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EFFECTIVENESS OF PROVIDING DIRECT VISUALIZATION ABOUT THE DANGERS OF CIGARETTES TO THE LUNGS ON THE KNOWLEDGE AND ATTITUDES OF STUDENTS OF SMAN 1 KANDAT

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ABSTRACT

Cigarettes are a major cause of health problems, particularly serious lung disease. Smoking habits among adolescents are increasing and can pose long-term health risks. Effective education about the dangers of smoking is crucial from an early age. The use of direct visualization media is believed to improve students' understanding and awareness better than conventional methods. This study aims to analyze the effectiveness of direct visualization about the dangers of smoking on the lungs in improving the knowledge and attitudes of students at SMAN 1 Kandat. This research was pre-experimental study with one-group pretest-posttest design. The research samples were 95 eleventh-grade students. The Samples were chosen with accidental technique sampling that selected based on discussions conducted by all examiners and guidance counselors at SMAN 1 Kandat. The main instrument was a valid and reliable questionnaire to measure knowledge and attitudes before and after visualization intervention with simulation. The study showed a significant increase in knowledge, from the “poor” category (86.3%) before the intervention to “good” (88.4%) after the intervention. Attitudes also shifted from predominantly negative (76.8%) to more positive (89.5%) after the intervention. The Wilcoxon Signed Ranks Test showed a significant difference in knowledge and attitudes before and after the intervention ($p < 0.05$), so there was a difference in knowledge and attitudes before and after direct visualization. This study found that the use of direct visualization as "shock therapy" was more effective in increasing students' knowledge and modifying their attitudes than conventional educational methods. This innovative strategy is recommended as a component of school health programs to foster awareness and preventative behavior among adolescents.

Keywords: Adolescents, Attitudes, Dangers of smoking, Direct visualization, Knowledge, Shock therapy

INTRODUCE

Indonesia ranks third in the world for the highest number of smokers. The prevalence of Indonesian smokers based on male gender aged ≥ 15 years is 66.6% and female smokers are 2.1%. Based on the results of the 2018 Basic Health Research, the prevalence of smokers ≥ 10 years in Indonesia nationally is 28.8%. Smokers aged 10-18 years have increased from 7.2% to 9.1%. Adolescents who start smoking earlier are at greater risk of nicotine dependence (Ministry of Health of the Republic of Indonesia, 2018).

Cigarettes contain various harmful substances that can cause serious illnesses, including lung cancer, heart disease, and respiratory disorders. According to research conducted by Hamdan (2014), the use of pictorial warnings on cigarette packaging has been shown to be more effective in raising awareness of the dangers of smoking than simply using text. This suggests that visualization can influence individuals' perceptions and attitudes toward

smoking.

Typically, novice smokers in Indonesia try smoking at the age of under 15 and start smoking when they are 17. Data from the 2019 Global Youth Tobacco Survey (GYTS) shows that 40.6% of Indonesian students (age range 13-15 years), 2 out of 3 boys and 1 out of 5 girls have used tobacco; 19.2% of students currently smoke and of them 60.6% are not even prevented from buying cigarettes because of their age, and two-thirds of them usually buy retail cigarettes from shops, stalls or kiosks (World Health Organization, 2020).

Research shows that visual education methods, such as using images or simulations of organs damaged by smoking, can raise awareness about the long-term impacts of smoking. According to Santrock (2013), visual learning methods can improve memory up to 65% more effectively than verbal methods. Furthermore, research from the Indonesian Ministry of Health (2020) confirms that educational interventions with a hands-on approach, such as showing damaged organs, can have a stronger emotional impact than conventional counseling.

This research took place at SMAN 1 Kandat, one of the educational institutions in Kediri Regency. The selection of this research location was based on the following considerations:

1. In accordance with the problem to be studied, at SMAN 1 Kandat many students have a habit of smoking, thus encouraging researchers to conduct research to reveal the motivation for smoking among students, found as many as 2 cases of students smoking in the school toilet during break time which was immediately known by the BK teacher to be given sanctions and asked to write a student violation report book so as not to repeat the mistake,
2. The high smoking rate among school students is a serious concern that requires comprehensive intervention. Unfortunately, efforts to disseminate information about the dangers of smoking through visual media such as posters and leaflets are still suboptimal. The limited number of posters and leaflets available at SMAN 1 Kandat, such as on bulletin boards and wall magazines, has led to a lack of student awareness of the health risks posed by smoking. This condition is also associated with a lack of innovation in the design and content of educational materials, resulting in messages that are less engaging and effective in changing smoking behavior. Therefore, a more intensive and creative strategy is needed in providing and distributing visual educational materials about the dangers of smoking to increase awareness and encourage positive behavioral changes in students.
3. Based on a preliminary survey of random students outside of school, 80% of them still smoke or are exposed to the influence of smokers. Two cases of students smoking in the school restroom were also found, violating school regulations. Therefore, creative interventions are needed, such as providing direct visualizations of the dangers of smoking to the lungs.

The importance of this research lies in the innovative educational approach that focuses on students' visual and emotional experiences to raise awareness of the negative impacts of smoking. This research is expected to contribute to the development of more effective health promotion strategies, especially in preventing smoking behavior among high school adolescents. Based on this problem, the researcher is interested in conducting a study entitled "The Effectiveness of Providing Direct Visualization About the Dangers of Cigarettes on the Lungs on the Knowledge and Attitudes of Students of SMAN 1 Kandat".

METHODS

The design of this research is an experimental quantitative approach with pre-test and post-test group design. The population intended in this study was all 354 class XI students at SMAN 1 Kandat. Sample selection used accidental sampling technique with a sample of students in grades XI-2, XI-3, and XI-9 totaling 95 respondents. The independent variable of the study was direct visualization of the smoking dangers, while the dependent variable was knowledge and attitudes about the smoking dangers. The inclusion criteria was selected based

on discussions conducted by all examiners and guidance counselors at SMAN 1 Kandat. The sample exclusion criteria were those who were not willing to participate in the research. Data collection was carried out by administering pre-test and post-test questionnaires and providing demonstrations of direct visualization of the dangers of cigarettes, the results were analyzed using Wilcoxon test with SPSS to produce a comparison of students' knowledge and attitudes before and after direct visualization of the dangers of cigarettes on the lungs of students at SMAN 1 Kandat. This study received clearance from STRADA's ethic committee with number 0723472/EC/KEPK/I/05/2025.

RESULT

A. Univariate Analysis

Table1Frequency Distribution of Respondents' Pre-Test Assessment Categories Based on Knowledge of the Dangers of Cigarettes on the Lungs of Students of SMAN 1 Kandat

No.	Knowledge	Answer	
		f	%
1	Not enough	82	86.3
2	Enough	10	10.5
3	Good	3	3.2
Total		95	100.0

Based on Table 1 above, the assessment categories show that the majority of students, 82 respondents (86.3%), had "poor" knowledge. This indicates that prior to the intervention, respondents' knowledge of cigarette content and health impacts was still very limited.

Table 2. Frequency Distribution of Respondents' Pre-Test Assessment Categories Based on Attitudes Towards the Dangers of Cigarettes on the Lungs of Students of SMAN 1 Kandat

No.	Attitude	Answer	
		f	%
1	Negative	73	76.8
2	Positive	22	23.2
Total		95	100.0

Based on table 2 above, the assessment category of most respondents (73 respondents 76.8%) was in the "negative" attitude category before the intervention, indicating the need for encouragement and significant behavioral changes.

Table 3. Frequency Distribution of Respondents' Post-Test Assessment Categories Based on Knowledge of the Dangers of Cigarettes on the Lungs of Students at SMAN 1 Kandat

No.	Knowledge	Answer	
		f	%
1	Not enough	4	4.2
2	Enough	7	7.4
3	Good	84	88.4
Total		95	100.0

Based on table 3 above, the assessment category shows an increase in students' understanding of the dangers of smoking, namely that 84 respondents (88.4%) are at the "good" knowledge level.

Table 4. Frequency Distribution of Respondents' Post-Test Assessment Categories Based on Attitudes Towards the Dangers of Cigarettes on the Lungs of Students at SMAN 1 Kandat

No.	Attitude	Answer	
		f	%
1	Negative	10	10.5
2	Positive	85	89.5
Total		95	100.0

Based on table 4 above, the assessment category after the intervention was carried out showed a large increase, namely the "positive" attitude category for 85 students or 89.5% of respondents, this shows an increase in students' positive attitudes towards the dangers of cigarettes with the importance of conveying education visually so that students feel the impact of the education directly.

B. Bivariate Analysis

Table 5. Output of Normality Test from Respondents' Pre- and Post-Test Answers Based on Students' Knowledge and Attitudes at SMAN 1 Kandat

	Normality Test	
Classification	Kolmogorov-Smirnov	Shapiro-Wilk
	Sig.	Sig.
Knowledge		
Pre-Test	0.000	0.005
Post-Test	0.000	0.000
Attitude		
Pre-Test	0.001	0.000
Post-Test	0.000	0.000

Based on table 5 above, after conducting the normality test of knowledge, especially the Shapiro-Wilk significance value (Sig.) of knowledge, because all significance values (Sig.) are smaller than 0.05, it can be concluded that the pre- and post-test data of knowledge, then H0 is rejected so that it is not normally distributed. Likewise, the significance value (Sig.) of attitude gets a value smaller than 0.5, it can be concluded that the pre- and post-test data of attitude, then H0 is rejected so that it is not normally distributed. From the results of the normality test, the hypothesis test used is the Wilcoxon Rank-Test.

Table 6. Wilcoxon Signed Ranks Test Output from Respondents' Pre- and Post-Test Answers Based on Students' Knowledge and Attitudes at SMAN 1 Kandat

Wilcoxon test				
Classification		Number of Cases (N)	Average	Sig.
Knowledge_Post-Test"Knowledge_Pre-Test	Negative	0	0.00	
	Positive	95	48.00	
	Same	0		
	Total	95		.000
Post-Test Attitude"Pre-Test Attitude	Negative	13	16.58	
	Positive	81	52.46	
	Same	1		
	Total	95		.000

Based on the results of the Wilcoxon Signed Rank Test in Table 6 above, the significance value (Sig.) of knowledge and attitudes is 0.000. When examined based on the Wilcoxon Signed Rank Test assessment criteria, this value is less than 0.05, which means the hypothesis of a significant difference in knowledge and attitudes before and after the intervention is accepted. Therefore, it can be concluded that there is a difference in knowledge and attitudes before and after direct visualization of the dangers of smoking on the lungs.

DISCUSSION

A. Identification of Knowledge and Attitudes Before Providing Direct Visualization About the Dangers of Cigarettes on the Lungs of Students of SMAN 1 Kandat

Based on pre-intervention observations, most students at SMAN 1 Kandat exhibited low knowledge and unfavorable attitudes toward the dangers of cigarette smoking: 86.3% of students were categorized as having poor knowledge regarding the harmful effects of cigarettes on the lungs, while only 3.2% were in the good category, and several respondents answered all knowledge questions incorrectly. In terms of attitudes, 76.8% demonstrated negative attitudes toward the dangers of smoking, and only 21.1% expressed a strong willingness to quit or not try smoking before learning about its impacts indicating low health literacy prior to the intervention. Research among adolescents supports that knowledge and attitudes about the risks of smoking are closely related to smoking behavior, with studies showing that lack of adequate knowledge and supportive attitudes can influence the prevalence of smoking among youth (Julaecha & Wuryandari, 2023; Narti et al., 2023; Inez Oktavi et al., 2023). These findings underscore the need for effective health education interventions to enhance adolescent awareness of smoking risks and positively shape attitudes toward tobacco use, which are crucial components in broader public health efforts to reduce smoking initiation among young people.

Based on Notoatmodjo's (2010) theory, knowledge and attitudes are formed from real-life experiences, exposure to information, and direct sensory perception. Often, learning methods in schools still focus on lectures or verbal explanations without visuals, leading students to receive information without actually experiencing its impact. Their perceptions and attitudes only become active if they have more concrete learning experiences, such as experiencing firsthand how smoking damages their lungs. The dominant negative attitude indicates that students' information consumption and motivation are still low before they are given real, lasting experiences.

Researchers see this phenomenon as a concrete illustration of the challenges of health education in the era of adolescents who are easily carried away by visuals and social media,

but do not get the opportunity to learn to touch their emotions and experiences. Changes in the learning approach in schools are urgently needed, so that students not only understand the dangers of smoking in theory, but can also see firsthand using teaching aids that are used to behave healthily before it is too late. Researchers also feel that the lack of focus and lack of responsiveness of students or respondents during this research activity can affect the results of filling out the questionnaire, so that the answers obtained may not fully reflect the students' or respondents' actual level of knowledge and attitudes towards the dangers of smoking.

B. Identification of Knowledge and Attitudes After Providing Direct Visualization About the Dangers of Cigarettes on the Lungs of Students at SMAN 1 Kandat

Based on the research results, after the intervention in the form of direct visualization through demonstrations of props, animated videos, and interactive presentations, there was a very rapid increase in both knowledge and attitudes. A total of 88.4% of students were categorized as having "good" knowledge, while only 4.2% remained "poor." A "positive" attitude increased to 89.5%, indicating that most students tended to reject smoking after seeing the real impacts visually. In various post-test questions, students demonstrated a deeper understanding of the harmful components of cigarettes and the long-term health risks, as well as a stronger willingness to not try smoking.

The following facts indicate that visual approaches are effective in building understanding and raising students' awareness of the risks of smoking. According to visual learning theory (Santrock, 2013), presenting information through visual media strengthens memory by up to 65% compared to verbal methods. The emotional impact of direct visualization has also been shown to encourage the development of preventive attitudes in students, according to findings from the Indonesian Ministry of Health (2020). Researchers believe that direct visualization can be used as an innovative health promotion strategy in schools, as it is more effective in arousing adolescents' emotions and awareness than conventional counseling, which tends to be purely informative.

C. Analysis of Differences in Knowledge and Attitudes Before and After Providing Direct Visualization of the Dangers of Cigarettes on the Lungs of Students at SMAN 1 Kandat

The Wilcoxon Signed Ranks Test showed a significant difference in knowledge and attitudes before and after direct visualization ($p < 0.05$), proving that the intervention not only improved understanding but also modified students' attitudes toward the dangers of smoking. This data is consistent with the shift in the number of students in the "poor" knowledge and "negative" attitude categories to the "good" and "positive" categories after the intervention.

From a behavioral theory perspective, this change can be explained using Bandura's Social Cognitive Theory (Ansani, F., & Muhammad Samsir, H., 2022), which states that individuals more easily change their behavior if exposed to models or direct experiences that have an emotional impact. Concrete visualization of the harmful effects of smoking on the lungs acts as "shock therapy," encouraging students not only to understand the dangers of smoking but also to strengthen their attitudes toward avoiding such behavior. Based on these findings and underlying theory, researchers argue that direct visualization is worthy of adoption as a primary health education method in schools, as it has been proven to effectively stimulate knowledge and attitude change in a relatively short time.

CONCLUSION

Based on the research that has been conducted, the following conclusions can be drawn:

1. Knowledge
   Before the intervention, the majority of SMAN 1 Kandat students (86.3%) were in the "poor" category regarding the dangers of smoking on the lungs. No question indicator was answered correctly by more than half of the respondents. After the direct visualization intervention, there was a significant improvement, with 88.4% of students falling into the "good" category, with an average correct answer rate of over 85% for each item.
2. Attitude
   Before the intervention, the majority (76.8%) of students had a "negative" assessment of smoking prevention efforts, reflecting a lack of proactiveness despite some awareness of the risks of smoking. After the intervention, the percentage of students with a "positive" assessment increased to 89.5%. This demonstrated increased support for smoking prevention programs and a willingness to avoid smoking.
3. Effectiveness of Visual Education: The results of statistical analysis show that visual education is very effective in increasing knowledge and quite effective in forming positive attitudes of students towards the dangers of cigarettes on the lungs. The p-value for knowledge is 0.000 and the p-value for attitude is 0.000, both of these results indicate that the effect of direct visualization is statistically significant ($p < 0.05$) This educational program has been proven to be able to provide meaningful changes, both in knowledge and attitudes, so it is highly recommended to be implemented sustainably in the school environment.

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