

## **THE EFFECTIVENESS OF EDUCATIONAL VIDEOS ABOUT PPE ON SAFE WORKING BEHAVIOR IN THE COAL YARD KEBUNKER AREA**

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### **ABSTRACT**

Based on data on work accidents at PLN Nusantara Power, South Lampung Regency in 2021 there were 22 cases, in 2022 there were 26 cases and in 2023 there were 31 cases. The area with the most workers is the area operating coal filling equipment from the coal yard to the bunker. The aim of the research is to determine the effectiveness of educational videos about PPE on safe behavior when working in the Kebunker Coal Yard Area at PT PLN Nusantara Power UPK Sebalang District. South Lampung in 2022. This type of research is quantitative with a Pre-Experiment Design, One Group Pretest - Posttest Design approach. The time of this research is from July 1 -13, 24 at PT PLN Nusantara Power UPK Sebalang District. The population in this study were all workers in the Kebunker Coal Yard area, 35 workers, with the sample in this study being the entire population, namely 35 workers. The data analysis used is univariate and bivariate analysis. The bivariate analysis used was Wilcoxon. The conclusion is that there is the effectiveness of educational videos about PPE on safe behavior in working in the coal yard plantation area at PT PLN Nusantara Power UPK Sebalang District. South Lampung with the results of statistical tests obtained a p value of 0.000 (p value  $<\alpha = 0.05$ ). Suggestions for educational activities about PPE must be carried out every day before coming to work for at least 15 minutes then an explanation using video media about the importance of using and demonstrating the use of PPE tools which are used in the Coal Yard Kebunker Area such as communication tools, Wearpacks, Safety Shoes, Masks, Safety Helmets, Earplugs, Safety Google, Gloves are then distributed to workers so that they have the video and explain the implementation of the education.

Keywords: behavior; educational videos safe; PPE

### **INTRODUCTION**

Safe behavior is the action of a person or several employees that does not cause an accident or incident (David, 2022). The risk of work accidents in industry results in 5 times higher mortality. Work accidents that occur in industry result in losses in the form of various costs that must be incurred both on the economic and social sides for workers, organizations and society. Losses from the economic side of unwanted expenses such as fines, prosecution costs, claims from workers, insurance, damage to buildings, equipment and vehicles and spending on medical expenses. Meanwhile, social costs include suffering and pain experienced by workers, emotional and psychological impacts on friends, family and coworkers (Noorce, 2023). By 2023, more than 250 million workplace accidents will occur annually and more than 160 million workers will become ill due to occupational risks. In addition, 1.2 million workers will die from accidents and diseases at work (International Labor Organization, 2023). Work accidents in Indonesia, according to the annual report of the Department of Social Security and Employment, the number of work accidents in 2020 was 221,740 cases, in 2021 it was 234. 370 cases, in 2022 as many as 265. 334 cases and in 2023 as many as 286,445 cases (BPJS Ketenagakerjaan, 2023). South Lampung Regency is an industrial area that has ports, railways and many BUMNs compared to other districts. In addition, South Lampung Regency became the district with the highest number of work accidents in 2023 with 984 workers (BPS Lampung Selatan, 2023).

Based on data on work accidents at PLN Nusantara Power in South Lampung Regency in 2021 there were 22 cases, in 2022 there were 26 cases and in 2023 there were 31 cases. The most common area for workers is the area of operating coal filling equipment from the coal yard to the bunker. Based on information from K3 officers, the most work accidents in 2023 were experienced in the Coal Yard Kebunker area with 19 workers. Work accidents experienced are pinched due to heavy equipment loads with bruises or swelling of the hands, falling due to slippery and high fields with sprained body parts and chest tightness due to coal dust (PLN Nusantara Power, 2023). The Coal Yard to Bunker area is the operation of equipment regarding the supply of coal from the Coal Yard to the Coal Bunker. Coal Yard to Bunker area workers consist of 7 operators, 8 Hino truck drivers, 6 Wheel Loader drivers, 4 Excavator drivers and 10 Conveyers. Based on the results of the pre-survey conducted by researchers by interviewing K3 officers at PLN Nusantara Power South Lampung Regency, it was found that there were still many work accidents in the area of workers' non-compliance factors in safe behavior at work. Based on interviews with workers in the Coal Yard Kebunker area, the reason for not behaving safely is due to workers' lack of knowledge about safe behavior such as not using PPE. According to workers, their low knowledge of safe behavior is due to the lack of information provided by the company, not only that the company is also less concerned about safety to prevent work accidents (PLN Nusantara Power, 2023).

In general, work accidents can occur due to two things, namely unsafe conditions (Unsafe Condition) and unsafe behavior (Unsafe Action). According to Heinrich, industrial accidents are generally caused by 88% unsafe actions and 10% dangerous conditions, and 2% unavoidable. Research results from the National Safety Council (NSC) of the United States show that the cause of work accidents is 87% unsafe actions and 78% come from mechanical hazards. Another study conducted by the DuPont Company showed that 96% of work accidents were caused by unsafe acts and 4% were caused by hazardous conditions (Noorce, 2023). Unsafe behavior is human failure (human error) in following work procedures or deviating from the correct work procedures based on mutual agreement resulting in work accidents (Noorce, 2023). Research conducted by Sonia (2021) on construction workers at PT PLN (Persero) Jenepono Transmission and Substation Service Unit states that unsafe behavior (Unsafe Act) has a major influence on the occurrence of work accidents compared to unsafe conditions (Unsafe Condition). The

results of another study, namely Nur elida (2021), show that most workers take unsafe actions when doing work at PT X experiencing work accidents (PLN Nusantara Power, 2023). To anticipate before accidents occur at PT PLN Nusantara Power caused by human factors, it is necessary to educate safe behavior at work. The importance of safe behavior education at work is needed so that workers are able to make decisions, identify and assess risks and strategies to reduce risks. By providing safe behavior education at work for workers, it is hoped that it can increase awareness of the importance of safe, orderly, and safe behavior while working. One way that can be done to improve the safe behavior of drivers is to conduct education about safe behavior at work through video media and become an alternative that can be used to socialize knowledge of safe behavior at work which is expected to be a means of increasing the behavior of safe behavior at work for workers (Hanif, 2021).

Based on Abia's journal (2018) at PT Nira Anugrah Filadelfia, the results of his research found that the p value of behavior before and after video shows is 0.000. Based on the results of the

study, it can be concluded that there is an effect of video impressions of the dangers of work accidents on the behavior of using personal protective equipment on workers. Based on Fahmi's journal (2021) on PT Iskandartex Weaving Workers. The results of the analysis show that there is a difference in the level of behavior of the group given the educational video (experimental group) and the group that is not given the educational video (control group) in weaving workers with the acquisition of a p value = 0.000 ( $p < 0.05$ ) for the pre-test results and post-test results with a p value = 0.003 ( $p < 0.05$ ) in both groups. There is a difference in the level of behavior between the experimental group and the control group at PT Iskandartex Weaving section workers. This research is in line with the research that Fatmawati (2022) on Tofu Factory Workers in South Magelang shows that there is an Effect of Occupational Health and Safety Education on Compliance Using Personal Protective Equipment. This research is in line with the research of Dewa Putu (22) in the laboratory showing that there is an effectiveness of video guidance using chemicals to improve occupational health and safety in the laboratory. Based on the description above, the researcher is interested in examining the title of the effectiveness of educational videos about PPE on safe behavior at work in the Kebunker Coal Yard Area at PT PLN Nusantara Power UPK Sebalang Kab. South Lampung Year 2024.

## METHOD

This type of research is quantitative with a Pre Experiment Design approach One Group Pretest - Posttest Design. The time of this research was from July 1 -13, 2024 at PT PLN Nusantara Power UPK Sebalang Kab. South Lampung, namely the Kebunker Coal Yard area. The population in this study were all workers in the Kebunker Coal Yard area as many as 35 workers consisting of 7 operators, 8 Hino truck drivers, 6 Wheel Loader drivers, 4 Excavator drivers and 10 Conveyers. While the sample in this study was the entire population of 35 workers. The independent variable in this study is the effectiveness of educational videos while the dependent variable in this study is safe working behavior. The instrument in this study used a questionnaire. The data analysis used was univariate and bivariate analysis. The bivariate analysis used was Wilcoxon.

## RESULT AND DISCUSSION

Table 1.  
 Frequency Distribution of Workers' Education in the *Coal Yard Kebunker Area*

Education	f	%
Low (Elementary and junior high school graduates)	10	28.6
Medium (High school or vocational school graduate)	20	57.1
Higher (Diplomat/College)	5	14.3
Total	35	100.0

Table 2.  
 Average value of safe behavior before being given an educational video about PPE

Behavior	f	Median	Min	Max
Safe behavior before the educational video on PPE	35	5	3	7

Table 3.  
 Average value of safe behavior after being given an educational video about PPE

Musculoskeletal Complaints	f	Median	Min	Max
Safe behavior after being given an educational video about PPE	35	7	5	7

Based on Table 1 above, it is known that most workers in the *Kebunker Coal Yard Area* have

amedium or vocational education of 20 workers (57.1%). Based on Table 2 above, it is known that the average value of safe behavior before being given an educational video about PPE is 5 with the lowest value of 3 and the highest value of 7. Based on Table 3 above, it is known that the average value of safe behavior after being given an educational video about PPE is 7 with the lowest value of 5 and the maximum value of 7.

Table 4.

Effectiveness of Educational Videos About PPE on Safe Behavior at Work in the *Coal Yard Kebunker Area at PT PLN Nusantara Power UPK Sebalang Kab. South Lampung Year 2024*

Variables <i>Safe Behavior</i>	Median	n	<i>p value</i>
Safe Behavior Before Educational Video	5	35	0,000
Safe Behavior after Educational	7	35	

Based on Table 4 above, it is known that the average value of safe behavior before being given an educational video about PPE is 5 with the lowest value of 3 and the maximum value of 7. While the average value of safe behavior after being given an educational video about PPE is 7 with the lowest value of 5 and the maximum value of 7. From the median value, it is known that there is a difference in the average score before and after being given an educational video about PPE, namely 2. The statistical test results obtained a p value of 0.000 ( $p \text{ value} < \alpha = 0.05$ ). So it can be concluded that there is an effectiveness of educational videos about PPE on safe behavior at work in the coal yard area at PT PLN Nusantara Power UPK Sebalang, South Lampung Regency.

### Education

Based on the results of the study, it shows that most workers in the Kebunker Coal Yard Area have a medium or vocational education of 20 workers (57.1%). Education greatly influences the knowledge and attitudes of respondents. This is in line with research by Fatmawati (2022) on Tofu Factory Workers in South Magelang showing that most respondents who have low knowledge have a lot of non-compliance with workers in the use of PPE. According to Notoadmojo (2018) Education is all learning experiences that take place organized in schools as formal educational institutions. Education is an effort of persuasion or learning to the community so that people want to take actions (practices) to maintain (overcome problems) and improve their health. Based on the description above, the researcher argues that education is an important factor in determining worker behavior. Workers with low education have the opportunity not to perform PPE use behavior and vice versa workers with high education have the opportunity to be able to perform PPE use behavior. However, to help workers with low levels of education (Not in School, Elementary School, Junior High School equivalent) it is necessary to socialize or educate about PPE and safety with the right media.

### Safe Behavior Before Education on PPE

Based on the results of the study, it shows that the average value of safe behavior before being given an educational video about PPE is 5, which means that workers in the Kebunker coal yard area only use 5 types of PPE. Whereas in the Work Instruction in the kebunker coal yard area workers are required to use 7 types of PPE, namely Communication Tools, Wearpacks, Safety Shoes, Masks, Safety Helmet, Eaplug, Safety Google. This study is in line with Fatmawati's research (2022) on Tofu Factory Workers in South Magelang showing that before being given health education using videos most workers have low or incomplete compliance with PPE. This research is also in line with the research of Dewa Putu (2022) in the laboratory showing that before being given health education using videos most workers have low or incomplete compliance with using PPE. Personal protective equipment (PPE) is a tool that has the ability to protect a person in

work whose function is to isolate the labor body from hazards in the workplace. PPE is a protective device worn by the workforce directly to prevent accidents caused by various factors that exist or arise in the work environment (Yulianto, 2020). Personal protective equipment (PPE) is equipment designed to protect workers from potential hazards in the work environment. PPE includes head protection, eye and face protection, ear protection, respiratory protection, hand protection, foot protection, protective clothing, and personal fall protection equipment (PT Safety Sign Indonesia, 2022).

The role of PPE in Occupational Safety and Health (K3) is very important to protect workers from possible accidents or potential hazards to minimize the risk of accidents. Although the use of PPE does not make the risk zero percent, PPE can minimize the worst possibilities that occur to workers, for example when an accident occurs (PT Safety Sign Indonesia, 2022). In 2023 the most work accidents experienced were in the Kebunker Coal Yard area as many as 19 workers. Work accidents experienced are pinched due to heavy equipment loads with bruises or swelling of the hands, falling due to slippery and high fields with sprained body parts and chest tightness due to coal dust (PLN Nusantara Power, 2023). The number of work accidents in the Kebunker Coal Yard area is caused by safe working behavior, especially the use of PPE which is very lacking. Based on field observations, there is still a lack of optimal education about PPE and work safety in the Kebunker coal yard area. It can be seen that the education carried out is carried out once every 2 weeks, namely on Tuesdays and the delivery time is also only 15 minutes before work. The media used is lecture media. What makes lecture media ineffective so that compliance with the use of PPE is low is due to the educational factor that workers have is secondary school graduates. That factor makes it difficult for workers to absorb information.

### **Safe Behavior After Education on PPE**

Based on the results of the study, it shows that the average value of safe behavior after being given an educational video about PPE is 7. This means that there is an increase in safe behavior at work. This research is in line with Fatmawati's research (2022) on Tofu Factory Workers in South Magelang showing that after being given health education using videos compliance using PPE increased. This research is also in line with the research of Dewa Putu (2022) in the laboratory showing that after being given health education using videos compliance using PPE increased. Educational aids are tools used by educators in delivering educational / teaching materials. Health education media are tools to convey health information and because these tools are used to facilitate the receipt of health messages for the community. In addition, health education media are all means or efforts to display information messages that the communicator wants to convey so that the target can increase his knowledge which is ultimately expected and change his behavior in a positive direction towards health. (Pakpahan, 2021).

Health education is a form of intervention or effort directed at behavior so that behavior is conducive to health. In other words, health education seeks that the behavior of individuals, groups or communities has a positive influence on maintaining and improving health (Notoadmojo, 2018). The purpose of education is to change the behavior of individuals, families and communities from unhealthy to healthy behavior. Behavior that is not in accordance with health values becomes behavior that is in accordance with health values or from negative behavior to positive behavior. Health education also aims to change behavior in relation to culture. Attitudes and behaviors are part of the culture that exists in the environment. (Pakpahan, 2021). However, some workers' scores did not increase between before being given health education using videos and after being given

health education using videos due to fatigue factors at work so that when giving health education using videos, they did not concentrate so they did not understand what was explained. Because this research was conducted during workers' rest hours, namely 12.30 - 13.30. Researchers argue that the increase in workers in the coal yard area in PT PLN Nusantara Power UPK Sebalang, South Lampung Regency is due to the health education provided to workers. This is because health education is a guidance, invitation or provision of information to someone in this study about reproductive health. The goal is to change behavior (knowledge, attitudes and actions) that is not in accordance with health values or from unhealthy to healthy behavior. This study provides health education on safe behavior about PPE at work through video media. Therefore, activities like this must be carried out continuously.

### **Effectiveness of Educational Video on PPE on Safe Behavior at Work**

Based on the results of the study, it shows that there is an effectiveness of educational videos about PPE on safe behavior at work in the coal yard area of the gardener at PT PLN Nusantara Power UPK Sebalang Kab. South Lampung with the results of statistical tests obtained p value of 0.000 ( $p \text{ value} < \alpha = 0.05$ ). The average value of safe behavior before being given educational videos about PPE is 5. While the average value of safe behavior after being given an educational video about PPE is 7. From the median value, it is known that there is a difference in the average score before and after being given an educational video about PPE, namely 2. This means that there was an increase in the use of PPE during the post test activities. This study is in line with Fatmawati's research (2022) on tofu factory workers in southern Magelang which shows an increase before and after education using videos with bivariate results found the effect of occupational health and safety education on compliance with PPE use. This study is also in line with research by Dewa Putu (2022) in the Laboratory which shows that after receiving health education through videos, compliance with PPE use increases. The two-way result is an instructional video on the use of effective chemicals to improve occupational safety and health in the laboratory. This video support makes it easier to explain abstract material, especially in the whole process of using PPE. In line with Fassya's research (2022), PPE use behavior has changed due to knowledge, good attitudes and adequate facilities such as education, supervision, and comprehensive PPE. Health education is an effort to increase community knowledge through self-learning by and for the community so that people can help themselves and develop community-sponsored activities. The goal of health education is to change the behavior of individuals, families and communities from unhealthy behavior to healthy behavior. Behavior that is not in accordance with health values will become behavior that is in accordance with health values or from negative behavior to positive behavior. Therefore, educational media plays an important role. Health education media is any means or effort that aims to display information messages that the communicator wants to convey so that the target audience can increase the expected final knowledge and change their behavior in a positive direction towards health (Pakpahan, 2021).

Videos are a way of conveying information visually, which is often easier to understand and remember than simply explaining it in words. Real-life examples can simplify complex concepts, videos can maintain viewers' attention for longer and increase their engagement. Elements such as sound, music and movement can make learning more fun and interactive, videos can be played, paused or sped up depending on individual needs. This makes it possible to learn at one's own pace and repeat difficult parts, videos can be accessed anytime, anywhere through various devices, making learning more flexible and not limited by space and time and creative and interesting videos can increase learning motivation and make the learning process more enjoyable. In addition, the

advantages of using video media are that it transcends time and distance, can repeat explanations or material that people do not understand, describes real conditions in a short time, is easy to accept and fast, easy to remember, can develop thinking and abilities. So that participants can explore their imagination and be able to explain things that are considered non-specific and give birth to a real understanding (Rahman, 2022).

The purpose of health education or the most basic education is to achieve changes in the behavior of individuals, families and communities by maintaining healthy behavior and playing an active role in achieving optimal health status. Success in health education can also be helped by the existence of tools or media to help facilitate the delivery of the message or material to be conveyed. The use of media that involves various senses will further increase understanding of information (Notoadmojo, 2012). The findings in the field are based on the results of information from the K3 officer of the coal yard kebungker area at PT PLN Nusantara Power UPK Sebalang, educational activities related to occupational safety and health already exist, which are carried out once every 2 weeks on Tuesdays and the time of administration is also only 15 minutes before work in the form of discussions between workers and HSE or SSC as K3 officers. The content of this discussion is about reminding workers to be able to use PPE completely and identify obstacles related to risk factors for work accidents. However, the educational activities carried out were not effective, so it was found that many workers at work did not use PPE in full. After further investigation, there are still many workers who do not understand the use of PPE. It turns out that many workers in the K3 area of the kebungker coal yard area have a vocational education. In addition, many workers also testified that the educational activities provided were very difficult for workers to understand. This is because there is no demonstration example of using PPE one by one that is good and correct so that when using it in the field it does not make workers feel disturbed and also comfortable when used. In addition, based on the observations of researchers, in terms of supervision is also very low. As there are no strict reprimands or sanctions if workers do not use PPE, besides that there are also no reprimands to K3 officers regarding low supervision. In fact, the supervision carried out by K3 officers is carried out 3 times a week.

Based on the description above, the researcher argues that health education using video media can affect PPE use behavior because 1) it has an appeal such as emotion, namely videos are able to evoke stronger emotions than text or static images. The emotions triggered, such as enthusiasm, inspiration, or empathy, can encourage behavior change and attention, namely interesting visuals and audio that make workers more focused and involved with the message conveyed. This increases the likelihood of the message being remembered and adopted. 2) Simulation of reality as hands-on experience is that video can provide a simulation of an experience that is close to reality. This allows workers to "experience" certain situations, such as occupational safety training, without having to be in the actual situation and better understanding is that by seeing and hearing, workers gain a better understanding of new concepts, procedures or products. 3) Effective communication, Clear messages i.e. videos can convey complex messages in a clearer and more concise manner. Appropriate use of animation, graphics and narration makes information easier to digest and reinforces the message i.e. video can reinforce the message delivered in training or internal campaigns. Attractive visualizations make the message easier to remember and implement. 4) Accessibility and flexibility i.e. learn anytime, anywhere i.e. videos can be accessed anytime and anywhere through various devices. This allows workers to learn at their own pace and repetition i.e. workers can watch videos repeatedly to reinforce their understanding.

## CONCLUSION

The average value of safe behavior before being given an educational video about PPE is 5, the average value of safe behavior after being given an educational video about PPE is 7. And there is the effectiveness of educational videos about PPE on safe behavior at work in the coal yard area of the gardener at PT PLN Nusantara Power UPK Sebalang Kab. South Lampung with the results of statistical tests obtained p value of 0.000 (p value  $<\alpha = 0.05$ ).

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