

The Effectiveness Of Health Belief Model-Based Poster Media In Promoting Smoking Cessation Behavior Among Low-Income Families In Gajah Village, Gajah District, Demak Regency

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Abstract. The high prevalence of smoking habits among poor families in Gajah Village, Gajah Sub-district, Demak Regency, has become a serious problem because it affects the health and economic conditions of the family. This study aims to analyze the effectiveness of poster media based on the Health Belief Model in promoting smoking cessation behavior among poor families.

This study uses a quantitative approach with a pre-experimental one group pre-test and post-test design. The population in the study is 124 families who are beneficiaries of the Family Hope Program and the sample consisted of 55 respondents obtained through a simple random sampling technique using the Spin The Wheel method based on the calculations of the Slovin formula. Data collection was carried out through pre-test and post-test using questionnaires that had been tested for validity and reliability. The data were analyzed using univariate and bivariate analysis, with the Wilcoxon to determine the differences before and after the intervention.

The results showed that the average knowledge of respondents experienced an increase in score between pretest and posttest by 4.1%, while in the average attitude it was known that the score increase between pretest and posttest was 10.3%. The results of the analysis of the Effectiveness of Poster Media Based on the Health Trust Model to Promote Smoking Cessation Behavior using the wilcoxon test obtained a knowledge p value of 0.000 ($p < 0.05$) and an attitude p value of 0.002 ($p < 0.05$).

Poster Media Based on Health Trust Model Effective in Promoting Smoking Cessation Behavior in Gajah Village, Gajah District, Demak Regency

Key words: [Poster Media, Health Belief Model, Smoking Cessation Behavior, Knowledge, Attitude]

INTRODUCTION

Poverty remains a persistent challenge faced by developing countries, including Indonesia. Data from Statistics Indonesia (BPS) in 2021 indicated that approximately 14 million people living in poverty resided on Java Island, accounting for around 52% of the total poor population in Indonesia. This condition is further exacerbated by the high prevalence of smoking on Java Island, which averages 28.37%. Smoking is not only an individual health issue but also a complex public health problem. Cigarette smoke contains more than 4,000 chemical substances that are harmful to health, including nicotine, which is highly addictive, and tar, which is carcinogenic. According to the Indonesian Ministry of Health (2018), toxins and carcinogenic substances produced by tobacco combustion can trigger cancer and various other chronic diseases.

Recent data indicate that the prevalence of active smokers in Indonesia continues to increase. The 2023 Indonesian Health Survey (SKI) conducted by the Ministry of Health estimated that the number of active smokers had reached approximately 70 million people, of whom 7.4% were aged 10–18 years. This situation is highly concerning given the adverse effects of smoking on both health and household economic conditions.

Smoking and poverty have a close and complex relationship. In low-income families, smoking

culture is commonly transmitted from one generation to the next through a continuous learning process. Over time, this process develops into a habit that is difficult to break, reinforced by the addictive substances contained in cigarettes. From an economic perspective, smoking behavior reflects a shift in individual and household consumption from beneficial goods and services to tobacco products. Consequently, this habit further worsens the economic conditions of low-income families, as household expenditures on cigarettes could otherwise be allocated to more essential needs, such as food, education, and healthcare.

Smoking is one of the leading causes of preventable deaths in the community. Its adverse effects are experienced not only by active smokers but also by passive smokers who are exposed to secondhand cigarette smoke. Smoking is a major risk factor for various life-threatening chronic diseases, including cancer, pulmonary diseases, and cardiovascular diseases. It has been reported that smoking contributes to at least 30 different diseases in humans. Of particular concern is that smoking is a habit that is difficult to eliminate and is rarely acknowledged as a harmful behavior. For smokers, quitting is challenging because smoking has become an essential part of daily life and provides a sense of satisfaction. Smoking is associated not only with health-related issues but also with economic, social, cultural, and even religious aspects. Consequently, changing smoking behavior is not an easy task.

The Health Belief Model is a health behavior theory from the social psychological perspective that emphasizes expectations, values, and decision-making processes that influence individuals' health-related actions (Conner & Norman, 2016; Daragmeh, Sági, & Zéman, 2021). The Health Belief Model aims to explain the reasons underlying individuals' decisions to adopt preventive behaviors. This model has been shown to be effective in describing health behaviors related to disease prevention, including preventive behaviors during the COVID-19 pandemic (Glanz, Rimer, & Viswanath, 2008; Siddiqui et al., 2016). Health promotion is one of the key strategies for improving public health by emphasizing promotive and preventive efforts. Through health promotion, health-related messages are delivered with the expectation of influencing individuals' health behaviors. A study conducted by Ervi Rachma Dewi et al. (2022) demonstrated significant differences in adolescents' knowledge regarding the hazards of smoking following health promotion interventions delivered through respiratory system teaching aids and the snakes-and-ladders educational game (Dewi, Ervi Rachma, et al., 2022).

The issue of poverty in Gajah Village, Gajah District, Demak Regency, represents one of the most complex social problems in the area, with approximately 124 beneficiary households of the Family Hope Program (KPM). According to Statistics Indonesia (BPS), the percentage of individuals aged 15 years and above who smoked in Central Java Province in 2023 was 21.11% among those aged 15–24 years, 32.73% among those aged 25–34 years, 34.44% among those aged 35–44 years, 30.86% among those aged 45–54 years, and 33.08% among those aged 65 years and above. Among these age groups, individuals aged 35–44 years had the highest smoking prevalence.

Based on the above description, the researchers were interested in further investigating the effectiveness of Health Belief Model-based poster media in promoting smoking cessation behavior

among low-income families in Gajah Village, Gajah District.

METHODS

This study was conducted in Gajah Village, Gajah District, Demak Regency. The study site was selected based on the high poverty rate in the area, with approximately 124 beneficiary households of the Family Hope Program (KPM). In addition, data from Statistics Indonesia (BPS) indicate that Demak Regency has a relatively high prevalence of smokers, particularly among individuals aged 25–34 years (37.02%) and 35–44 years (33.16%). The study population consisted of all members of low-income families with smoking habits residing in Gajah Village, Gajah District, Demak Regency. The inclusion criteria were as follows: beneficiaries of social assistance programs (low-income families), active smokers, aged 18 years or older, and willing to participate in the study.

This study employed a quasi-experimental design using a pre-test and post-test approach. This design was selected to evaluate the effectiveness of an educational intervention delivered through Health Belief Model-based poster media on respondents' knowledge and attitudes toward smoking cessation behavior. The research instrument used in this study was a structured questionnaire. Univariate analysis was performed to describe the respondents' mean knowledge scores before and after the health promotion intervention. The analytical procedure began with a normality test, which is a statistical procedure used to determine whether a dataset follows a normal distribution. A normal distribution is characterized by a symmetrical, bell-shaped curve in which the mean, median, and mode are equal. If the data were normally distributed, a paired *t*-test was performed. Otherwise, the Wilcoxon signed-rank test was used.

RESULTS AND DISCUSSION

Based on the findings of this study, the frequency distribution of respondents' characteristics was obtained according to age, occupation, and duration of smoking.

Table 1 Distribution of Respondents by Age, Occupation, and Duration of Smoking

Variable	Frequency	Percentage
Age		
<20 Years	0	0%
20-30 Years	7	12,7%
31-40 Years	21	38,2%
41-50 Years	23	41,8%
>50 Years	4	7,3%
Total	55	100
Occupation		
Farmer	12	21,8%
Labor	31	56,4%
Trader	5	9,1%
Self-employed	4	7,3%
Others	3	5,5%
Total	55	100
Duration of Smoking		
<10 Years	3	5,5%

11-15 Years	7	12,7%
16-20 Years	14	25,5%
21-25 Years	15	27,3%
26-30 Years	12	21,8%
>30 Years	4	7,3%
Total	55	100

Source: *Primary data*, 2025

Based on Table 1, the majority of respondents were aged 41–50 years, comprising 23 individuals (41.8%), followed by those aged 31–40 years, with 21 individuals (38.2%). Meanwhile, 7 respondents (12.7%) were aged 20–30 years, and 4 respondents (7.3%) were over 50 years of age. No respondents were younger than 20 years.

Regarding occupation, the majority of respondents were laborers, accounting for 31 individuals (56.4%). Farmers constituted the second-largest occupational group, with 12 respondents (21.8%), followed by traders with 5 respondents (9.1%), self-employed individuals with 4 respondents (7.3%), and respondents in other occupations with 3 individuals (5.5%).

Regarding the duration of smoking, most respondents had been smoking for a relatively long period. The largest group consisted of respondents who had smoked for 21–25 years, totaling 15 individuals (27.3%), followed by those who had smoked for 16–20 years with 14 individuals (25.5%), and those who had smoked for 26–30 years with 12 individuals (21.8%). In addition, 7 respondents (12.7%) had smoked for 11–15 years, 4 respondents (7.3%) had smoked for more than 30 years, and only 3 respondents (5.5%) had smoked for less than 10 years.

The distribution of knowledge among low-income families regarding smoking cessation behavior before and after the health promotion intervention using Health Belief Model-based poster media is presented in the table below:

Table 2 Distribution of Respondents Knowledge and Attitudes Before the Intervention					
Score	Mean	Median	Std.deviation	Min	Max
Knowledge					
Pretest	16,62	17,00	2,32	11	20
Posttest	17,31	18,00	2,56	11	20
Attitude					
Pretest	11,85	12,00	1,43	9	14
Posttest	13,00	13,00	1,76	6	15

Source: *Primary data*, 2025

Based on Table 2, the distribution of knowledge among low-income families regarding smoking cessation behavior before the health promotion intervention using poster media showed a mean score of 16.62, with a minimum score of 11 and a maximum score of 20. The median score was 17.00, with a standard deviation of 2.32. Following the health promotion intervention using poster media, the respondents' knowledge showed a mean score of 17.31, with a minimum score of 11 and a maximum score of 20. The median score was 18.00, with a standard deviation of 2.56.

Regarding respondents' attitudes toward smoking cessation behavior, the mean pre-test score was 11.85, with a minimum score of 9 and a maximum score of 14. The median score was 12.00, with a standard deviation of 1.43. After the health promotion intervention using poster media, the mean attitude score increased to 13.00, with a minimum score of 6 and a maximum score of 15. The median score was 13.00, with a standard deviation of 1.76.

Table 3 Results of the Normality Test for Knowledge and Attitude Data

Variable	Frequency	Shapiro-Wilk		
		Statistic	df	Sig.
Knowledge				
Pretest	55	0,932	55	0,004
Posttest	55	0,872	55	0,000
Attitude				
Pretest	55	0,865	55	0,000
Posttest	55	0,903	55	0,000

source: *Primary data*, 2025

Based on Table 3, the normality of the knowledge and attitude data was assessed using the *Shapiro–Wilk normality test*. The *p-value* for the *pre-test* knowledge data was 0.004, while the *p-value* for the *post-test* knowledge data was 0.000. For the attitude data, the *p-values* for both the *pre-test* and *post-test* were 0.000.

Since all *p-values* were less than 0.05, it was concluded that the knowledge and attitude data were not normally distributed. Therefore, the *paired t-test* could not be applied in this study. Instead, the *Wilcoxon signed-rank test*, a non-parametric statistical test, was used to determine whether there were significant differences between the *pre-test* and *post-test* scores.

Table 4 Analysis of Respondents Knowledge and Attitudes Before and After the Intervention

Analysis results		P Value
	Pretest	Posttest
Knowledge		
Wilcoxon Signed Ranks Test		0,000
Attitude		
Wilcoxon Signed Ranks Test		0,002

Source: *Primary data*, 2025

Table 4 presents the results of the analysis of respondents' knowledge and attitudes before and after the intervention using Health Belief Model-based poster media. Based on the *Wilcoxon signed-rank test*, the *p-value* for knowledge was 0.000. Since the *p-value* for knowledge was less than 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted, indicating a statistically significant difference in respondents' knowledge before and after the intervention. Therefore, it can be concluded that Health Belief Model-based poster media were effective in improving respondents' knowledge regarding smoking cessation behavior among low-income families in Gajah Village, Gajah District, Demak Regency.

The table also presents the results of the analysis of respondents' behavior before and after receiving health promotion through Health Belief Model-based poster media. Based on the *Wilcoxon signed-rank test*, the *p-value* for knowledge was 0.000. Since the *p-value* for knowledge was less than 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted, indicating a statistically significant difference in respondents' knowledge before and after the intervention. The *p-value* of 0.000 for the knowledge variable indicates a highly significant difference between the knowledge scores before and after the health promotion intervention. This extremely small *p-value* (approaching zero) suggests that the likelihood of the observed difference occurring by chance is very low. Therefore, it can be concluded that the health promotion intervention had a positive effect on improving respondents' knowledge.

The analysis of respondents' attitudes before and after the intervention using Health Belief Model-based poster media showed that the *p-value* obtained from the *Wilcoxon signed-rank test* was 0.002. Since the *p-value* for knowledge was less than 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted, indicating a statistically significant difference in respondents' attitudes before and after the intervention. Therefore, it can be concluded that Health Belief Model-based poster media were effective in improving respondents' attitudes toward smoking cessation behavior among low-income families in Gajah Village, Gajah District, Demak Regency.

Table 4 also presents the results of the analysis of respondents' attitudes before and after receiving health promotion using Health Belief Model-based poster media. Based on the *Wilcoxon signed-rank test*, the *p-value* for knowledge was 0.002. Since the *p-value* for knowledge was less than 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted, indicating a statistically significant difference in respondents' knowledge before and after the intervention. The *p-value* of 0.002 for the attitude variable also indicates a statistically significant difference between the attitude scores before and after the health promotion intervention. Although the *p-value* for attitude was slightly higher than that for knowledge, it remained well below the significance level of $\alpha = 0.05$, indicating that the observed change in attitude was unlikely to have occurred by chance.

Table 5 Analysis of Knowledge and Attitude Variables to Determine the Effectiveness of Health Belief Model-Based Poster Media

Health Belief Model-Based Poster Media		
Results	Mean	Score Increase
Knowledge		
Pretest	16,62	3,97%
Posttest	17,31	
Attitude		
Pretest	11,85	8,8%
Posttest	13,00	

Source: *Primary data*. 2025

Based on Table 5, the knowledge score increased by 3.97% from the pre-test to the post-test, indicating that the poster media were effective in improving respondents' knowledge regarding smoking cessation behavior among low-income families in Gajah Village. Meanwhile, the attitude score

increased by 8.8% from the pre-test to the post-test. This finding indicates that health promotion delivered through Health Belief Model-based poster media was effective in improving smoking cessation behavior among low-income families in Gajah Village, Gajah District, Demak Regency.

The 3.97% increase in knowledge indicates an improvement, although it falls within a modest range. In the context of low-income families, however, this improvement is meaningful because such families generally have limited access to health information. Therefore, even a modest increase in knowledge represents an important achievement. The 3.97% increase suggests that the information presented through the poster media was successfully understood by the respondents. This improvement in knowledge provides the foundation for subsequent changes in attitudes and behaviors, consistent with theories of health communication.

The 8.8% increase in attitude demonstrates greater effectiveness than the increase observed for knowledge. The poster media successfully influenced the respondents' emotional responses, creating a strong impact through messages regarding the dangers of smoking and the benefits of smoking cessation. The greater improvement in attitude also indicates a higher level of readiness among respondents to adopt actual behavioral changes

A study conducted by Sri Mediati Nasution (2019) reported that there was a significant effect and difference in students' knowledge regarding the hazards of smoking before and after receiving health education through poster media, with a calculated t -value of 7.132, which was greater than the critical t -value of 1.666. Similarly, a study conducted by Dharmastuti (2017) on the effect of health education regarding the dangers of smoking delivered through *booklet* and poster media among students at SMP Negeri 2 Tasikmadu found significant differences in knowledge before and after the intervention using booklet media ($p = 0.000$) and poster media ($p = 0.017$). Significant differences in attitudes were also observed before and after the intervention using booklet media ($p = 0.000$), whereas no significant difference in attitudes was found before and after the intervention using poster media ($p = 0.946$). Furthermore, the comparative analysis between booklet and poster media demonstrated significant differences in their effects on both knowledge ($p = 0.000$) and attitudes ($p = 0.000$).

Health promotion is an effort to promote, disseminate, and introduce health-related information with the aim of improving public health. Health promotion is supported by educational media to ensure that health messages are more attractive, understandable, and easier for the target population to learn (Notoatmodjo, 2010). The findings of this study are also consistent with those of Listriawulan (2017), who investigated the effect of health counseling on adolescents' perceptions of smoking at SMA Negeri 2 Ngaglik. The study demonstrated significant differences in adolescents' perceptions before and after receiving health counseling on smoking. The author recommended strengthening and optimizing the Youth Information and Counseling Center (PIKR) program and increasing the installation of posters on the dangers of smoking so that students could better understand smoking-related health issues.

A study by Grieger and Norman (2020) found that visual media were able to improve knowledge and attitudes by up to 76.2% among participants who received visual-based educational interventions.

These findings indicate that poster media are not only effective in conveying information but also in promoting positive attitudes toward healthy dietary behaviors among adolescents. This study is further supported by findings reported by *Hypertension* (2023), which showed that visual-based educational media improved awareness and knowledge regarding the health risks associated with unhealthy dietary habits. In that study, respondents exposed to visual information demonstrated significant improvements in both knowledge and attitudes, consistent with the findings of the present study, which showed increases in knowledge scores from 60% to 85% and attitude scores from 55% to 80%.

Furthermore, Setiawan (2022) emphasized that effective educational media, such as posters and seminars, can improve adolescents' knowledge and attitudes toward health-related issues. The study demonstrated that well-designed educational interventions can produce significant positive impacts and highlighted the importance of continuing educational programs in schools to enhance adolescents' awareness of reproductive health and the effects of fast-food consumption. Accordingly, adequate knowledge serves as a fundamental factor influencing adolescents' attitudes and behaviors in maintaining their reproductive health. Notoatmodjo (2019) also emphasized that knowledge acquired through human sensory perception, including visual media, can influence individuals' attitudes and behaviors.

A study conducted by Septia Dwi Lestari (2024) demonstrated the effectiveness of poster media regarding the impact of fast food consumption on primary dysmenorrhea among students at SMA Al-Khairiyah, North Jakarta, in 2024. The Wilcoxon test produced a significance value of 0.00, indicating that the use of poster media was effective. These findings are consistent with those reported by Grieger and Norman (2020), who stated that visual media, including posters, can improve adolescents' knowledge and attitudes. Their study found that visual-based educational interventions increased knowledge and attitudes by up to 76.2%, indicating that poster media are effective not only in delivering information but also in fostering positive attitudes toward healthy dietary behaviors.

Behavior is the result of a learning process and an individual's interaction with the surrounding environment, as reflected in the domains of knowledge, attitudes, and actions. In the context of health behavior, these changes are directed toward improving, restoring, or maintaining the health status of individuals and communities. Referring to Bloom's theory, as modified by subsequent scholars, behavior can be classified into three main domains: knowledge, attitudes, and actions (Pakpahan et al., 2021). Knowledge refers to information acquired through sensory perception, which is processed and stored in memory. Attitude represents an individual's affective or emotional response to a particular stimulus, whereas action refers to observable behavior that is influenced by both motivation and environmental conditions (Nurmala et al., 2018).

These findings are supported by the study conducted by Susanty and Saputra (2020), which demonstrated that health promotion using visual and interactive methods significantly improved knowledge and attitudes regarding the dangers of smoking ($p = 0.000$). Similar findings were reported by Jannah and Hertiana (2022) and Sulastri and Rindu (2019), who observed improvements in

participants' knowledge and attitudes following educational interventions. These results are consistent with the theory proposed by the World Health Organization (WHO), which states that an individual's behavior is influenced by perceptions, social norms, access to information, and habits that develop within the community (Pakpahan et al., 2021). Therefore, the effectiveness of poster media in improving attitudes toward smoking cessation suggests that theory-based visual media can serve as an effective health promotion tool.

Nevertheless, these findings also indicate the need to strengthen information delivery strategies to achieve greater improvements in knowledge. For example, poster media could be combined with audiovisual media to reinforce participants' understanding of the educational content. Overall, Health Belief Model-based poster media were found to be effective in improving the attitudes of low-income families toward smoking cessation behavior and have the potential to serve as a practical health promotion strategy at the village community level.

CONCLUSION

Based on the findings and discussion of this study, it can be concluded that Health Belief Model-based poster media were effective in promoting smoking cessation behavior among low-income families in Gajah Village, Gajah District, Demak Regency. This effectiveness is demonstrated by the following key findings:

1. The mean knowledge score of low-income families regarding smoking cessation behavior was 16.62 before the health promotion intervention using poster media and increased to 17.31 after the intervention.
2. The mean attitude score of low-income families regarding smoking cessation behavior was 11.85 before the health promotion intervention using poster media and increased to 13.00 after the intervention.
3. The increase in knowledge by 0.69 points indicates that health promotion regarding smoking cessation behavior through Health Belief Model-based poster media had a positive effect on respondents' knowledge. Meanwhile, the increase in attitude by 1.15 points indicates that health promotion regarding smoking cessation behavior through Health Belief Model-based poster media had a positive effect on respondents' knowledge.
4. Based on the results of the *Wilcoxon signed-rank test*, the *p-value* was 0.000 for knowledge and 0.002 for attitude. Since the *p-values* for both knowledge and attitude were less than 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted, indicating a statistically significant difference in respondents' behavior before and after receiving health promotion on smoking cessation through Health Belief Model-based poster media.

5. The effectiveness of the intervention was reflected in a 3.97% increase in the knowledge score and an 8.8% increase in the attitude score from the pre-test to the post-test. These findings indicate that health promotion delivered through Health Belief Model-based poster media was effective in promoting smoking cessation behavior among low-income families in Gajah Village, Gajah District, Demak Regency.

RECOMMENDATIONS

It is recommended that the community, particularly active smokers, increase their awareness of the adverse effects of smoking on both health and household economic conditions. One of the initial steps that can be taken is to become more receptive to health information through educational media such as posters, participate in health education programs conducted by healthcare professionals, and gradually reduce cigarette consumption.

Healthcare professionals and village authorities are encouraged to take a more active role in implementing continuous health promotion programs, particularly through visual and easily understandable educational media, such as videos, leaflets, or simple interactive media. Health promotion efforts should focus not only on the dangers of smoking but also on healthy stress-coping strategies, household economic management, and the role of family members in supporting smoking cessation.

The findings of this study may serve as a reference for future research exploring additional factors that influence successful smoking cessation, such as social support and individuals' psychological conditions. Future studies are also expected to employ a mixed-methods design and adopt a multidisciplinary approach to provide more comprehensive and applicable findings for the development of health promotion interventions tailored to the characteristics of the target population. In addition, the development of multidisciplinary promotional materials and research instruments is recommended to produce more comprehensive and practical health promotion interventions.

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