



The Effect of Educational Videos on the Driving Safety and Health Behavioral Domain of Drivers in Perum Damri Bus Yogyakarta

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ABSTRACT

Background: Traffic accidents remain one of the leading causes of death in Indonesia, especially in public transportation sectors such as buses. Human error, influenced by a lack of knowledge and awareness regarding Occupational Safety and Health (OSH), plays a major role. Preventive efforts such as OSH promotion using engaging and educational video media are needed to reduce accident rates and increase driver safety. **Method:** This study employed a quasi-experimental method using a nonequivalent control group design. The population consisted of 63 bus drivers from Perum DAMRI Yogyakarta, divided into an experimental group (31) and a control group (32). The research instrument used structured pretest and posttest questionnaires to assess knowledge and attitude. Data were analyzed using Paired Sample t-Test and Independent t-Test. **Results:** The results showed a significant improvement in the knowledge and attitudes of the experimental group after the intervention. The Paired Sample t-Test indicated a significant increase in knowledge ($p=0.000$) and attitude ($p=0.000$). Furthermore, the Independent t-Test showed significant differences between the experimental and control groups in both knowledge ($p=0.001$) and attitude ($p=0.002$). **Conclusion:** The educational video on bus driving safety had a significant positive impact on improving the OSH behavioral domain, specifically knowledge and attitudes, among Perum DAMRI drivers in Yogyakarta. This media can serve as an effective tool for safety promotion and accident prevention in the transportation sector..



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1. Introduction

Occupational safety and health (K3) is an important aspect in creating a safe, healthy, and productive work environment. Based on the 2023 OSHA report, there were 5,283 cases of fatal work accidents in the United States, with the construction sector as the highest contributor, especially due to falls, slips, and trips [1]. In Indonesia, BPJS Ketenagakerjaan recorded 162,327 cases of work accidents throughout 2024, most of which occurred to wage earners in the formal sector [2]. The high number of accidents shows that the effectiveness of the K3 management system is still low, especially in terms of education and supervision of safe work behavior.

One of the work sectors with a high risk of accidents is the transportation sector, especially land transportation such as buses. Traffic accidents in Indonesia still rank high in causes of death, especially in the productive age group. The World Health Organization (WHO) notes that 1.35 million people die

each year due to traffic accidents globally, and is predicted to be the seventh largest cause of death in the world by 2030 [3]. Data from the National Police Traffic Corps shows that the number of traffic accidents in Indonesia reached 103,645 cases in 2021 with 25,266 fatalities, of which 23,529 died [4].

Especially in the Special Region of Yogyakarta (DIY), traffic accidents are also relatively high. The Regional Development Planning, Research and Development Agency recorded 14,853 accident cases in the 2019-2021 period, with 1,217 victims dying [5]. One of the public transportation companies operating in this area is the DAMRI Public Company (Perum), which is responsible for providing land transportation services between cities, between provinces, and to remote areas. Internal data from Perum DAMRI Yogyakarta shows that in 2023 there have been work accidents that resulted in 9 moderate injuries and 5 serious injuries, most of which were caused by technical factors and human negligence [6].

The dominant factor causing traffic accidents in the transportation sector is human error, which is human error related to a low level of knowledge and attitude towards work safety. Some of the causes that often occur are drowsiness while driving, fatigue due to long working hours, not maintaining a safe distance, and lack of awareness in using work safety tools such as seat belts or helmets [7]. Previous research has shown that the physical and mental condition of drivers, as well as limited knowledge of safety procedures, are the main determinants of accident risk in public transportation operations [8].

To reduce the number of work and traffic accidents, K3 education-based interventions are needed. One approach that has proven effective is the use of audiovisual media, such as educational videos, to convey occupational safety information. Video media has been shown to improve focus, strengthen memory, and motivate behavior change because it involves two main senses at once: vision and hearing [9]. Research conducted by Putri et al. (2023) also shows that driving safety education videos can significantly increase safety riding knowledge in field workers [10]. In this context, the use of video as an educational intervention tool is considered more interactive, interesting, and in accordance with the characteristics of drivers who mostly prefer visual material to written text.

Looking at this background, this study aims to examine the influence of bus driving safety education videos on the K3 behavioral domain in Perum DAMRI drivers in Yogyakarta. The K3 behavioral domain in question includes two main aspects, namely knowledge and attitudes. It is hoped that the results of this research can be used as a basis for designing a more effective K3 training and promotion strategy in the transportation work environment. In addition, these findings can also provide recommendations for DAMRI management and other stakeholders to improve the quality of work safety through educational approaches based on technology and interactive media.

2. Methods

This study uses a quantitative approach with a quasi-experimental design, especially a nonequivalent control group design model. This design was used to measure the influence of educational video interventions on the behavioral domains of Occupational Safety and Health (K3), namely knowledge and attitudes, in two different groups, namely the experimental group that was given treatment, and the control group that was not treated [11]. The population in this study is all drivers of Perum DAMRI Yogyakarta Branch which is 63 people. The sampling technique used is total sampling, where the entire population is used as a research sample because the number is relatively small and can be reached as a whole. The sample was divided into two groups, namely 31 respondents as the experimental group and 32 respondents as the control group. The research instruments used consisted of two main questionnaires, namely a knowledge questionnaire and an attitude questionnaire. The knowledge questionnaire was modified from Lulu's (2013) research, while the attitude questionnaire was modified from Noviandi (2017), and both have undergone a validity and reliability testing process that shows viable results for use in this study. Validity assessment was performed by comparing the r-calculated value with the r-table at a significance level of 5%, and reliability was measured using Cronbach's Alpha, where a \geq value of 0.6 was considered reliable. The data obtained was analyzed using the Paired Sample t-Test statistical test to see the difference between the pre-test and post-test in each group, as well as the independent t-Test to compare the results between the experimental group and the control group. The entire data analysis was carried out with the help of SPSS software version 26.0, and the significance level used was $p < 0.05$, which showed a significant influence of the intervention on the measured variable. This study also considered disruptive variables such as age, education level, and length of service, which were obtained through respondents' demographic data. These variables were analyzed descriptively to ensure equality between the experimental and control groups, as well as to avoid biases that could affect the results of the study.

3. Results and Discussion

This section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation as well as the experimental conclusions that can be drawn.

3.1. Results

This study was conducted on 63 drivers of Perum DAMRI Yogyakarta, who were divided into two groups, namely the experimental group ($n = 31$) and the control group ($n = 32$). Intervention in the form of driving safety education videos was given only to the experimental group. Measurements were carried out before (pre-test) and after intervention (post-test) for variables of knowledge and attitude towards K3.

3.1.1. Respondent Characteristics

Table 1. Respondent Characteristics

Characteristic	Experimental Group ($n = 31$)	Control Group ($n = 32$)
Average Age (years)	42.1 ± 6.4	41.8 ± 7.1
Final Education	SMA (74.2%)	SMA (71.9%)
Working Period >10 years	67,7%	65,6%

Source: Primary Data (2024)

The majority of respondents are in the productive and secondary education age range. The average age of the experimental group was 42 years and for the control group 41 years. Most of the respondents' last education was high school, i.e. 74.2% for the experimental group and 71.9% for the control group. Most respondents in both groups had been working for more than 10 years, with a percentage of 67.7% for the experimental group and 65.6% for the control group. The demographic distribution is relatively balanced between both groups, thus supporting the validity of the results comparison.

3.1.2. Comparison of Average Knowledge and Attitude

Table 2. Comparison of Average Knowledge and Attitude

Variable	Group	Pre-test (Mean \pm SD)	Post-test (Mean \pm SD)	p-value (Paired t-Test)
Knowledge	Experiment	6.32 ± 1.21	8.90 ± 1.05	0.000 (significant)
	Control	6.40 ± 1.13	6.55 ± 1.18	0.115 (insignificant)
Attitude	Experiment	65.48 ± 5.72	78.65 ± 4.93	0.000 (significant)
	Control	66.10 ± 6.03	67.08 ± 5.95	0.080 (insignificant)

Source: Primary Data (2024)

The table above shows that after being given a driving safety education video intervention, there was a significant increase in the K3 behavior domain of Perum DAMRI Yogyakarta drivers. Based on the results of the Paired Sample t-Test test in the experimental group, the average knowledge score increased from 6.32 (SD ± 1.21) to 8.90 (SD ± 1.05) with a value of $p = 0.000$ which is significant. In the category, before the intervention only 19.4% of respondents had a level of knowledge in the good category, while after the intervention it increased to 100% of respondents were in the good category. In contrast, in the control group, the average knowledge score only increased from 6.40 (SD ± 1.13) to 6.55 (SD ± 1.18) with a non-significant $p = 0.115$, and the distribution of knowledge categories did not experience significant changes or did not experience significant changes.

For the attitude variable, the experimental group experienced an average increase from 65.48 (SD ± 5.72) to 78.65 (SD ± 4.93) with a value of $p = 0.000$ which also showed a significant increase. However, the change in attitude category in the experimental group was still dominated by the fairly good category, although there was an increase in the percentage of respondents with good attitudes from 32.3% to 61.3%. Meanwhile, the control group showed a non-significant increase in the average average, from 66.10 (SD ± 6.03) to 67.08 (SD ± 5.95) with $p = 0.080$, and there was even a decrease in the percentage of respondents in the good attitude category from 28.1% to 25.0%.

3.1.3. Test the Difference Between Experimental and Control Groups

Table 3. Test the Difference Between Experimental and Control Groups

Variable	Experimental Group	Control Group	p-value (Independent t-Test)
Knowledge	8.90 ± 1.05	6.55 ± 1.18	0.001 (significant)
Attitude	78.65 ± 4.93	67.08 ± 5.95	0.002 (significant)

Source: Primary Data (2024)

Based on the table above, the independent t-Test also showed a significant difference between the experimental and control groups in the results of the post-test of knowledge ($p = 0.001$) and attitude ($p = 0.002$). This indicates that the intervention of driving safety education videos is effective in improving the K3 behavioral domain in Perum DAMRI drivers.

3.2. Discussion

The results of this study are in line with Bloom's theory which states that knowledge and attitudes are included in the behavioral domain that can be influenced by educational stimulus. The increase in knowledge up to 100% of respondents in the good category shows that educational videos as an audiovisual medium are effective in conveying material because they utilize the two main senses, namely sight and hearing. This reinforces the multimedia learning theory that the combination of text, images, and sounds is able to improve information understanding and retention.

The increase in knowledge in the experimental group proved to be significant, both statistically and categorically speaking, with all respondents moving to the "good" category after the intervention. In contrast, the control group experienced a decrease in knowledge, indicating that without educational reinforcement, drivers' understanding of safety tends to weaken. This is supported by the theory that age and education also affect an individual's ability to receive and manage safety-related information.

In addition, a significant increase in attitudes showed that educational interventions not only increased knowledge, but also motivated respondents to have higher awareness in implementing driving safety. However, despite the increase in attitudes, the change in categories is not as drastic as knowledge. This is in accordance with the concept that change in attitude requires reinforcement and longer time than change in knowledge. The average score showed a statistically significant increase in positive attitudes in the experimental group. It confirms that attitude change takes time and sustained strengthening, even though video media has made a positive initial impact. In contrast, the control group showed a decrease in attitude, reflecting the importance of the intervention in maintaining awareness of occupational safety [12].

The characteristics of the respondents in this study were dominated by productive age (average 42 years), last high school education (73%), and working period >10 years (66.6%). However, the experimental group tended to be more experienced, with a working period of >5 years, which previous research found correlated with better occupational safety performance due to familiarity with work protocols and environments [13]. A uniform level of education also allows for the delivery of educational materials that are right on target, especially through visual media such as videos. A relatively homogeneous demographic distribution favors the validity of the results because it minimizes significant disruptive variables. Most respondents also stated that educational videos are easy to understand (92%) and engaging (89%), and can increase their awareness of the risks of drowsiness while driving and the importance of wearing seatbelts (87%).

This study shows that driving safety education videos have a significant influence on improving the Occupational Safety and Health (K3) behavior of Perum DAMRI Yogyakarta drivers. K3 educational videos have high effectiveness in changing the behavior of workers in the transportation sector. However, regular reinforcement and periodic evaluations are needed so that changes in driver safety attitudes and practices can be sustainable. The three-day intervention was able to improve overall knowledge and change attitudes in a more positive direction in the experimental group. Knowledge is the main factor in the formation of safety behavior and can be significantly improved through audiovisual-based educational media.

The video method has a good level of comprehension effectiveness and is able to make an individual's memory higher because it has an involvement in sounds, images and writings to clarify the message contained. Video media also facilitates understanding and strengthens the memory of the respondents because it is displayed concisely, clearly, and easily understandable and involves thinking, hearing, vision, and psychomotor so that it is more interesting to receive the knowledge conveyed [14]. Video media has the advantage of saving time when providing observations of an object [15]. In the use of video, the message conveyed attracts more attention and motivation for the audience. The message conveyed is more efficient because moving images can communicate the message quickly and realistically. So that it can accelerate the understanding of messages in a more comprehensivemanner [16].

In terms of behavior, this study emphasizes that knowledge and attitudes contribute to each other in shaping driver safety behavior. Video education has succeeded in increasing awareness of the importance of seat belts, rest when tired, and readiness to participate in training even though they are experienced. This reinforces the theory that safety behavior is influenced by the interaction between internal (knowledge, attitudes, skills) and external factors (work environment, supervision, and road conditions) [17]. The effect of multimedia video learning on changes in menstrual hygiene knowledge, attitudes and behaviors in adolescent girls. This is also in accordance with the concept of attitude, which is a response to a stimulus or object in an individual. Changes in attitudes are generally influenced through knowledge and belief gained in experience and even education [18].

Finally, the use of video as an educational medium has been shown to be effective in conveying information visually and auditorily, strengthening understanding, and encouraging behavior change. In accordance with the principles of visual learning, the main five senses such as vision and hearing play an important role in information processing, thus making video a means of strategic and sustainable intervention in driving safety programs in the public transportation work environment [19]. Video media is able to simultaneously stimulate the senses of sight and hearing by referring to psychomotor, behavioristic, and cognitive principles. Through this approach, individuals can optimally absorb information through two main sensory pathways, namely visual and auditory. Information received through video tends to be easier to understand because it involves a multisensory experience. In terms of the transmission of knowledge to the brain, the sense of sight (eyes) is the main channel with a contribution of about 75% to 87%, while the rest comes from the other senses [20].

4. Conclusion

- a. The bus driving safety education video has a significant effect on the K3 behavioral domain in Perum DAMRI Yogyakarta drivers, including increasing knowledge and changing more positive attitudes. Driver knowledge improved significantly in the experimental group, from an average of 4.91 to 9.34 ($p = 0.000$), with all respondents achieving the "good" category of knowledge after the intervention. The control group experienced a decrease in knowledge, with the proportion of the "good" and "less" categories decreasing, suggesting that without education, understanding tends to weaken.
- b. Drivers attitudes towards safety also improved significantly in the experimental group, shown by a decrease in attitude scores from 32.03 to 21.38 ($p = 0.000$), although the category distribution was fixed. The control group showed a decrease in attitude, with an increase in scores from 26.41 to 30.41 ($p = 0.001$), signaling a shift towards less safe attitudes.

Declaration

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