

School Promotion to Smoking-Related Knowledge, Attitude, Self-Efficacy and Practice of Sundanese Students in Indonesia

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Abstract: *The impact of smoking is both a threat and challenge to the nation. Schools have particular advantage for educational initiatives because they have access to students and can encourage them to develop knowledge, attitude and practice concerning a healthy lifestyle. This research was conducted in the intervening program based on reducing or preventing smoking initiation. The design was quasi-experimental study, while data was analyzed inferentially using One Way ANOVA of Dependent Groups/Within Subjects and Independent Group/Between Subjects. Data analysis was assisted by using software STATA 12.0. The results showed the health education intervention affected positive changes in knowledge, attitude, self-efficacy, and practice either in Intervention 1 and 2 groups, even in the Control Group, slight behavior changes were found due to factors of school policy. Meanwhile, the best changes that linearly increased through three time measurements in variables of knowledge, attitude, self-efficacy, and practice were found in the Intervention 1 Group. It can be concluded that policy factors determine the success of health promotion and education. On one hand, schools are under the Department of Education and Culture, while community activities are referred to the Department of Home Affairs. Therefore, improved cooperation between these two relevant departments is needed to regulate smoking and enhance the implementation of smoking prevention policies in schools.*

Keywords: Adolescents, school-based intervention, smoking prevention

1. Introduction

Smoking is also the major known cause of non-communicable diseases such as cancer and cardiovascular diseases. (1)Indicates smoking causes about 90% (or 9 out of 10) of all lung cancer deaths for men and women, along with 80% (or 8 out of 10) of all deaths from cardiovascular disease, are caused by smoking [1].

Nevertheless, smoking is one of the preventable causes of deaths in the world. It is recognized that, as the life expectancy of societies improve, the prominence of non-communicable chronic diseases, many of which are associated with smoking, will gain greater prominence [2]. In addition, most smokers begin smoking when they are in their teens. About 25 percent of all adolescents who experiment with cigarette-smoking become regular smokers, and among them, about one-third will die from a smoking-related health disease [3–6].

Yet, studies on smoking behavior among teens are scarce in most Asian countries. Identified the following significant risk factors for adolescent tobacco use: smoking among friends and siblings, poor academic performance, being older, being male, working, and having parents who were separated [7]. Also, studies on the effects of a school-based intervention program on smoking behavior in Indonesia are rare, with the most recent, a study focusing on the implementation of school-based smoking prevention and cessation programs in Aceh Province, Indonesia [8]. Currently, in Indonesia, approximately 215 billion cigarettes are consumed every year by 57 million smokers. In 2010,

there are 34.4% of people aged above 10 years who smoked, with a higher prevalence in rural areas (36.6 percent), compared to 31.7% in urban areas, increasing from 31.5 in 2001. Furthermore, the number of adolescents smoking: among the youth (age 13-15), 12% currently smoke cigarettes (boys 24%; girls 2%); more than 78% of smokers start before age 19, one-third of whom reported trying their first cigarette before the age of 10 [9].

Additionally, in Indonesia, smoking exterminates at least 200,000 people each year. Secondly, more than 97 million Indonesian non-smokers are regularly exposed to secondhand smoke. Furthermore, 81% of youth (age 13-15) are exposed to secondhand smoke in public places, while 65% are exposed to secondhand smoke at home [10].

In some studies, especially in Indonesia, a correlation was found between knowledge and smoking practices: 52.22% respondents who had good knowledge also had high intention to quit smoking. However, other researches found no correlation between knowledge, attitude, and smoking practice [11]. These studies also showed the adolescents' attitudes toward smoking, most of whom stating that being a smoker was about being looked manly and being like their friends. With regard to self-efficacy and smoking, some findings showed that social self-efficacy, peer's smoking behavior, and the intention to smoke proved to have the strongest associations with smoking. Additionally, studies also showed that a decrease in self-efficacy is related to the increase in adolescent smoking [12],[13].

Smoking is a threat and challenge to the nation because of the increasing number of adolescents who are smoking. An

important challenge to those committed to the well-being of adolescents is to lessen the potentially deadly impact of tobacco by helping young people avoid smoking initiation, assisting them with cessation, and helping them to remain tobacco-free once they quit the habit.

Schools, in fact, have particular advantage for educational initiatives because they have access to students when it comes to developing knowledge, attitude, and practices concerning a healthy life-style. School-based programs should be designed to promote a healthy lifestyle, avoid or quit smoking, and other behavioral modification programs. Interventions might also be designed to induce and maintain long-term behavioral changes regarding smoking prevention.

The general objective of this study was to determine the knowledge, attitude, and self-efficacy and practices on smoking behavior among students in West Java Province, Indonesia. The specific objectives were: 1) To determine the level of pre-intervention smoking-related knowledge, attitude, self-efficacy scores, and practices among the participants; 2) To determine the effects of the school-based intervention program on the smoking-related knowledge, attitude, self-efficacy scores, and practices of the participants; 3) To recommend effective school-based smoking prevention program strategies.

2. Method

The research design utilized a quasi-experimental design. It attempted to identify any improvements in the predisposing factors (knowledge, attitude and self-efficacy) for smokers and non smokers through health education package. Subjects were students from Junior High School (SMP) from three schools in West Java Province. The three schools had a population of 2,034 students. Furthermore, from the students of the three schools, the 690 sample were chosen through proportionate random sampling. Random assignment of subjects to experimental and control groups was conducted. The quasi-experimental study design comparing control and experimental group students were matched on enrollment at similar times.

A self-administered questionnaire was used to investigate knowledge, attitudes and self-efficacy, as well as smoking practice. The questionnaire utilized in this study was modified using, as reference, several smoking related questionnaire regarding knowledge, attitudes, self-efficacy, and practice, as well as other related literature.

The collected data were analyzed both descriptively and inferentially. Descriptive data was presented in terms of frequency, percentage, mean score, and standard deviation for each variable of knowledge, attitude, self efficacy and practice. Also, descriptive data was presented with respect to socio demographic profile of students.

Afterward, data were analyzed inferentially using: 1) One

Table 1: Analysis of Pretest, Posttest and Follow-Up Test in Knowledge Attitude, Self-efficacy of Smoking Behavior in School

	Pretest	Posttest 1 (one week)	Posttest 2 (3 months)
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Way Analysis of Variance (ANOVA) for independent groups, a parametric test to analyze the significant difference among the 3 independent groups (2 intervention groups and 1 control group) in terms of knowledge, attitude and self-efficacy; 2) One Way ANOVA for dependent groups or repeated measures of variable knowledge, attitude, self-efficacy during pre test, one week posttest and three months follow up. Furthermore, Post Hoc Test using Tukey's Multiple Mean Comparison was utilized for significant ANOVA results; 3) Chi Square Test was utilized for variable of practice. Data analysis was done using STATA 12 software

3. Results

The general characteristic of students is described in several tables. There was a total of 690 respondents, 524 males (75.94%) and 166 females (24.06%). The percentages of age indicated that the youngest respondents were 11 years old and the oldest were 17 years old, while the highest percentage of students belonged to ages between 12-14 years old (67.54%). In addition, most of the students surveyed were Sundanese (625; 90.58%), followed by a small number of other students belonging to other ethnic groups (9.42%). Religious affiliations among the respondents indicated that 671 (97.25%) were Muslim while 17 (2.46%) were Christian Protestans and Catholics and the rest of the students were Hindus and Buddhists 2 (0.29%).

The demographic data also shows that there were more male students in each of the treatment groups: 82.86% in the Control Group, 83.19% in the first intervention group, and 71.85% in the second intervention group. The percentage of female students in the Control, first intervention, and second intervention groups were 17.14%, 16.81%, and 28.15%, respectively.

The majority of students were Sundanese ethnicity, with percentage distributions as follows: 88.57% in the Control Group, 92.04% in Intervention 1, and 90.85% in Intervention 2. Javanese ethnic students came next with relatively small numbers, with its composition in the Control Group as 5.71%, 4.42% in Intervention 1, and 4.81% in Intervention 2 (4.81%). Finally, the distribution of students from other ethnic groups (Bataks, Kalimantan and Indo-Australia) were as follows: Control Group had 5.71%, Intervention 1 had 3.54%, and Intervention 2 had 4.35%.

Effect of the School-based Intervention Program on the Smoking-related Knowledge, Attitude, Self-efficacy, and Practice

The following tables show the "Effects of a School-based Intervention Program on Smoking Behaviors". Table 1 explains the changes in knowledge, attitude, self-efficacy, and practice during the three times that measurements (pretest, posttest 1, and posttest 2) were done among the three groups.

Group	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation
Control						
Knowledge	13	Good	13.84	Good	13.98	Good
Attitude	60.47	Positive	41.58	Moderate	60.47	Positive
Self-efficacy	55.23	Positive	47.25	Moderate	54.07	Moderate
Intervention 1						
Knowledge	13.88	Good	14.05	Good	14	Good
Attitude	51.79	Moderate	56.8	Positive	59.46	Positive
Self-efficacy	50.96	Moderate	55.84	Positive	60.42	Positive
Intervention 2						
Knowledge	13.63	Good	14.33	Good	14.34	Good
Attitude	52.02	Moderate	55.93	Positive	60.4	Positive
Self-efficacy	52.51	Moderate	59.14	Positive	53.97	Moderate

Table 2: Pairwise Comparisons of Marginal Linear Prediction of Attitude by Treatment Groups

Treat	Contrast	Std Error	Tukey	
			t	P>It I
Intervention 1 vs Control	15.2196	1.197489	12.71	0.000
Intervention 2 vs Control	14.34792	0.9195976	15.60	0.000
Intervention 2 vs Intervention 1	-0.8716713	0.9993465	-0.87	0.658

Practice of Smoking before and after Intervention

Table 3: Practice of Smoking on Before and After Intervention by Three Groups

Practice Indicator	Control Group			Intervention 1 Group			Intervention 2 Group		
	Freq (%)			Freq (%)			Freq (%)		
	Pre-test	Post-test 1	Post-test 2	Pre-test	Post-test 1	Post-test 2	Pre-test	Post-test 1	Post-test 2
Intention to quit	59 (42.14)	32 (22.86)	27 (19.29)	21 (18.58)	21 (18.58)	11 (9.73)	197 (45.08)	119 (27.23)	262 (59.95)
Actual quitting	35 (25.00)	15 (10.71)	59 (42.14)	1 (0.88)	1 (0.88)	11 (9.73)	61 (13.96)	170(38.90)	9 (2.06)
Intention to smoke	35 (25.00)	53 (37.86)	36 (25.71)	82(72.57)	82 (72.57)	52 (46.02)	159 (36.38)	12 (2.75)	154 (35.24)
Intention not to start	11 (7.86)	40 (28.57)	18 (12.86)	9 (7.96)	9 (7.96)	39 (34.51)	20 (13.96)	136 (31.12)	12 (2.75)
Total	140 (100)	140 (100)	140 (100)	113 (100)	113 (100)	113 (100)	437 (100)	437 (100)	437 (100)

Table 1 describes the tendency to change among students from their pretest to their first and second posttests in each of the group. The changes and indicators for an increase or a decrease in the variables are further examined in the Table 2. The results of ANOVA between subjects indicated that Intervention 2 group was better than the Intervention 1 group in terms of knowledge at follow up. Furthermore, the Intervention 1 group was better compared to the Control Group in terms of knowledge at the follow-up phase. The repeated measures test result of attitude in the three groups will be seen in Table 2.

Table 2 shows that groups Intervention 1 and Intervention 2 were better compared with the Control Group in terms of attitude in posttest 1. It can be seen that the indicator value of the contrast is positive in Intervention 1 versus Control Group as well as in Intervention 2 versus Control Group. Therefore, both Intervention 1 and Intervention 2 groups were better compared with the Control Group.

It can be analysed from Table 2 that there were no significant differences among treatment groups in terms of attitude in posttest 2. The result was proven by the significance value which resulted from the calculation, $p = 0.2844$ is greater than the significance value of $\alpha = 0.05$. Therefore, the Post Hoc Tukey Test can not be done.

An overview of ANOVA among subjects in terms of attitude from showed that Intervention 1 and Intervention 2 groups

were better than the Control Group, specifically in the test given after one week. However, no significant difference appeared in the test which was given after 3 months.

Anova results gave an overview that the health education intervention had significant influence in terms of self-efficacy in the Intervention 1 Group and Control Group after posttest 1 and posttest 2, especially the former.

Results of Chi Square in the pretest in terms of practice was $X^2=2.9964$ with p value= 0.224 . This means that there was no significant difference in the proportion of students' smoking related-practice in the three groups during pretest. However, the results of posttest 1 indicated that there was significant difference in the proportion of the students' smoking-related practice. Also in the posttest 2, the Chi Square test ($X^2= 23.1698$, $p<0.0001$) showed that the smoking-related practice of students differed significantly among the control and two treatment groups. It can be concluded that the health education package influenced the practice behavior among students. In other words, the health education package reduced the number of smokers, specifically in the Intervention 2 groups.

In summary, comparing the Intervention group 1 and group 2, there was a different outcome in terms of variable change regarding knowledge, attitude, self-efficacy, and practice. In the follow up study, the results showed that the greater self-efficacy improvement and the percentage of decreasing

number of smokers in Intervention group 1 was higher than those of Intervention group 2 and Control Group. On the other hand, the Intervention group 2 had advantage of greater knowledge improvement in comparison with Intervention group 1 and the Control Group.

4. Discussion

Based on quantitative analysis, there are some similarities in the respondents' characteristics. Furthermore, data on respondents' demographic characteristics similarly depict the condition of students in the Province of West Java. These data are comparisons in the scope of West Java province with the research situation. The number of Sundanese (population 78.3%: sample 90%); the number of Moslems (population 97%: sample 97.25%).

Referring to the result of knowledge in pretests, the highest score goes to the Intervention 1 group, while in the posttest 1 and 2, the Intervention 1 Group takes charge. Nonetheless, for attitude variable, the pretest's highest score goes to the control group, but in pretest, the result of control group is lower than the Intervention 1 and 2 groups, and in the posttest 2, the Intervention 2 group leads the rank. It goes much the same way with self-efficacy variable, the highest score in pretest is control group, although in the 1st pretest, its scores are lower than those of the Intervention 1 and 2 groups'. Nonetheless, in the posttest 2, the highest score goes to the Intervention 1 Group. By comparing those three groups, it could be analyzed that the result of knowledge, attitude, and self-efficacy in control group tends to be unstable with the frequency of drastic decline. Meanwhile, in the Intervention 1 and 2 Group, although a rise of comparison in pretest, posttest 1 and 2 emerges, it is not dynamic. In sum, the result of best intervention is gained in the Intervention 1 Group compared to others, which means that the Intervention 1 strategy is relatively effective in making progress or improvement on knowledge and attitude, while the Intervention 2 on self-efficacy.

The results of ANOVA within subjects recorded that the health education treatment or intervention had significant influence in terms of knowledge between pretest and posttest 2. Specifically, the increase in knowledge at posttest was higher in the Intervention 2 group compared to the Intervention 1 and the Control groups. Also, the Intervention 2 Group showed linear improvement of knowledge during pretest, posttest 1 (evaluation after one week), and posttest 2 (evaluation after three months). Yet, it was the Control Group which showed the highest scores of knowledge in the pretest, decreased level of scores in the posttest 1, and somewhat increased scores in the posttest 2. Because fluctuating results exist, therefore there was no good improvement of knowledge in the three times of measurements.

Meanwhile, in relation to Green's theory, linearly knowledge only (as part of the predisposing factors) is not sufficient to give effects on behaviors, but other factors should be taken into consideration, such as the enabling factors (service availability, facilities, policy on smoking) and the reinforcing

factors (human resources, both the health officers and the stakeholders interested in healthy behavior changes pertaining to smoking), as they are the complementary elements to behavior changes.

Talking specifically about smoking behavior, previous results suggested that, oftentimes, knowledge is not correlated with behavior. The logistic regression analysis using the Pearson correlation coefficient = 0.08869, $p = 0.2364$, found no statistically significant correlation between smoking cognition and positively reinforced behavior to quit smoking [14]. The possible reason in this study indicated there was no family support to change the behavior.

It is true, indeed, that the existence of a respected or popular role model can help trigger positive changes in behaviors. Such a role model can provide real examples of behavior that should be maintained in order to support smoking prevention. By witnessing directly the people who chose not to smoke or were able to quit smoking will convince a person that s/he herself/himself can also do the same thing. As Bandura stated, much of the socialization of children involves the shaping of behaviors directed by people in their outer world. Also, there is the importance of observational learning:

Acquiring new skills, information, or altering old behaviors simply by watching other children and adults [15].

The mean scores of the pretest and posttests on attitude and the standard deviation of the respondents in the three groups were at the medium category with a positive trend. Specifically, for the first and second intervention groups, the attitude changes moved upward linearly. In contrast, the Control Group had the lowest score in terms of attitude for their first posttest, which somewhat increased in the posttest 2. The results indicate that the Control Group tended to fluctuate in attitude scores, meaning that it cannot be ascertained whether behavior changes and self-efficacy took place, and it is possible that even when they happened, they were not caused by the standard intervention given in the research during the posttest.

The high scores on self-efficacy show the students' strong confidence in the importance of smoking prevention, also the high scores on self-efficacy the stronger the confidence will be in practicing positive behavior. Some references indicated the self-efficacy theory to help identify how confidence in one's ability to quit smoking influences smoking cessation behavior, specifically with regard to initial cessation and relapse. Because self-efficacy is thought to be associated with both the initiation of behavior change (attempts to quit) and the persistence with which a person is able to maintain the change (abstinence), research has focused on self-efficacy at various points during the cessation process.

Research results at the level of practice demonstrate that there was an increased number of non-smokers compared to smokers. Nevertheless, this finding can certainly be temporary, because there will be various other factors which can affect negative changes in behaviors. The behavior will worsen if positive support, such as health education in theory

or practice, is not given. There are some simple steps that allow for practice to be maintained, namely: improving the knowledge on smoking prevention, encouraging positive attitude to stay away from cigarettes, and improving self-efficacy to prevent the desire to smoke.

Moreover, the research findings show that the school as the control group has a program of “peer education”, aiming to share information regarding various aspects related to school, whether it is health, social, religious, or learning motivation. Peer education in this context indeed has more effect on the changes in the self-efficacy and practice of the control group than on the increased knowledge and improved attitude.

5. Conclusion

The results of dependent group or within subjects were that Intervention 1 and Intervention 2 groups have improved on knowledge, attitude, and self-efficacy in three succeeding time measurements (pretest, posttest 1, and posttest 2), while the Control Group had very fluctuating results.

Based on the findings, some recommendations for the effectiveness of the program based on the special characteristics of students in West Java Schools, is to develop a health education plan that takes into account the students’ age, their development level, background, the socio-cultural norms around them, school goals, and students’ needs. In order to determine the educational content to be given in a certain school, other factors have to also be considered, such as the beliefs and values of the society, school members’ attitude and aspiration, and the opinion of parents and the prominent members of the society.

6. Conflict of interest

There is no conflict of interest.

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