

# Effect of a Smoking Prevention Program on Smoking-Related Knowledge, Refusal Self-Efficacy, Attitude, and Intention of Non-Smoking Adolescents

Albert Atabila<sup>1\*</sup>, MPH and Eleanor C. Castillo<sup>2</sup>, DrPH

1. International Labor Organization(ILO) , International Program on the Elimination of Child Labor (IPEC), Office of the Head of Civil Service, P.M.B, Ministries, Accra, Ghana
2. College of Health, Adventist University of Philippines, P.O. Box 1834, Manila 1099, Philippines

\* E-mail of the corresponding author: [atabila@gmail.com](mailto:atabila@gmail.com)

## Abstract

The primary purpose of this study was to examine the effects of a three week smoking prevention program on smoking-related knowledge, refusal self-efficacy, attitudes and intentions of non-smoking adolescents. The purposive sampling technique was used in selecting the participants of the study. The participants consisted of 32 non-smoking adolescents ranging in age from 10 to 18 years. The intervention was guided by constructs from the Theory of Planned Behaviour, and the Health Belief Model. This study used the one group pretest-posttest design to investigate the impact of the smoking prevention program. A comparison of the pre-intervention and post-intervention scores revealed that after the intervention, the participants registered higher smoking-related knowledge and refusal self-efficacy; they were less favourable in attitude towards smoking and less likely to smoke in the future ( $p < 0.01$ ).

**Keywords:** Health education, Smoking prevention, Evaluation, Adolescent health

## INTRODUCTION

Tobacco use is one of the leading preventable causes of premature death, disease and disability around the world<sup>1</sup>. Tobacco epidemic killed about 100 million people in the 20<sup>th</sup> century worldwide and during the 21<sup>st</sup> century, it could kill one billion people<sup>2</sup>. Smokers not only put themselves at risk for disease and death related to cigarette use, but they also expose others to second-hand smoke<sup>3</sup>. Teenage smoking prevalence is around 15% in developing countries with wide variation from country to country<sup>4</sup>. In the Philippines, tobacco use among adolescents has been reported to be approximately 37% among male and 18% among female, with almost one fifth of adolescents beginning smoking before the age of ten<sup>5</sup>.

Adolescent smoking is of public health significance as many adult smokers initiated the smoking habit as adolescents. Smoking in adolescents may be a marker of other unhealthy lifestyles or social problems such as alcohol use, illicit drug use, sedentary lifestyle, unprotected sex and truancy<sup>6</sup>. Once an adolescent has taken up the habit of smoking, he or she is more likely than an adult to become addicted<sup>7</sup>. Unfortunately, little progress has been made over the years in improving cessation rates among smokers and relapse is still the rule rather than the exception in treatment studies<sup>8</sup>. This therefore calls for effective primary prevention programmes for adolescent before life-long smoking habits are established. Various educational strategies have been developed and implemented to provide knowledge, motivation, social skills, and social influence recognition to equip adolescents with the needed information and abilities to overcome pressures to smoke and thereby preventing them from smoking<sup>8</sup>. However, finding the appropriate mechanism for prevention has been challenging<sup>9</sup>, hence more smoking prevention programs need to be designed and tested to identify those that work best.

The purpose of this study was to evaluate the effects of a smoking prevention program on smoking-related knowledge, refusal self-efficacy, attitudes, and intentions of non-smoking adolescents.

## METHOD

### Design and Sample

The one group pretest-posttest-only design was used in this study to investigate the effects of the smoking prevention program. A control group could not be included in the design because of the possibility of "contamination" by the experimental group as a result of the small size of the target community. The design was also utilized to ensure that as much adolescents in the target community benefit from the program without any intentional exclusion of some group of adolescents.

The participants of the study consisted of 32 non-smoking adolescents aged 10-18 years. They were recruited from "Casile", a small community in the Philippines, using the purposive sampling technique.

### **Description of the intervention**

The intervention was adapted from a smoking prevention curriculum developed by Whalen *et al.*<sup>10</sup> and synthesizes concepts from the Theory of Planned Behaviour, and the Health Belief Model<sup>11-12</sup>. The intervention was made up of eight sessions with each session lasting for about one hour, implemented over a period of three weeks in a class room setting. The titles of the sessions were: (a) “Tobacco People Hunt” (initiation of a discussion regarding the use of tobacco products and their effects on health), (b) “Tobacco Grab Bag”( brainstorming what participants know about various tobacco-related products and to enable them differentiate myths from facts in regard to smoking and health), (c) Demonstration of Tobacco’s Harmful Effects(listing and describing the harmful effects of tobacco smoke), (d) Film Show of the Harmful Effects of Smoking( offering the participants an audio and visual portrayal of the harmful effects if smoking) (e) “Tobacco No-No”(defining and practicing assertive communication and refusal skills related to tobacco use through role playing), (f) Tobacco Decision Making (identifying and applying decision-making skills to common problems that adolescents face through role playing), (g) Multiple Intelligent Tobacco Project(creating a project that advertises the negative effects of tobacco use), and (h) “Tobacco Lecture”(giving overview of lessons learnt in the previous sessions). The main objective of the curriculum was to educate the participants on the health hazards of smoking, risk factors associated with smoking, smoking refusal skills, general decision making skills, and interpersonal communication skills. Also, the participants were asked to create a project on their own, which advertised the negative effects of smoking, using the knowledge they had acquired during the intervention. Moreover, the curriculum was aimed at changing the attitudes and social norms of the participants about cigarettes smoking. Ultimately, the curriculum was intended to equip the participants with the needed knowledge and skills to prevent them from initiating cigarette smoking.

The lesson activities were hands-on, participant-centered, and interactive. They were created to be stimulating, fun and exciting so as to capture the interest of the participants. Also, the lessons did not merely address the cognitive, or knowledge-based domain of learning, but they also included the affective (emotional) and behavioural domains of learning as well. This was to enable the participants translate the health knowledge into healthy behaviours.

### **Instrumentation and Data collection**

Pre-intervention and post-intervention questionnaires were used to collect data before and after the program, respectively. The questions were based on the questionnaire of dela Torre and Kremers *et al.*<sup>13-14</sup>. The questionnaire consisted of five sections, namely: (a) demographic profile of the participants, (b) smoking-related knowledge, (c) smoking refusal self-efficacy (d) smoking-related attitudes and (e) smoking-related intentions.

The researcher developed the questionnaires in consultation with Health Education Experts in the College of Health and a Statistician, from the Adventist University of the Philippines. A Cronbach alpha reliability analysis of the instrument yielded a score of 0.7586.

Demographic information collected on the participants were: age, gender, grade/year level, religion, father’s occupation, mother’s occupation, estimated family monthly income, highest educational attainment of father, highest educational attainment of mother and the smoking status of parents, and peers. Smoking-related knowledge was measured with 23 items on a two point scale (“true or false” items). Examples of the items included were: “Cigarette smoking kills many people”, “Cigarette smoking is not addictive”. Smoking refusal self-efficacy was operationalized to include items addressing the ability to avoid smoking in social and emotional situations. Seven items on a three point scale was used to measure smoking refusal self-efficacy. For example, one of the questions read: “I can refuse a cigarette when with friends who smoke.” Answering options were “Agree” (3), “Somewhat agree” (2) and “Disagree” (1). In measuring smoking-related attitudes, eleven items on a three point scale were used. Examples of the questions were “Smoking is personally acceptable”, “Smoking makes a man look more masculine”. The options for the questions were “Agree” (1), “Somewhat agree” (2) and “Disagree” (3). Five items on a three point scale was used to measure smoking related intentions. Some of the questions were: “Do you think you will smoke a cigarette in the next six months?”, “Do you have plans to encourage smokers to quit?” The items had the following options: “Yes” (1), “Undecided” (2) and “No” (3). All items of the questionnaire that were negatively valenced were subsequently reverse-coded before creating a composite score.

### **Ethical consideration**

Prior to implementation, approval for this study was obtained from the Research Committee of the researcher’s institution, Adventist University of the Philippines. Also, permissions were obtained from the Mayor of Cabuyao, the Municipal Health Officer of Cabuyao and the “Barangay” captain of Casile. Furthermore, consent of the participants and their parents were obtained prior to implementation of the intervention. They were fully informed about the purpose of the study and the procedures that were involved.

## Data analysis

The data of the study was statistically analyzed with the Statistical Package for Social Sciences (SPSS) computer software program. Descriptive statistics of frequencies, percentages, and means were used to describe the demographic profile of the participants as well as their smoking-related knowledge, refusal self-efficacy, attitudes and intentions. The differences between the pre-intervention and post-intervention scores were established using paired t- test.

## RESULTS

### Demographic profile of the participants

The sample (n=32) consisted of non-smoking adolescents aged between 10 to 18 years old (mean=13.7 years). 15 (46.9%) of them were boys and 17(53.1%) were girls. 30(93.7%) were Roman Catholics with the remaining two (6.3%) not belonging to any religious denomination. 20(62.5%) of the participants reported that none of their parents smoke whilst at least one of the parents of the remaining 12(37.5%) smoke. Also, 18(56.3%) of the participants reported that none of their close friends smoke while at least one friend of the remaining 14(43.7%) smoke.

### Effects of the intervention

#### Smoking-related knowledge

Table 1 show that the mean difference between the smoking-related knowledge pre-intervention and post-intervention scores was found to be -6.812 with a t-value and p-value of -12.803 and 0.000, respectively. This indicates that the smoking-related knowledge score at post-intervention was higher by 6.812 points. Furthermore, the mean difference between the pre-intervention and post-intervention score was statistically significant at 0.01 level. The finding implies that the post-intervention smoking-related knowledge score of the participants was statistically higher compared to that of the pre-intervention score.

#### Smoking refusal self-efficacy

There was a difference of -0.8028 between the pre-intervention and post-intervention smoking refusal self-efficacy mean scores. The t-value of the mean difference was -13.058 with a p-value of 0.000. This shows that after the intervention, the post-intervention score for smoking refusal self-efficacy increased by 0.8028 points. Also, the difference between the pre-intervention and post-intervention was found to be statistically significant at 0.01 level.

#### Smoking-Related Attitude

In terms of smoking-related attitude, the difference between pre-intervention and post-intervention mean scores was found to be -0.6273 with a t-value and p-value of 11.361 and 0.000, respectively. It therefore implies that, at post-intervention, there was an increase in the scores of smoking-related attitude during post-intervention by 0.6273. Hence, at post-intervention, the participants had a less favourable attitude toward smoking than at pre-intervention. The mean difference between the pre-intervention and post-intervention scores was found to be statistically significant at 0.01 level.

#### Smoking-Related Intention

The difference between the smoking-related intention pre-intervention and post-intervention scores was -0.3500 with a t-value of -5.568 and a p-value of 0.000. This shows that the intention score after the intervention was higher than the score before the intervention. The findings further indicate that the pre-intervention score for intention was significantly different from the post-intervention score, although these two scores appear to be close.

## DISCUSSION

The purpose of this study was to assess the effect of a smoking prevention program on non-smoking adolescents. The findings of the study highlight the positive impact of smoking prevention programs on smoking-related knowledge, refusal self-efficacy, attitudes and intentions of adolescents.

After the intervention, there was a significant increase in the smoking-related knowledge of the participants. This outcome is consistent with previous studies<sup>15, 16</sup> on a comparable group. These studies recorded an increase in smoking-related knowledge of 39% and 25%, respectively, when the pre-intervention and post-intervention results of the participants were compared. However, the studies did not report on the significance level of these results. The reported increase in smoking related-knowledge in this study could be attributed to the inclusion of program activities related to the outcome. This result is encouraging because according to Tobler *et al.* and Lantz *et al.* adolescents would refrain from smoking if they were supplied with adequate information regarding the harmful effects of smoking<sup>17, 18</sup>. Lantz *et al* further state that with increased awareness on the health hazards of cigarette smoking, these individuals will then develop anti-tobacco attitudes, and make a rational and logical decision not to smoke.

With peer pressure being recognized by various authors as one of the important determinants of

adolescents smoking behaviour<sup>19-21</sup>, the researcher included components in the intervention of this study, that were meant to equip the participants with smoking refusal skill to enable them resist pressures from their peers to smoke. Chen and Yeh define self-efficacy as how a person determines how to handle a troublesome situation. The authors state that “if an individual is lacking in efficacy expectation or self-efficacy, frustration, fear, and doubt will no doubt take over”<sup>22</sup>. A comparison of the pre-test and post-test scores of the participants reveals that, there was a significant increase in the smoking refusal self-efficacy of the participants. The findings show that the participants were more capable of overcoming pressures to smoke after the intervention than before the intervention. This outcome could therefore be a protective factor in enabling them to overcome the temptation to smoke.

The attitudes of the participants were observed to be relatively less favourable to smoking, after the intervention. This observation could be explained by the increase in smoking-related knowledge among the participants after the intervention. Increased knowledge about the hazards of a health behaviour leads to the development of a negative attitude towards that behaviour. On the other hand, if one believes that the consequences of smoking produce no detrimental effects, his/her attitude toward smoking would be a positive one<sup>18, 23</sup>. Also, the increased refusal self-efficacy reported among the participants after the intervention could contribute the relatively negative attitude among the participants after the intervention. This is because if someone has the ability to resist negative health behaviour, that individual would develop a more negative attitude towards that behaviour<sup>23</sup>.

After the intervention, the participants were less likely to smoke in the future. The increased smoking-related knowledge, refusal self-efficacy, less favourable attitude to smoking after the intervention, could have contributed to the gain in smoking-related intention scores of the participants. This is because knowledge about the health hazards of smoking and efficacy to refuse cigarette from friends and other significant others, determine whether a person would intent to smoke or not<sup>17, 24</sup>. The increased smoking-related intention scores after the intervention may indicate that the adolescents feel strong enough to resist pressures to smoke. However, 18 (56.3 %) of them do not have friends who smoke and so might not have been put to the test of resisting influences from friends to smoke. Intending not to smoke in the future might be different from what actually happens then. According to McGahee *et al.*, “saying and doing may be two entirely different matters”<sup>25</sup>.

## STUDY LIMITATIONS

Although there was a significant difference in the pre-intervention and post-intervention scores in terms of smoking-related knowledge, refusal self-efficacy, attitude and intention, confounding factors cannot be ruled out owing to the weakness of the research design used.

Also, due to time constraints the effect of the intervention on the long-term smoking behaviour of the participants could not be ascertained. However, self-reported intention to smoke has been found to be a predictor of subsequent self-reported smoking behaviour among adolescents followed longitudinally over a 4-year interval<sup>26</sup>.

Moreover, due to the small sample size of this study caution should be exercised in generalizing the findings of this study.

## CONCLUSION AND RECOMMENDATIONS

The smoking prevention program led to a significant increase in smoking-related knowledge and refusal self-efficacy among the participants. The participants also reported a significantly less favourable attitude toward smoking and a lesser intention to smoke in the future. However, generalization of these outcomes should be done with caution, considering the weakness of the research design and the small sample size of the study.

Findings of this study support the usefulness of smoking prevention programs in increasing smoking-related knowledge and refusal self-efficacy, positively impacting on smoking-related attitude, and intention. Therefore, more smoking prevention programs need to be done for young adolescents to help them not to start smoking before they become addicted.

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**Table 1: Difference in Pre-test and Post-test Scores**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	S.D	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Knowledge	-6.8125	3.01006	.53211	-7.8977	-5.7273	-12.803	31	.000
Self-efficacy	-.8028	.34779	.06148	-.9282	-.6774	-13.058	31	.000
Attitude	.6273	.31233	.05521	.5147	.7399	11.361	31	.000
Intention	-.3500	.3556	.06286	-.4782	-.2218	-5.568	31	.000

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