



Research

The Effectiveness of Health Promotion Using Lecture Media and Teaching Aids on Improving Smoking-Danger-Awareness Behavior Among Junior High School

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ABSTRACT

According to the World Health Organization, Indonesia ranks third highest in the world in the number of active smokers, with 3.5 million women and 58 million men (WHO, 2022). One region in South Sulawesi Province with active smokers aged 15 years is Makassar City, where 16.58% of adolescents were reported to smoke in 2022 (BPS, 2022). Adolescence is the stage of human development after childhood in which physical, mental, and emotional changes occur. Some adolescents often find it difficult to cope with these changes, so guidance from more mature individuals is needed to protect them from harm. This study aimed to examine the effectiveness of health promotion in improving smoking-danger-awareness behavior among junior high school students. This quantitative study used a quasi-experimental approach with a one-group pretest-posttest design to determine the effectiveness of lecture media and teaching aids about the health dangers of smoking on students' knowledge, attitudes, and actions. The population of this study consisted of 256 eighth-grade students at SMP Negeri 9 Makassar (Ministry of Education, 2023). The sample size was 52 students, selected using a purposive sampling technique. The results of the Wilcoxon test analysis obtained a significance value of 0.000 for knowledge, attitudes, and actions, with a p-value < 0.05, from which it can be concluded that lecture media and teaching aids are effective in improving smoking-danger-awareness behavior among junior high school students at SMP Negeri 9 Makassar. It is recommended that institutions make use of instructional media to disseminate health information on the dangers of smoking to students.

1. Introduction

Adolescence is the stage of human development after childhood in which physical, mental, and emotional changes occur. Some adolescents often find it difficult to cope with these changes, so guidance from more mature individuals is needed to protect them from harm. According to Milman and Botvin (1983), the factors that drive adolescents to use illegal drugs and cigarettes can be divided into internal and external factors. Internal factors are the mentality and emotions of adolescents as they react to harmful environmental influences, including cognitive features, attitudes, and personality traits. External factors are the influence of the adolescent's social environment on their decisions to use alcohol, marijuana, or tobacco (Heng, 2020).

Based on the 2019 Global Youth Tobacco Survey, data on the knowledge and attitudes of adolescents aged 13–15 years in Indonesia showed that 27.8% found it difficult to quit smoking, 12.1% believed smoking made them feel more comfortable, 72.9% considered smoking dangerous to themselves, 89% supported a ban on smoking in enclosed public places, 81.7% supported a ban on smoking in open public places, 67.6% favored a ban on cigarette advertising, 74.5% supported a ban on the sale of single cigarettes, and 62.9% supported an increase in cigarette prices.

The same survey, reporting on adolescents aged 16–17 years in Indonesia, found that 26.5% found it difficult to quit smoking, 17.1% believed smoking made them feel more comfortable, 81.5% were certain that smoking was dangerous to them, 91.7% supported a ban on smoking in enclosed public places, 77.9% supported a ban on smoking in open public places, 59.4% favored a ban on cigarette advertising, 68% supported a ban on the sale of single cigarettes, and 67% supported an increase in cigarette prices (Kementerian Kesehatan RI, 2019).

According to the United Nations International Children's Emergency Fund (2021), 76.6% of adolescents aged 13–15 years purchased cigarettes from shops, stalls, street vendors, or small kiosks. Approximately 63.7% of adolescent girls and 60.4% of adolescent boys were not prevented from buying cigarettes on the basis of their age (UNICEF, 2021).

According to the World Health Organization, Indonesia ranks third highest in the world in the number of active smokers, with 3.5 million women and 58 million men (WHO, 2022). Data from the Central Statistics Agency (Badan Pusat Statistik) for 2022 show that 28.69% of 15-year-old adolescents in Indonesia smoked, while in South Sulawesi Province the figure was 23.76% among active smokers aged 15 years. One area in South Sulawesi Province with active smokers aged 15 years is Makassar City, where 16.58% of adolescents were reported to smoke in 2022 (BPS, 2022).

The dangers of smoking and its health effects are already stated on cigarette packaging sold on the market. Although health warnings on cigarette packs state that "smoking can cause cancer, heart attack, impotence, and pregnancy and fetal complications," many people continue to choose to smoke. Despite cigarettes containing around 4,000 compounds, including tar, carbon monoxide, nicotine, and hydrogen cyanide, the number of smokers in Indonesia remains high (Herawati, 2021).

One effort that can be undertaken to address students' smoking behavior is health promotion using health-promotion media. Health-promotion media is a method of disseminating ideas from a communicator to an audience through print, electronic, and outdoor media, so that the target

audience can learn more, with the ultimate goal of changing behavior in ways that benefit their health (Harahap et al., 2022).

The more senses that are engaged during health promotion, the clearer the information obtained. This illustrates that the purpose of health-promotion media is to involve as many senses as possible in relation to a given subject in order to improve understanding. Spoken words, written text, audio recordings, film, television, exhibitions, field trips, demonstrations, role-play, model objects, and real objects represent the intensity of teaching aids, ranked from lowest to highest (7).

Research conducted by Hermin & Kurnia (2019) on adolescents' knowledge and attitudes about smoking in Barombong Village, Makassar City, clearly demonstrated a relationship between adolescents' knowledge and their smoking behavior: adolescents with higher knowledge exhibited milder smoking-related attitudes, whereas adolescents with lower knowledge exhibited more severe smoking-related attitudes (Harahap et al., 2022).

Previous research by Nalle & Asih (2022) found a considerable difference in learning outcomes between the experimental and control classes. Students in the experimental class, who used a practicum method with teaching aids made from recycled materials, achieved better learning outcomes than students in the control class, who were taught using the lecture method.

Based on the background and data described above, the researchers were interested in investigating the effectiveness of health promotion using lecture media and teaching aids in improving smoking-danger-awareness behavior among junior high school students, conducted at SMP Negeri 9 Makassar.

2. Method

This quantitative study used a quasi-experimental approach with a one-group pretest-posttest design to determine the effectiveness of lecture media and teaching aids about the health dangers of smoking on students' knowledge, attitudes, and actions. To assess the effectiveness of the health-promotion media on students' knowledge, attitudes, and actions, a pretest was first administered, followed by the intervention, and then a posttest.

The study population comprised all subjects possessing the specific characteristics and qualities defined by the researcher. The population of this study consisted of 256 eighth-grade students at SMP Negeri 9 Makassar (Ministry of Education, 2023). The sample comprised a subset of the population whose quality and characteristics were used to draw conclusions. The sample size in this study was 52 students.

A purposive sampling technique was used, in which the sample was selected after taking several factors into consideration. Respondents were first given a pretest, and the pretest results were then classified as good, sufficient, or poor according to the study's criteria. To determine the final study sample, the researcher considered respondents' attendance at each stage of the study – the pretest, the intervention, and the posttest. Respondents who did not attend every stage of the study in full were excluded from the sample. The researcher then administered a posttest using the same instrument to assess changes in respondents' knowledge, attitudes, and actions following the intervention.

3. Results & Discussion

Respondent Characteristics

Table 1. *Frequency Distribution of Respondents by Age*

Age	Frequency (n)	Percentage (%)
13 years	10	19.2
14 years	35	67.3
15 years	7	13.5
Total	52	100

Source: Primary Data, 2023

Based on Table 1, respondents' ages ranged from 13 to 15 years. The majority of respondents were 14 years old (35 respondents, 67.3%), while the smallest group was 15 years old (7 respondents, 13.5%).

Table 2. *Frequency Distribution of Respondents by Sex*

Sex	Frequency (n)	Percentage (%)
Male	29	55.8
Female	23	44.2
Total	52	100

Source: Primary Data, 2023

Based on Table 2, showing the distribution of respondents by sex, there were 23 female respondents (44.2%) and 29 male respondents (55.8%).

Table 3. *Frequency Distribution of Respondents by Presence of an Active Smoker in the Family*

Active Smoker in Family	Frequency (n)	Percentage (%)
Present	40	76.9
Not present	12	23.1
Total	52	100

Source: Primary Data, 2023

Based on Table 3, 40 respondents (76.9%) had an active smoker within their family, while 12 respondents (23.1%) did not.

Table 4. *Frequency Distribution of Respondents by Smoking Behavior*

Smoking Behavior	Pre-test n	Pre-test %	Post-test n	Post-test %
Ever smoked	13	25	0	0
Never smoked	39	75	52	100

Total	52	100	52	100
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Source: Primary Data, 2023

Based on Table 4, 13 respondents (25%) had previously smoked, while 39 respondents (75%) had never smoked. After three days following the intervention, a significant decrease was observed, with all 52 respondents (100%) reporting no smoking within the previous three days.

Table 5. Frequency Distribution of Respondents by Cigarette-Purchasing Behavior

Cigarette-Purchasing Behavior	Pre-test n	Pre-test %	Post-test n	Post-test %
Ever purchased	36	69.2	19	36.5
Never purchased	16	30.8	33	63.5
Total	52	100	52	100

Source: Primary Data, 2023

Based on Table 5, 36 respondents (69.2%) had previously purchased cigarettes, while 16 respondents (30.8%) had never done so. After the intervention, the number of respondents who had purchased cigarettes decreased to 19 (36.5%), meaning that 33 respondents (63.5%) reported not purchasing cigarettes within the previous three days.

Table 6. Frequency Distribution of Respondents by the Type of Cigarette First Known

Cigarette Type First Known	Frequency (n)	Percentage (%)
Filtered cigarette	38	73.1
Kretek (clove) cigarette	6	11.5
Electronic cigarette	8	15.4
Total	52	100

Source: Primary Data, 2023

Based on Table 6, 38 respondents (73.1%) first became familiar with filtered cigarettes, 8 respondents (15.4%) with electronic cigarettes, and 6 respondents (11.5%) with kretek (clove) cigarettes.

Table 7. Frequency Distribution of Respondents by Age at First Smoking

Age at First Smoking	Frequency (n)	Percentage (%)
Never smoked	41	78.8
6 years	2	3.9
9 years	1	1.9
10 years	2	3.9
11 years	1	1.9
13 years	4	7.7

14 years	1	1.9
Total	52	100

Table 8. *Frequency Distribution of Respondents by Motivation for First Smoking*

Motivation for First Smoking	Frequency (n)	Percentage (%)
None	41	78.9
Curiosity / wanting to try	9	17.3
Curiosity	1	1.9
Wanting to look cool	1	1.9
Total	52	100

Source: Primary Data, 2023

Based on Table 8, respondents' motivations for first smoking included the desire to try cigarettes (9 respondents, 17.3%), curiosity, and the perception that smoking makes one look cool (1 respondent each, 1.9%).

Univariate Analysis

Table 9. *Distribution of Respondents' Knowledge, Attitudes, and Actions Before and After the Intervention*

Category	Knowledge Pre n(%)	Knowledge Post n(%)	Attitude Pre n(%)	Attitude Post n(%)	Action Pre n(%)	Action Post n(%)
Poor	6 (11.6)	0 (0)	0 (0)	0 (0)	4 (7.7)	0 (0)
Sufficient	18 (34.6)	1 (1.9)	9 (17.3)	2 (3.8)	13 (25.0)	0 (0)
Good	28 (53.8)	51 (98.1)	43 (82.7)	50 (96.2)	35 (67.3)	52 (100)
Total	52 (100)	52 (100)	52 (100)	52 (100)	52 (100)	52 (100)

Source: Primary Data, 2023

Based on Table 9, increases in knowledge, attitudes, and actions were observed among the 52 respondents. Respondents' knowledge in the good category increased from 28 respondents (53.8%) before the intervention to 51 respondents (98.1%) afterward. Respondents' attitudes in the good category increased from 43 respondents (82.7%) before the intervention to 50 respondents (96.2%) afterward. Respondents' actions in the good category increased from 35 respondents (67.3%) before the intervention to 52 respondents (100%) afterward.

Bivariate Analysis

Table 10. *Normality Test*

Behavior	Pre-test (Asymp. Sig.)	Post-test (Asymp. Sig.)
Knowledge	0.003	0.001
Attitude	0.001	0.017
Action	0	0

Source: Primary Data, 2023

Based on Table 10, the significance values for knowledge before and after the intervention were 0.003 and 0.001, respectively; for attitude, 0.001 and 0.017; and for action, 0.000 both before and after the intervention. It can therefore be concluded that the data were not normally distributed, as all values were below 0.05.

Table 11. Analysis of Respondents' Behavior Before and After the Intervention

Analysis Result	Knowledge Pre	Knowledge Post	Attitude Pre	Attitude Post	Action Pre	Action Post
Minimum	1	5	32	41	1	4
Maximum	9	11	54	56	6	6
Mean	5.65	8.77	46.31	51.5	3.94	5.48

Wilcoxon Signed-Rank Test: Knowledge = 0.000; Attitude = 0.000; Action = 0.000

Source: Primary Data, 2023

Based on Table 11, the minimum knowledge scores before and after the intervention were 1 and 5, respectively; the minimum attitude scores were 32 and 41; and the minimum action scores were 1 and 4. The maximum knowledge scores before and after the intervention were 9 and 11; the maximum attitude scores were 54 and 56; and the maximum action score was 6 both before and after. The mean knowledge scores before and after the intervention were 5.65 and 8.77; the mean attitude scores were 46.31 and 51.50; and the mean action scores were 3.94 and 5.48.

The results of the Wilcoxon test analysis obtained a significance value of 0.000 for knowledge, attitudes, and actions, with a p-value < 0.05. It can therefore be concluded that the lecture media and teaching aids used in health promotion were effective in improving smoking-danger-awareness behavior among junior high school students at SMP Negeri 9 Makassar.

The findings show that, based on Table 9, after the intervention, respondents' knowledge in the good category increased from 28 respondents (53.8%) to 51 respondents (98.1%); attitudes in the good category increased from 43 respondents (82.7%) to 50 respondents (96.2%); and actions in the good category increased from 35 respondents (67.3%) to 52 respondents (100%). The results of the data analysis in Table 11 show a significance value of 0.000 for knowledge, attitude, and action, with a p-value < 0.05, indicating that the lecture media and teaching aids used were effective in improving smoking-danger-awareness behavior among junior high school students.

The more senses engaged in receiving information about the health dangers of smoking during health promotion, the more information that can be obtained. The information gained by students is

then processed, producing new attitudes and actions in response to smoking-related stimuli in their environment.

These findings are consistent with previous research conducted in 2018 by Nevi Eka Pravana and Rusni Masnina, who found a significant difference in students' knowledge before and after health education about the dangers of smoking using teaching aids made from a simple suction bottle (Pravana & Masnina, 2018). Research by Nalle and Asih (2022) also found a significant difference in learning outcomes between the control and experimental groups, with the experimental group, which used teaching aids made from recycled materials, achieving better outcomes than the control group (Nalle & Asih, 2022).

Previous research by Ervi Rachma Dewi et al. (2022) found a difference in students' knowledge when using respiratory-system teaching aids compared with a snakes-and-ladders teaching aid about the dangers of smoking, evidenced by a significance value of 0.026 ($p < 0.05$) (11). Meanwhile, research by Santoso and Sudyasih (2018) found that students' intention to quit smoking increased following health education, indicating that health education can influence male students' attitudes toward quitting smoking.

After examining respondent characteristics, several factors were identified that may influence respondents' actions. Internal and external factors indirectly influence respondents' decisions and responses to smoking-related stimuli, such as sex, parents, environment, smoking behavior, age at first smoking, and motivation for smoking. Based on Table 2, there were 23 female respondents (44.2%) and 29 male respondents (55.8%), showing a larger number of male than female respondents. This finding is reinforced by adolescent smoking-prevalence data by sex, which show that in 2019, 2.9% of adolescent girls smoked, compared with 35.5% of adolescent boys, indicating that sex indirectly influences respondents' smoking-related behavior (UNICEF, 2021).

The findings in Table 3 show that 40 respondents (76.9%) had an active smoker within their family, while 12 respondents (23.1%) did not, indicating that a majority of respondents had an active smoker present in the household. In Table 4, 13 respondents (25%) had previously smoked, and 39 respondents (75%) had never smoked. Following the three-day period after the health-promotion intervention on the dangers of smoking, a decrease in smoking behavior was observed, with all 52 respondents (100%) reporting no smoking within the previous three days, indicating a positive change following the intervention among respondents who had previously smoked.

Table 6 shows that 38 respondents (73.1%) first became familiar with filtered cigarettes, 8 respondents (15.4%) with electronic cigarettes, and 6 respondents (11.5%) with kretek (clove) cigarettes, indicating that most respondents possess information regarding different cigarette types. Table 7 shows that 4 respondents (7.7%) first smoked at age 13, 2 respondents (3.9%) each first smoked at ages 6 and 10, and 1 respondent (1.9%) each first smoked at ages 9, 11, and 14, indicating that a considerable number of respondents began smoking at a young age.

Table 8 shows several motivations behind respondents' smoking behavior, such as the desire to try cigarettes (9 respondents, 17.3%) and curiosity or the perception that smoking makes one look cool (1 respondent each, 1.9%), indicating that most respondents who smoked had a specific initial motivation underlying their tobacco use. This finding is supported by previous research conducted in 2018 by Mirnawati et al., which showed that several factors influence students' smoking behavior,

such as sex, peers, environment, and curiosity. The researchers also explained that the earlier students begin smoking, the stronger the smoking habit becomes and the more difficult it is for them to quit (13).

Research conducted by Tri Karini and Retna Siwi Padmawati in 2018 found that smoking behavior among females specifically was influenced by limited knowledge and by close relationships such as friends, parents, or partners (14). Research by Febrian Adiwijaya and Ekorini Listiowati (2013) found that students' smoking behavior was influenced by family and peer factors, with peer influence being the strongest predictor of students' smoking behavior.

Additionally, research conducted by Erlina Wijayanti in 2017 found that students' smoking behavior was associated with sex, age, experience, knowledge, and attitude. Similarly, research by Martini Pratiwi (2022) found that place of residence, students' developmental stage, maternal education, and the presence of a smoking family member significantly influenced students' smoking behavior, with late adolescents being 67 times more likely to exhibit smoking behavior (17).

The conclusions drawn from this study's findings are reinforced by Lawrence Green's theory, which posits that behavior is influenced by three factors: predisposing factors, enabling factors, and reinforcing factors. Predisposing factors include knowledge, attitudes, beliefs, values, social norms, culture, and environment that facilitate the emergence of a particular behavior. Enabling factors include facilities and infrastructure that support a behavior. Reinforcing factors are attitudes and behaviors that support or strengthen the manifestation of a behavior (18).

Edgar Dale's Cone of Experience theory also supports the researchers' findings, describing 11 levels of learning experience grouped into four categories: verbal, visual, observed, and enacted. The effectiveness of media in supporting audience understanding is divided into three levels: verbal media, visual media, and verbal media paired with visual media. Verbal media can increase understanding by 70% after 3 hours and 10% after 3 days; visual media can increase understanding by 72% after 3 hours and 20% after 3 days; while combined verbal and visual media can increase understanding by 85% after 3 hours and 65% after 3 days (19).

One health-promotion medium used for direct engagement is the teaching-aid or demonstration medium, which has both advantages and disadvantages. Its advantages include providing more concrete information, keeping students proactive during activities, being more engaging, and enabling alignment between theory and practice. Its disadvantages include the need for specialized skills, the requirement that the teaching aid or demonstration used be valid, the need for adequate facilities, and the need for thorough planning (20).

As Allah SWT states in QS Ali 'Imran/3:104 (21):

وَلْتَكُنْ مِنْكُمْ أُمَّةٌ يَدْعُونَ إِلَى الْخَيْرِ وَيَأْمُرُونَ بِالْمَعْرُوفِ وَيَنْهَوْنَ عَنِ الْمُنكَرِ ۚ أُولَٰئِكَ هُمُ الْمُتَّقُونَ

"Let there be among you a group of people who call to what is good, enjoin what is right, and forbid what is wrong. It is they who are successful." (QS Ali 'Imran/3:104)

This finding is consistent with research conducted by Akhmad Sukardi in 2016, which identified several da'wah (Islamic outreach) methods suited to adolescents' needs in dealing with life's challenges, including question-and-answer methods, discussion methods, exemplary-model (uswatun hasanah) methods, technology-based methods, and sport- and art-based methods. The uswatun hasanah method was found to be the most effective for adolescents even when delivered

without words, since exemplary attitudes and actions communicate more powerfully than speech. This is further reinforced by the characteristic tendency of adolescents to imitate and seek role models (22).

Mubasyaroh's 2017 study identified effective communication strategies that account for the stages of change in adolescents' knowledge, attitudes, and behavior, based on the principles of persuasive da'wah: qaulan layyinan (gentle speech), qaulan sadidan (truthful speech), qaulan maysuran (easily understood speech), qaulan baligha (impactful speech), qaulan ma'rufa (kind words), and qaulan karima (noble words) (23).

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