DETERMINANTS OF COMPLIANCE MAINTENANCE WORKERS TO SITE OPERATIONAL PROCEDURE GRINDING MACHINE

Dewangga Lazuardi¹, Y. Denny Ardyanto W.²*, Tjipto Suwandi³

¹ Student Occupational Health and Safety Department, Public Health Faculty, Airlangga University.
² Lecturer of Occupational Health and Safety Department, Public Health Faculty, Airlangga University
³ Lecturer of Occupational Health and Safety Department, Public Health Faculty, Airlangga University

*Corresponding author: Y. Denny Ardyanto W, Indonesia,
Email: denny.ardyanto@fkm.unair.ac.id

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ABSTRACT

Background: Site Operational Procedure (SOP) is a form of standard operating procedure applicable applied by PT. X. Initial review says, 70% of workers grinding maintenance contractor team in maintenance fabrication area do not implement SOP properly. Such behavior leads to workers at risk of working accidents. The purpose of this study was to identify individual factors, work factors, organizational factors and compliance of SOP Grinding Tools machine

Materials and Methods: The design of this research is cross sectional and observational research. The respondents were 54 people with the inclusion criteria, physically fit, had never had an accident and willing to participate in research. The independent variables are individual factors (age, education, years of service, knowledge), occupational factors (supervision and availability of facilities) and organizational factors (communication and training). The dependent variable is the compliance of the Site Operational Procedure (SOP) of the Grinding Tools tool. Data collection techniques such as questionnaires, and observation. The analytical methods used include quantitative descriptive analysis.

Result: Found 27 (50%) of 54 respondents comply with SOP. Multiple logistic regression analysis showed that independent variables significantly influencing SOP compliance were education, knowledge and facilities (p <0.10).

Conclusion: Individual factors and occupational factors have a role for workers to comply with Machine Tool Grinding SOP was greater than organizational factors.

Keywords: Compliance, Site Operational Procedure, Grinding, determinant, individuals, jobs, organization
1.0 Introduction

Based on the number of work accidents in Indonesia in 2011 were recorded about 9,891 cases of accidents, 2,218 of them due to fatal accidents to death, and 65 cases due to violations of work procedures. The number of cases of violations of standard operating procedures in Indonesia increased in 2011 by more than 50% compared to 2010, of which previously 27 cases to 65 cases. (Dyanita, 2017; Kemenaker, 2014; Jamsostek, 2011).

Violation of work procedures due to worker noncompliance is closely related to accident risk. Non-compliance is a behavior (Huda dkk, 2016). Such behavior is basically an unsafe behavior and one of the causes of accident. Unsafe behaviors such as working out of procedure, working jokingly, putting improper tools or items, improper work attitude, working near a rotating device, and running the engine over speed (Saloni dan Ferida, 2016; Aksorn dan Hadikusumo, 2007). This is supported by Heinrich's theory and research result from National Safety Council (NSC) about the cause of work accident, showing that cause of work accident 88% is unsafe behavior, 10% because unsafe condition and 2% unknown cause (DuPont, 2005).

One of the efforts to control accidents is through a hierarchical approach to control, especially at the level of administrative control. Administrative control is the control that governs workers to limit the duration of contact with hazard factors. This control is intended as a rule in writing, it is expected that workers comply with, have enough ability and expertise to work safely. Control of the foregoing and often violated is the standard application of working procedures which are specific instructions in the work process, with due respect to OHS. The work procedure or SOP referred to in this study is called Site Operational Procedure (SOP).

Site Operational Procedure (SOP) is a must-have company to manage every job to avoid the risk of danger. SOP has been described in OHSAS 18001 (2007), is a determination of how to perform an activity or a work process. Furthermore Tambunan (2013) explains, SOP is a set of standard operations used as a basis for the company to ensure the measures are effective and consistent, and meets the standards and systematic. The aim of the SOP is made to avoid errors in the execution of a work process (Patria, 2017).

Compliance is one behavior that is influenced by internal and external factors. Based on the research of Bates and Holroyd (2012), the problem that often occurs in failure to comply with the SOP is that workers do not want to study the behavior that caused the accident. The behavior is maintained without any improvement. This failure falls within the scope of worker factors in the workplace accident. The Company also has an important role in creating compliance with SOPs in the workplace. The company has an obligation to socialize, provide training and conduct supervision so that SOP is executed properly.

Bates and Holroyd (2012) also explained that there are three factors will influenced the worker's compliance to SOP, are individual factors, occupational factors, and organizational factors. Individual factors include knowledge, personality, and motivation. Job factors include supervision and availability of facilities. Organizational factors include communication, training, OSH culture, workload, and time pressure. These three factors indicate factors that cause SOP compliance not only from the workers alone, but also the role of the company's management. In this study, researchers focused on SOPs with a special scale in grinding to
see the factors that influence adherence to them. The three factors that influence SOP compliance are dynamic and interactive. The change of one factor will also affect the other two factors. For example, behavior in avoiding accident risk often involves changes in the environment and leads to an attitude consistent with safe behavior (Geller, 2001).

Individual factors such as new hires which less experience was one caused of non-compliant behavior against SOP. Workers often do not understand what the safe workplace isolation area procedures, why they to use protective equipment and how to avoid danger. Other factor such as supervision of workers in the area of maintenance is still less done. Based on safety officer interviews, intensive monitoring just done on high risk area or work activity such as production area.

Companies will be hard to control the terms of individual factors, because it arise from within the worker. Job factors and organizational factors such as supervision, availability of facilities, training and interpersonal communication, can be used to control a compliance behavior issues against SOP.

Accordingly, the aim of the present study was to identify the compliance of grinding workers and to examine the correlation between individual factors, occupational factors, organizational factors and their compliances to SOP.

2.0 Materials and Methods

This research was an observational studied and quantitative approached with cross sectional design. It conducted at a large company of cement industry during the month of August 2017 until June 2018 (PT. X). A random sampling test was used in this research to calculate minimum sample required, using Sample Size version 2.0 software’s by Stephen K. Lawanga & Stanley Lemeshow. There was 74 workers of grinding machines population size were set by the criteria; physically fit, had never had an accident before and willing to participate in research. And the sample size calculated result was 54 respondents.

The independent variables of this study are individual factors (age, education, years of service, knowledge), occupational factors (supervision and availability of facilities) and organizational factors (communication and training). The dependent variable is, compliance to Site Operational Procedure (SOP) Tools Grinding engine. Technique of collecting data by filling questionnaire valid about individual characteristic, supervision, facility availability and compliance. Furthermore, the direct observation of the respondents related to compliance with Operational Site Procedure (SOP) Grinding Tools machine. The observations were made and filled by a researcher observing the respondent during the work using a checklist sheet which has been adapted to SOP Tools Grinding machines owned enterprises. The analytical methods used are quantitative descriptive analysis with logistic regression test.
3.0 Result

3.1 Individual Factors

Most respondents are in the age range of 21-36 years, 28 people (51.9%) and 51.7% of them do not comply with the SOP grinding tools. Meanwhile, respondents who responded to the SOP compliance more in the category of age over 37 years of 57.7%.

Workers tend to have worked within the 1 to 5 year span, where in that range most of the work for 1 year. Behavior obedient to SOP machine grinding tool is illustrated in the category of workers whose working period is more than 6 years (53.1%).

Characteristics of respondents in this study 74.1% has received the last education level of Senior High School and Junior High School, so that there are 55% of respondents behave obediently and 45% disobey the SOP at the level of education. The majority of 47 respondents (87.0%) knew that the grinding tool machine work procedures were in good category and 55.3% of respondents who obeyed the grinding tools machine SOP.

3.2 Job Factor

The results of the SOP supervision questionnaire on PT. X are mostly in good category as many as 32 respondents (59.3%). Similarly, the availability of facilities (74.1%) in grinding work is expressed by most respondents in either category.

3.3 Organizational factor

The majority of Site Operational Procedure training on grinding work has gone well, 38 respondents (70.4%) by behaving in compliance with SOP equal to 52.6%. Similarly, communication between Grinding Tools Machine Workers of PT. X which tends to go well. It can be seen from the presentation category of communication in both categories of 68.5% by behaving SOP comply with the percentage of 52.6%.

3.4 Compliance with Machine Tool Grinding SOP

Compliance of respondents to Site Operational Procedure found categorized obediently, 27 respondents (50%) this is as much as respondents who are not obedient in Site Operational Procedure.

3.5 Compliance test results for Machine Tool Grinding SOP and Its Factors

The statistical test in this study used logistic regression test. Variables in the test are individual factors, work factors and organizational factors. Each variable is tested to see the value of the significant influence and strength of the relationship.
The results of multiple logistic regression tests (p <0.10) indicate that the variables of education, knowledge, and availability of facilities affect the compliance of SOP grinding tools and each variable has a different relationship strength. Based on these results can explain that:

- **a.** Workers with tertiary level education will have a better chance of not adhering to the SOP of grinding tools than those with middle and high school education. Education has a significant effect with the value of the relationship strength of 0.649.

- **b.** Workers who have good knowledge will be more likely to behave obediently to SOP grinding machine tools compared with less knowledge related to SOP. Knowledge has a significant effect on the value of its relationship strength of 3.872.

- **c.** The availability of good grinding facilities in the workplace will be more likely to make the workers comply with the SOP grinding machine tools compared with the availability of bad facilities. The influence given to the availability of facilities is of significant value and its relationship strength is 1.540.

### 4.0 Discussion

The results of the research in the maintenance contractor department found that age was one of the variables that did not have a significant influence on the compliance with the SOP grinding tool machines. The age variable value that has no influence also does not have an attachment relationship with the worker's compliance to SOP machine grinding tool. The majority of workers aged 21-36 years are more likely to behave in non-compliance with SOPs than respondents aged over 37 years. The age 21-36 years is a category of early adulthood, the age was the transitional period, physical, intellectual and social role transition to begin for work and social relationships (Department of Health, 2009).

The transition period can be interpreted that physically and intellectually respondents are ready to work and interact socially with adjustments to the role and work environment. It can be concluded that most of the study respondents tend to have started a sufficient age or mature for work and social interaction in the workplace. As described by Apriluana et al (2016), the 26-35 year age range is considered an important and stable period of interaction in the world of work. Related research results show that the working life working life does not have a significant effect on adherence to SOPs grinding machine tools. The results in these variables also can not show that length of service and compliance have a relationship attachment.
between the two. This may explain that workers with a working period of 1 to 5 years or more than 6 years can not be sure they will comply with the SOP or not.

Workers with sufficient experience tend to ignore safety procedures at work. In line with the research of Kurniawan et al (2006), that the work period is not related to the practice of implementing workplace safety procedures. Workers who have been working in the company are usually more familiar with the work and the working environment rather than labor has not been working. Workers over five years of age tend to be more understanding of their work, but often workers who feel their job is safe from potential dangers will ignore their work procedures. This is called to believe that unsafe working habits are an acceptable standard, which is actually the basic cause of unsafe behavior in work (Mahzun, 2006).

Furthermore, education was found not to be associated with adherence to SOP grinding machine tools. The majority of educated workers at junior and senior high school levels, of which largely behave disobediently to SOP machine grinding tools. Some statements in research on high school graduates such as SMK mention that their age is too young to work and knowledge and skills are considered inadequate (Baiti and Munadi, 2014). However, in this study the statement can be understood based on the role of respondents as the company's trained workforce, especially in the operation of grinding machines. This is acknowledged by supervisors not as the main problem, considering the company continues to support by running training programs on a regular basis, both skills and safety. This is in line with the Kaloa et al (2017) study, that there is no correlation between education level and adherence to SOP in medical personnel. In addition to education, respondents' knowledge about grinding is an important factor to see their compliance with SOP grinding tools. Walau hasil pada penelitian ini menunjukkan tidak terdapat hubungan antara pengetahuan dengan kepatuhan SOP mesin tools grinding, namun pengetahuan responden dalam memahami SOP gerinda dinilai cukup baik dimana sebagian besar responden berada pada kategori pemahaman yang baik terhadap SOP. In line with the results of crosstabulation showing the majority of well-knowledge workers also behave in compliance with SOPs. This can explain that knowledge plays an important role in shaping workplace behavior, including the behavior of complying with work procedures (Pradipta et al, 2016).

Job factors are one of the support systems of workers' behaviour formation. In this study it was found that having a good supervision and provision of facilities encourages the distribution of employees' obedient behaviour to SOP greater than non-compliant behaviour. The reason why the supervision in this study is considered good by the worker, because the supervision is applied through a group or team work, where one supervisor appointed in each team will supervise several mechanical workers. This method is in line with the supervisory objectives described by Hughes (2010) that supervision aims to support, ensure and develop the knowledge, skills and values of people supervised, either individually or in groups, so that control over work processes can be safe and targeted.

O'Dea and Flin (2003) have stated that supervisors are a key in the prevention of industrial accidents. The role of supervisory work performance control is the biggest influence factor in the success of accident prevention and the quality of good supervision ultimately becomes an important role in the management of accidents within a company.
The work factor that also becomes a benchmark for compliance with SOP Grinding in this research is the availability of good grinding facilities in the workplace. According to Mongkaren (2013), facilities are a means to smooth the implementation of work functions. Facilities that are always complete and available in the workplace will provide convenience and generate greater profits and create work efficiency. In line with Mongkaren (2013), this study significantly found great opportunities for workers to comply with SOP grinding machine tools with good grinding facilities.

The availability of good facilities has been proven by the real implementation by PT. X through the provision of facilities of good grinding equipment, safety for grinding equipment, grinding procedures, quality PPE and can be accessed easily. This is nothing but aimed at protecting workers from work disruptions, preventing work accidents directly and can reduce the risk of serious accidents at work in long term used (Setiawan et al., 2011).

A good company will always develop the quality of its workers by providing tiered training. In addition, well-created communication in the workplace will encourage superior communication behaviour to subordinates or fellow co-workers as well. Both factors are one of the main factors in organizational factors.

An overview of organizational factors through training and communication in this study shows that the training of Site Operational Procedure on grinding work has been going well. Just as in communication between workers Machine Tools Grinding PT. X is progressing well. However, organizational factors were examined in this study did not have a significant relationship with adherence to SOPs grinding machine tools statistically. Another research shows that there is no significant relationship between supervision and compliance with SOPs. Possible causes are surveillance and communications made most of the running either, which means that the supervisor is responsible in performing their duties and communications can be received by every level element.

5.0 Conclusion and recommendation

Individual factors, education of equivalent workers of junior high/high school and have knowledge about SOP well, would have greater chance to comply to SOP Grinding, as well as the availability of adequate facilities. In this study individual factors and occupational factors tend to have a role to worker compliance to Machine Tool SOP Grinding is greater than organizational factors.

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Declaration

Author(s) declare that the data collection was carried out after the research proposal passed the ethical test and was passed by the Airlangga University Public Health Faculty Ethics Commission. All research respondents have been given explanations and information about the purpose and method of this research and have signed the form of willingness to be respondents.

Author’s contribution

Author 1: Dewangga Lazuardi as a researcher and author of this article. Student of Occupational Health and Safety Department, Public Health Faculty, Airlangga University
Author 2: Y. Denny Ardyanto W. As a co-author and supervisor while being a lecturer of Occupational Health and Safety Department, Public Health Faculty, Airlangga University.
Author 3: Tjipto Suwandi as a co-author and Professor of Occupational Health and Safety Department, Public Health Faculty, Airlangga University

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