



**DEVELOPMENT, IMPLEMENTATION AND  
EVALUATION OF SCHOOL-BASED SMOKING  
PREVENTION EDUCATION PROGRAM AMONG NON-  
SMOKING ADOLESCENTS**

**BY**

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## ABSTRACT

Preventing smoking among adolescents is critical to end the epidemic of smoking in Malaysia. Despite the implementation of several smoking prevention programs, the prevalence of adolescent smoking and experimenting with tobacco in Malaysia is still increasing. Therefore, the purpose of this quasi-experimental study was to evaluate the effectiveness of Smoking Prevention Education Programs (SPEP) in preventing the smoking initiation among non-smoker adolescents based on their smoking status on follow-up and smoking intention, which includes; attitude, subjective norms, and perceived behavioural control as described by the Theory of Planned Behaviour. A total of 140 Primary five students (non- smokers) were involved in this study. Four schools in Kuantan district were randomly assigned to intervention and control groups. The intervention schools received a lecture on the hazards of smoking and SPEP intervention whereas the control schools received just a lecture on the hazards of smoking. The questionnaires and exhale carbon monoxide levels were first assessed at baseline and then again after three months. The findings of this study showed that after three months, the percentage of never smoker remained 100% in the intervention group, compared to the control group, and 2.9% of participants reported to have smoked in past seven days. Furthermore, the results indicated that the mean score of attitude, subjective norm, and smoking intention of the intervention group improved significantly after the SPEP intervention. In addition, the findings indicate that being a male ( $b= 0.494$ ,  $p<0.001$ ), having friends who smoke ( $b= -0.82$ ,  $p=0.023$ ), and having positive attitude toward smoking ( $b= -0.669$ ,  $p= <0.001$ ) were significant factors for smoking intention among adolescents. The current study demonstrated that, in short-term, the SPEP intervention was effective in preventing smoking intention and smoking initiation, and it can be integrated as a part of the school curriculum. Additionally, the study has identified valuable information to improve existing smoking prevention programmes through combining the social influence and social competence approach. Further studies are recommended to assess the long-term effectiveness of SPEP intervention.

*KEYWORDS: Adolescents, Non- smoker, Smoking Prevention Education Program*

## خلاصة البحث

مكافحة التدخين بين المراهقين أمر بالغ الأهمية للقضاء على وباء التدخين في ماليزيا، وعلى الرغم من تنظيم العديد من برامج مكافحة التدخين في ماليزيا فإن انتشار تدخين المراهقين وتجريب منتجات التبغ لا يزال في تزايد. ولذلك كان الهدف من هذه الدراسة الشبه التجريبية تقييم فعالية البرامج التوعوية لمكافحة التدخين في منع بدء التدخين بين المراهقين الغير المدخنين بناء على حالة التدخين في وقت المتابعة والتي تشمل على نية التدخين، والموقف الشخصي، والعرف الغير موضوعي، والتحكم السلوكي المتصور كما هو موضح في نظرية السلوك المخطط. شارك في هذه الدراسة 140 طالبا ابتدائيا (غير مدخنين)، وتم تعيين أربع مدارس في منطقة كوانتان عشوائيا إلى مجموعة تدخل ومجموعة ضابطة. تلقت مجموعة التدخل محاضرة حول مخاطر التدخين بالإضافة إلى البرنامج التوعوي لمكافحة التدخين، بينما تلقت مدارس المجموعة الضابطة محاضرة عن مخاطر التدخين فقط. تم تقييم الاستبيان ومستوى أول أكسيد الكربون الزفيرى على الحد مرجعي وثلاثة أشهر بعد الحد المرجعي. أظهرت نتائج الدراسة أنه بعد ثلاثة أشهر ظلت نسبة عدم المدخنين 100% في مجموعة التدخل مقارنة مع المجموعة الضابطة حيث أن 2.9% من المشاركين أبلغوا أنهم دخنوا في الأيام السبعة الماضية. وعلاوة على ذلك، أشارت النتائج إلى أن متوسط علامات الموقف الشخصي، والعرف الغير موضوعي، ونية العزم على التدخين لمجموعة التدخل تحسنت بشكل ملحوظ بعد تدخل البرنامج التوعوي لمكافحة التدخين. بالإضافة إلى ذلك، أشارت النتائج إلى أن عوامل ذكر الجنس ( $b=0.494$ ،  $p<0.001$ )، ووجود أصدقاء مدخنين ( $b=-0.82$ )، والموقف الإيجابي ( $b=-0.669$ ،  $p=0.023$ ) تجاه التدخين كانت عوامل هامة للعزم على التدخين بين المراهقين. أثبتت هذه الدراسة أن تدخل البرنامج التوعوي لمكافحة التدخين كان فعالا على المدى القصير في منع الاعتزام على التدخين وبدء التدخين وبالامكان دمج كجزء من المنهج الدراسي. وبالإضافة إلى ذلك، حددت هذه الدراسة معلومات قيمة لتحسين برنامج مكافحة التدخين الحالي من خلال الجمع بين التأثير الاجتماعي وطرق الكفاءة الاجتماعية. أوصت الدراسة بالقيام بفحص فعالية تدخل البرنامج التوعوي لمكافحة التدخين على المدى الطويل.

الكلمات المفتاحية: المراهقين، غير مدخن، البرنامج التوعوي لمكافحة التدخين.

## APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master in Nursing Science.

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## DECLARATION

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## TABLE OF CONTENTS

Abstract.....	ii
Abstract in Arabic.....	iii
Approval page.....	iv
Declaration.....	v
Copyright Page.....	vii
Acknowledgements.....	viii
Table of Contents.....	ix
List of tables.....	xii
List of figures.....	xiii
List of abbreviations.....	xiv
<b>CHAPTER ONE: INTRODUCTION.....</b>	<b>1</b>
1.1 Introduction.....	1
1.2 Background of the Study .....	1
1.3 Statement of the Problem.....	4
1.4 Research Questions.....	7
1.5 Research Objectives.....	8
1.6 Alternative Hypothesis.....	9
1.7 Significant of the Study.....	9
1.8 Definition of terms .....	10
1.9 The structure of the thesis .....	12
1.10 Chapter summary.....	13
<b>CHAPTER TWO: LITERATURE REVIEW.....</b>	<b>14</b>
2.1 Overview .....	14
2.2 Introduction.....	14
2.3 Smoking from Islamic Perspectives .....	15
2.4 Effects of Smoking .....	16
2.5 Tobacco Control and Prevention in Malaysia.....	17
2.6 Smoking Initiation among Adolescents .....	19
2.7 School-Based Smoking Prevention Program.....	35
2.8 Theoretical Framework .....	54
2.9 Conceptual Framework.....	55
<b>CHAPTER THREE: METHODOLOGY.....</b>	<b>58</b>
3.1 Introduction.....	58
3.2 Research Design.....	58
3.3 Study Setting .....	60
3.4 Study Population .....	60
3.5 Data Collection .....	62
3.5.1 Questionnaire .....	62
3.5.2 Data Collection Procedure .....	68
3.5.3 Instrumentation .....	70
3.5.4 Variable Measure.....	71



3.6	Description of Intervention .....	71
3.7	Ethical Approval.....	72
3.8	Statistical Analysis.....	73
3.9	Conclusion.....	78
<b>CHAPTER FOUR: DEVELOPMENT OF SPEP.....</b>		<b>79</b>
4.1	Introduction.....	79
4.2	Program Development and Method .....	79
4.2.1	Formative Research.....	79
4.2.2	Development of SPEP.....	83
4.2.3	Formative Evaluation of the program .....	90
4.2.4	Process Evaluation of the Program.....	93
4.3	Conclusion .....	94
<b>CHAPTER FIVE: RESULT .....</b>		<b>95</b>
5.1	Introduction.....	95
5.2	Socio-demographic and Characteristics.....	96
5.3	Smoking Prevention in Schools by Teachers.....	100
5.4	Smoking Prevention by Health Staff .....	100
5.5	Self reporting of Smoking.....	102
5.6	Evaluation of SPEP based on TPB .....	102
5.7	Associated Factors on Smoking Intention .....	105
5.8	Summary.....	107
<b>CHAPTER SIX: DISCUSSION.....</b>		<b>108</b>
6.1	Introduction.....	108
6.2	Reporting of Smoking.....	108
6.3	Evaluation of SPEP based on TPB .....	110
6.4	Associated Factors on Smoking Intention .....	113
6.5	Conclusion .....	116
<b>CHAPTER SEVEN: CONCLUSION.....</b>		<b>117</b>
7.1	Introduction.....	117
7.2	Strength .....	117
7.3	Limitation.....	118
7.4	Implication of the study .....	119
7.5	Recommendation .....	120
7.6	Conclusion .....	121
<b>REFERENCES.....</b>		<b>122</b>
APPENDIX	A: SUMMARY OF THE CONTRIBUTING FACTORS OF SMOKING INITIATION.....	138
APPENDIX	B: SUMMARY STUDIES OF SCHOOL-BASE SMOKING PREVENTION PROGRAM .....	147
APPENDIX	C: BASELINE AND FOLLOW-UP QUESTIONNAIRE (English Version) .....	161
APPENDIX	D: BASELINE AND FOLLOW-UP QUESTIONNAIRE (Malay Version).....	176

APPENDIX E:	INFORMED CONSENT FORM (SCHOOL PRINCIPAL).....	191
	E.1 Information sheet.....	192
	E.2 Consent Form.....	193
	E.3 Information sheet (Malay version).....	194
	E.4 Consent Form (Malay version).....	195
APPENDIX F:	INFORMED CONSENT FORM (Parent).....	196
	F.1 Consent form.....	197
	F.2 Information sheet.....	198
	F.3 Letter of information.....	199
	F.4 Refusal parental form.....	200
	F.5 Consent form (Malay version).....	201
	F.6 Information sheet (Malay version).....	202
	F.7 Letter of information (Malay version).....	203
	F.8 Refusal parental form (Malay version).....	204
APPENDIX G:	ETHICAL APPROVAL.....	205
	G.1 Approval of research proposal.....	206
	G.2 Approval from IREC.....	207
	G.3 Approval from MOE.....	208
	G.4 Approval from Pahang State Education Department	209
	G.5 Permission from author.....	210
APPENDIX H:	MULTIPLE LINEAR REGRESSION.....	211
APPENDIX I:	DESIGN FOR BADGE BUTTON.....	227
APPENDIX J:	DESIGN FOR FRIDGE MAGNET.....	228
APPENDIX K:	10 TIPS TO OVERCOME PEER PRESSURE.....	229
APPENDIX L:	INTERVIEW GUIDE.....	230
APPENDIX M:	EDUCATIONAL MODULE EVALUATION.....	232
APPENDIX N:	QUESTIONNAIRE ON VIDEOS OF ANTI-SMOKING	234
APPENDIX O:	RESEARCHER CERTIFICATE ON THIS STUDY.....	238

## LIST OF TABLES

Table 2.1	PICO framework for literature review	36
Table 3.1	The internal reliability of the questionnaire	67
Table 3.2	Statistical test value for checking on data normality	74
Table 3.3	The summary of statistical analysis	76
Table 4.1	The descriptions of the SPEP intervention	89
Table 5.1	Summary of background characteristic	97
Table 5.2	Summary of smoking prevention activities in school	101
Table 5.3	Smoking status during follow-up	102
Table 5.4	Compare the mean score for intervention and control group at baseline and follow-up	103
Table 5.5	Compare the mean score for baseline and follow-up of intervention and control group	104
Table 5.6	Associated factors of smoking intention among adolescents	106

## LIST OF FIGURES

Figure 2.1	Search strategy for contributing factors of smoking initiation among adolescents	21
Figure 2.2	Intergrative conceptual model on factors influencing smoking initiation among adolescents in Malaysia	27
Figure 2.3	Search strategy for school-based smoking prevention program among adolescents	38
Figure 2.4	Model of Planned Behaviour derived from Ajzen (1991)	57
Figure 3.1	Diagram of study design	59
Figure 3.2	Flow chart of the study	77
Figure 4.1	Stages of development	82
Figure 4.2	Intervention mapping model for SPEP	88
Figure 4.3	Evaluation of power point presentation	91
Figure 4.4	Perceived effectiveness of tailored video	92
Figure 4.5	Emotional responses toward tailored video	93

## LIST OF ABBREVIATIONS

CDC	Centre for Diseases Control
CO	Carbon Monoxide
COPD	Chronic Obstructive Pulmonary Disease
CI	Confidence Intervel
CPG	Clinical Practice Guideline
FCTC	Framework Convention on Tobacco Control
GATS	Global Adult Tobacco Survey
HDL	High Density Lipid
IHD	Ischemic Heart Disease
IPH	Institute of Public Health
IREC	IIUM Research Ethic Comittee
MOE	Ministry of Education
MOH	Ministry of Health
NHMS	National Health and Morbidity Survey
RCP	Roral College of Physician
SPEP	Smoking Prevention Education Program
TECMA	Tobacco e-cigarette survey among Malaysian Adolescents
TPB	Theory of Planned Behaviour
WHO	World Health Organization
YLL	Years of Life Lost

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 INTRODUCTION**

This chapter describes the background of the study and the problem statement of this thesis. The study objectives, the research questions and the significance of the study are present at the end of this chapter.

### **1.2 BACKGROUND OF THE STUDY**

According to the World Health Organization (WHO, 2011), smoking related diseases are the main cause of premature death globally. More than 5 million population die each year due to smoking-related diseases, an average of one person every 6 second and 1 in 10 adults worldwide (CDC, 2015). The current global estimate of the number of death due to smoking- related diseases such as lung cancer and heart disease will reach to more than 8 million by 2030 from 5 million in 2006 if the current trends still no change (Institute of Public Health (IPH), 2012). There are 70% of deaths that are results from smoking-related diseases in developing countries (Lim et al., 2017). About 20% of premature death which are due to tobacco-related diseases could have been avoided if the smoker had never smoked (Thomas et al., 2013). According to the Ministry of Health (MOH) Malaysia, 20, 000 Malaysians had died from smoking- related diseases and these lives could have been saved if they never smoked (Global Adult Tobacco Survey (GATS), 2011). A study on the burden of diseases estimated that one fifth of disability adjusted life years (DALYs) and one-third of years of life lost (YLL) were due to smoking- related diseases (IPH, 2012). As a matter of fact, Malaysia comprises

73% of the world's active smoker population and have spent as much as three billion Malaysian Ringgit(RM) per year treating chronic obstructive pulmonary disease (COPD), ischemic heart disease (IHD), lung cancer and other smoking- related diseases (MOH, 2006; Tan et al., 2009).

There are almost 5 million smokers in Malaysia that have initiated smoking before the age of 18 (Deputy Director-General of Health (Public Health) Malaysia, 2015). According to Centre for Disease Control and Prevention (CDC, 1994), although there are a lot of programs and policies that discourages smoking, there has been no progress on curbing smoking, and the onset rates of smoking among adolescents has never declined. Several studies have shown that majority of adult' smokers initiate their tobacco consumption and smoking addiction during adolescence and very few adults begin smoking as an adult (CDC, 2006; Ghayeb et al., 2013). WHO (2011) estimated that half of those who smoke during their adolescence are predicted to continue smoking for another 15 to 20 years, and are less likely to quit smoking, due to nicotine addiction. Therefore, a report of the Surgeon General (2014) estimated that about 5.6 million adolescents under the age of 18 will die from smoking- related diseases if the current trends continue. Compared to neighbouring countries such as Thailand, Indonesia, Philippines, and Singapore, current cigarette smoking prevalence among adolescents in Malaysia is significantly higher (35%) (WHO, 2008; Sirichotiratana et al., 2008; WHO, 2013). An early exposure to smoking results in the increase of duration of smoking and the amount of cigarette used and thus, increases, the risk of smoking- related diseases and hence causes lower possibility to quit smoking. The risks of immediate or long-term adverse health consequences such as asthma, chronic cough, lung cancer, chronic obstructive airways disease, and cardiovascular diseases is a major public health

concern for smoking adolescents (Gilliland et al., 2006; CDC, 1994). In addition, others acute effects of smoking among adolescent and adults include, irritability, restlessness, sleep disturbance, decreased appetite, anxiety, difficulty in concentrating, and depression. However, most of the adolescents are oblivious of the health consequences of smoking because most of the evidences of harm related to smoking such as cancer, respiratory diseases, and cardiovascular diseases only occur at the later stage of life, except for nicotine dependence (Al-Sadat et al., 2014). A report from (The Royal College of Physician (RCP, 1992) as cited from Conner & Higgins (2010) proved that initiating smoking at earlier adolescents increased risks of getting strokes and respiratory infection. According to Leiva et al. (2014), the most effective ways to reduce the numbers of smoking- related diseases in the intermediate and long-term period is to prevent the adolescents from initiating smoking and helping them breaking from the smoking habit. Evidence showed that young adolescents who are exposed to nicotine become addicted within a very short period (Dahlui et al., 2015). A study done by DiFranza et al. (2002) revealed that an adolescent smoker will show symptoms of addiction to nicotine within days or weeks after occasional smoking begins. Immaturity of adolescents' brains causes nicotine to have more bothersome effects (Dahlui et al., 2015). On top of that, smoking also brings negative impacts to other peoples in the surroundings especially to their family members and peers (second-hand smoking). This reality reinforces the need to prevent adolescents from initiating smoking and which at the same time reduce the risk of smoking- related diseases in the future.



### **1.3 STATEMENT OF THE PROBLEM**

A recent population-based study done by Hammond et al. (2008), found that the percentage of active smoker among adolescents in Malaysia aged between 13 and 17 years is still low but increasing. On top of that, Malaysian National Health and Morbidity Survey (NHMS) reported that 15% of adolescents aged between 13 and 18 years old had tried smoking and another 8% declared to be regular smokers (IPH, 2008). To date, a national survey conducted among Malaysian adolescents (TECMA, 2016) found that, 78.7% of ever smoker had their first cigarette before the age of 14 years old. Indeed, in order to achieve the global Non-Communicable Disease target of reducing tobacco use by 30% by the year 2025, preventing the initiation of smoking among adolescents is crucial. According to Norsiah (2013), MOH was aiming that by the year 2020, smoking prevalence in Malaysia will be reduced by half. Furthermore, the incidences of smoking and smoking-related diseases will be decreased if the percentage of the adolescents' initiates smoking is decreased (Lim et al. 2014). In addition, an initiation of smoking in earlier adolescents results in subsequent heavier smoking, higher level of nicotine dependence, a lower chance to quit smoking and higher mortality (RCP, 2010). An individual who does not initiate smoking during adolescents age is found to be less unlikely to initiate smoking during adulthood (Lim et al., 2014). Therefore, primary smoking prevention should be focusing on this age period. Crone et al., (2011) also supported that the interventions in the prevention of smoking initiation among adolescents should start at an early age before attitudes and belief about smoking are formed.

Smoking prevention programs for adolescents particularly at school level is an important strategy to reduce future morbidity and mortality due to tobacco related diseases (Kumra & Markoff, 2000; Chou et al., 2006). In a Cochrane report, a review

of recent 134 studies done by Thomas et al., (2013) showed that school-based interventions were effective to prevent smoking initiation among adolescents in the future.

There are several factors that contribute to smoking initiation among adolescents, which includes peer influence and approval, smoking behaviour of parents and siblings smoking the ease of accessibility to cigarettes, and lack of awareness of the health effects of smoking (Foong & Khor,2003). The adolescence is a transition period where environmental processes, exploration, and experimentation are part of their development thus, there is bigger potential for them to involved in smoking (Maher et al., 2014; Santrock, 2005). As such, preventing the adolescents from initiating smoking habit is crucial (Verma et al., 2015).

Preventing smoking among adolescents is critical to end the epidemic of tobacco use in Malaysia. The prevalence of smoking adolescents is still increasing annually despite the implementation of several primary smoking prevention programs at schools, which are based on health promotion programs like anti-smoking talk and exhibitions, counsellings and disciplinary actions (Lim et al., 2017). For example, “Program Doktor Muda” (Young Doctors Program) was included in the co-curricular activities of primary schools under Ministry of Education (MOE) since 2007 to improve skills and knowledge of the students, particularly regarding healthy lifestyle, including smoking through a peer approach. However, smoking among adolescent still occurs (Dahlui et al., 2015). The Health Minister of Malaysia, highlighted that there is no significant reduction in smoking prevalence despite implementation of various programed for smoking prevention (MOH CPG, 2016). Hence, a proper study should be done to evaluate the effectiveness of smoking prevention programs among non-smokers and to develop more innovative programs that are appropriate for adolescents and targeting to

improve the adolescents' skills to refuse influence to smoke (Dahlui et al., 2015), such as educational interventions based on Theory of Planned Behaviour (TPB) (Nazari et al., 2013). Only a few studies have examined the role of TPB to evaluate smoking initiation among adolescents (Gwon et al., 2017). This theory proposes that adolescence smoking intention is influenced by their attitude, perceived behaviour control, subjective norms, and knowledge (Ajzen, 1991; Nazari et al., 2013). Smoking initiation is a key behaviour that determines the health consequences of a smoker in the future (Pierce et al., 2012). Educational interventions were planned based on this priority. In addition, video is also being used as a multimedia tobacco educational program to educate the students to overcome social influences and to resist peer pressure to start smoking and as a part of the curriculum of the school system (Salim et al., 2011).

Based on previous studies, the most successful intervention to prevent adolescents from starting to smoke begins before the individual makes the decision for smoking. Thus, it is important to identify the factors predicting intention to smoke. Nazari et al., (2013) proposed that having a positive attitude towards smoking may lead to the intention to smoke. Tsai (2005) and Dahlui et al. (2015) agreed that knowledge of tobacco hazard and the ability to refuse to smoke (social competence and social influence) should be reinforced in order to form positive attitude against smoking. A systematic review by Thomas et al., (2015) suggested that the most effective school-based smoking prevention program should focus on a combination of social competence and social influence in order to develop a positive attitude against smoking and to maintain never- smoking status.

In Malaysia, there are multiple studies on smoking prevalence and its related factors. However, there is limited study done to evaluate the effectiveness of school-based interventions in preventing the initiation of smoking (Melson, 2014). For

instance, a study done by Melson (2014) revealed that peer educator intervention in a school-based program had significant positive effects on the smoking behaviour of baseline active smoker, but less impact towards baseline never-smoker. Furthermore, the evaluation of the effectiveness of school-based program is necessary to determine the area of the program that needs improvement (Lorna-Schmidt, 2015). In addition, the finding of the evaluation is also important to prevent and decrease the rate of smoking among adolescents (Dahlui et al., 2015), thus prevents the increasing burden of smoking related morbidity and mortality in Malaysia (Lim et al., 2017). It is consistent with the vision of MOH to make Malaysia a healthy country (Lim et al., 2013).

#### **1.4 RESEARCH QUESTIONS**

1. What kind of school-based smoking prevention education programs (SPEP) are suitable for preventing smoking uptake among adolescents?
2. What are the socio-demographic characteristics and previous exposures to smoking prevention activities at schools in each arm of the study (intervention and control)?
3. What is the effect of SPEP in preventing the uptake of smoking among adolescents based on their smoking status on follow-up (baseline never-smoker)?
4. What is the effect of SPEP in preventing the uptake of smoking among adolescents based on their smoking intention (includes; attitude, subjective norms and perceived behavioural control) as described by TPB?
5. What are the factors associated with smoking intention among adolescents?

## **1.5 RESEARCH OBJECTIVES**

### **1.5.1 General objective**

To evaluate the effectiveness of SPEP to prevent the smoking initiation among adolescents based on their smoking status on follow-up (baseline never- smoker) and smoking intention (includes; attitude, subjective norms, and perceived behavioural control) as described by the TPB.

### **1.5.2 Specific objectives**

1. To develop and implement the teaching guideline on SPEP in preventing smoking uptake among adolescents.
2. To describe socio-demographic characteristics and previous exposures to smoking prevention activities at schools in each arm of the study (intervention and control)
3. To compare the effects of SPEP between the intervention and control group based on smoking status during follow-up, whether they remain as non-smoker or started smoking.
4. To compare the effects of the SPEP on the adolescents' attitude, subjective norm, perceived behavioural control and smoking intention between the intervention and control group.
5. To determine associated factors related to smoking intention among adolescents.

## **1.6 ALTERNATIVE HYPOTHESES**

- HA1 There will be a significant difference in smoking status in participants receiving SPEP intervention compared with control group during follow-up.
- HA2 There will be a significant difference in smoking intention of participants receiving SPEP intervention compared with control group
- HA3 There will be a significant difference in the attitude of participants receiving SPEP intervention compared with control group
- HA4 There will be a significant difference in subjective norms of participants receiving SPEP intervention compared with control group
- HA5 There will be a significant difference in perceived behavioural control in participants receiving SPEP intervention compared with control group

## **1.7 SIGNIFICANCE OF THE STUDY**

Various measures were done by the government yet they are still ineffective in preventing the initiation of smoking especially among the adolescents. This study could possibly help MOH, MOE, and healthcare providers to find new ways of improving the effectiveness of school-based smoking prevention intervention programs that aim to prevent the initiation and escalation of smoking thus promoting healthy behaviour, lifestyle, and environment without tobacco use. Besides that, by preventing smoking among adolescents smoking-related mortality and morbidity will decrease and thus reducing government's medical expenditure as well as preventing progression of the usage of another drug. In addition, effective prevention intervention of smoking initiation will protect present and future generations from devastating health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke (second-hand smoke).

## **1.8 DEFINITION OF TERMS**

**Adolescent-** is defined as young people between the age of 10 and 19 years old (Department of Statistic Malaysia, 2010), it is a transitional period where a time of rapid physical and psychological (cognitive and emotional) growth and development, a time in which new capacities are developed, a time of changing social relationships, expectations, roles and responsibilities (WHO, 2011). In this study, adolescents are primary five student aged 11 years old.

**Smoking initiation-** is defined as the occurrence of smoking onset (Tajidah et al., 2016). In this study is referring to the transition from non-smoker to the experimental or regular smoker.

**Ever smoking-** is defined as lifetime smoking (IPH, 2008). In this study is defined as self-reporting to have smoked even a single puff of a cigarette during an adolescent's lifetime and includes adolescents who have already stopped smoking (same with the study by Melson (2014)).

**Never smoking-** is defined as self-reporting never having smoked (IPH, 2008). In this study is defined as self reporting never having smoked not even a puff in an adolescent's lifetime (same with the study by Melson (2014)).

**Ex-smoker-** is defined as self-reporting to have smoked even a single puff but currently did not smoke anymore (Muhammed et al, 2016). In this study is defined as self-reporting have quit smoking (same with the study by Melson (2014)).

**Smoking intention-** is defined as a conscious plan or decision to exert effort to smoke (Higgins & Conner, 2003). In this study, the smoking intention refers to the future intention of the adolescents either choosing to smoke or not to smoke.

**Attitude-** is defined as the degree to which a person perceives behaviour based on a favorable or unfavourable assessment of the behaviour (Ajzen, 1991). In this study is referring to beliefs about smoking and the consequences of it.

**Subjective norm-** is defined as any social influence that may determine if the individual will perform or will not perform the behaviour (Ajzen, 1991). In this study is referring to perceived social pressure from friends, parents, and siblings to smoke or to not smoke.

**Perceived behavioural control-** is defined as the level of confidence an individual has about their ability to perform a behaviour, based on how easy or difficult they perceive the performance is as it relates to hindrances or facilitators (Ajzen, 1991). In this study is referring to the ability of participants as perceived by the participants themselves to not smoke if they do not want to start smoking (same with the study by Melson (2014)).

**Social influence-** is defined as the changes in an individual's behaviour, thoughts, actions or feelings resulting from what other people or group do or feel (Berkman, 2000). In this study, social influence approach is referring to the intervention that helps the adolescents to overcome social influence to initiate smoking. (same with the study by Thomas et al., (2015)).

**Social competence-** is defined as the ability to handle social interactions effectively (Orpinas, 2010). In this study, social competence approach is referring to the intervention that encourages students to refuse offers to smoke by improving their general social competence and personal and social skill via refuse skill training (same with the study by Thomas et al., (2015)).

**Satirical fictitious scenario** is defined as using the actors to resemble typical experience of individual in those situation (Eakin et al, 1998). In this study is referring,