



Pop-Up Book as A Health Education Media on Smoking Prevention For Elementary School Students

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Abstrak

Perilaku merokok dan penyakit akibat merokok adalah masalah kesehatan global. Prevalensi perokok anak usia anak sekolah di kota Samarinda mengalami peningkatan dalam tiga tahun terakhir. Penelitian ini bertujuan menganalisis pengaruh pendidikan kesehatan dengan media pop-up book terhadap pengetahuan dan motivasi pencegahan merokok pada siswa SDN 009 Loa Janan Ilir. Jenis penelitian ini adalah penelitian pre eksperimen dengan desain one group pre-test post-test design. Intervensi penelitian melalui pendidikan kesehatan dengan media pop-up book. Sampel penelitian berjumlah 67 siswa kelas V SDN 009 Loa Janan Ilir yang ditentukan dengan total sampling. Pengumpulan data melalui pengisian kuesioner. Data penelitian diuji secara statistika menggunakan uji Wilcoxon. Hasil penelitian menunjukkan jumlah siswa yang memiliki pengetahuan baik meningkat sebanyak 47 orang (70,1%) dan motivasi positif bertambah sebanyak 29 orang (46,3%). Hasil analisis statistik menunjukkan ada pengaruh pendidikan kesehatan menggunakan media pop-up book terhadap pengetahuan (p -value = 0,000) dan motivasi responden (p -value = 0,002) tentang pencegahan merokok. Media pop-up book efektif sebagai media pendidikan kesehatan tentang pencegahan merokok bagi siswa sekolah dasar.

Abstract

Smoking behavior and smoking-related diseases were global health problems. The prevalence of school-age child smokers in Samarinda city has increased in the last three years. The study aimed to analyze the effect of health education with pop-up book media on knowledge and motivation to prevent smoking in students of SDN 009 Loa Janan Ilir. The type of research was a pre-experimental study with a one group pretest-posttest design. Research intervention was applied through health education with pop-up book media. The research sample was amounted to 67 fifth-grade students of SDN 009 Loa Janan Ilir which determined by total sampling. Data were collected through questionnaires. The research data were tested statistically using the Wilcoxon test. The results showed that the number of students who had good knowledge increased by 47 people (70.1%) and positive motivation increased by 29 people (46.3%). The results of statistical analysis showed that there was an effect of pop-up book media health education on the knowledge (p -value = 0.000) and motivation of respondents (p -value = 0.002) about smoking prevention. Pop-up book media was effective as a health education media on smoking prevention for primary students.

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INTRODUCTION

Smoking behavior and smoking-related diseases were global health problems. WHO data explained that 22.3 percent of the world's population smokes and about 80 percent of those smokers live in middle- and low-income countries. The data also stated that 8 million people die from smoking-related diseases every year. The health burden of smoking was particularly high in developing countries, one of which was Indonesia (WHO, 2023).

The estimated total number of active smokers in Indonesia reached 70 million people. The main group of the total number was children and adolescents. Smoking behavior in Indonesia began in childhood. The average age of first smoking in Indonesia was less than 12 years (Ministry of Health, 2024). The prevalence of child and adolescent smokers was increasing. The prevalence of smokers aged 13-19 years was 18.8% in 2019) and increased to 22.04% in 2022. The phenomenon showed that children were the most vulnerable group in smoking (Liziawati and Ayuningtyas, 2024).

Child and adolescent smokers were an asset to the tobacco industry. Children and adolescents were replacement smokers who would replace smokers who had quit or died from smoking. The issue was very worrying because the younger a person starts smoking, the greater the risk of experiencing smoking-related diseases and the more difficult it was to stop in future (Hasanah and Hayati, 2022). Effort to increasing the knowledge and motivation of elementary school children about the dangers of smoking was an urgency in preventing the formation of smoking behavior.

One of the efforts to increase the knowledge could be done through health education. Health education was needed to upload awareness to provide or increase public knowledge about maintaining and improving health both for themselves, families, and communities (Agustin, Adyas, and Saleh, 2025). In general, health education in Indonesia was still carried out using the lecture method with slide presentation media. These health education methods and media were less effective when applied to groups of children.

There is a need for innovation in the use of health education media to prevent smoking. Salawati, Larasaty, and Zein (2022) stated that one of the educational media innovations that could be used is pop-up book. Pop-up book was one type of health education media innovation that has been proven effective in increasing children's knowledge and motivation about health material. It was belong to smoking prevention that could be pursued early on through health education for students in elementary school.

Research by Damayanti, Kurniawati, and Septiyono (2022) stated that pop-up book was effective in increasing the knowledge of elementary school students in Jember about menstrual syndrome. The results of research by Mordayanti, Winarni, Mujito, and Suryani (2023) noted that pop-up book succeeded in increasing the knowledge of elementary school students in Malang about personal hygiene. The results of research by Pibriyanti, Putri, and Rooiqoh (2024) confirmed the effect of using pop-up book media in increasing the knowledge of elementary school students in Kendal about anemia.

The prevalence of smoking in East Kalimantan in the population aged 10-18

years as active smokers was 3.3%, while in occasional smokers it was 1.9%. The data showed that there was still a large percentage of active smokers in East Kalimantan. The percentage of the population aged 15 years and over who smoked in East Kalimantan Province in 2021 was 23.37%, while in 2022 there was a decrease of 22.21% and based on 2023 data it was 22.97%, in this case indicating an increase in the percentage of smoking age children from 2022 to 2023 (Asmadina, Hendriani, and Rahayu, 2024).

Data from the Samarinda City Health Office in 2023 stated that there were 17% smoking cases in the age group of children and adolescents in Samarinda city. Reports on school-age smoking behavior screening activities in 2023 in the Trauma Center puskesmas area were 19% of students who had smoked from SDN Trauma Center work area. The results of the Trauma Center puskesmas survey to elementary schools in Loa Janan Ilir obtained the results of four schools in the Trauma Center work area there could be schools that had the highest smoking cases, namely SDN 009 Loa Janan Ilir, which was 25.7%.

The results of preliminary study at SDN 009 Loa Janan Ilir school showed that from the working area of the trauma center SDN 009 Loa Janan Ilir had the most students, namely 505 people with the number of male students 260 and female students 246. There was a sample of class 6C as many as 28 students including 14 boys and 14 girls showing that 42% of male students have smoked and started trying smoking at the age of 5-13 years. The results of the preliminary study showed that there were 56% of students who had poor category knowledge about smoking, 32% in the moderate category, and 12% in the poor

category. Students' negative motivation in preventing smoking was also high as much as 60%.

The description above directed to the purpose of this study, which was to analyze the effect of health education using pop-up book media on knowledge about smoking prevention in students of SDN 009 Loa Janan Ilir. The results of the study were expected to be additional information for the Trauma Center puskesmas and SDN 009 Samarinda Ilir in the management of smoking prevention programs for students in elementary school age.

METHOD

The type of research was pre-experimental research with a one group pretest posttest design. Researchers gave an initial test (pretest) before giving treatment to research respondents and then applied the final test (posttest). There was one research group whom would receive the research intervention. The research intervention was provided through health education using pop-up book media

The research was conducted in January 2025 at SDN 009 Loa Janan Ilir, Samarinda City, East Kalimantan. The independent variable of was health education using pop-up book media. The dependent variable was knowledge and motivation about smoking prevention. The sample of the study was amounted to 67 students who were calculated and determined through the sample size formula for one proportion. Determination of samples from each class applied proportional random sampling and simple random sampling techniques.

The research instrument was a questionnaire sheet, namely a knowledge questionnaire totalled 20 questions and a

motivation questionnaire about smoking prevention totalled 20 questions. The research questionnaire was tested for validity and reliability before being used in data collection. Data were tested statistically using the Wilcoxon test because it was carried out on the dependent variable with a categorical scale and was paired data.

RESULT AND DISCUSSION

The results of the characteristics of respondents were presented in the following table.

Table 1. Frequency Distribution of Respondent Characteristics

Variable	N	(%)
Age		
11 years old	63	94.0
12 years old	4	6.0
Gender		
Boy	32	47.8
Girl	35	52.2
Smoking status		
Yes	21	31.3
No	46	68.7
Smoking friend status		
Some	36	53.7
None	31	46.3
Parental smoking status		
Yes	32	47.8
No	35	52.2
Exposure to advertisements		
Ever	49	73.1
Never	18	26.9
Exposure to information on the dangers of smoking from the health center (last 1 month)		
Ever	17	25.4
Never	50	74.6
Total	67	100.0

Based on Table 1, it is known that the most of the respondents were male as many as 35 students (52.2%), did not have smoking status as many as 46 students (68.7%), had smoking friends as many as 36 students (53.7%), and had smoking parents as many as 35 students (52.2%) Most of the respondents had also been exposed to cigarette advertisements, namely 49 students (73.1%) and had never received exposure to hazard information from the puskesmas as many as 50 students (74.6%).

The results of the analysis of the effect of research interventions on respondent's knowledge of smoking prevention are presented in the following table.

Based on table 2, it was known that there was an increase in the number of respondents who had good knowledge between the pre-test and post-test by 47 students. Meanwhile, there was a decrease in the number of respondents who had poor knowledge between the pre-test and post-test by 40 students. The results of statistical analysis through the Wilcoxon test resulted in a p-value of 0.000 (<0.05). It could be concluded statistically that H_0 was rejected, stated that there was a significant effect of health education with pop-up book media on respondent's knowledge between before and after being given health education with pop-up book media.

The results of the analysis of the effect of research interventions on respondent's motivation of smoking prevention were presented in the following table.

Table 2. The Effect of Health Education Using Pop-Up Book on Respondents' Knowledge

Knowledge	Pre-test		Post-test		Selisih		p-value	Keterangan
	f	%	f	%	f	%		
Good	6	9.0	53	79.1	+ 47	70.1	0.000	There was the effect
Fair	16	23.9	9	13.4	- 7	- 2.6		
Poor	45	67.2	5	7.5	- 40	- 59,7		
Total	67	100.0	67	100.0				

Table 3. The Effect of Health Education Using Pop-Up Book on Respondents' Motivation

Knowledge	Pre-test		Post-test		Selisih		p-value	Keterangan
	f	%	f	%	f	%		
Good	27	40.3	58	86.6	+ 31	+ 46.3	0.002	There was the effect
Fair	40	59.7	9	13.4	- 31	- 46.3		
Total	67	100.0	67	100.0				

Based on table 3, it was known that there was an increase in the number of respondents who had positive motivation between the pre-test and post-test by 31 students. Meanwhile, there was a decrease in the number of respondents who had negative motivation between the pre-test and post-test by 31 students. The results of statistical analysis through the Wilcoxon test resulted in a p-value of 0.002 (<0.05). It could be concluded statistically that H_0 was rejected, stated that there was a significant effect of health education with pop-up book media on respondent's motivation of smoking prevention between before and after being given health education with pop-up book media

The results of this study were in accordance with several other studies that produced similar information. The results of research by Kulsum, Sukaesih, and Haryeti (2023) stated that there was an increase in the number of elementary school students in Sumedang who had knowledge about myopia in the good category after providing health education using pop-up book media. The results of Sulistyorini's research (2023) also noted that pop-up book media was able to increase the knowledge

of elementary school students in Jakarta about oral health. The results of Wahid et al.'s research (2023) also concluded that health education with pop-up books was successful in increasing the knowledge of elementary school students in Jambi regarding the dangers of smoking. Oktarina et al.'s research (2024) confirmed that pop-up book media was effective in increasing the knowledge of orphanage children in Jambi about mental health.

A person's knowledge is shaped by internal and external factors. In the context of health education, these internal factors include age and gender. External factors include receiving health information (Primidita, Suralaga, and Respati, 2025). Both factors can influence the increase in the number of respondents who have good category knowledge. For example, girls tend to pay more attention to their health conditions. The concept affects their interest and attention in receiving information by researchers during health education. The increase in the number of respondents who have good knowledge was assumed to be related to the most of respondents who were girls.

Most of the respondents in this study were 11 years old, amounting to 94%. Age

11 years was included in the age group of children who had their own cognitive development characteristics. According to Piaget's theory, the cognitive development of 11-year-old children was at the formal operational stage. The stage was characterized by the ability to think creatively and systematically (Lestari, 2018). The characteristics of this stage were assumed to stimulate an increase in research respondents' knowledge about smoking prevention.

Most of the research respondents were female, namely 52.2%. The observations of Islami, Azizah, and Arifah (2021) stated that in general girls had better knowledge about health than boys. The main reason that forms the concept was that women had higher concern for health. This was strongly related to the factor of women's weaker immunity and personal desire to had a better appearance, The high level of concern would create efforts to maintain the health status by increase health knowledge.

Smoking prevention information was delivered by researchers to respondents through health education with pop-up book media. Rezeki and Utari (2021) stated that the main goal of health education was to increase the target's knowledge about health material. The achievement of these goals is influenced by various factors, one of which was the selection and use of appropriate educational media. The selection and use of pop-up books as the intervention media in this study was in accordance with the objectives of the activity and the characteristics of the respondents.

The main characteristic of pop-up books was three-dimensional props that can stimulate children's imagination so as to provide a more interesting visualization experience (Nurahmadi and Dalimunthe, 2024). These characteristics could make it

easier for children to acquire new knowledge better. The information in the pop-up book that the researchers used contained information about smoking prevention designed with simple sentences and attractive images. It was assumed that this can increase the memory and knowledge of research respondents about the information presented.

This study provided information that pop-up books were effective as a health education media. The results of this study were in line with the results of research by Nufus, Mariyam, and Sholekhah (2022) which stated that there was an effect of pop-up books as a health education media on the motivation to brush teeth in elementary school students in Semarang. The results of Wahid, Ridwan, and Ningsih's research (2023) also stated that health education with pop-up book media succeeded in increasing the number of elementary school students in Jambi who had positive motivation not to start smoking. The results of Mohamed and Ali's research (2024) also concluded the effectiveness of pop-up books as a health education media in increasing motivation to maintain environmental health on children in Saudi Arabia.

Motivation was the driving force from within a person to behave in a certain way to achieve a goal. Sari, Ayunin, and Setyowati (2021) stated that the better a person's knowledge, the more positive the motivation formed. This concept could be applied to the results of this study. Most respondents had poor knowledge in the pre-test category. The result was assumed to be related to some respondents who had negative motivation at the time of the pre-test. An increase in the number of research respondents who have good knowledge is related to an increase in the number of respondents who had positive motivation.

Lestari (2020) explained that a person's motivation was influenced by his level of knowledge. The better a person's knowledge, the more positive motivation was formed. New knowledge that was formed would create an understanding of what was right and wrong so that it could affect behavioral motivation.

The characteristics of the respondents and the implementation of the research intervention were also assumed to influence the formation of positive motivation of the respondents. All respondents who were still in the age group of children would more easily absorb information and form new motivations. Most of the respondents were girls who more motivated to live healthy lives by not smoking behavior. The implementation of the intervention twice was assumed to be able to increase knowledge that would form positive motivation of respondents in smoking prevention.

CONCLUSION

Pop-up books were effective as health education media to increase knowledge and motivation to prevent smoking in elementary school students. This was evidenced by the results of statistical tests and an increase in the number of respondents who have good knowledge and positive motivation about smoking prevention after receiving the research intervention.

Researchers only used one intervention group without a control group in this study. Future research is highly-expected to develop the methods and results of this study by applying the quasi-experimental research. Schools and health centers are also hoped for develop and use pop-up book media as a health education

media on smoking prevention for elementary school students.

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