



The Effect of OSH Knowledge and The Applied Reward and Punishment on Students' Safety Behavior

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Abstract

This study aims to determine the effect of OSH knowledge and the application of reward and punishment on students' safety behavior at Berbah National Vocational School. In addition, this study also aims to determine the simultaneous effect of OSH knowledge variables and the application of rewards and punishments on students' safety behavior. This research is associative research with a quantitative approach. The research subject in this research were fifty-two students. The data analysis technique used descriptive statistical analysis of multiple linear regression, t test, F test and R². The results of this study indicate (1) OSH knowledge has a positive effect on students' safety behavior with the results of $t_{2.642} > t_{table\ 2.009}$ and $p\text{-value of } 0.001 < 0.05$; (2) reward and punishment has an effect on students' safety behavior with the results of $t_{2.296} > t_{table\ 2.009}$ and $p\text{-value } 0.001 < 0.05$; (3) OSH knowledge together with applied reward and punishment simultaneously affect students' safety behavior during learning practice at Berbah Vocational School with the results of $F_{8.678} > F_{table\ 3.19}$ and a $p\text{-value of } 0.001 < 0.05$.

Keywords: OSH Knowledge, Students' Safety Behavior, Reward and Punishment

1. INTRODUCTION

Occupational safety and health (OSH) always gain special attention throughout the world in relation to efforts to reduce the number of work accidents. The number of work accidents in developed countries has decreased, but this is different from that in developing countries, which are currently still increasing, including in Indonesia. According to the ILO, Asia Pacific has experienced 1.8 million deaths due to work accidents every year since 2018, with more than 250 million accidents on a global scale. Countries in Asia Pacific need to work harder to reduce the number of work accidents, including Indonesia.

The number of work accident in Indonesia continues to increase from 2017-2022, reaching a record at the end of 2022 according to data from the Minister of Manpower. BPJS Ketenagakerjaan data recorded 265,334 work accident cases in

Indonesia in January-November 2022, an increase of 13.26% from the previous year. Accidents mainly occur in the work environment in the morning. BPJS Ketenagakerjaan paid 1.79 trillion for claims in 2021. Most work accident cases occur in factory environments, this may indicate a lack of knowledge and awareness of occupational safety and health. Safety learning is identified as a key factor in reducing workplace accidents, with an important role in increasing awareness of occupational safety and health. Experts agree that occupational safety and health education should be taught at the early age. Vocational School is the right level of education to start providing occupational health and safety knowledge and skills because Vocational Schools are work-oriented educational institutions.

Work safety is a means of preventing accidents, disability and even death [1]. Occupational safety and health is an activity that has the aim of ensuring the safety and comfort of workers in a work environment by reducing the risk of work accidents. Efforts to prevent work accidents include having occupational safety and health behavior by every worker (and prospective worker) from an early age. Vocational high schools are the proper institutions to form awareness of occupational safety and health behavior [2]. An adequate occupational safety and health knowledge and skills should be given at this level of school because students at vocational high schools will learn with tools and machines that have the potential to cause work accidents. Instilling awareness of occupational safety and health behavior needs to be supported by adequate knowledge, family support in discipline, application of appropriate rules (reward and punishment) so that students have appropriate knowledge and occupational safety and health behavior.

Continuity in upholding an attitude of discipline and a sense of responsibility during the learning process is very important. Therefore, it is hoped that the use of reward and punishment methods in learning can stimulate students' enthusiasm for learning. According to [3] as quoted by Setiawan [4], rewards in the context of educational implementation are considered an important element in learning methods to motivate students. Apart from providing rewards, it is also important to balance the implementation of sanctions. [4] states that punishment is given to vocational high school students who carry out practical learning in workshops [5]. Vocational high schools are educational institutions that prepare workforce needs in the industrial world [6]. The research will be conducted at Berbah National Vocational High School which provides practical learning for Light Vehicle Engine Maintenance in the Automotive Light Vehicle Engineering study program which really requires knowledge of occupational safety and health. Knowledge of occupational safety and health is an important factor in efforts to reduce the risk of accidents in the workplace [7]. The problem at the Berbah National Vocational High School is that there is an indication of a lack of knowledge and application of reward and punishment methods for occupational safety and health behavior in class XI students in the Automotive Light Vehicle Engineering Study Program. Because there are still many students' behavior that do not implement occupational safety and health properly and ignore the

risk of danger in using personal protective equipment during practical learning in workshops. This research was conducted with the aim of determining the influence of occupational safety and health knowledge and the application of reward and punishment on students' occupational safety and health behavior in Automotive Department at Berbah National Vocational High School.

2. METHODS

This research is associative research with a quantitative approach and was carried out at the Berbah National Vocational High School. The subjects used in this research were class XI students of the Automotive Light Vehicle Engineering Study Program with a total of 52 students. Class XI students are the subjects of this research because they are already given the safety materials (in the practice briefing at least) and experienced in practicing welding process in the workshop. Class X students are unexperienced students since they just enter the school. Class XI students are in the industries for apprenticeship. The instrument used in the research was a questionnaire distributed using paper sheets offline. The validity of the questionnaire is using expert judgement and product moment correlation technique. The reliability of the questionnaire is measured using internal reliability testing. The instruments of this research were in the form of multiple-choice questions for the occupational safety and health knowledge variable and the Likert scale in the form of statements for the reward and punishment variables and occupational safety and health behavior. To get the final judgement of the students' knowledge, the scores of the tests are classified into four (4) levels which are very high, high, low and very low. All of the data from safety knowledge variable and reward and punishments and also OSH behavior are in nominal. Multiple linear regression analysis are used to test the hypothesis of the research

3. RESULTS AND DISCUSSION

Research results show that the knowledge of occupational safety and health of class low, and 15% fall into the low category. Some of the causal factors include a lack of awareness of the importance of occupational safety and health, inadequate curriculum, less interactive teaching methods, and individual factors. Meanwhile, the level of reward and punishment tendency for students in the Automotive Light Vehicle Engineering skills program is 0% in the very high, 1% high, 48% low and 50% very low categories. Factors that cause this low level of tendency involve a lack of consistency, a lack of understanding regarding the importance of reward and punishment, a lack of awareness of effective techniques, and a mismatch between methods and student characteristics. Apart from that, students' occupational safety and health behavior also tends to be very low, with 0% very high, 2% high, 42% low, and 56% very low. Some of students have not behaved properly in occupational safety and health, such as not obeying regulations, not using personal protective equipment,

not keeping the workplace clean, and not following work procedures when carrying out Light Vehicle Engine Maintenance practicum.

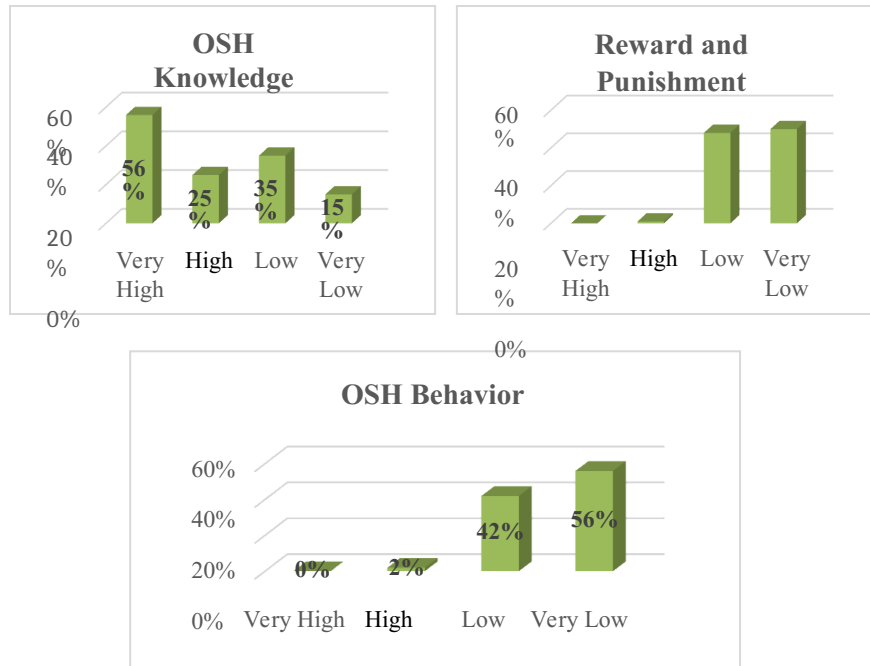


Figure 1. Research Variable Trend Categories

The results of multiple linear regression analysis found an equation that showed the relationship between OSH behavior and two independent variables, namely OSH knowledge with reward and punishment. The regression equation formula are as follows:

$$Y = 17.203 + 0.631 X1 + 0.282 X2$$

Information:

Y = Occupational safety and health behavior variable

X1 = Occupational safety and health knowledge variable

X2 = Reward and Punishment Variable

17.203 = Constant

The regression coefficient for each variable shows that a one unit increase in OSH knowledge together with reward and punishment variable will result in an increase in occupational safety and health behavior of 0.631 and 0.282. The higher level of student's OSH knowledge means the higher the student's implementation of

occupational health and safety. The constant value of 17.203 shows the level of occupational safety and health behavior that is expected when students have zero or minimal levels of OSH together with reward and punishment.

Table 1. Results Of The T Test Analysis

Variable	T Test		F Test		R ² Test
	t	p-value	F	p-value	
OSH Knowledge	2,642	0,001	8,678	0,001	0,262
Reward and Punishment	2,296	0,001			

The results of the t test analysis revealed that each of the reward and punishment occupational safety and health knowledge variables individually showed a significant influence on students' occupational safety and health behavior with a p-value <0.05. This reveals that each variable has an important role in determining the level of student occupational safety and health behavior in the PMKR practicum. Furthermore, the results of the F test analysis also provide significant confirmation with a p-value of 0.001 < 0.05. These results indicate that the two variables simultaneously have a significant impact on students' occupational safety and health behavior in the Light Vehicle Engine Maintenance practicum. The coefficient of determination (R²) of 0.262 indicates that variability in occupational safety and health behavior can be explained by 26.2% by the variables of occupational safety and health knowledge and reward and punishment. The remaining 73.8% of the variation that is not explained by the model can be distributed to factors outside the model, such as environmental factors, student personality, and other aspects that may influence occupational safety and health behavior.

3.1 The Influence of OSH Knowledge on The Students' Safety Behavior

Based on the results of multiple linear regression, the value of occupational safety and health knowledge contributed to an increase of 0.631 units in students' occupational safety and health behavior. These results indicate that the higher the student's level of occupational safety and health knowledge, the higher the student's application of occupational safety and health behavior when practicing Light Vehicle Engine Maintenance. The positive coefficient indicates that occupational safety and health knowledge has a positive effect on students' occupational safety and health behavior.

Furthermore, the calculated t value is 2.642 > t table 2.009 and the p-value is 0.001 < 0.05. The results of the t test accept the first hypothesis that Ke knowledge has a positive and significant effect on students' occupational safety and health behavior. These results indicate that students who have better knowledge of

occupational safety and health tend to show better occupational safety and health behavior in maintaining occupational safety and health. Students may be more aware of the risks of accidents in the work environment and more likely to follow the safety procedures set out in the Light Vehicle Engine Maintenance practicum at the Berbah National Vocational High School.

These findings support the theory that occupational safety and health knowledge has a positive influence on students' occupational safety and health behavior, with measurements using multiple choice questions that can shape students' critical powers. This is in accordance with the views of [8] and [9] regarding knowledge of occupational safety and health which can be measured through questionnaires. This research is consistent with previous findings, such as research by [10] which shows a positive relationship between knowledge of occupational safety and health and occupational safety and health behavior of students, as well as research by [11] and [12] which states that knowledge of occupational safety and health has a positive effect on students' occupational health and safety awareness and behavior. In conclusion, education and training that improves occupational safety and health knowledge in schools can be considered a valuable investment in strengthening students' safety awareness and practices, in accordance with the views of [13].

Based on previous research, it can be concluded that knowledge of occupational safety and health has a positive and significant effect on students' occupational safety and health behavior when practicing in workshops. Students with extensive knowledge of occupational safety and health tend to be more aware of the risk of danger if they do not pay attention to occupational safety and health aspects. Thus, it can be concluded that the higher the occupational safety and health knowledge of class occupational safety and health regulations.

3.2 The Influence of Reward and Punishment on Students' Safety Behavior

Based on the results of multiple linear regression, the value of reward and punishment contributed to an increase of 0.282 units in students' occupational safety and health behavior, which illustrates that students who have a high level of correlation with reward and punishment have a significant tendency to demonstrate occupational safety and health behavior. better. These findings emphasize the important role of students' perceptions of reward and punishment in shaping safety and health behavior in the school environment. Other factors such as awareness of the importance of safety, understanding of risks, and internal motivation can also influence students' occupational safety and health behavior.

The calculated t value is $2.642 > t_{\text{table}} 2.009$ and the p-value is $0.001 < 0.05$. The results of the t test accept the second hypothesis that reward and punishment have a positive effect on students' work safety and health behavior. This indicates that the stricter the application of reward and punishment in practical learning, the higher the

quality of students' work safety and health behavior. The results of this research show that there is a positive impact in implementing reward and punishment strategies to improve students' work safety and health behavior in the school environment. Increasing (tightening) the application of rewards and punishments has a positive impact on increasing students' awareness and compliance with appropriate occupational safety and health behavior by class

This finding is in line with the theory of [14] which emphasizes the important role of reward and punishment in shaping human behavior. [15] research shows that giving gifts can be a positive motivator, encouraging students to try more, and improving the quality of motor skills. Rewards provide positive feedback that reinforces desired behavior, while punishment functions as a deterrence for undesired behavior, creating the sense that negative consequences can be avoided by avoiding certain actions. Research by [16] confirms that reward and punishment have a significant impact on student behavior in the learning context. Providing rewards can be a positive motivation, while punishment acts as a deterrent to risky work accident behavior. The context of using personal protective equipment shows that the application of punishment, such as warnings, has a significant influence on behavior in using personal protective equipment. The importance of consistent supervision and school policies in implementing rewards and punishments is also recognized. The research results underline the need to develop efficient strategies in implementing rewards and punishments to improve students' occupational safety and health behavior, ensuring safety and health in the learning environment.

3.3 The Influence of OSH Knowledge and the Applied of Reward and Punishment on Students' Safety Behavior

F test shows that $F \text{ count } 8.678 > F \text{ table } 3.19$ and $p\text{-value of } 0.001 < 0.05$. The results of the F test accept the third hypothesis that knowledge of occupational safety and health and reward and punishment together have a positive and significant effect on the occupational safety and health behavior of class XI TKRO students in the Light Vehicle Engine Maintenance practicum at Berbah National Vocational High School. These findings illustrate that to create a safe and efficient Light Vehicle Engine Maintenance practicum environment, it is not only enough to increase occupational safety and health knowledge, but it is also important to implement a system that provides positive motivation and consequences for student behavior. A holistic approach that combines aspects of knowledge and behavior management is the key to creating practicums that avoid the risk of work accidents.

The results of the coefficient of determination test (R^2) show an R square value of 0.262, which indicates that 26.2% of the variation in students' occupational safety and health behavior can be explained by variations in the independent variables, namely knowledge of occupational safety and health and the application of reward

and punishment. Meanwhile, the remaining 73.8% is explained by other factors outside the model. Although knowledge of occupational safety and health and the application of reward and punishment have a significant impact on students' occupational safety and health behavior in the Light Vehicle Engine Maintenance practicum at Berbah National Vocational High School, the existence of other variables not included in the model shows the complexity and multi-dimensionality of the factors- factors that influence occupational safety and health behavior. These findings provide a strong basis for the development of more targeted intervention strategies in increasing students' safety awareness and compliance. Schools, by considering other factors, are expected to be able to design holistic and effective programs to create a safe and supportive learning environment for students.

A balance between knowledge of occupational safety and health and the application of rewards and punishment creates a positive influence on occupational safety and health behavior. Occupational safety and health knowledge provides a foundation for risk understanding, while reward and punishment provide additional encouragement to motivate consistent occupational safety and health behavior. The support of both creates an environment where students feel motivated to implement safe and responsible work safety and health behavior, especially in Light Vehicle Engine Maintenance activities at the Berbah National Vocational High School workshop. In conclusion, adequate knowledge of occupational safety and health and support from reward and punishment are key factors in forming a safety culture, in line with previous research findings such as [10],[16].

The implication of the findings of the research maybe found in some areas related to vocational education. The results of the research show the association of OSH knowledge to student's safety behavior. It should be important to put Occupational Safety and Health as a subject in vocational schools to provide proper safety knowledge to the students. The law enforcement or the application of reward and punishment in the learning process at vocational schools will provide support to students' safety behavior. Teachers should provide more attention to the students when they are practicing welding process learning and give rewards to the students who protect themselves well. Research findings from study that is conducted by [17] show that proper safety knowledge is a must for students in vocational schools. [17] also say that giving the reasonable rewards and punishments to the students in the learning process will allow the students to know easily which behavior is recommended and prohibited.

4. CONCLUSION

OSH knowledge has a positive influence on the student's safety behavior. The application of reward and punishment also has a positive impact students' OSH

behavior. The combination of OSH knowledge and the application of reward and punishment together has a more significant impact, creating a holistic approach that is effective in forming a positive culture of occupational safety and health in the school environment, especially in the context of Light Vehicle Engine Maintenance practicum.

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