtained from those who agreed to participate. Data was analyzed using SPSS. All tests were performed at level of significance of 5%. Data processing is presented in the frequency distribution table. Influenced Analysis of independent variables with dependent variable used Logistic Regresion Test.

III. RESULT AND DISCUSSION

1. Frequency Distribution of Personal Factors and Job Factors

Frequency of personal factors (work experience and knowledge of PPE) and job factors (training and supervision of PPE) are presented in table 1

Table 1. The Frequency of Personal Factors (Work Experience and Knowledge of PPE) and Job Factors (Training of PPE and supervision of PPE)

Independent Variables	Respondents	
	n=54	%
Personal Factors		

Independent Variables	Respondents	
	n=54	%
Work Experience		
< 5 years	20	37,0
≥ 5 years	34	63,0
Knowledge of PPE		
Lack	10	18,5
Good	44	81,5
Job Factors		
Training of PPE		
Lack	18	33,3
Good	36	66,7
Supervision of PPE		
Lack	19	35,2
Good	35	64,8

Table 1 showed that on personal factors variables of work experience and knowledge of PPE, most respondents with a 63% percentage have a work experience of ≥ 5 years. Meanwhile, 81,5% of respondents have good knowledge of PPE. On job factors variabels of training of PPE and supervision of PPE, most respondents (66,7%) stated their assesment that PPE training conducted by corporate management was good. A total of 35 respondents with a percentage of 64,8% stated their assessment that supervision of PPE conducted by supervisors is good.

2. Frequency Distribution of Susbtandard Practice Of Using PPE

Frequency distribution of substandard practice of using PPE are presented in table 2

Table 2. Frequency Distribution of Substandard Practice of Using Personal Protective Equipment (PPE)

Dependent Variables	Respondents	
	n=54	%
Substandard Practice Of Using PPE		
Using PPE properly (Standard Practice)	39	72,2
Do not use PPE properly (substandard Practice)	15	27,8

Table 2 above shows that based on the observation, most of the research respondents use PPE properly according to standard when doing work in Maintenance Workshop, that was with percentage 72,2% while 27,8% other respondent do not use PPE properly and according to standard. The results of this observation indicated that some respondents do substandard practice of using PPE.

3. Cross Tabulation of Work Experience, Knowledge of PPE, Training of PPE, and supervision of PPE With Substandard Practice of Using PPE.

Cross Tabulation of Work Experience, Knowledge of PPE, Training of PPE, and supervision of PPE With Substandard Practice of Using PPE are presented in table 3.

Tabel 3. Cross Tabulation of Work Experience, Knowledge of PPE, Training of PPE, and supervision of PPE With Substandard Practice of Using PPE.

Variables		Substandard Practice of Using PPE				Total	
		Standard Practice of Using PPE		Substandard Practice of Using PPE			
		N	%	N	%	N	%
Work Experience	< 5 years	17	85	3	15	20	100
	≥ 5 years	22	64,7	12	35,3	34	100
	Total	39	72,2	15	27,8	54	100
Knowledge of PPE	Lack	4	40	6	60	10	100
	Good	35	79,5	9	20,5	44	100
	Total	39	72,2	15	27,8	54	100
Training of PPE	Lack	6	33,3	12	66,7	18	100
	Good	33	91,7	3	8,3	36	100
	Total	39	72,2	15	27,8	54	100
Supervision of PPE	Lack	10	52,6	9	47,4	19	100
	Good	29	82,9	6	17,1	35	100
	Total	39	72,2	15	27,8	54	100

Repondents who used PPE properly by standard are workers who have work experience <5 years (85%) and ≥ 5 years (64,7%), whereas most respondent that did not use PPE properly by standard was respondent with work experience ≥ 5 years (35.3%). Respondents who have less knowledge of PPE, 60% did not use PPE properly. Respondents with good knowledge of PPE were 79.5% using PPE properly and standard.

Respondents who stated that PPE training was less, most did not use PPE properly and according to the standard (66.7%). Respondents who stated good on PPE training as much as 91.7% had used PPE properly. Majority (82.9%) of respondents who stated PPE supervision is good, they have been using PPE properly and standard while 47.4% of workers who stated PPE supervision are less, they did not use PPE properly.

4. The Influence of Personal Factors (Work Experience and Knowledge of PPE) and Job Factors (Training of PPE and supervision of PPE) To Substandard Practice of Using PPE.

The influenced of personal factors (work experience and knowledge of PPE) and job factors (training of PPE and supervision of PPE) with substandard practice of using PPE are presented in table 4.

Table 4.The Influence of Personal Factors (Work Experience and Knowledge of PPE) and Job Factors (Training of PPE and Supervision of PPE) With Substandard Practice of Using PPE

No	Variables	*P-value*	*Prevalence Ratio(PR)*
1	Work Experience	0,118	-
2	Knowledge of PPE	0,018	-
3	Training of PPE	0,000*	8,07
4	Supervision of PPE	0,122	-

**significant*

The result of analysis by using multiple logistic regression test showed that there were influence of training of PPE (p=0,000 and PR=8,07) while work experience, knowledge of PPE, and

supervision of PPE does not have significant influence on the substandard practice because they do not qualifyed on multiple logistic regression. Respondents who stated PPE training is lack were at risk in doing substandard practice of PPE usage 8.07 times greater than those who stated that the PPE training is good.

PPE training has a significant influence on substandard practice of PPE usage in maintenance workers. Purnamasari (2015) concluded that there was a significant correlation between Occupational Health and Safety training with substandard action on 1 and 2 machine maintenance workers at Power Plant Industry. Previous study by Marion et al (2004) stated that lack of training influences workers awareness to use PPE even though they understand occupational hazard and was prone to work accident. PPE training needs to be given by the company to all workers on a regular and ongoing basis to improve and increase the knowledge, skill, and behavior so that PPE training should be tailored to the specificity of work and worker needs.

The statistical results of the study showed that the supervision of PPE does not influence the substandard practice of using PPE. The more effective of PPE supervision applied was not necessarily the more positive the workers behavior in using PPE according to the standard. This is because workers who stated that supervision of PPE is good also do substandard practice of using PPE. The results of this study contradict the results of research by Rakhmawati (2017) there was a relationship between supervision with compliance use of PPE by welder. According to observation, still found some workers who did not use PPE (gloves) when there were supervisors around them while doing a cutting job. Awareness of supervisors on the use of workers PPE was low.

Bird and Germain (1992) stated that the supervision (controlling) was one of the important management functions in the work accident control efforts. If there was a lack in the implementation, it will lead to the emergence of unsafe act (substandard practice). According to Roughton (2002) one of the disadvantages of the rules of salvation was simply writing, but not supervising its activities. Workers will tend to forgot their obligations within days or weeks. Therefore, it takes supervision to enforce the regulations at work**.**

Supervisors should be able to understand the circumstances of his subordinates, such as skills, work habits, including his behavior in using PPE in workplace. Based on research observations, supervisors have not provided feedback on workers behavior in the use of PPE. This is seen during the observation, the supervisor does not directly reprimand the workers that did not use PPE properly while doing fabrication work in the Maintenance Workshop. The role of a supervisor was very important and should be able to make good use of time in speaking, to notify, or reprimand workers who performed unsafe acts and gave praise to workers who act safely and followed safe working procedures.

The results of statistical tests showed that the work experience does not influence the substandard practice of PPE usage by maintenance workers. The results of this study are similar to the research conducted by Agustina (2015) that work experience has no relationship with the use of PPE in Power Plant Industry. Theoretically, someone will behave in accordance with the experience ever done. Positive work experience will have a positive impact on the job well done and safe (Strank, 2007). The higher the work experience of a person in the field of work the more able to complete the job properly and survived, increased work skills and awareness of danger.

The results showed that the higher the work experience of workers, the more that do substandard practice the use of PPE when working. However, the results of this study contradict the results of Zhou et.al (2008) research that the probability of good safety behavior increases from 65.3% to 66.4% as new work experience varies into old work experience. The higher the work experience the more positive (good) safety behavior.

This is because employees feel already understood and accustomed to work with good work in the field of maintenance work so that awareness of the hazards and risks decreased and did not realize that has behaved unsafe i.e work without using PPE according to the standard. Work experience is generally related to skills and accuracy as well as good work in doing the job but not with regard to the habit of using PPE according to the standard. In this case the workers have

cognitive dissonance, i.e inconsistencies between attitudes or beliefs with behavior (Baron and Byrne, 2004). While workers with new work experience (<5 years) mostly use PPE according to the standard because they feel that they need more attention, training, supervision and guidance to increase their experience than those who have long work experience so that they will try or be motivated to show safe behavior every time they doing work. This explains that work experience is not a decisive factor that can influence the substandard practice of using PPE on the maintenance workers.

The results of statistical research indicated that knowledge of PPE does not influence substandard practice of using PPE by maintenance workers. This is because the composition is almost homogeneous about the knowledge of PPE workers are the majority good. In addition, some workers who have good knowledge of PPE also do substandard practice the use of PPE. This result is in line with Santosa's (2012) study which concludes that there is no correlation between the behavior of PPE use from well-informed workers and knowledgeable workers.

Green (1980) states that increased knowledge does not necessarily lead to behavioral change but very important knowledge is given before individuals take action. The action will be in accordance with knowledge if the individual receives a signal strong enough to motivate the individual to act in accordance with his knowledge.

Good workers knowledge is motivated by the implementation of training and information about PPE through communication, information, and education activities of PPE by company. These activities include safety induction, training of PPE, safety communication in the form of safety briefing before doing the job, safety monthly meeting, poster installation and signs of PPE in each work area. As a company that has built commitments and policies to implement safety program especially PPE'sprogram is a good enough capital.

IV. CONCLUSION

This study concluded that there were significant influence between training of PPE with substandard practice of PPE usage while work experience, knowledge of PPE and supervision of PPE does not have significant influence on substandard practice og PPE usage. It is necessary to increase and strengthen the feedback system (reward and punishment), especially from the supervisory party based on the action or practice of workers PPE usage, supervisor and also safety officers need to increase the intensity of supervision periodically and scheduled, site management have to undertakes socialization or improvement or simplifies the procedures for replacing PPE to all workers. In addition, the Supervisor need to conduct a review or corrective action regarding the recording and reporting of PPE inspections. The results of such recording and reporting can be an evaluation material that needs to be communicated to all workers in raising workers awareness to comply and consistently use appropriate PPE when they working.

V. ACKNOWLEDGEMENTS

I would like to express my gratitude to all the study respondents who are willing to participate and all those who helped me in this study.

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