

## RESEARCH ARTICLE

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# The Effectiveness of Self-Help Group (SHG) Intervention on Smoking Prevention of Adolescents in Aceh, Indonesia: A Controlled Field Trail

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## Abstract

**Objective:** This study aims to examine the effectiveness of the Self-Help Group (SHG) intervention in smoking prevention among adolescents. **Methods:** This study was carried out in 2 Junior High Schools in Aceh Besar using a quasi-experimental method, which was conducted in the intervention and the control groups with a pre-post design. The number of samples was determined based on power analysis with medium effect size and power (0.08) with 40 respondents per group. After randomizing the schools, a total of 40 students who met the criteria were randomly selected for each school. The data were collected by using a self-report questionnaire, consisting of knowledge, as well as smoking attitudes, intentions, and behavior. The SHG intervention consist of 6 sessions, each of which was conducted per week with a duration of 40-60 minutes per session. The data were analyzed using descriptive and inferential statistics. **Results:** The results of statistical tests using the Mann-Whitney and t-test showed that there was an effect of the SHG intervention on knowledge (p-value 0.043), attitude (p-value 0.001), intention (p-value 0.029), and behavior (p-value 0.003). The average score of knowledge was higher in the SHG intervention group than in the control group, while the average score of attitude, smoking intention and behavior was lower in the SHG intervention group than in the control group. **Conclusion:** Health practitioners, specifically community nurses are suggested to implement SHG interventions as one of the strategies for preventing smoking among adolescents.

**Keywords:** Self-Help Group- SHG- smoking- adolescent

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## Introduction

Previous investigations showed that smokers are at risk for heart disease, stroke, and various types of cancer (Duncan et al., 2018). However, Indonesia is one of the countries with the highest number of smokers (Amalia et al., 2019). Reports from 9 countries in North and Southeast Asia showed that Indonesia is among the 3 countries with a high smoking rate among men alongside Maldives and Bangladesh (Sreeramareddy et al., 2014; Wulan et al., 2022).

Smoking is not only a national problem in Indonesia but also a major challenge, specifically in Aceh Province. The prevalence of people aged >15 years and who smoke every day in Aceh is 31.9%, while active smokers, including daily and occasional smoking, is 37.1%, which is above the national average of only 34.7%. Meanwhile, the prevalence of people over the age of 15 who smoke indoors is 78.3% (Kemenkes RI, 2013).

Currently, smoking is also experienced by many adolescents. A national survey in the country showed that

of 3,737 students aged 13 to 15 years, 37.7% are smokers. The survey also reported that 95.1% of adolescents who had not smoked before desired to start smoking in the next 12 months (Tahlil et al., 2013). Data from the Global Youth Tobacco Survey (GYTS) also showed that 20.3% of adolescents aged 13 to 15 years are smokers (Global Youth Tobacco Survey (GYTS), 2014). This high number of adolescents needs the attention of health practitioners because smoking causes various cancers and also reduces academic achievement. Furthermore, nicotine causes addiction, which makes it difficult to quit smoking (Sadarang, 2021).

Teenagers who smoke harm physical and mental health (Livingston et al., 2022). It is estimated that 5.6 million or 1 out of every 13 children today will eventually die prematurely from smoking-related diseases (CDC, 2022). The high number of smokers among adolescents is caused by various factors, including the existence of different cigarette advertisements (Nurhayati et al., 2022; Yoo et al., 2016). Other factors include the transition from primary to secondary school (O'Loughlin et al., 2017),

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the assumption that smoking can relieve anxiety (Garey et al., 2017), and peer influence (Urrutia-Pereira et al., 2017). A similar phenomenon was also obtained from a qualitative study on adolescent perceptions related to smoking behavior conducted on 24 students in Aceh Besar. The results indicated that peer influence is an important factor affecting smoking behavior, while others are parental smoking status, masculinity, and curiosity (Fithria et al., 2021).

Various investigations above proved that the influence of friends plays an important role in smoking behavior. Therefore, this study provides a smoking prevention intervention using the Self-Help Group (SHG) method to improve the ability of adolescents to avoid smoking. SHG is a group of people with the same problems who help each other to solve their challenges. Research conducted on mechanical engineering students shows health education with social media by SHG method affects increasing knowledge and attitudes to stop smoking (Sugiyo et al., 2016). The results of a systematic review show that SHG is effective in helping individuals to quit smoking. SHG is a smoking cessation program that is oriented towards changing habits, but basically to achieve this target one must increase the will and motivation to change oneself (Suwetty, 2018). However, in this study, adolescents will discuss the problems of smoking naturally and search for the right solution. It was carried out to examine the effectiveness of the SHG intervention in preventing adolescents from smoking. The result is expected to be a reference for health workers, specifically family and community nurses. It can also contribute to preventing various cancers caused by smoking and have an impact on improving academic achievement as well as the quality of life of adolescents in the future.

## Materials and Methods

### Study Design

This is a quantitative study with a quasi-experimental method using a pre-post control group design. It was carried out in two groups, namely the intervention and the control groups. Outcome variables are knowledge, attitudes, as well as smoking intention and behavior of adolescents. The effectiveness of the intervention was measured using a self-report questionnaire (Tahlil et al., 2013). The questionnaire was used to measure the variables including knowledge, attitudes, smoking intentions and smoking behavior. The outcome was measured 2 times, a week before intervention (pre-test) and another week after intervention (post-test).

### Population and Sample

The population was all male students at 2 Junior High Schools located in the working area of the Kuta Baro Health Center, Aceh Besar. The selection of these 2 schools was based on the high smoking rates found in the area (Fithria et al., 2021).

The sample in this study was male students who smoked and were in grade VII or VIII. The number of samples was determined based on power analysis with medium effect size and power (0.08), 95% confidence

level, and alpha 0.05, with a value of  $d = 0.70$  to obtain a sample size of 40 respondents per group (Cohen et al., 2007). To determine the intervention group and the control group, randomization was carried out using a random generator. A total of 40 students for each group were randomly selected using a random generator.

### Study instrument

The instrument used was a self-report questionnaire, which consist of knowledge, attitudes, smoking intention, and behavior (Tahlil et al., 2013). The knowledge questionnaire consists of 21 multiple-choice statement items, attitudes about smoking were assessed using 22 statements with a Likert scale, and smoking intention was measured by 3 questions including whether they would smoke tobacco next year, during Senior High School, and when older or over 50 years of age. Each question with 5 response categories, ranging from 0 for "certain not to smoke" to 4 for "certain to smoke". A higher score indicates that adolescents are more intent to smoke. Subsequently, smoking behavior was assessed using 3 questions, the number of cigarettes smoked in the last 7 days, 30 days, and during life.

### Implementation and Intervention techniques

The activity was initiated by conducting a pre-test on the control and intervention groups with a total of 40 students per group. Furthermore, the SHG was only given to the intervention group. The intervention session refers to the SHG guidelines for adolescents (Purnomo et al., 2018) and includes 6 sessions, namely identifying the problem/cause of smoking, grouping the problems, identifying solutions, selecting ways to solve problems, role-playing for solving, and reconciling problem-solving strategies. During the intervention, booklets and leaflets which consist of the topic about the health hazards of smoking were also given.

The 6 sessions intervention offers one per week with a duration of 40-60 minutes per session. After finishing the intervention, the study team followed up on the implementation of the SHG intervention for one week. Subsequently, after one week, a post-test was carried out in the intervention and the control groups to determine the differences in knowledge, attitude, smoking intention, and behavior. The duration of intervention referred to a previous report by (Yardley et al., 2014), which stated that short-term intervention activities can last 2-6 months.

The researcher did not provide any intervention for the control group. Post-test data collection was also carried out 2 months after the pre-test was carried out. For more details, the method of conducting research and data collection can be seen in Figure 1.

### Data Analysis

The data were analyzed using descriptive and inferential statistics. Descriptive statistics used frequency, percentage, mean, and standard deviation, while inferential uses independent t-test for normally distributed data and Mann Whitney U-test for non-normally distributed data. this test was used to assess the difference in mean scores of the intervention and control groups.

## Results

The results include respondent characteristics, descriptive analysis of knowledge, as well as smoking attitude, intention and behavior of the intervention and the control groups. The comparison of both groups before and after SHG intervention was also recorded.

### Demographic Data

Table 1 shows that the majority of respondents in the intervention and control groups are class VIII with a percentage of 62.5% and 60%, respectively. Furthermore, based on parental occupation, 37.5% of respondents' parents in the intervention group worked as private employees. Similarly, in the control group, the majority of parents worked as traders, which is 37.5%. The education of parents in the majority intervention and control groups was the high school with a percentage of 42.5% and 40%, respectively. Based on the smoking status of parents, most respondents had smoking parents, with a percentage of 57.5% in each group.

### Description of knowledge, attitude, intention, and smoking behavior in the intervention and the control groups in the pre- and post-test

The results of the descriptive analysis of knowledge, attitudes, smoking intention, and behavior in the intervention and the control groups in the pre- and post-test are shown in the Table 2.

Table 2 shows that there was an increase in knowledge of the intervention group in the post-test, while the control group did not improve. Furthermore, for the variables of attitude, smoking intention, and behavior, the results of the analysis only showed a decrease in the mean score in the intervention group at the time of the post-test. These indicated that the SHG intervention can increase

knowledge about the dangers of smoking and reduce pro-smoking attitudes, intentions, and behavior among adolescents.

### Comparison of knowledge, attitude, intention, and smoking behavior in the intervention group and the control group

The Mann-Whitney test was used to compare knowledge, intention, and smoking behavior in the group receiving the SHG intervention with the control group in the pre- and post-test. The results of the detailed analysis are shown in Table 3. It shows that the mean rank of knowledge in the pre-test SHG intervention group was 35.8 and the post-test score was 45.49. Meanwhile, in the control group, the values were 45.14 and 35.51 in the pre- and post-test, respectively. The results of the comparative analysis of the mean rank of knowledge in the SHG intervention with the control group obtained a post-test p-value was 0.043. This indicates that there is a difference in knowledge in the SHG intervention group compared to the control.

The analysis of the smoking intention variable based on Table 3 shows that the mean rank of desire in the SHG group in the pre-test is 40.76, while the post-test is 34.89. Meanwhile, in the control group, the mean rank of smoking desire pre-test was 40.24, and the post-test was 46.11. The results of the comparative analysis of the mean rank of smoking intention in the SHG intervention with the control group obtained a post-test p-value was 0.029. This indicated that there is a difference in the smoking intention between the 2 groups in the post-test. Therefore, the SHG intervention can reduce adolescent smoking intention.

The results of the analysis of smoking behavior variables from Table 3. showed that the mean rank in the SHG group in the pre-test is 42.08, and the post is 33.05. Meanwhile, in the control group, the mean rank of smoking behavior was 38.92 and 47.95 in the pre- and post-test, respectively. The results of the comparative analysis of the mean rank in both groups obtained a post-test p-value of 0.003. This indicated that there are differences in smoking behavior in the SHG intervention

Table 1. Characteristics of Research Respondents

Variable	Intervention Group		Control Group	
	f	%	f	%
Class				
VII	25	62.5	24	60.0
VIII	15	37.5	16	40.0
Parents' Job				
Civil Servant	4	10.0	1	2.5
Private employess	15	37.5	10	25.0
Trader	10	25.0	15	37.5
Farmer	3	7.5	4	10.0
Etc.	8	20.0	10	25.0
Parents' Education				
Elementary School	7	17.5	13	32.5
Junior High School	16	40.0	8	20.0
Senior High School	17	42.5	16	40.0
Bachelor	0	0	3	7.5
Parents' Smoking Status				
Smoke	23	57.5	23	57.5
Don't Smoke	17	42.5	17	42.5

Table 2. Descriptive Analysis of Knowledge, Attitudes, Intention, and Smoking Behavior in the Intervention and the Control Groups in the Pre- and Post-Test

Variable	Intervention Group	Control Group
Knowledge		
Pre-test	7.15 ± 2.7	8.07 ± 2.9
Post-test	9.22 ± 2.6	8.00 ± 2.6
Attitude		
Pre-test	41.53 ± 11.53	38.03 ± 8.9
Post-test	30.13 ± 6.2	37.70 ± 9.0
Smoking intention		
Pre-test	4.45 ± 2.9	4.75 ± 4.3
Post-test 1	2.40 ± 1.5	4.57 ± 3.9
Smoking behavior		
Pre-test	5.60 ± 6.2	4.20 ± 4.8
Post-test	1.58 ± 1.8	4.65 ± 4.7

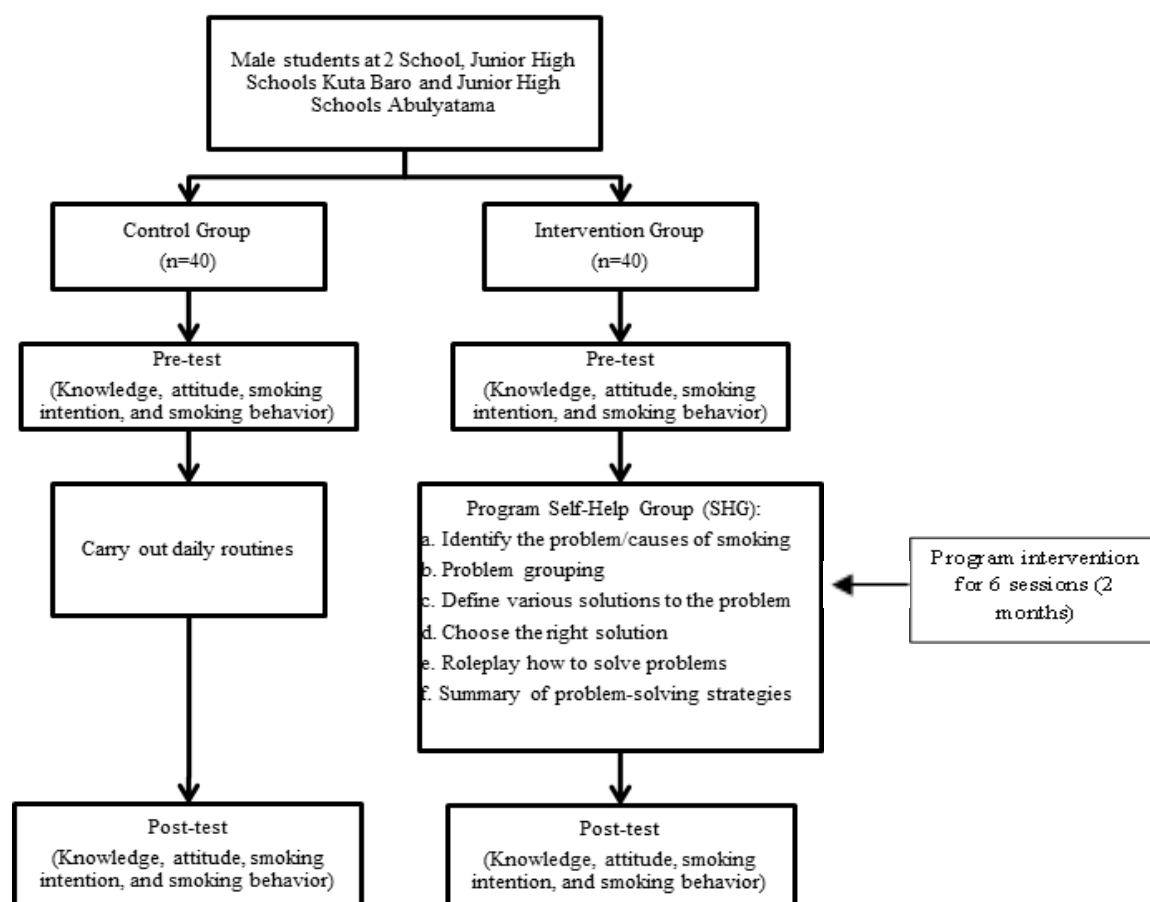


Figure 1. Research Implementation Methods and Data Collection

compared to the control group. Therefore, it can be concluded that the SHG intervention can reduce smoking behavior among adolescents.

#### *Comparison of smoking attitudes in the intervention and the control groups*

Comparison of smoking attitudes in the SHG intervention with the control groups was tested using a t-test. The results of the analysis are shown in Table 4. It shows the results of the analysis of smoking attitude, where the mean score in the SHG intervention group in

the pre- and post-test were 41.53 and 30.13, respectively. Meanwhile, in the control group, the mean scores were 38.03 and 37.70 in the pre- and post-test, respectively, with a p-value of 0.001. This indicated that there is a difference in the mean score of attitudes in the SHG and the control group. Therefore, the SHG intervention can reduce pro-smoking attitudes among adolescents.

## Discussion

This study indicated that SHG intervention effectively

Table 3. Comparison of Knowledge, Attitudes, Smoking Intention, and Behavior in the SHG Intervention Group with the Control Group (Mann-Whitney U Test)

Variable	Intervention group		Control Group		Mann-Whitney U Test	P-value
	Mean Rank	Sum of Ranks	Mean Rank	Sum of Ranks		
Knowledge						
Pre-test	35.86	1434.5	45.14	1805.5	614.5	0.072
Post-test	45.49	1819.5	35.51	1420.5	600.5	0.043*
Smoking Intention						
Pre-test	40.76	1630.5	40.24	1609.5	789.5	0.919
Post-test	34.89	1395.5	46.11	1844.9	575.5	0.029*
Smoking Behavior						
Pre-test	42.08	1683	38.92	1557	737	0.534
Post-test	33.05	1322	47.95	1918	502	0.003*

\*p-value &lt;0.05



Table 4. Comparison of Smoking Attitudes in the SHG Intervention Group with the Control Group in the Pre- and Post-Test (Independent t-test)

Variable	Intervention Group		Control Group		Mean Diff	95% CI Diff		t-test	P-value
	Mean	SD	Mean	SD		Lower	Upper		
Attitude									
Pre-test	41.53	11.32	38.03	8.99	3.5	-1.03	8.053		0.130
Post-test	30.13	6.23	37.70	9.07	-7.57	-11.04	-4.11		0.001*

\*p-value &lt;0.05

increased adolescent knowledge about the dangers of smoking. The increase in knowledge is an important strategy to reduce smoking prevalence among adolescents. A previous report stated that approximately 68.4% of students did not have an adequate understanding of nicotine addiction (Xu et al., 2016). This is because optimal knowledge is expected to reduce and prevent smoking behavior. It was also discovered that knowledge about quitting smoking is significantly and positively related to the application of smoking cessation behavior. However, it is effectively encouraged by knowledge related to smoking (Xu et al., 2016). Likewise, previous research shows that different intervention themes about smoking increase motivation to quit smoking. Audiovisual health education with the theme of the highest risk of developing cancer due to smoking increases the motivation to quit smoking (Ismail et al., 2021).

Many factors including peer support contribute to the effectiveness of SHG intervention in increasing smoking knowledge. The adolescent enjoys talking with their friends during SHG intervention, where the non-smoker and the smoker-friends influence each other. Similarly, a previous study discovered that close friends are significantly associated with smoking (Saari et al., 2014). It was also discovered that social environment and peer support have a large impact on smoking (Go et al., 2010; Harakeh et al., 2012; Mandil et al., 2010; Schaefer et al., 2013; Van den Brand et al., 2019).

Another factor that contributed to the effectiveness of SHG intervention is the focus on the impact of smoking on health. This is because the health aspect is the main reason for the importance of smoking prevention as many harmful substances in cigarettes (Gatto et al., 2017). Since smoking triggers various diseases and health problems (Duncan et al., 2018), health knowledge is expected to show the dangers and various diseases associated with the behavior. Adolescents who have gained knowledge about the health effects of smoking have a strong motivation and reason not to smoke as well as quit smoking. This is supported by a previous report, which concluded that health-based smoking prevention interventions can increase respondents' understanding of the dangers of smoking (Tahlil et al., 2013).

The result showed that SHG interventions effectively reduced the smoking attitudes of adolescents. Attitude is one of the predictors that can determine whether an adolescent will smoke. Teens who have positive attitudes regarding smoking consider it to have various benefits, thereby they become smokers. One of the perceived benefits is that smoking can show maturity and masculinity

(Fithria et al., 2021). This perception can trigger adolescents to smoke and become a smoker in the future.

The smoking attitude shows a tendency of the respondent to become a smoker. Therefore, the decline in the attitude in the SHG intervention group means that after the intervention, the tendency to smoke in the respondent decreases because health factors became the basis for individual thinking. The information received also affected the respondents' attitude toward smoking behavior. This is in line with one theory (Parsons et al., 2011), which explained that personal factors, including self-motivation, affect individual health behavior.

Therefore, health professionals play a significant role in smoking cessation and prevention. In Sri Lanka, 34% of dental students strongly agree toward the professional responsibility of dentists in tobacco cessation (Medawela et al., 2021). Then, according to Novesar et al. (2022), urologists play an important role in the education and intervention process to support smokers to stop smoking cigarettes. The intensity of heavy smoking and low education are factors in the low desire to quit smoking (Novesar et al., 2022).

Other factors that support the effectiveness of the SHG intervention group in reducing adolescent pro-smoking attitudes include the use of various media to conduct health education such as digital and video related to smoking-related diseases. Digital media offers many potential benefits as an active health education tool to promote youth health and prevent smoking. Similarly, a previous reported that interactive media effectively increased knowledge and attitudes about smoking (Park et al., 2017).

This study showed that SHG interventions were effective in reducing smoking intention among adolescents, which is a significant predictor of future behavior (Khosravi et al., 2016). The results showed that the SHG interventions can reduce smoking intention because adolescents obtained sufficient information and understood the dangers of smoking from a health aspect. Furthermore, counseling and watching a video about the dangers, as well as discussions regarding the health effects can also directly reduce intention.

The results also showed that the SHG intervention programs were effective in reducing smoking behavior. The information provided can directly increase adolescents' understanding of the dangers of smoking. Furthermore, a video displaying content, which contains various diseases and health problems due to smoking, can have a direct impact on increasing understanding of the dangers. In the video, adolescents will see the types of diseases caused by smoking. This can attract their attention because they

like novelties, including videos with interesting features.

### Study Limitations

One of the limitations is related to outcome measurements. This is because the outcomes were measured using a self-report questionnaire, therefore, participants might be inclined to underestimate their tobacco use.

In conclusions, this study indicated that SHG intervention effectively increase adolescents' knowledge about the danger of smoking, then effectively decrease pro-smoking attitude, smoking intention, and behavior among adolescents. Health professionals who are interested in smoking prevention among adolescents were suggested to pay more attention to the influence of peer groups on smoking behavior. This is because prevention will be more effective when adolescents discuss the danger of smoking with their peer group.

### Author Contribution Statement

FF was involved in all steps of the research, including study design, data collection, and analysis. NH was involved in research design and interpretation of the data, SS participated in research planning and review of published articles. All authors agreed to the final manuscript for publication.

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### Ethical Declaration

This study obtained ethical approval from the Research Ethics Committee of the Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia, number 113001070422.

### Conflict of Interests

All authors declared that there is no competing interest in this study.

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