



**Effects of an Intervention Program with and Without Pretest Assessment on  
Schoolchildren's Self-efficacy to Create a Smoke-free Home**

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**A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of  
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| <b>Thesis Title</b>  | Effects of an Intervention Program with and without Pretest Assessment on Schoolchildren's Self-efficacy to create a Smoke-free Home |
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## ABSTRACT

**Background:** A school-based smoke free home (SFH) program is useful in empowering the mother and child to reduce secondhand smoke exposure or create a smoke-free home but the effects of pretesting on knowledge and attitude has been largely ignored. We aimed to test whether such a program can be effective in Southern Thailand with an additional assessment of the net effect of the pretest.

**Methods:** A Solomon four-group design was conducted in 12 out of 50 schools of Hatyai district, Songkhla province, Thailand. Schools were assigned to receive an immediate intervention with and without pretest assessment; or control group with and without pretest assessment. Four hundred and eighty-two households participated. Four classroom sessions taught by a trained teacher over a 1-month period were implemented. Outcome variables included smoke-free home status, knowledge and attitude towards the harms of exposure to secondhand smoke and smoking, self-confidence in creating a smoke-free home, avoiding exposure to secondhand smoke, encouraging the smoker to not smoke in the home, and number of cigarettes smoked per day. The outcomes were assessed at baseline and 3 months after the intervention using self-administered questionnaires.

**Results:** A total of 482 households participated and completed the study, 129 in the intervention with pretest group and 98 without pretest, 130 in the control with pretest group and 125 without pretest. Among intervention with pretesting group, the rate of SFH was non-significantly increased from 41.9% at baseline to 46.5% at endline (difference: 4.65%, 95% CI: -0.13, 9.43, P value: 0.06). Similarly, a non-significant increased rate of SFH was seen in the control with pretesting group from 31.6% at baseline to 36.7% at endline (difference: 5.1%, 95% CI: -1.5, 11.7, P value: 0.13). After adjusting for religion and mothers schooling years, there was non-significant effect of the intervention on SFH (OR: 1.52, 95% CI: 1.00, 2.26). Attitude, knowledge and self-confidence in creating a smoke-free home, in avoidance of secondhand smoke exposure and persuading smokers to not smoke in their home were significantly improved. No pretest effect was observed.

**Conclusions:** Gain in attitude, knowledge and self-confidence among family members from the brief school-based education should be enhanced by other measures.

**Keywords:** Smoke free home, educational intervention, brief intervention, Solomon Four Group

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Nirun Intarut

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## LIST OF ABBREVIATIONS AND SYMBOLS

|       |  |
|-------|--|
| SHS   | Second-hand smoke  |
| DALYs | Disability-adjusted life years                           |
| ETS   | Environmental tobacco smoke                              |
| SS    | Sidestream smoke   |
| MS    | Mainstream smoke   |
| WHO   | World Health Organization                                |
| FCTC  | Framework Conventional on Tobacco Control                |
| GYTS  | Global youth tobacco survey                              |
| CRCT  | Cluster randomized controlled trial                      |
| RCT   | Randomized controlled trial                              |
| GM    | Geometric mean   |
| SHSe  | Second-hand smoke exposure                               |
| IARC  | International Agency for Research on Cancer              |
| FGD   | Focus group discussion                                   |
| IDI   | In-depth interview                                       |
| SFH   | Smoke free home  |
| GYTS  | Global youth tobacco survey                              |
| TRC   | Tobacco Control Research and Knowledge Management Center |
| ETS   | Environmental tobacco smoke                              |

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Second-hand smoke (SHS) is comprised of several toxic gases and small particles.<sup>1</sup> Epidemiological evidence shows that exposure to SHS can cause mortality and morbidities in both children and adults.<sup>2, 3</sup> In children, exposure to SHS is linked to low birth weight (LBW), ear infections, sudden infant death and behavioural problems and learning.<sup>4-8</sup> Likewise, heart disease, cancer, and chronic obstructive pulmonary disease are linked to exposure to SHS.<sup>9</sup> In 2004, the prevalence of exposure to SHS in children aged 0-14 years was 40%, and it is estimated that exposure to SHS has caused 603,000 deaths and 10.9 million disability adjusted life years (DALYs) corresponding to 1.0% of all deaths and 0.7% of the worldwide burden of disease in DALYs.<sup>10, 11</sup> This report reveals that children are more heavily exposed to SHS than any other age group, and they are not able to avoid the main source of exposure.<sup>11-14</sup>

In Thailand, the prevalence of tobacco consumption has declined gradually from 32.0% in 1991 to 21.4% in 2011. However, the prevalence of exposure to SHS at public places such as fresh markets, public transportation and restaurants was 74.2%, 50.4%, and 49.1% respectively.<sup>15</sup> In 2009, the global youth tobacco survey (GYTS) reported that the prevalence of exposure to SHS at home, and outside the home was 45.7%, and 67.7% respectively.<sup>16</sup> Thongthai et al. (2004) reported that the prevalence of exposure to SHS at home was more common among people with low socioeconomic status.<sup>17</sup> In addition, Wannaporn et al. reported that the prevalence of parental smoking in the presence of an infant was 35.1%, and parental smoking was significantly associated with age and religion.<sup>18</sup>

The World Health Organization - Framework Conventional on Tobacco Control (WHO-FCTC) is a treaty for prevention and tobacco control. Ratified by the

WHO-FCTC, MPOWER is a policy package that assists members of WHO-FCTC for implementation of effective interventions to reduce the demand for tobacco. MPOWER include six evidence-based components; Monitoring tobacco use and tobacco control policies (M); Protecting people from the dangers of tobacco smoke (P); Offering help to quit tobacco (O); Warning the public about the dangers of tobacco (W); Enforcing bans on tobacco advertising, promotion and sponsorship (E); and Raising tobacco taxes (R).<sup>19, 20</sup> Thailand has been a member of WHO-FCTC since 2003, and has been implementing those measures for tobacco control.<sup>21</sup>

The WHO guidelines (FCTC articles 8) recommend a smoke-free area in all indoor buildings, public places, and public transport. The guidelines do not cover private households. Educational strategies are suggested to be more effective in a household setting. Several studies have been conducted that aimed to reduce exposure to SHS at home by creating a smoke-free home.<sup>22</sup> However, the effectiveness of interventions is still unclear. The effectiveness may differ according to the intervention strategies, population, setting, and outcome measurement.<sup>23</sup> The intervention implementation is a time consuming process and requires specialized personnel such as doctors and psychologists. This it might be impractical to implement an intervention in a hospital or community setting. Studies for reducing exposure to SHS by enhancing student's self-efficacy for creating a smoke-free home are rare. Therefore, this study will develop a culturally appropriate intervention for enhancing student's self-efficacy to create a smoke-free home.

## 1.2 Background of the study site

Tobacco Control Research and Knowledge Management Center (TRC), in 2011, reported that the prevalence of tobacco consumption and exposure to SHS among adults in Southern Thailand was 22.1% and 32.1%, respectively. In Songkhla, the prevalence of tobacco consumption and exposure to SHS at home was 22.8% and 24.6%, respectively.<sup>24</sup> The prevalence of exposure to SHS was higher than the mean provincial prevalence. Furthermore, smoking is socially unacceptable among Buddhists

in Thailand, compared with people who smoke in Malaysia, where most are Muslims.<sup>25</sup> In a review related to tobacco consumption in Songkhla, in 1990, Chongsuvivatwong reported that the effects of alcohol and tobacco were associated with oesophageal cancers.<sup>26</sup> In 2012, Saejong studied the behaviour of smoking cessation in Hat Yai district by qualitative methods. She reported that the effects of quitting smoking might encourage smokers to maintain a healthy life style than those who could not quit smoking.<sup>27</sup> Ketchoo et al. (2013) studied the smoking behaviour of smuggled cigarettes in Southern Thailand and reported that a major problem of smoking behaviour was having a friend who knows a shop where the smuggled cigarettes could be bought. This might be a reason that smokers have difficulty in quitting smoking.<sup>28</sup>

## **CHAPTER 2**

### **LITERATURE REVIEW**

In this study, the literature review is separated into the following topics;

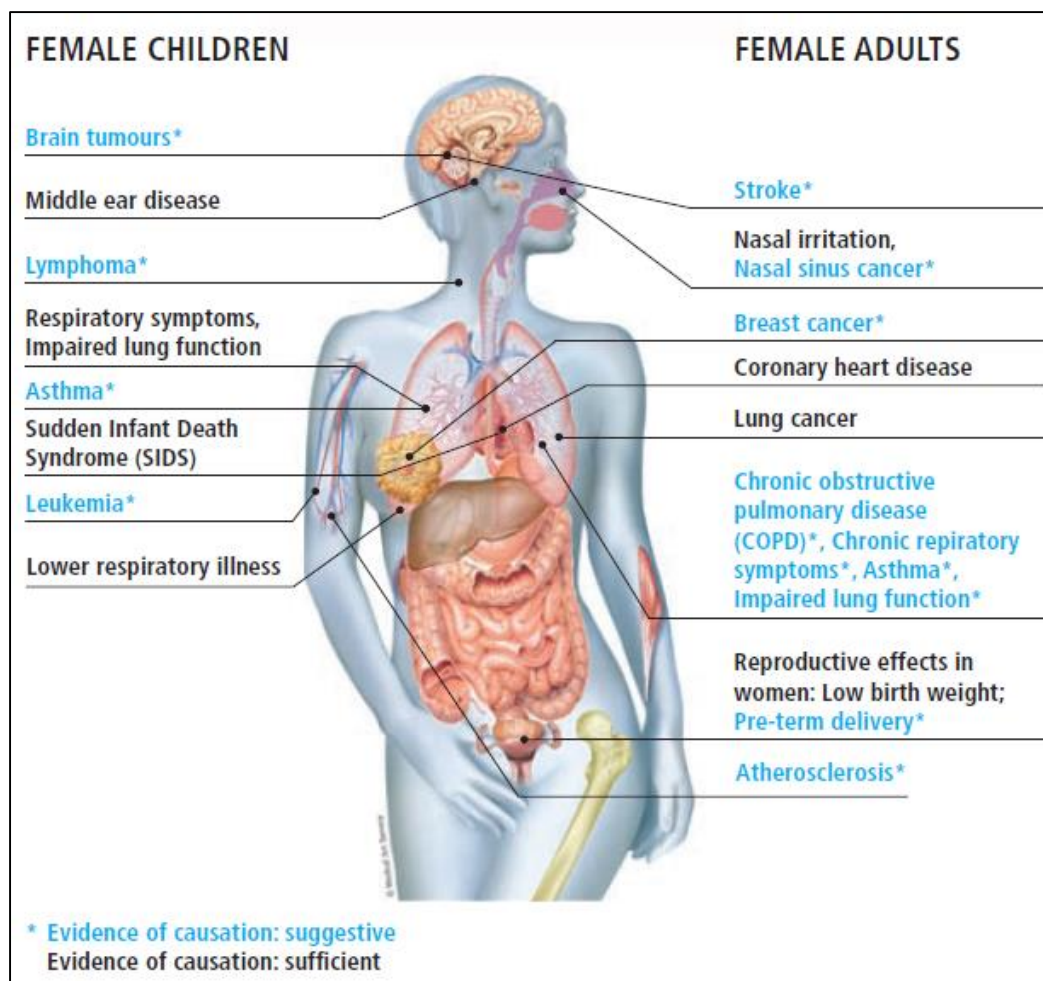
1. Health effects of exposure to SHS
2. Measures of SHS in Thailand
3. SHS exposure studies
4. Creating a smoke-free home to reduce SHS exposure intervention studies
5. SHS measurements
6. Self-efficacy

#### **2.1 Health effects of exposure to SHS**

SHS is composed of gas and small particulates, which is a chemical product. It is toxic and comprised of 4000 compounds, among which more than 50 can cause various types of cancer. Exposure to SHS means the inhalation of the tobacco smoke into respiratory systems. SHS is also called environmental tobacco smoke (ETS) or passive smoke. It is a mixture of 2 forms of smoke; sidestream smoke (SS), and mainstream (MS). SS is emitted from the lit end of a cigarette, pipe, or cigar; MS is exhaled by a smoker.<sup>29</sup>

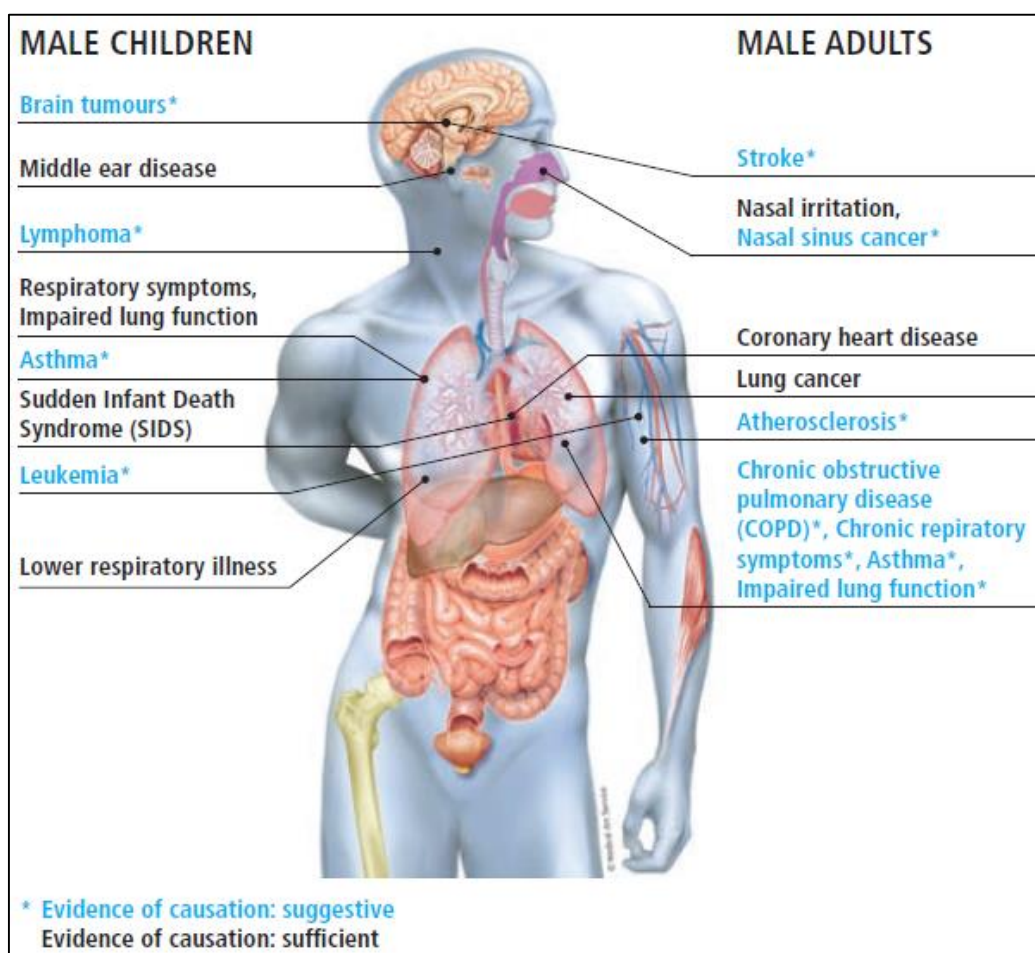
Evidence suggests that SHS can cause disease in both children and adults. In children, it can cause brain tumours, respiratory symptoms, and sudden infant death syndrome. In adults, it can cause lung cancer, coronary heart disease, and respiratory systems, as shown in Figure 1 and Figure 2.<sup>9</sup>

**Figure 1: Diseases caused by exposure to SHS**



Source: World Health Organization, 2009.

**Figure 2: Diseases caused by exposure to SHS in men**



Source: World Health Organization, 2009.

## 2.2 Measures of SHS in Thailand

In Thailand, SHS tobacco controls have been implemented a treaty of smoke-free and “the Health Protection Act of 2553” for protection of non-smokers. According to which, indoor public places should be 100% smoke-free or strictly prohibited smoking areas. The areas are divided into 3 groups as follows; group 1, 100% smoke-free such as schools, health facilities, religious places, banks, financial institutions and other public places; group 2, 100% smoke-free in the building, but



designated smoking areas outside the buildings such as government offices, gas stations, universities, educational institutions, private workplaces and bus or public transport stations; group 3, allowed place for smoking in restricted areas such as international airports. The FCTC Article 8 guidelines have also been implementing for creating 100% smoke-free place.

### **2.3 SHS exposure studies**

Knowledge, attitude, risk perception of harms of exposure to SHS, and smoking behaviour at home is an important factor for planning intervention. Education intervention about the harms of exposure to SHS as well as smoking aims to improve knowledge and change attitudes and behaviours. It is important to make strategies for intervention planning to prevent or reduce exposure to SHS <sup>30</sup>. Several studies have been conducted on SHS. There are several factors that are associated with levels of nicotine or cotinine in children which are tabulated in Table 1.

**Table 1: Variables related to reducing SHS exposure or creating a smoke-free home**

| Variables related to nicotine/cotinine concentration or smoke-free home |        |
|---|--------|
| Age (smoker, children)  | 31, 32 |
| Socioeconomic status  | 32, 33 |
| Education   | 33     |
| Race/ethnicity,   | 32     |
| Region  | 32     |
| Household income  | 33     |
| Household structure   | 33     |
| Duration of smoking in the home   | 33     |
| Having spouse   | 31     |
| Living with current smoker  | 34     |
| Number of cigarettes smoked in home                                     | 35     |
| Smoker's mother   | 35-37  |
| Parents smoked in the same room as the child                            | 38, 39 |
| Open ventilation  | 40     |
| Smoking only in restricted home areas                                   | 40     |
| Household members smoking   | 40     |
| Visitors smoking  | 41     |
| Belief in the harms of exposure to SHS                                  | 38     |
| Location (inner-city)   | 39     |

## 2.4 Creating a smoke-free home to reduce SHS exposure

### **intervention studies**

The interventions for reducing exposure to SHS were aimed to educate smokers or non-smokers and raise awareness about the harm of exposure to SHS. When they acknowledge the SHS information, they might change attitude and behaviour later. The knowledge about the harm of exposure to SHS was delivered to smoker or non-smoker by counselling, health education programs and mass media. Several studies on intervention for reducing exposure to SHS intervention were reviewed which are summarized below.

Gehrman and Hovell (2003) conducted review study on intervention that was aimed to reduce exposure to SHS in children. The review study comprised of 19 studies extracted from the database of PsychInfo and Medline from the years 1987 to 2002. Most of the participants were woman and mother of the children. They reported 11 studies were statistically significant, which the other was not in reducing exposure to SHS compared with control group. They also reported the mean of overall effect size (Cohen's d) was 0.34 (range, -0.14 to 1.04). The results are presented as follows; (1) Setting: the interventions implemented at home might be more effective than at the hospital or clinic. There were different types of study designs and outcomes measurement. So with the insufficient evidence to conclude which setting to be recommended, they suggested that the home tends to be more effective in reducing exposure to SHS; (2) Theory: Educational strategies about the harms of exposure to SHS were used to increase knowledge of the harm of exposure to SHS. The studies did not recommend the strategies to reduce or avoid exposure to SHS. In addition, five-studies used the theory of behaviour modification, and one-study used social cognitive theory; (3) Health status of children: The evidence revealed that the effectiveness of intervention among healthy and unhealthy children could not be concluded to show that which group were suitable. However, they suggested that an intervention focussing on healthy children might be more important and useful than unhealthy children; (4) Duration of implemented intervention: The studies performed at home were more

effective than at the hospital. It might be that the intensity of intervention (duration of intervention) at home was frequently implemented than at the hospital.<sup>23</sup>

The studies that are published after 2002 have been reviewed in a variety of strategies and methods to create SFH and reduce SHSe in the home. Summarized results have the different in theoretical approaches such as the intervention based on self-efficacy, educational strategies or change behavior. Some intervention aimed to look at change in ill-child, babies and infants, children or non-smoker. Interventions have been also tested in school, hospital, or community settings, and delivered by clinical staff, research staff, or volunteer community health workers.

In Table 2, we critically review studies measuring the effectiveness of smoke-free home interventions focusing on school based settings and using schoolchildren to be a change agent approaches.

In clinical setting, there have both successive and failure results. The successive results found by Harutyunyan et al. (2013). They conducted a randomized controlled trial to reduce exposure to SHS at home in Armenia. The objective was to compare between motivational interviewing and self-help education materials among children aged 2-6 years of 250 families. The hair nicotine level in intervention decreased (From 0.30 ng/mg to 0.23 ng/mg). The difference of geometric mean of hair nicotine level between intervention and control group were 17% (P value = 0.239). Finally, they found the effectiveness in decreasing children's exposure to SHS through educating mothers and promoting smoking restrictions at home.<sup>42</sup>

The others study conducted by Baheiraei et al. (2011), the results shows that the intervention for reducing exposure to SHS among healthy children in Iran was effective. When the intervention (mother was advised in three session) was compared with the control group (standard health examination). The result showed that the urine cotinine in intervention decreased significantly (48.7 ng/mg at baseline to 28.7 ng/mg; P value = 0.029 one-tailed). In addition, smoking near children was decreased control group, and the statistical significance was found in this comparison (P value = 0.03).

The researchers concluded that the counselling technique was effective in reducing exposure to SHS.<sup>43</sup>

The study using urine cotinine level for measurement reducing SHSe, Tyc et al. (2013) conducted an intervention to reduce exposure to SHS among unhealthy children (aged < 18 years) diagnosed with cancer. The component of intervention comprised of counselling 6 times lasting for 3 months and follow up s at 6, 9 and 12 months (n = 66) which was compared with the group in which the parents were briefly advised (n = 69). The result showed that exposure to SHS was reduced of urine cotinine level among intervention (Reduction 65.8% from baseline to 3 month) and control (Reduction 32.8% from baseline to 3 month) was different (P value <0.05).<sup>45</sup>

The studies that was failure to achieve the effective of the intervention those are in school-based, home and community setting.

Blanch et al. (2013) studied the effectiveness of intervention to reduce exposure to SHS in school children aged 12-14 years. The aims were to deliver the information on the harms of SHS in 6 sessions by using poster, brochures and sticker in school to make the smoke-free home. Exposure to SHS in intervention group decreased to 19.9 %. After controlling for confounders, the result was not different in the intervention and control group.<sup>44</sup>

Butz et al. (2011) compared the use of only air cleaner, air cleaner combined with the training of health professional and only material documents about asthma for reducing exposure to SHS with children aged 2-12 years. The 3 outcomes were measured including particulate matter (PM<sub>2.5</sub>), air nicotine level and urine cotinine level in children by assessing at 6-month. The study showed a reduction of PM<sub>2.5</sub> among using air cleaner in both groups compared with the control group (P value = 0.02). In addition, difference in mean of air nicotine and urine nicotine in children was not significantly. The researcher concluded that although there was evidence that the use of the air cleaner might reduce air particulates and asthma symptoms. It was insufficient to conclude that it could prevent exposure to SHS.<sup>46</sup>

Hovell et al. (2009) conducted an intervention study (counselling) to reduce exposure to SHS among children aged less than 4 years, and helped parents to quit smoking. The intervention comprised of counselling on reducing the exposure to SHS at home which conducted face-to-face 10 times and by phone 4 times over 6 months. The control received usual care of treatment. The outcomes were measured and assessed at 3, 6, 8 and 12 months by parental report and urine cotinine in children. The reduction exposure to SHS in intervention was higher than in control (P value = 0.011). However, urine cotinine level was not statistically significant.<sup>47</sup>

In addition, reviews of studies that have conducted a pilot study as a guideline for research design suitable for cultural context are as the following;

Schane et al. (2013) studied the effectiveness of counselling intervention to increase abstinence rates among occasional smokers. The counselling message was about harms to themselves and harms to others. The intervention included 52 participants with follow up at 3 months. The results showed that an abstinence rate in the intervention (36.8 %) was higher than in the control (8.5 %). They concluded that the counselling that focuses on the harms to others might be effective more than harms to them.<sup>48</sup>

Alwan et al. (2013) conducted a study of smoke-free home intervention using educational material to teach about the harms of SHS in school. The health worker volunteer assisted to make smoke-free home. In addition, the exhibitions and campaigns about the harms of SHS was organised in the community. A theoretical framework (providing information, empowerment, and negotiation) was used to motivate children to create the smoke-free home. The smoke-free home increased from 35 % to 68 % in 6 months.<sup>49</sup>

Wilson et al. (2013) conducted an intervention for reducing exposure to SHS at home using the theory of behavioural change and self-efficacy to strengthen motivation to change smoking behaviour in their home. A total of 54 houses over 1 month were included in the study. They found that the quality of air (PM<sub>2.5</sub>) and urine

cotinine were improved after the intervention. However, the biomarker showed that a urine cotinine level was not different between intervention and control group.<sup>50</sup>

Kegler et al. (2012) studied a brief intervention for reducing SHS at home. The intervention consisted of 4 components; 1) Poster for creating smoke-free home, 2) Follow-up by phone, 3) Booklet, and 4) Information sheet and letter explaining harms of exposure to SHS. The transtheoretical model's stage of change was used to be a strategy in implementing intervention. The participants were 20 including both smokers and non-smokers. The results show that the smoke-free home increased by 78 % after the intervention was implemented, and the number of daily tobacco consumption decreased.<sup>51</sup>

Siddiqi et al. (2010) conducted an interventional study to reduce exposure to SHS at home. The aims of study were to modify the smoking behaviour and create smoke-free home. The intervention comprised of educational material about harms of exposure to SHS. The health worker volunteer provided education and suggested to create smoke-free home. The results show that smoke-free home increased from 43 % to 85 %, and daily tobacco consumption decreased from 44 % to 28 %.<sup>52</sup>

In summary, the strategies to create a smoke-free home for reducing exposure to SHS were aimed to motivate or help smokers to quit smoking, or help smokers to smoke outside the home. Recently, both drug and behavioural therapy are strategies that have been used to help smokers quit smoking. The aims of behavioural therapy are to educate smokers and non-smokers about the harms of exposure to SHS. Self-help materials such as leaflets or manuals, audio, video and computer programs were included in intervention strategies. In addition, counselling (motivational interviewing and coaching) were used to motivate them for creating smoke-free home. The drug therapy is used by for helping addicted smokers to quit <sup>53</sup>. The review of literature shows the interventions were comprised of awareness of the harms of exposure to SHS, counselling and helping non-smoker or smokers to make their home to be smoke-free. The campaigns were implemented at schools, health care facilities,

communities, and homes. However, the outcome measurements were measured both by parental reports of exposure of the children to SHS and biomarkers.



**Table 2: Summary of intervention studies related to reducing exposure to SHS and creating a smoke-free home**

Abbreviation; SHS=Second-hand smoke, SHSe=Second-hand smoke exposure, CRCT= Cluster randomized controlled trial, RCT= Randomized controlled trial, GM=geometric mean

| Author                              | Objective   | Design / Setting  | Participants  | Intervention / Control   | Outcome  | Results  | Study suggestion   |
|-------------------------------------|---|---|---|--|--|--|--|
| Blanch et al., (2013) <sup>44</sup> | To assess the effectiveness of a multi-level program (individual, family, and school) to prevent the SHSe | Design<br>CRCT<br><br>Setting<br>Class, School and Home | -Schoolchildren aged 12–14 years in the metropolitan area of Barcelona, Spain<br><br>Child health status<br>- Healthy<br><br>FU time<br>12 months | Intervention (n=757)<br>-Classroom level, six sessions with the pupils of 1 h each that were conducted by the teacher/tutor.<br><br>-School level, four types of posters with specific messages directed to students, teachers, and parents.<br><br>-Family level, parents received a brochure with information on the risks of SHSe and recommendations to prevent SHS exposure, and a refrigerator magnet with the logo of the program.<br><br>Control (977)<br>Comparison schools did not follow any alternative or special program of lessons. | -Home<br>“How many people living with you at home usually smoke at home (not including balcony, terrace, or gallery)?” Those who answered “nobody” were considered to be non-exposed.<br><br>Biomarker<br>- No | SHSe in intervention group significantly decreased at school (−14.0%), at home (−19.9%), and on transportation (−21.8%).<br><br>Comparison group, SHSe significantly decreased only at home (−16.9%).<br><br>After adjustment for potential confounders, the effect of multi-level program showed a non-significant reduction in exposure at home, transportation, and leisure time. | The improvement of the activities focused on preventing SHS would be needed in order to achieve a significant decrease in the proportion of children exposed to SHS. |

| Author                           | Objective                                 | Design / Setting                     | Participants  | Intervention / Control  | Outcome  | Results  | Study suggestion  |
|----------------------------------|---|--------------------------------------|---|---|--|--|---|
| Tyc et al., (2013) <sup>45</sup> | To reduce SHSe among children with cancer | Design<br>RCT<br>Setting<br>Hospital | - age of children < 18 years<br><br>Inclusion<br>Children receiving treatment for cancer who lived with at least one adult smoker and were exposed to SHS in the home or car setting, at least 30 days post diagnosis,<br><br>Exclusion<br>A high risk prognosis or had a medical or family social crisis precluding participation<br><br>Child health status<br>- Unhealthy (Cancer)<br><br>FU time: 12 months | Intervention (n=69)<br>A multicomponent behavioural program delivered by trained counsellors over 3 months. Counselling consisted of three individual, face-to-face, biweekly 1-h sessions followed by three 25-min telephone sessions for a total of six individual contacts with their counsellor.<br><br>Control (66)<br>Advice about the adverse health problems for children exposed to SHS. Parents were briefly advised to remove their child from sources of exposure and to protect their child from SHSe. This group received all study measures but did not receive SHSe counselling from the study counsellors. | -Parental, Number of cigarettes smoked over the past 7 days<br><br>-Parent-reported the number of cigarettes to which the child was exposed by all smoking persons in the home and car for the previous 7 days.<br><br>Biomarker<br>- Urine cotinine | There was a significantly greater reduction in parent-reported smoking and child SHSe at 3 months for the intervention group compared with the control group.<br><br>Child SHSe was significantly lower at 12 months relative to baseline in both groups.<br><br>Children's cotinine levels did not show significant change over time in either group.<br><br>Exposure outcomes were influenced by the number of smokers at home, smoking status of the parent participating in the trial, and the child's environment (home versus hospital) the day before the assessment. | Children's SHSe can be reduced by advising parents to protect their child from SHSe, combined with routine reporting of their child's exposure and cotinine testing, when delivered in the context of the paediatric cancer setting.<br><br>More intensive interventions may be required to achieve greater reductions in SHSe. |

| Author                                   | Objective  | Design / Setting  | Participants  | Intervention / Control  | Outcome  | Results   | Study suggestion  |
|--|--|---|---|---|--|---|---|
| Harutyunyan et al., (2013) <sup>42</sup> | To develop and test an intervention to reduce children's SHSe at homes in Yerevan, Armenia | Design<br>RCT<br><br>Setting<br>Hospital and Households | Non-smoking mother having at least 1 child<br><br>Age 2 to 6 years<br><br>Residing with at least 1 daily smoker<br><br>Smoking by parents or other household members<br><br>Child health status<br>- Healthy<br><br>FU time<br>4 months | Intervention (n=125)<br><br>In-person counselling session at home<br><br>A tailored educational brochure<br><br>2 follow-up counselling telephone sessions<br><br>The intervention was based on the motivational interviewing technique.<br><br>Control (n=125)<br>Only a brief educational leaflet on the hazards of SHS | -Knowledge about hazards of smoking and SHS<br><br>-Smoking restrictions<br><br>Biomarker<br>- Hair nicotine | After adjusting for baseline hair nicotine concentration, child's age and gender, the follow-up GM of hair nicotine concentration in the intervention group was 17% lower than in the control group (P = .239).<br><br>GM of hair nicotine in the intervention group significantly decreased from 0.30 ng/mg to 0.23 ng/mg (p-value =0.024), control group decreased from 0.29 ng/mg to 0.27 ng/mg (p-value =0.613),<br><br>GM of mothers' knowledge scores at follow-up was 10% higher in the intervention group than in the control group (P = .006). | Intensive intervention is effective in decreasing children's exposure to SHS through educating mothers and promoting smoking restrictions at home.<br><br>Superiority over minimal intervention to decrease children's exposure was not statistically significant |

| Author                                  | Objective   | Design / Setting  | Participants   | Intervention / Control  | Outcome   | Results  | Study suggestion  |
|---|---|---|--|---|---|--|---|
| Kazemi et. al., (2012)<br><sup>54</sup> | To test the impact of education on health belief and environmental tobacco smoke exposure in pregnant women | Design<br>RCT<br><br>Setting<br><br>Prenatal care (Isfahan, Iran) | Pregnant women<br><br>12weeks gestation or less based on last menstrual period<br><br>Having ETS exposure from at least six cigarettes per week or more within 2 months before or since pregnancy.<br><br>Exclusion included termination of pregnancy before the third visit, using illicit substances and suffering from mental disorders.<br><br>Child health status<br>- FU time 5 sections with 4-week intervals | Intervention (n=47)<br>-Health Belief Model<br><br>-Education about environmental tobacco smoke (ETS) exposure<br><br>Control (44)<br>-Education about prevention against infectious diseases | -Weekly number of ETS exposures at home and health belief in ETS exposure by self-report<br><br>A 15-item questionnaire was developed covering a review of the literature and expert-opinion determinants of health belief model constructs.<br><br>Biomarker<br>- No | Intervention group, perceived susceptibility/severity and perceived benefits increased<br><br>Weekly ETS exposure decreased on the third (P < 0.05).<br><br>Perceived susceptibility or severity and benefits significantly correlated with weekly ETS exposure in the intervention group (P < 0.05) | Education about the impacts of ETS exposure of pregnant women is an effective way to increase the theoretical constructs according to the health belief model<br><br>Health belief model associated with a reduction of ETS exposure, but this is not sufficient for making smoke-free homes. |

| Author                      | Objective  | Design / Setting   | Participants   | Intervention / Control   | Outcome   | Results  | Study suggestion   |
|-----------------------------|--|--|--|--|---|--|--|
| Wilson et al., (2011)<br>55 | To test the efficacy of interventions to reduce children's exposure and improve disease outcomes | Design<br>RCT<br>Setting<br>Hospital (Northern California) | Children aged 3 to 12 years<br><br>Medication use and/or a physician diagnosis suggesting persistent asthma<br><br>Parent reported exposure of the child to secondhand tobacco smoke<br><br>Confirmation of exposure by a urinary cotinine level $\geq 10$ ng/mL from $\geq$ one baseline visit test result<br><br>One asthma-related medical visit in the past year<br><br>Child health status<br>- Unhealthy (asthma)<br>FU time 12 months | Intervention (n=178)<br><br>-Behavioural counselling (SHS reduction intervention based on social cognitive learning theory)<br>3 follow up interviews by phone (2, 4, and 6 weeks)<br><br>Control (n=174)<br>Usual care in setting (health care service) | Home smoking policy<br>Caregiver smoking status<br><br>Exposed in day care<br><br><br>Biomarker<br>- Urine cotinine | Intervention was associated with a lower mean follow-up for the natural logarithm of the cotinine compared with control, but non-significant (-0.307; p-value= .064)<br><br>Home smoking policy, caregiver smoking status, exposed in day care was not associated with the intervention. | The intervention did not provide a statistically significant reduction in SHSe or use of health-care services. |

| Author                            | Objective  | Design / Setting   | Participants   | Intervention / Control   | Outcome   | Results  | Study suggestion   |
|-----------------------------------|--|--|--|--|---|--|--|
| Butz et al., (2011) <sup>46</sup> | To test an air cleaner and health coach intervention to reduce secondhand smoke exposure | Design<br>RCT<br>(Block randomization)<br>Setting<br>The Johns Hopkins Hospital Children's Center and homes of children. | Age of 6 to 12 year<br>Physician-diagnosed asthma, symptom frequency, and/or controller medication use signifying persistent asthma<br>A smoker in the home who smoked more than 5 cigarettes per day<br>Resided in the home at least 4 days per week<br>Child health status - Unhealthy (Asthma)<br>FU time<br>6 months | Control (44)<br>Received asthma education during 4 home visits. Two high-efficiency particle air cleaners were placed in the child's home (bedroom and living room) after the final follow-up home-monitoring visit.<br>Air Cleaner Group (41)<br>2 air cleaners and the 4 asthma education sessions<br>Air cleaners were placed in the bedroom where the child slept 4 or more nights per week and in the family or living room.<br>Air Cleaner Plus Health Coach Group (41)<br>Air cleaner plus health coach behavioural intervention group received the 2 air cleaners<br>Four 30- to 45-minute health coach home visits that included the asthma education | Caregiver's self-report of smoking frequency and location in the home, in the past 7 days<br><br>Biomarker<br>- PM(2.5, 2.5-1.0),<br>air nicotine<br>-Urine cotinine concentrations | Changes in mean fine and coarse PM (PM2.5 and PM2.5-10) concentrations (baseline to 6 months) were significantly lower in both air cleaner groups compared with the control group (mean differences for PM2.5 concentrations: control, 3.5 µg/m <sup>3</sup> ; air cleaner only, -19.9 µg/m <sup>3</sup> ; and air cleaner plus health coach, -16.1 µg/m <sup>3</sup> ; P=.003; and PM2.5-10 concentrations: control, 2.4 µg/m <sup>3</sup> ; air cleaner only, -8.7 µg/m <sup>3</sup> ; and air cleaner plus health coach, -10.6 µg/m <sup>3</sup> ; P=.02).<br><br>No differences were noted in air nicotine or urine cotinine concentrations. The health coach provided no additional reduction in PM concentrations. | The use of air cleaners can result in a significant reduction in indoor PM concentrations and a significant increase in symptom-free days<br><br>The intervention was not enough to prevent exposure to SHS. |

| Author                         | Objective  | Design / Setting  | Participants  | Intervention / Control  | Outcome   | Results   | Study suggestion                               |
|--------------------------------|--|---|---|---|---|---|--|
| Baheiraei et al., (2011)<br>43 | To assess whether counselling both mothers and fathers reduces their infants' SHSe | Design<br>RCT<br>Setting<br>Health centre in southern Tehran (Iran) | Healthy infants aged less than 12 months<br><br>At least one smoking parent who smoked at least 1 cigarette/day<br><br>The parents also had to be able to speak Persian and have a telephone number.<br><br>Exclusion<br>Parents who reported the use of other addictive substances or being under a smoking cessation treatment program<br><br>Child health status<br>- Healthy<br><br>FU time<br>3 months | Intervention (n=65)<br>Motivational interviewing<br><br>Mothers were provided three counselling sessions, (face to face and two of telephone). Fathers were provided three counselling sessions by telephone. Parents were given an educational pamphlet about reducing infant exposure to SHS and a sticker depicting a smoke-free home where the father chooses to smoke outside to protect the infant.<br>Control (n=65). Received usual care but had the opportunity to receive the intervention after completion of the study.<br><br>The usual care included usual health visits for checking the infants' growth and developmental milestones. | Parental Reports<br>Mean number of cigarettes smoked per day<br><br>Total daily cigarette consumption in presence of the infant<br><br>Biomarker<br>- Urinary Cotinine (at baseline and at a 3-month follow-up) | The intervention was effective in reducing infant urinary cotinine levels ( $p = 0.029$ ).<br><br>There was a greater decrease in the total daily cigarette consumption in the presence of the child in the intervention group compared with the control group<br><br>The differences of cotinine between the 2 groups were statistically significant ( $p = 0.03$ ).<br><br>The differences between home-smoking bans in the 2 groups were statistically significant ( $p = 0.049$ ), the differences between car-smoking bans did not reach significance. | Counselling can reduce infant exposure to SHS. |

| Author                                 | Objective  | Design / Setting                 | Participants  | Intervention / Control   | Outcome   | Results  | Study suggestion   |
|--|--|----------------------------------|---|--|---|--|--|
| Hovell et al., (2009)<br><sup>47</sup> | To test a combined intervention to reduce children's SHSe and help parents quit smoking. | Design<br>RCT<br>Setting<br>Home | Mothers with children aged $\leq 4$ years who were exposed to a minimum of 3 of their mothers' cigarettes per day<br>"Exposed" meant the child was in the same room of the home or in the car when any part of a cigarette was smoked.<br>Exclusion<br>Breast-feeding children, children who did not live with their mothers full time, and they did not plan to reside in San Diego County for the next 19 months.<br>Child health status<br>- Healthy<br>FU time: 18 months | Counsellors were masters-level students or graduates of psychology, social work, and public health.<br>Intervention (n=76)<br>Consisted of 14 biweekly counselling sessions over 6 months: 10 in-person at home and 4 by telephone.<br>Counselled to set SHSe reduction goals, regardless of their interest in or success with quitting. Health education materials to support cessation.<br>All smokers in the counselling group families were offered free nicotine patches and/or gum to assist with quit attempts. Control (n=74)<br>Not receive SHSe or cessation counselling. Self-help booklet and written materials based on the counselling protocol. | Parent's reports mothers and "other parents" reported their smoking inside the home and their child's SHSe on typical work and nonwork days (or week and weekend days if parents did not work outside the home) during the past 7 days, including exposure from parents, other residents, and visitors, and outside the home, including in the car.<br><br>Biomarker<br>- Children's urine cotinine | Parents' reports of their smoking and children's exposure showed moderate and significant correlations with children's urine cotinine levels and home air nicotine ( $r = 0.40, 0.78$ ).<br>Thirteen (17.1%) intervention group mothers and 4 (5.4%) controls reported that they quit smoking for 7 days prior to 1 or more study measurements, without biochemical contradiction ( $p = .024$ ).<br>The results showed a significantly greater decrease in reported SHSe and mothers' smoking in the counselled group compared with controls.<br>Reported indoor smoking and children's urine cotinine decreased, yet group differences for changes were not significant. | Nicotine contamination of the home and resulting thirdhand exposure may have contributed to the failure to obtain a differential decrease in cotinine concentration.<br><br>Partial exposure to counselling due to dropouts and lack of full participation from all family members and measurement reactivity in both conditions may have constrained intervention effects.<br><br>Secondhand smoke exposure counselling may have been less powerful when combined with smoking cessation. |



## 2.5 SHS measurements

As mentioned earlier, SHS is comprised of SS and MS and both cause similar health hazards but they differ in the amount of toxin released. The emission and ratio of SS and MS constituent varies greatly depending on the type of smoke. Physical SHS are diluted in the air and spreads to the environment quickly. Jaakkola et al (1997) shows the proportional concentration of MS and SS and found varying smoke concentration depending on time and environment. The ratio of SS to MS is shown in Table 3. The ratio of the toxins of SS is greater than MS.<sup>56</sup>

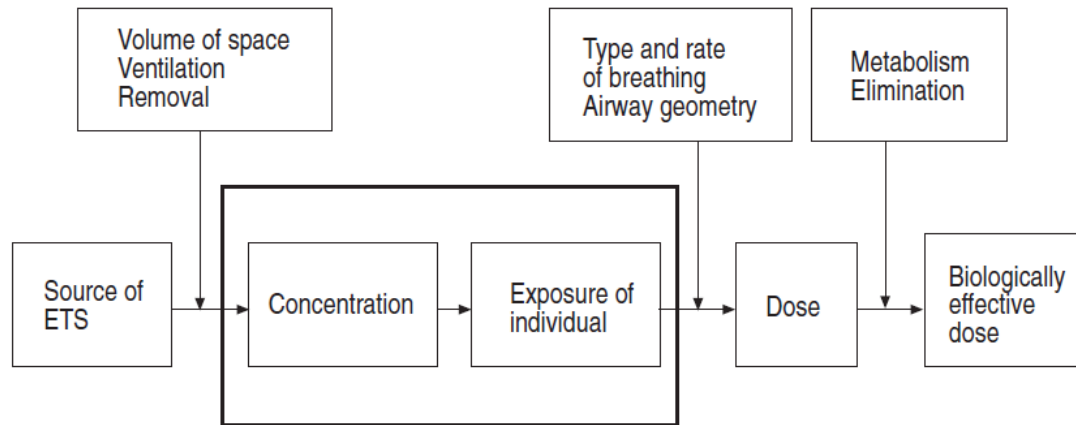
**Table 3: The ratio of second-hand smoke; Sidestream (SS); Mainstream (MS)**

| Constituent                       | Emissions in MS | SS/MS ratio |
|-----------------------------------|-----------------|-------------|
| <b>Known human carcinogens</b>    |                 |             |
| Benzene                           | 12–48 µg        | 5–10        |
| 2-Naphthylamine                   | 1.7 ng          | 30          |
| 4-Aminobiphenyl                   | 4.6 ng          | 31          |
| Nickel                            | 20–80 ng        | 13–30       |
| Polonium-210                      | 0.04–0.1 pCi    | 1–4         |
| <b>Probable human carcinogens</b> |                 |             |
| Formaldehyde                      | 70–100 µg       | 0.1–50      |
| Hydrazine                         | 32 ng           | 3           |
| <i>N</i> -Nitrosodimethylamine    | 10–40 ng        | 20–100      |
| <i>N</i> -Nitrosodiethylamine     | ND–25 ng        | <40         |
| <i>N</i> -Nitrosopyrrolidine      | 6–30 ng         | 6–30        |
| 1,3-Butadiene                     | 69.2 µg         | 3–6         |
| Aniline                           | 360 ng          | 30          |
| Benzo[a]pyrene                    | 20–40 ng        | 2.5–3.5     |
| <i>N</i> -Nitrosodiethanolamine   | 20–70 ng        | 1.2         |
| Cadmium                           | 110 ng          | 7.2         |
| <b>Toxic substances</b>           |                 |             |
| Carbon monoxide                   | 10–23 mg        | 2.5–4.7     |
| Acrolein                          | 60–100 µg       | 8–15        |
| Ammonia                           | 50–130 µg       | 3.7–5.1     |
| Nitrogen oxides                   | 100–600 µg      | 4–10        |

PCi: picocurie (1 Curie =  $3.7 \times 10^{10}$  Becquerel); ND: nondetectable.

Source: Jaakkola et al. (1997)

**Figure 3: Second-hand smoke chain and level of biological samples  
(ETS = Environmental tobacco smoke)**



Source: Jaakkola et al. (1997)

Figure 3 shows SHS chain that is exposed to people. International Agency for Research on Cancer (IARC) stated that the sources of exposure to SHS are homes, work places, public places, restaurants, hospitals, and education institutes. Furthermore, the majority of people who are exposed to SHS are non-smoking children and women.

SHS exposure to children can be measured in several ways; parental reports from environment and biologically.<sup>57</sup> Biological measurement of SHS is expensive, which is a barriers for studies with long follow up, large sample size and a low budget.<sup>58</sup> However, researchers may have concerns about the ability and willingness of parents to the children's report about the history of exposure to SHS including recall bias of not being able to remember history of exposure to SHS accurately.<sup>59-61</sup> Therefore, randomized controlled studies are planned to measure both biological indicator and parental report in order to confirm the accuracy of those measurements.<sup>62</sup>

### 2.5.1 Questionnaire


The questionnaire was used to interview the participant about the history of exposure to SHS such as number of smokers in the family, frequency of smoke, duration smoking in home. Assessment exposure to SHS with some confidence as study participants will answer reliably about childhood exposure to SHS by their mother or their father, and during adulthood if they live with a regular smoker. Study participants can consistently report the number of years of exposure to SHS during their lifetime (reported by mother), childhood (reported by mother and father) and adulthood (reported by spouse or other household members). Hours per day of exposure during childhood (reported by father) as well as pack-years of exposure (reported by parents and all household members) were shown to be reliable questions. However, a set of core questions for SHS exposure assessment are untested or developed for reliability or validity for assessments of exposure SHS at home, in transport vehicles and in social settings.<sup>63</sup>

### 2.5.2 Environmental measurement

SHS in the air is determined by measuring the concentrations of toxins, such as arsenic, carbon monoxide and cyanide, in the smoke. Particles having a diameter less than 2.5 microns (PM2.5) can be inhaled into the lungs easily. Using a nicotine detector, this method is used to detect nicotine in the air. The principle of this method is that the air will pass through the detector, and then nicotine in the air will be absorbed by the filter in the machine. The filter is taken to the laboratory for determination of nicotine level. The results are reported as milligrams of nicotine per cubic meter. TSI AM 510 SidePak is a machine used to measure environmental SHS. Environmental SHS monitoring has numerous applications in research and policy development, including studies on the adverse health effects of SHS exposure, research supporting development and evaluation of smoke-free legislation, and evaluations of the impact of interventions and control measures to reduce exposure to SHS. Apelberg

et al. (2013) summarized exposure to SHS monitoring approaches using environmental markers and discusses the strengths and weaknesses of methods and approaches, as showed in Error! Reference source not found..<sup>64</sup>

**Figure 4: SHS exposure assessment using environmental markers for epidemiological studies**

| Feasibility   | Approach  |
|---|---|
| <div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;">           Most feasible<br/>Less ideal         </div> <div style="text-align: center; margin: 10px 0;">  </div> <div data-bbox="347 1182 507 1245" style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;">           Least feasible<br/>Ideal         </div> | Modeled concentrations of relevant environments combined with survey data on typical time-activity-location.  |
|   | Modeled concentrations in relevant environments combined with individual questionnaires;  |
|   | Personal sampling of other individuals to establish typical exposures, combined with individual data on how the experience of subjects may vary from those of the people sampled ;                              |
|   | Area sampling in the microenvironments of each individual at a later time period and adjusted for temporal changes (e.g., prevalence of smoking) combined with questionnaire data for the relevant time period; |
|   | Area sampling in the microenvironments of each individual during the relevant time period combined with time activity diary data for that time period;  |
|   | Personal sampling to establish typical exposures, which are then combined with knowledge of historical changes and time activity to estimate current or historical exposures during the relevant time period;   |
|   | Personal sampling during the entire time period relevant to the health effect under study;  |

Source: Apelberg et al. (2013)

### 2.5.3 Biological measurement

Exposure to SHS can be measured from biological samples such as blood, saliva, hair and nails. However, the method is the most commonly used to measure nicotine or cotinine directly. Biological measurement can be indicated the level of exposure to SHS that non-smoker exposed for short or long term. Aviala et al. (2013) conducted a literature review on the measurement of biological indicators as shown in Figure 4. The choice of each type of biomarker measurements was based on conditions of that study.<sup>65</sup>

**Table 4: Biomarkers of SHS exposure, characteristics and cut-off points for distinguishing smokers from non-smokers**

| Biomarker                | Half-life  | Invasiveness | Cut-off point   | Pros  | Cons  |
|--------------------------|--|--------------|---|---|---|
| <b>Cotinine</b>          |  |              |   |   |   |
| Urine                    | 16 h (average)   | Non-invasive | 50 ng/ml for higher SHSe  | Reflects recent SHSe<br>Higher concentrations than other matrices (higher sensitivity)  | Need of facilities with privacy during collection<br>Difficulty for population-based or children studies<br>Need for creatinine clearance adjustment<br>Collect data on renal disease and some prescription drugs |
| Blood                    | 16 h (average)   | Invasive     | 12 ng/ml for higher SHSe<br>3 ng/ml for lower SHSe                | No adjustment required for hydration  | Pregnant women have increased clearance rate<br>Difficulty for infants and young children<br>Lower sensitivity  |
| Saliva                   | 16 h (average)   | Non-invasive | 14 ng/ml for higher SHSe  | Good for multiple measurements over a limited period of time  | Potential issues with age, gender, race, oral pH, type of diet, dehydration, or drug treatment<br>Lower sensitivity   |
| <b>Nicotine/cotinine</b> |  |              |   |   |   |
| Hair                     | 1 cm of hair proximal to the scalp is approximately equal to the last month's exposure | Non-invasive | 0.8 ng/mg (women)<br>0.2 ng/mg (pregnant)<br>0.2 ng/mg (children) | Easy to collect, ship and store (room temperature $\leq$ 5 years)<br>Less affected by daily variability (fluctuating exposure, varying metabolism and nicotine elimination)<br>Represents longer exposure | Scarcity of hair in infants and adults<br>Chemical hair treatments can reduce concentrations by 9% to 30%<br>Age, gender and race may play roles in determining hair nicotine concentrations                      |
| Toenails                 | 1 mm is approximately equal to last month's exposure                                   | Non-invasive | Not available   | Easy to collect, ship and store (room temperature $\leq$ 20 years)<br>Overcomes day-to-day exposure variability<br>Represents longer exposure   | Need for further research and population concentrations   |
| <b>NNAL*</b>             |  |              |   |   |   |
| Urine                    | Up to 3 weeks  | Non-invasive | Not available   | Related to a lung carcinogen<br>Represents longer exposure than cotinine (urine/blood/saliva)   | Analytical expertise<br>Costly equipment<br>NNAL is carcinogenic and mutagenic, special lab handling<br>Further research needed   |

\*NNAL (4-[methylnitrosamino]-1-[3-pyridyl]-1-butanol).

Source: Aviala et al. (2013)

Exposure to SHS of children reported by parents may not be precise, and might be forgotten.<sup>66-68</sup> Measurements of biological samples have been considering by research question, participants, and budget. In this study, the purpose is to create a smoke-free home, so the biological indicator of exposure to SHS will not be measured.

## 2.6 Self-efficacy

Self-efficacy is a component of Bandura's social-cognitive theory<sup>69</sup>. According to Bandura's theory, it is influenced by four factors: personal mastery experiences, vicarious experiences, verbal persuasion, and physiological reactions.

Personal mastery experiences (past experience) refer to an individual's previous successes or accomplishments with a given task and are considered to have the strongest and most consistent influence on self-efficacy. Vicarious experiences, a form of social comparison, occur when other individuals model or perform a specific behaviour. Verbal persuasion in the form of encouraging feedback from important others, such as parents, teachers, and peers, has been found to positively impact self-efficacy if subsequent performance of the task is successful. Finally, emotional cue (physiological indicators of anxiety), such as increased heart rate, may detract from self-efficacy by signalling to the individual that he/she lacks the capability to perform a task successfully.<sup>70</sup>

Self-efficacy is an individual's confidence in determining how well he or she can take the actions necessary for producing certain results'. In smoking prevention and promotion (smoking cessation), self-efficacy refers to how certain a smoker feels about his or her ability to take the necessary action to improve the indicators and maintenance of their health.<sup>71, 72</sup>

Chen et al. (2007) examined knowledge of, self-efficacy with, and behaviour toward avoiding environmental tobacco smoke and related factors among pregnant women in Taiwan. They found that knowledge of, self-efficacy with, and behaviour toward avoiding environmental tobacco smoke was all related to both the woman and her partner's educational levels. There were also significant differences in mean knowledge, self-efficacy, and avoidance of environmental tobacco smoke scores among different household smoking groups (smoke-free family and smoke family). Overall avoidance of environmental tobacco smoke was associated with self-efficacy, with a no-smoking policy at home, and with both a woman and her partner's educational levels.<sup>73</sup> Lin et al. (2010) examined the exposure of SHS and the factors associated with SHS avoidance behaviour among the mothers of pre-school children. They found that the factors significantly associated with the avoidance behaviour of SHS were self-efficacy, being a current smoker, and the attitude toward the avoidance of SHS.<sup>74</sup> Almost studies were aimed to enhance the mother's mother ability to create a smoke-free homes, avoidance of exposure to SHS of their child. There have been studies of

students in primary school (class grades 4-6; ages 9-11 years) for enhancing behaviours knowledge and self-confidence to create smoke-free home.

## 2.7 **Gap of knowledge**

Interventions to educate, help, and motivate to schoolchildren for creating a smoke-free home are rare. A review of the literature uncovered little evidence of effective interventions. It might be that interventions were designed to be suitable with locally cultural context. This study will develop an intervention to be suitable with local and social context, and investigate the effect of an intervention targeting schoolchildren for making their home to be a smoke-free.

## 2.8 **Main objective**

- 1) To develop and test the effect of an intervention program for creating a smoke-free home.

## 2.9 **Specific objectives**

- 1) To explore perceptions of non-smokers (mother) about a family member smoking behaviour in the home.
- 2) To explore perceptions among smoking family members about receiving such advice from their children.
- 3) To develop an intervention for enhancing schoolchildren's self-efficacy to create a smoke-free home.
- 4) To test the effect of the intervention, and pretest effect

## 2.10 **Expected outcomes**

- 1) To provide a brief intervention to enhance schoolchildren for making their home to be a smoke-free that is appropriate with Thai context in Southern Thailand.
- 2) To prevent children and non-smokers from being exposed to SHS in their home.

## **CHAPTER 3**

### **METHODS**

#### **3.1 Overview of the methods**

This study was conducted by using both qualitative and quantitative methods. The qualitative method in phase I was used in exploring a range of perceptions of smokers (father or other family members) who smoke in the home, non-smokers, and children. In phase II, the information from phase I was used in developing and modifying the intervention to be appropriate within the Thai context. Testing of the effect of the intervention for creating a smoke-free home was performed in phase III. A smoker was defined as any member of the family who is a current smoker.

#### **3.2 Eligibility criteria of the study population**

The household members who were invited to participate in this study included children, mothers, and any other family member who is a smoker. Schoolchildren are studying in the primary school class grades 4, 5, or 6 in Hatyai district, Songkhla province, and these schools must belong to Songkhla Primary Education Service Office 2. Eligibility criteria was as the follows:

Inclusion criteria for schoolchildren:

1. Students studying class grades 4 or 5 or 6.
2. Student has never smoked.

Inclusion criteria for other family members of the child:

1. Mother of student (non-smoker)
2. A current smoker who smoke in the home.
3. All three have been living together in the same household for the past 1 month.



Exclusion criteria

-None

### 3.3 Phase I

#### 3.3.1 Aims

- 1) To explore perceptions among non-smokers and smokers about smoking behaviour in the home.
- 2) To identify suggestions and barriers for implementing a smoke-free home program

#### 3.3.2 Study design

Qualitative study using a focus group discussion (FGD) and in-depth interview (IDI).

#### 3.3.3 Study subjects

Smokers who have a child aged between 9-12 years were invited to participating a FGD (2 groups; 5-8 person/group; 1 hour/group) and IDI (1 person/one FGD; 30 minutes/person). Non-smoking mothers were invited to participate in a FGD (1 group; 5-8 person/group; 1 hour/group).

#### 3.3.4 Data collection

A one-hour focus-group discussion was conducted in Hatyai district, Songkha province. At the beginning of the session, participants were asked to informed about the objectives and the processes of the study. After signing the consent form, participants were asked to complete a questionnaire about their demographic characteristics. A research assistant recorded the conversation by using an audiotape.

### 3.3.5 Interview guideline

A semi-structured interview guideline was modified, and the aspects of behaviour included a range of perceptions of SHS, smoking behaviour at home, children's role in supporting their father to smoke outside, and creating a smoke-free home. This guideline was developed by Hairi et al. <sup>75</sup>. The guideline is summarised follows;

#### FGD for smokers

- 1) Have you ever been advised to stop smoking or smoke outside the home from family members (child, wife, or other)? How do you feel about that?
- 2) What do you think if your child makes the home being smoke-free?
- 3) What do you think if your child will request you to smoke outside the home?
- 4) Do you normally smoke at home? Where and When do you smoke?
- 5) Who tends to be at home when you smoke?
- 6) How far are you from other family members when you smoke?
- 7) Do you usually permit quests to smoke in your house? How do you feel about guests smoking in your house?

#### FGD non-smokers (mother or parent of schoolchildren)

- 1) What is second-hand smoke?
- 2) Is exposure to tobacco smoke harmful to your health?
- 3) What diseases do you think could be caused by exposure to tobacco smoke?
- 4) How long has he (the family member who smokers) been a smoker? How many cigarettes does he smoke each week?
- 5) Have you ever felt worried about his health?
- 6) Have you ever advised him to stop smoking or smoke outside the home?
- 7) What do you think about his smoking? (accepting, feel neutral, feel unhappy)
- 8) Does he normally smoke at home?
- 9) Who tends to be at home when he smokes?
- 10) How do you feel about guests smoking in your house?

### 3.3.6 *Data analysis and interpretation*

The data were analysed by using content analysis. Verbatim comments were subsequently transcribed. The researcher independently reviewed the entire transcript, inductively created a master list of possible themes and codes to describe segments of text for each question.

The results of analysis are shown in ANNEX I: Results from the Phase I Study.

## 3.4 **Phase II**

### 3.4.7 *Aim*

- 1) To develop and test the intervention strategies
- 2) To test reliability of attitude and knowledge related to the harms of exposure to SHS

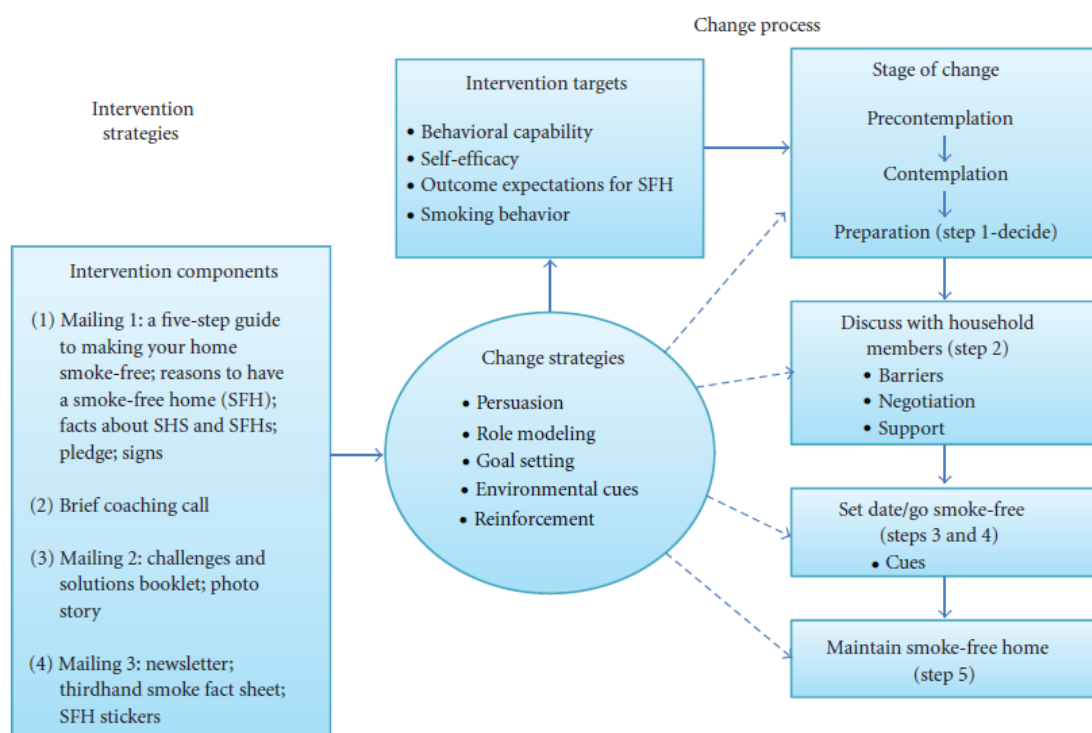
### 3.4.8 *Intervention development*

From the literature review, there are several types of studies such as RCT, CRCT and pilot study. Because of no standard or intervention for creating a smoke-free home, the studies of Kegler (2012) and Alwan (2010) were used to be an original intervention.<sup>49,51</sup> The summary of the intervention strategies is summarized as follows.

In Kegler's study, the intervention consisted of four components: three mailings of print materials and one coaching call, aimed at increasing household smoking bans and reducing second-hand smoke exposure. The materials were designed to target both smokers and non-smokers who allow smoking in the home. The conceptual model is based on social cognitive theory and the stages of change from the trans-theoretical model. Social cognitive theory was selected because of its emphasis on both cognitive and environmental determinants of behaviour and the interplay

between them known as reciprocal determinism. The intervention targets proximal determinants of behavioural capacity, self-efficacy, and outcome expectations related to creating a smoke-free home and smoking behaviours. Through the use of persuasion, role modelling, goal setting, environmental cues and reinforcement—change strategies tied to social cognitive theory—participants were encouraged to work through the five steps of creating a smoke-free home. These include (1) deciding to create a smoke-free home, (2) talking to household members about making a home smoke-free, (3) setting a date for going smoke-free, (4) actually making a home smoke-free, and (5) keeping the home smoke-free. The model of steps of creating a smoke-free home is shown in Figure 5.

**Figure 5: Model of behaviour change: brief intervention to create smoke-free home**



Source: Kegler et al, 2012

In Alwan's study, the smoke-free home intervention was designed to encourage families to implement smoking restrictions in their homes, and was delivered over a period of 6 months by schoolchildren, and trained health professionals.

For this study, the intervention was developed based on these interventions. The teachers (non-smoker) were trained in teaching about the harms of SHS, how to reduce or avoid exposure to SHS, and how to create their home to be smoke-free. Schoolchildren attended in classrooms with 4 sessions (30-minutes/session/week; over one month).

**Table 5: Session of Smoke-free home intervention in the classroom**

| Session              | Learning objectives and materials   | Activity   |
|----------------------|---|--|
| 1 <sup>st</sup> week | <p><b>Objective</b><br/>To recognize the harms of second-hand smoke exposure and smoking; the danger of smoking in the home</p> <p><b>Materials</b><br/>Smoke-free home (booklet); included an information about SHSe, reducing SHS in home; avoidance of SHSe, steps of creating SFH, and quit line<br/>Steps to create a smoke-free home sheet<br/>Stickers and embed quit line<br/>Worksheet; (1) disease related to SHSe; (2) SFH sheet</p> | <p><b>Classroom</b><br/>Teaching about the harms of exposure to SHS and smoking<br/>Negotiation with their family for creating SFH<br/>Fill the name of disease related to exposure to SHS on the worksheet (1)</p> <p><b>Family</b><br/>Take the home sheet and discuss with family members about set up the date of creating SFH</p>   |
| 2 <sup>nd</sup> week | <p><b>Objective</b><br/>To be able to initiate activities leading to a SFH</p> <p><b>Materials</b><br/>Booklet<br/>Game and role-play<br/>SFH stickers<br/>Promise form for creating SFH</p>  | <p><b>Classroom</b><br/>Teaching about techniques to reduce SHS in their home<br/>Drawing a picture and take it to paste on a door or wall in their house. With quotation "Don't smoke in home, it can hurt me"<br/>Playing a game and role-play<br/>Painting the colour on the SFH sticker</p> <p><b>Family</b><br/>Setting up the date of SFH and let smoker or mother sign up on the promise form; if no smoker, mother will sign up on the form.<br/>Paste sticker "Smoke-free home"</p> |
| 3 <sup>rd</sup> week | <p><b>Objective</b><br/>To gain direct experience on avoiding SHSe and refusing of tobacco use</p> <p><b>Materials</b><br/>Booklet</p>  | <p><b>Classroom</b><br/>Teaching how to avoid SHSe and refusing tobacco use<br/>Sharing the experience with family members to set up a smoke-free home<br/>Watching video</p>  |

|                      |   |  |
|----------------------|---|--|
|                      | Video about avoidance SHSe, creating a smoke free home, and the danger of tobacco use | <b>Family</b><br>-   |
| 4 <sup>th</sup> week | To get feedback about smoke-free home program   | <b>Classroom;</b> Summarize the activities, feedback from students |

### 3.4.9 Pilot study

Thirty participants will be randomly selected in this phase. The methodology, inclusion and exclusion criteria, data management, and analysis will be the same as in the Phase III. The pilot study will be implemented over one month. The aims of this phase are:

- 1) To develop and test the intervention program.
- 2) To test the reliability of the questionnaire (attitude and knowledge)
- 3) To give the team some practice for data collection.

The results of analysis was shown in ANNEX II: Results from the Phase II Study, and the student booklet and teacher's manual was also shown in ANNEX III: Smoke-free home program.

## 3.5 Phase III

### 3.5.10 Aim

- 1) To test the effect of the intervention
- 2) To assess the pretesting effect

### 3.5.11 Objectives

### 3.5.12 Primary objective

1. To compare smoke-free home status between the intervention and control groups.

### *3.5.13 Secondary objectives*

1. To compare knowledge and attitude of schoolchildren and non-smoker between intervention and control groups on harms of smoking.
2. To compare the self-confidence for creating a smoke-free home between the intervention and control groups.
3. To compare the self-confidence for avoidance second-hand smoke in their home between the intervention and control groups.
4. To compare the self-confidence for persuading a smoker not to smoke in home between the intervention and control groups.
5. To compare cigarette consumption of smokers between intervention and control groups.

### *3.5.14 Study design*

Solomon four-group cluster randomized controlled trial

### *3.5.15 Study subjects*

Participants were as the follows;

1. Schoolchildren studying in class grades 4,5, or 6.
2. The mother of the child is a non-smoker
3. A family member who smoke cigarettes in their home

### *3.5.16 Sample size calculation*

We assumed that there would be a 25% difference in the SFH status between the intervention and control groups after the 3-month intervention period. With a power of 80 %, a two-tailed significance level of 5 %, a design effect of 1.5 and a loss to follow-up rate of 20 %, at least 110 participants per group were needed. As there were 4 groups, 440 households were required in total. The required sample size was determined based on the following two sample proportion formula:

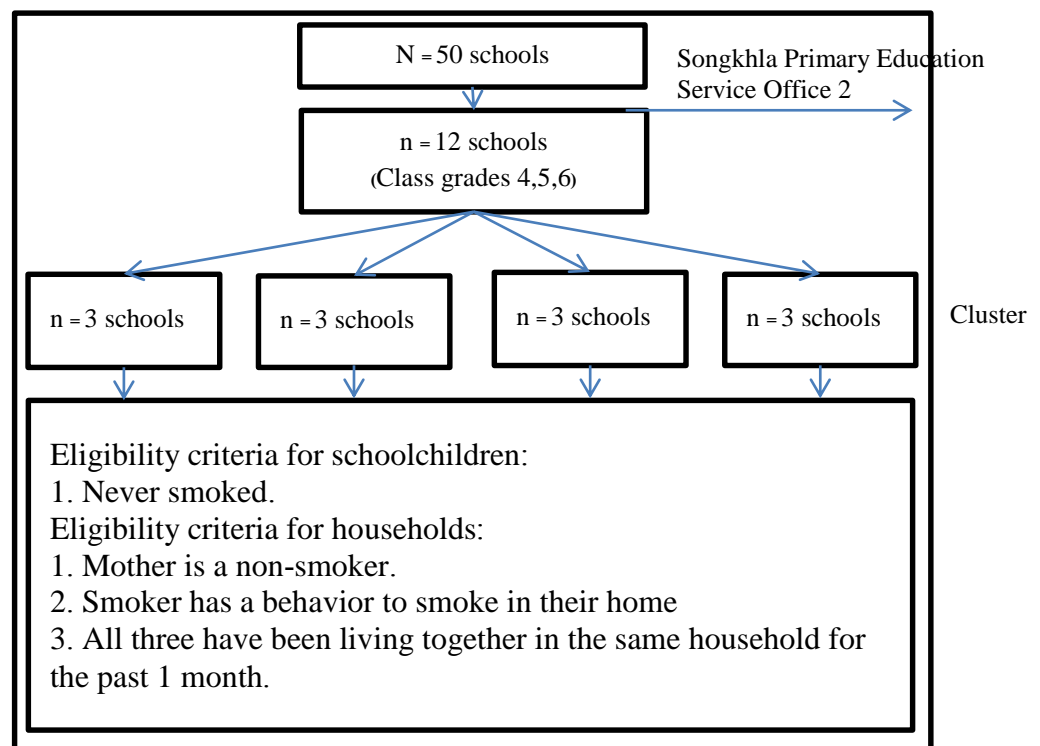
$$Z_{\alpha/2} = 1.96, \quad \text{Alpha} = 0.05, \quad Z_{\beta} = 0.84, \quad \text{Beta} = 0.20$$

$$n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 [(p_1(1-p_1) + p_2(1-p_2))]}{d^2} \times deff$$

Effect size (d) = 0.25; Design effect (deff) = 1.5, Lost to follow up = 20%

### 3.5.17 Sampling

**Figure 6: Sampling and randomization**





### *3.5.18 Operational definitions*

#### Second-hand smoke

Second-hand smoke is defined as the smoke resulting from a lit cigarette, cigar, hand-rolled smoke, or pipe which is exhaled by active smokers.

### *3.5.19 Data collection*

The Solomon four-group design used in this study is summarized in Figure 7. Each group contained 3 schools (clusters). Group 1 (G1) and Group 3 (G3) were given the intervention with and without pretesting, respectively. Group 2 (G2) and Group 4 (G4) acted as the control with and without pretesting, respectively. The pretesting period was August-September, 2014. The intervention was given in September 2014, and the post-testing period was January-February, 2015. Pre-testing was assessed only in G1 and G2 while the post-test was assessed in all the groups.

All public schools in Hatyai district were eligible for the study. Of 50 schools invited to participate, 12 (24%) agreed to join and were included in the study. We conducted a cluster controlled trial in which participating schools were assigned into the above-mentioned four groups. Initially, a school, which is the primary unit under intervention, was considered to be randomly allocated into one of the four groups. Randomized allocation was, however, not possible because all schools demanded the intervention. Finally, the first 6 schools were allocated to the intervention arm (3 with and without pretest) and the remaining were given the intervention after the endline data collection was completed.

In each school, all 4th- to 6th-grade students aged between 9 and 12 years were recruited. The data collection of student, the research team visited the schools for baseline data collection. After giving consent, students were requested to complete a baseline questionnaire (See ANNEX IV: Questionnaire for schoolchildren.). Additionally, sealed envelopes containing an invitation letter, consent form, assent form, and a questionnaire were sent to the student's mother. If another family member

currently smoked, they were also requested to complete the questionnaire. As the project aimed to create a SFH environment within the whole community, regardless of whether the household contained a current smoker or not, the mother was also requested to complete the questionnaire. However, if the mother was a smoker, the family was excluded from the study. Informed consent was obtained from all participants. For the student's mother and smoker, they filled the information on the self-completed the questionnaire, and were requested to return it to the school within 7 days (See Annex V and Annex VI).

After the program was implemented for 3 months, the research team revisited the same schools to obtain post-intervention data from the same students. Endline information was collected at the end of the intervention in a similar fashion to that at the baseline. In addition, for the intervention, the research team visited the participant's house to obtain the parent's feedback on the activities and observed whether the distributed media (sticker and poster) were placed as suggested.

### *3.5.20 Outcome measurements*

#### *3.5.21 Primary outcome*

##### Smoke-free home status

The primary outcome measure was assessed at the baseline and the end line of follow up by using the item, "In the past 7 days, did you see anybody smoke in your home?"<sup>51, 76</sup>, with possible choices of "yes" or "no". This outcome was assessed by children's mother.

#### *3.5.22 Secondary outcomes*

##### Knowledge and attitude toward exposure to SHS

Knowledge and attitudes toward exposure to SHS was assessed by a questionnaire; (1) knowledge of the adverse effects associated with SHS exposure; and (2) attitudes and personal feelings toward SHS exposure <sup>77</sup>. The core questionnaire was modified from the study of Josephine <sup>78</sup> and was used for measure as in Table 6.

#### Self-confidence for creating a smoke-free home

This scale was modified from the study of Kegler (2012). The original question is “On a scale of 0 to 10, with 0 being not confident at all and 10 being very confident, how confident are you that you can [make/keep] your home smoke-free for the next 6 months?”

This question was modified to “How much confidence do you have in making your home smoke-free?” The participants ranked the scale of 0 to 10, with 0 being not confident at all and 10 being very confident.

#### Self-confidence for avoidance exposure to second-hand smoke in their home

The following question was asked to the participants as follows; “How much confidence do you have in avoiding SHSe from ..... in your home?” The question was asked about “**a smoker who was a family member**” and “**guest**”. Each scale was similar to the self-confidence score for creating a smoke-free home. The total scores ranged from 0 to 20.

#### Self-confidence for persuading a smoker not to smoke in their home

The participants were asked the question; “When ..... is smoking in the home, how much confidence do you have in telling/persuading them to not smoke in the home?” The question was asked about “**a smoker who is a family member**” and “**guest**”. Each scale was similar to the self-confidence score for creating a smoke-free home. Therefore, the total scores ranged from 0 to 20.

### Cigarette consumption

Cigarette consumption was assessed by asking, “On average, on the days you smoke, how many cigarettes do you smoke in a day?”<sup>79</sup>

Table 6 shows the outcome assessment in schoolchildren, mother, and smokers

**Table 6: Outcomes assessment**

| variables   | Schoolchildren |       | Mother |       | Smoker |       |
|---|----------------|-------|--------|-------|--------|-------|
|   | Before         | After | Before | After | Before | After |
| Demographic data  | x              |       | x      |       | x      |       |
| Smoke-Free Home Status  | x              | x     | x      | x     | x      | x     |
| Knowledge and attitude toward exposure to SHS                             | x              | x     | x      | x     | x      | x     |
| Self-confidence for creating a smoke-free home                            | x              | x     | x      | x     |        |       |
| Self-confidence for avoidance exposure to second-hand smoke in their home | x              | x     | x      | x     |        |       |
| Self-confidence for persuading a smoker not to smoke in their home        | x              | x     | x      | x     |        |       |
| Cigarette consumption   |                |       |        |       | x      | x     |

#### 3.5.23 Study groups

Group 1: Intervention with pretesting assessment; Participants were assessed at baseline and endline of the study and received the intervention.

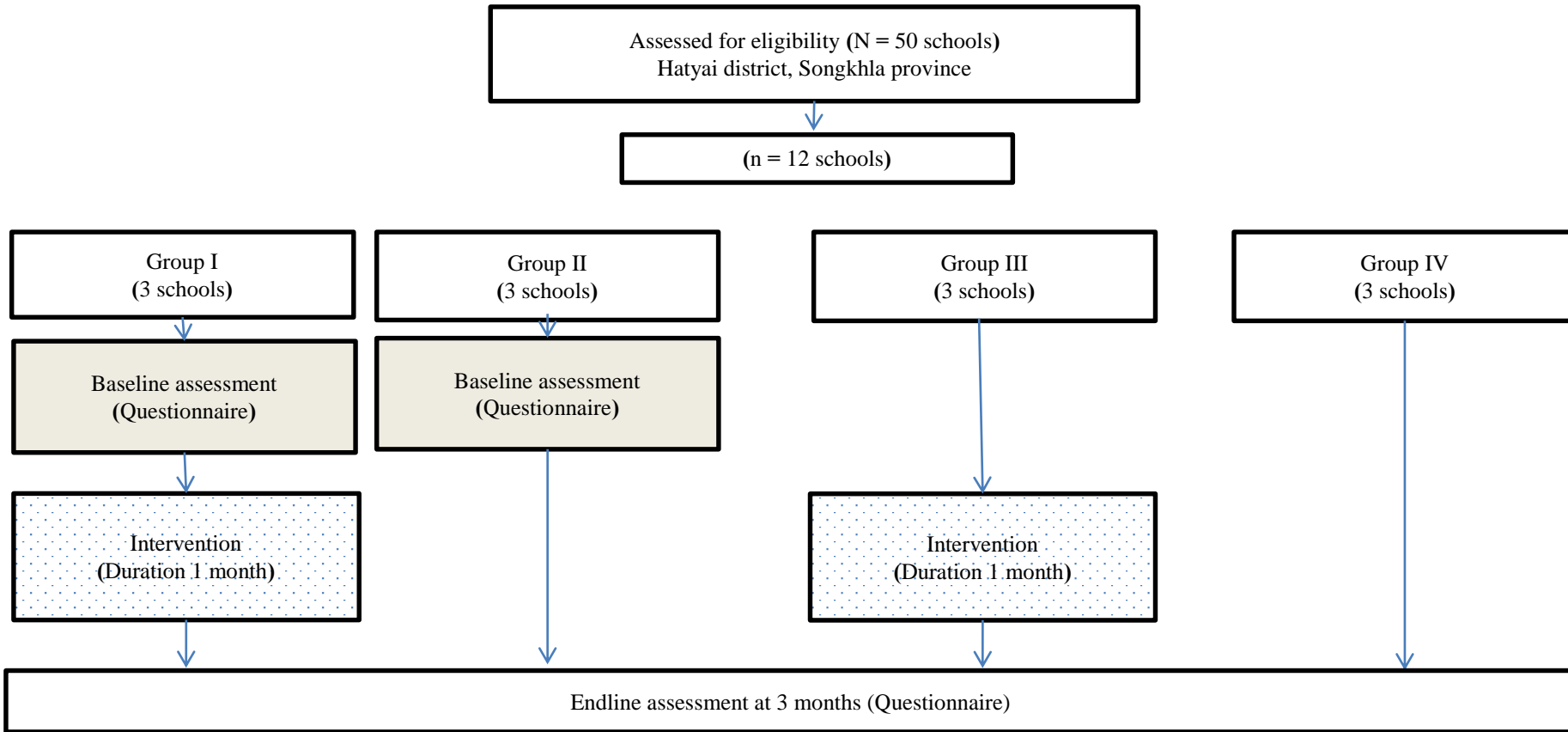
Group 2: Control with pretesting assessment; Participants were assessed at baseline and endline of the study and received the control.

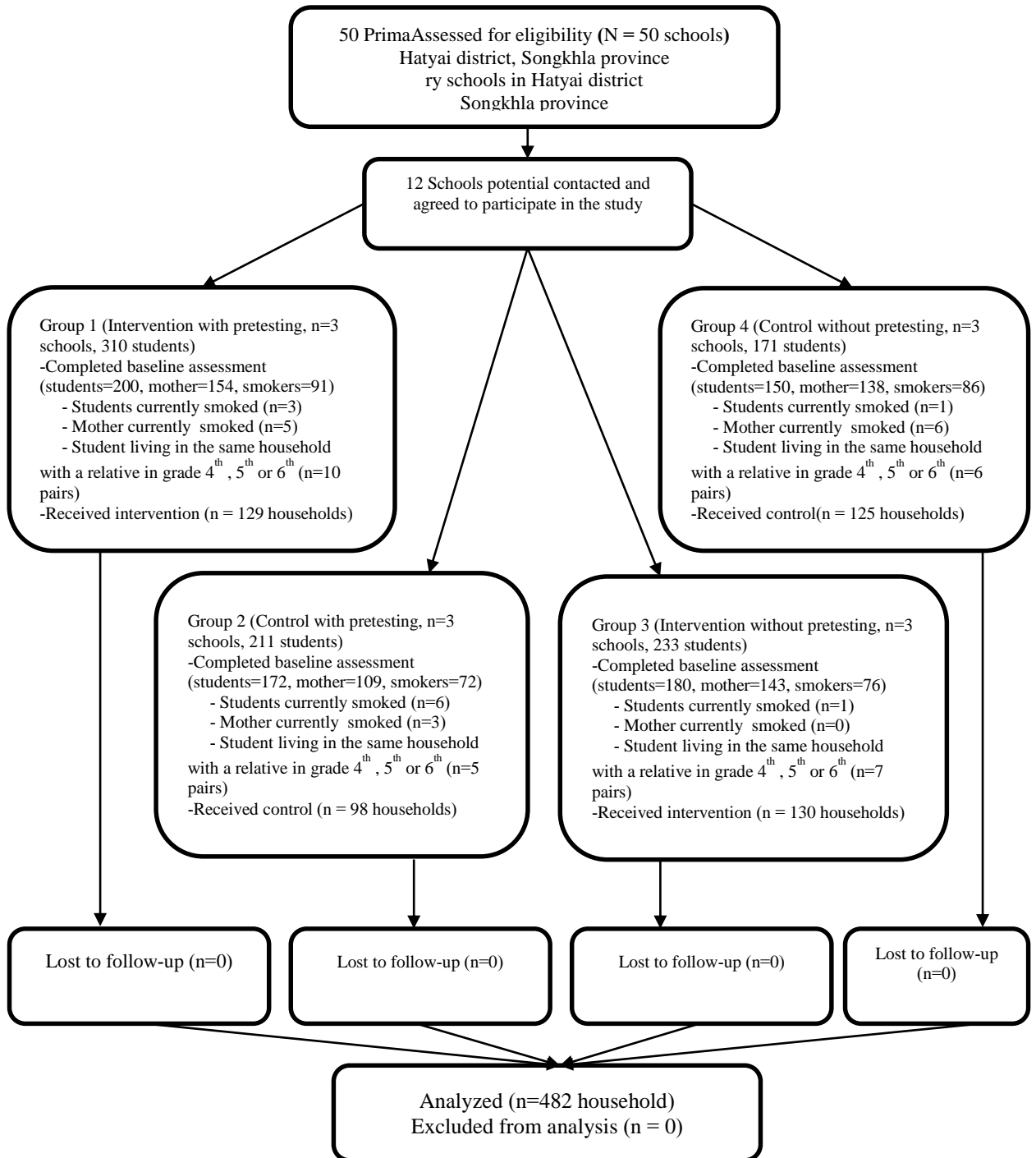
Group 3: Intervention without pretesting assessment; Participants were assessed at only at endline of the study and received the intervention.

Group 4: Control without pretesting assessment; Participants were assessed at only at endline of the study and received no intervention.

Participants were the household members including schoolchildren, mother, and a smoker. In the control group, the participants received SHS information at the end of study. A flow diagram of conducting the study is shown in Figure 7 and Figure 8

**Figure 7: Flow diagram of research study**



**Figure 8: Flow diagram of the study**

Follow-up procedure

The follow-up procedure was at 3 months (12 weeks) after the intervention. The house of the participants was visited for obtaining the parent's feedback on the activities and observed whether the distributed media (sticker and poster) were placed as suggested.

#### *3.5.24 Data management*

Double data entry technique was performed with data cleaning and checking using Epidata software version 3.1. All data was analysed using the R language and environment version 3.2.2.

#### *3.5.25 Data analysis*

Results are reported as frequencies, percentages, means, medians, or standard deviation as appropriately. Person's chi-squared tests or students' independent t-tests were used for comparing demographic characteristics and smoking behaviour between the intervention and control groups.

Braver and Braver (1988), the strategy of analysis was modified from them for testing the independent effects of the pretest and the intervention in a Solomon four-group design. A 2 x 2 (Pretest x Program) of the four posttest scores, and on interaction term between Group x Condition, was constructed for testing those effects. For the primary outcome, McNemar's chi square test for testing the increase in rate of SFH within groups 1 and 2 was performed. Multiple logistic regression was used to test the main effect of the intervention on SFH status. For secondary outcomes, multiple linear regression was used. All statistical assessments were two sided and evaluated at the 0.05 level of statistical significance. All statistical analyses were performed using R version 3.0.1 with epicalc package version 2.15.1. As students were clustered by school, we used the survey package to adjust for the clustered nature in the final model. This was done using School ID as the primary sampling unit.



## CHAPTER 4

### RESULTS

This research aims to investigate the effect of the SFH program in Hat Yai, Songkhla province. The participants consist of primary school grade 4<sup>th</sup> to 6<sup>th</sup>, their mother and a smoker. The data collection had been performed during August 2014 to March 2015. The results were shown as the follows:

#### 4.1 Characteristics

##### 4.1.1 Households characteristics

The majority of household were Buddhist (61.4%), had an income less than 15,000 baht per month (75%), and had at least one smoker (81.2%). The mean (sd) family relationship score was 11.3 (3.1).

**Table 7: Characteristics of household**

| Variables                    | Intervention with pretesting (O1)<br>(N= 129) | Control with pretesting (O3)<br>(N=98) | Intervention without pretesting (O5)<br>(N= 130) | Control without pretesting (O6)<br>(N= 125) | Total<br>(N= 482) |
|------------------------------|---|--|--|---|-------------------|
| Religion                     |   |  |  |   |                   |
| Buddhist                     | 102 (79.1)                                    | 43 (43.9)                              | 36 (27.7)  | 115 (92.0)                                  | 296 (61.4)        |
| Muslim                       | 27 (20.9)                                     | 55 (56.1)                              | 94 (72.3)  | 10 ( 8.0)                                   | 186 (38.6)        |
| Household income (Thai Baht) |   |  |  |   |                   |
| ≤15,000                      | 106 (82.2)                                    | 73 (74.5)                              | 81 (62.3)  | 101 (81.5)                                  | 361 (75.1)        |
| >15,000                      | 23 (17.8)                                     | 25 (25.5)                              | 49 (37.7)  | 23 (18.5)                                   | 120 (24.9)        |
| Number of smokers in home    |   |  |  |   |                   |
| One                          | 66 (85.7)                                     | 56 (77.8)                              | 56 (84.8)  | 71 (79.8)                                   | 249 (81.9)        |
| Two or more                  | 11 (14.3)                                     | 16 (22.2)                              | 10 (15.2)  | 18 (20.2)                                   | 55 (18.1)         |
| Family relationship score    |   |  |  |   |                   |
| Mean (SD)                    | 11.6 (3.1)                                    | 11.7 (3.1)                             | 11.1 (3.2)                                       | 11.1 (3.3)                                  | 11.3 (3.2)        |

#### 4.1.2 Schoolchildren characteristics

Among schoolchildren, the distribution of each grade were around 30%, female (52%). In addition, the distribution among 4 groups was similar.

**Table 8: Schoolchildren characteristics**

| Variables             | Intervention with pretesting (O1) (N= 129) | Control with pretesting (O3) (N=98 ) | Intervention without pretesting (O5) (N= 130) | Control Without pretesting (O6) (N= 125) | Total (N= 482) |
|-----------------------|--|--------------------------------------|---|--|----------------|
| Student               |  |                                      |   |  |                |
| 4 <sup>th</sup> grade | 27 (20.9)                                  | 32 (32.7)                            | 46 (35.4)                                     | 43 (34.4)                                | 148 (30.7)     |
| 5 <sup>th</sup> grade | 47 (36.4)                                  | 35 (35.7)                            | 52 (40.0)                                     | 34 (27.2)                                | 168 (34.9)     |
| 6 <sup>th</sup> grade | 55 (42.6)                                  | 31 (31.6)                            | 32 (24.6)                                     | 48 (38.4)                                | 166 (34.4)     |
| Gender Male           | 57 (44.2)                                  | 54 (55.1)                            | 68 (52.3)                                     | 69 (55.2)                                | 248 (51.5)     |
| Female                | 72 (55.8)                                  | 44 (44.9)                            | 62 (47.7)                                     | 56 (44.8)                                | 234 (48.5)     |

#### 4.1.3 Mother characteristics

The mean age of mother was 39 years (SD 7.4), most attended more than 7 years of schooling (57%), and most were employed (86%)

**Table 9: Mother characteristics**

| Variables                       | Intervention with pretesting (O1) (N= 129) | Control with pretesting (O3) (N=98 ) | Intervention without pretesting (O5) (N= 130) | Control without pretesting (O6) (N= 125) | Total (N= 482) |
|---------------------------------|--|--------------------------------------|---|--|----------------|
| Age (years); Mean(SD)           | 39.2 (7.4)                                 | 38 (7.4)                             | 39.2 (7)                                      | 39.1 (8.0)                               | 38.9 (7.4)     |
| Number of years attended school |  |                                      |   |  |                |
| <7                              | 57 (44.2)                                  | 42 (42.9)                            | 42 (32.3)                                     | 66 (52.8)                                | 207 (42.9)     |
| ≥7                              | 72 (55.8)                                  | 56 (57.1)                            | 88 (67.7)                                     | 59 (47.2)                                | 275 (57.1)     |
| Occupation status               |  |                                      |   |  |                |
| Unemployed                      | 16 (12.4)                                  | 18 (18.4)                            | 13 (10)                                       | 19 (15.2)                                | 66 (13.7)      |
| Employed                        | 113 (87.6)                                 | 80 (81.6)                            | 117 (90)                                      | 106 (84.8)                               | 416 (86.3)     |

#### 4.1.4 Smoker's characteristics

The mean age of smokers was 39 years (SD 10.1), about half of attended school for more than 7 years (49%), and most were employed (86%). The level of nicotine dependence was low in the majority of smokers (26%)

**Table 10: Smoker characteristics**

| Variables                                     | Intervention with pretesting (n=75) | Control with pretesting (n=67) | Intervention without pretesting (n=66) | Control without pretesting (n=77) | Total (n=285) |
|---|-------------------------------------|--------------------------------|--|-----------------------------------|---------------|
| Age (years); Mean (SD)                        | 39.1 (10.7)                         | 39 (9.5)                       | 38.2 (11.3)                            | 38.8 (9.1)                        | 38.8 (10.1)   |
| Number of years attended school               |                                     |                                |  |                                   |               |
| <7  | 31 (41.3)                           | 33 (49.3)                      | 38 (57.6)                              | 44 (57.1)                         | 146 (51.2)    |
| ≥7  | 44 (58.7)                           | 34 (50.7)                      | 28 (42.4)                              | 33 (42.9)                         | 139 (48.8)    |
| Occupation status                             |                                     |                                |  |                                   |               |
| Unemployed                                    | 9 (12.0)                            | 16 (23.9)                      | 8 (12.1)                               | 6 ( 7.8)                          | 39 (13.7)     |
| Employed                                      | 66 (88.0)                           | 51 (76.1)                      | 58 (87.9)                              | 71 (92.2)                         | 246 (86.3)    |
| Fagerstrom test for nicotine dependence score |                                     |                                |  |                                   |               |
| Low   | 53 (70.7)                           | 53 (79.1)                      | 57 (86.4)                              | 48 (62.3)                         | 211 (74.0)    |
| Moderate/high                                 | 22 (29.3)                           | 14 (20.9)                      | 9 (13.6)                               | 29 (37.7)                         | 74 (26.0)     |

#### 4.1.5 Comparisons of characteristics between intervention and control groups

Household religion and the number of years attended school was significantly different between intervention and control groups. Therefore, in the multivariate analysis, these variables were included in the model.

**Table 11: Comparisons of characteristics between intervention and control**

| Variables                                       | P value |
|---|---------|
| Household variables                             |         |
| Religion  | < 0.001 |
| Household income                                | 0.070   |
| Number of smokers in home                       | 0.695   |
| Family relationship score                       | 0.916   |
| Schoolchildren                                  |         |
| Grade   | 0.617   |
| Gender  | 0.170   |
| Mother  |         |
| Age   | 1.000   |
| Number of years attended school                 | 0.030   |
| Occupation status                               | 0.272   |
| Smoker  |         |
| Age (years)                                     | 0.210   |
| Number of years attended school                 | 0.757   |
| Occupation status                               | 0.517   |
| Fagerstrom's test for nicotine dependence score | 0.080   |

## 4.2 Primary outcome

Within intervention group 1, the percentage of SFH before the intervention was 41.8% and 46.1% after the intervention. The increased rate in group 1 was 4.26% (95% CI: -0.58, 9.09). Within control group 2, the proportion of SFH was 30.1% and 34.9% at before and after intervention with increased rate 4.85 (95% CI; -1.48, 11.19). The change in proportion of SFH for the intervention group was not significantly different than the control group (-0.59%, 95% CI: -4.72, 5.92)

**Table 12: The proportion of smoke free home before-after and among groups**

|                                  | Before<br>N (%) | After<br>N (%) | Difference<br>(95% confidence interval) | P value |
|----------------------------------|-----------------|----------------|---|---------|
| Group 1 (N= 129)<br>Intervention | 59 (41.8)       | 65 (46.10)     | 4.26 (-0.58, 9.09)                      | 0.083*  |
| Group 2 (N= 98)<br>Control       | 31 (30.1)       | 36 (34.9)      | 4.85 (-1.48, 11.19)                     | 0.131*  |
| Comparing between groups         |                 |                | -0.59% (-4.72, 5.92)**                  |         |

\* McNemar's chi-square test; \*\* Person's chi-square test

### 4.3 Secondary outcomes

#### 4.3.6 Knowledge on harms of SHSe

The scores of knowledge on harms of SHSe between intervention group 1 and group 2 was increased from before to after intervention as 0.39 (95% CI: 0.05, 0.73) and 0.04 (95% CI: -0.44, 0.52), respectively. Compared between group 1 and 2, the scores of knowledge in intervention group 1 was higher than in control group 2 (difference: 0.62; 95% CI: 0.21, 1.02). In addition, the scores of knowledge in the intervention without pretest group was higher than in control without pretest group (difference: 0.41; 95% CI: 0.09, 0.72).

Among mothers, the knowledge scores in intervention with baseline (Group 1) increased from before to after (difference: 0.15; 95% CI: -0.18, 0.48) and decreased in control group 2 (difference: -0.17; 95%CI: -0.93, 0.58). The difference of scores between intervention (G1) and control (G2) was statistically significant (difference 0.76; 95% CI: 0.34, 1.18). Furthermore, the knowledge scores in the intervention without pretesting group was higher than in control without pretesting group (difference: 0.14; 95% CI: -0.22, 0.5).

Among smokers, the knowledge scores in intervention with pretesting (group 1) slightly increased from baseline to endline (difference: 0.52; 95% CI: -0.03, 1.08) and in control with pretesting group (group 2) was slightly increased as well (difference: 0.20; 95% CI: -0.37, 0.78). Compared between group 1 and 2, the

difference of scores was not statistically significant (difference: 0.03; 95% CI: -0.57, 0.64). Additionally, the knowledge scores in intervention without pretesting (group 3) was slightly higher than in control without pretesting group (group 4) (difference: 0.24; 95%CI: -0.33, 0.82)

In addition, the relationship between mother's knowledge and child's knowledge at baseline was not observed (P value: 0.59, r:0.04).

**Table 13: Scores of knowledge on harms of SHSe and smoking**

|                       | Before<br>Mean (SD) | After<br>Mean (SD) | Before-After<br>(95% confidence interval)* | Between groups<br>(95% confidence interval)* |
|-----------------------|---------------------|--------------------|--|--|
| <b>Schoolchildren</b> |                     |                    |  |  |
| Group 1               | 4.3 (1.5)           | 4.7 (1.3)          | 0.39 (0.05, 0.73)                          | 0.62 (0.21, 1.02)                            |
| Group 2               | 4.0 (1.8)           | 4.1 (1.8)          | 0.04 (-0.44, 0.52)                         |  |
| Group 3               |                     | 5.3 (1.2)          |  | 0.41 (0.09, 0.72)                            |
| Group 4               |                     | 4.8 (1.4)          |  |  |
| <b>Mothers</b>        |                     |                    |  |  |
| Group 1               | 4.5 (1.4)           | 4.6 (1.4)          | 0.15 (-0.18, 0.48)                         | 0.76 (0.34, 1.18)                            |
| Group 2               | 4.0 (3.4)           | 3.8 (1.8)          | -0.17 (-0.93, 0.58)                        |  |
| Group 3               |                     | 4.5 (1.5)          |  | 0.14 (-0.22, 0.5)                            |
| Group 4               |                     | 4.3 (1.6)          |  |  |
| <b>Smokers</b>        |                     |                    |  |  |
| Group 1               | 2.8 (2.4)           | 3.3 (2.5)          | 0.52 (-0.03, 1.08)                         | 0.03 (-0.57, 0.64)                           |
| Group 2               | 3.0 (2.2)           | 3.2 (2.2)          | 0.20 (-0.37, 0.78)                         |  |
| Group 3               |                     | 2.6 (2.6)          |  | 0.24 (-0.33, 0.82)                           |
| Group 4               |                     | 2.4 (2.2)          |  |  |

SD=standard deviation; \*difference of mean and 95% confidence interval

Group 1 = intervention with pretest; Group 2 = control with pretest; Group 3 = intervention without pretest; Group 4 = control without pretest

#### 4.3.7 Attitude on harms of SHSe and smoking

From Table 14, the scores of attitude on harms of SHSe among intervention group 1 and group 2 increased from before to after the intervention as 0.58 (95% CI: -0.29, 1.45) and 0.74 (95% CI: -0.4, 1.87), respectively. Compared between group 1 and 2, the scores of knowledge in intervention group 1 was higher than in control group 2 (difference 1.14; 95% CI; 0.17, 2.11). In addition, the scores of knowledge in intervention without pretest group was higher than in control without pretest group (difference: 0.54; 95% CI; -0.29, 1.37).

Among mothers, the attitude scores in intervention with baseline (group 1) increased from before to after (difference: 0.74; 95% CI: -0.05, 1.53) and in control group 2 (difference: 1.66; 95% CI: 0.65, 2.67). The difference of scores between intervention (group 1) and control (group 2) was not statistically significant (difference: 0.09; 95% CI: -0.73, 0.9). Furthermore, the attitude scores in intervention without pretesting (group 4) was higher than control without pretesting group (difference: 0.43; 95% CI: -0.41, 1.28).

Among smokers, the attitude scores in intervention without pretesting increased from before to after the intervention (difference: 1.57; 95%: -1.3, 4.43) and in control with pretesting group (difference: 0.11; 95% CI: -2.53, 2.74). Compared between group 1 and 2, the scores were not statistically significant (difference: -1.63; 95% CI: -4.48, 1.22). Additionally, the attitude scores in intervention without pretesting group was slightly lower than in control without pretesting group (difference: -0.95; 95%CI: -3.9, 2.01).

The relationship between mother's attitude and child's attitude at baseline was also not observed (r:0.08; P value: 0.260).

**Table 14: Attitude on harms of SHSe and smoking**

|                       | Before<br>Mean (SD) | After<br>Mean (SD) | Before-After<br>(95% confidence interval)* | Between groups<br>(95% confidence interval)* |
|-----------------------|---------------------|--------------------|--|--|
| <b>Schoolchildren</b> |                     |                    |  |  |
| Group 1               | 28.1 (4.0)          | 28.7 (3.2)         | 0.58 (-0.29, 1.45)                         | 1.14 (0.17, 2.11)                            |
| Group 2               | 26.8 (3.6)          | 27.5 (4.2)         | 0.74 (-0.4, 1.87)                          |  |
| Group 3               |                     | 28.1 (3.5)         |  | 0.54 (-0.29, 1.37)                           |
| Group 4               |                     | 27.6 (3.5)         |  |  |
| <b>Mothers</b>        |                     |                    |  |  |
| Group 1               | 27.5 (3.9)          | 28.3 (2.8)         | 0.74 (-0.05, 1.53)                         | 0.09 (-0.73, 0.9)                            |
| Group 2               | 26.5 (4.2)          | 28.2 (3.4)         | 1.66 (0.65, 2.67)                          |  |
| Group 3               |                     | 27.9 (3.5)         |  | 0.43 (-0.41, 1.28)                           |
| Group 4               |                     | 27.5 (3.6)         |  |  |
| <b>Smokers</b>        |                     |                    |  |  |
| Group 1               | 16.1 (12.0)         | 17.7 (12.7)        | 1.57 (-1.3, 4.43)                          | -1.63 (-4.48, 1.22)                          |
| Group 2               | 19.2 (9.9)          | 19.3 (9.9)         | 0.11 (-2.53, 2.74)                         |  |
| Group 3               |                     | 14.9 (13.8)        |  | -0.95 (-3.9, 2.01)                           |
| Group 4               |                     | 15.8 (10.9)        |  |  |

SD=standard deviation; \*difference of mean and 95% confidence interval



#### 4.3.8 creating a SFH confidence score

Among schoolchildren, the scores of self-confidence for creating their home to be smoke free in the intervention group was improved from baseline to endline in group 1 (difference: 0.25; 95% CI: -0.27, 0.77) but not in group 2 changed (difference: -0.93; 95% CI: -1.67, -0.2). The difference of scores between group 1 and 2 was statistically significant (difference: 1.53; 95% CI 0.88, 2.19). Moreover, the scores in group 3 were higher than in group 4 (difference: 0.79; 95% CI: 0.23, 1.36)

Among mothers, the scores of self-confidence for creating a SFH in group 1 (difference: 0.50; 95%CI: -0.28, 1.27) and group 2 (difference: 0.18; 95% CI: -0.64, 1.01) improved but not significantly. Comparing between group 1 and 2, the confidence scores were not significantly different (difference: 0.12; 95% CI: -0.62, 0.87). Among the without pretesting group, the scores in group 3 were slightly higher than in group 4 (difference: 0.64; 95% CI: -0.08, 1.37).

**Table 15: Creating a SFH confidence score**

|                | Before<br>Mean (SD) | After<br>Mean (SD) | Before-After<br>(95% confidence interval)* | Between groups<br>(95% confidence interval)* |
|----------------|---------------------|--------------------|--|--|
| Schoolchildren |                     |                    |  |  |
| Group 1        | 7.3 (2.4)           | 7.6 (1.9)          | 0.25 (-0.27, 0.77)                         | 1.53 (0.88, 2.19)                            |
| Group 2        | 7.0 (2.4)           | 6.0 (2.9)          | -0.93 (-1.67, -0.2)                        |  |
| Group 3        |                     | 7.7 (2.1)          |  | 0.79 (0.23, 1.36)                            |
| Group 4        |                     | 6.9 (2.6)          |  |  |
| Mothers        |                     |                    |  |  |
| Group 1        | 6.2 (3.4)           | 6.7 (2.9)          | 0.50 (-0.28, 1.27)                         | 0.12 (-0.62, 0.87)                           |
| Group 2        | 6.4 (3.0)           | 6.6 (2.9)          | 0.18 (-0.64, 1.01)                         |  |
| Group 3        |                     | 6.8 (2.8)          |  | 0.64 (-0.08, 1.37)                           |
| Group 4        |                     | 6.2 (3.3)          |  |  |

SD=standard deviation; \*difference of mean and 95% confidence interval

#### 4.3.9 Avoidance of SHSe in home confidence score

Among schoolchildren, the scores of self-confidence for avoiding SHSe in the intervention group improved from baseline to endline in group 1 (difference: 1.05; 95% CI: 0.10, 2.00) but not in group 2 (difference: -0.41; 95% CI: -1.79, 0.97). The difference of scores between group 1 and 2 was statistically significant (difference: 1.96; 95% CI 0.81, 3.11). Moreover, the scores in group 3 were higher than group 4 (difference: 1.11; 95% CI: 0.32, 1.9)

Among mothers, the scores of self-confidence for avoiding SHSe in group 1 (difference: 1.21; 95% CI: -0.12, 2.55) and group 2 (difference: 0.32; 95% CI: -1.29, 1.93) improved from before to after the intervention. Compared between group 1 and 2, the scores in group 3 were slightly higher than in group 4 (difference: 0.45; 95% CI: -0.88, 1.79). Among the without pretesting group, the scores in group 3 were significantly higher than in group 4 (difference: 1.95; 95% CI: 0.69, 3.2).

**Table 16: Avoidance of SHSe in home confidence score**

|                       | Before<br>Mean (SD) | After<br>Mean (SD) | Before-After<br>(95% confidence interval)* | Between groups<br>(95% confidence interval)* |
|-----------------------|---------------------|--------------------|--|--|
| <b>Schoolchildren</b> |                     |                    |  |  |
| Group 1               | 14.7 (4.6)          | 15.8 (3.7)         | 1.05 (0.10, 2.00)                          | 1.96 (0.81, 3.11)                            |
| Group 2               | 14.2 (4.4)          | 13.8 (5.0)         | -0.41 (-1.79, 0.97)                        |  |
| Group 3               |                     | 16.6 (3.1)         |  | 1.11 (0.32, 1.9)                             |
| Group 4               |                     | 15.5 (3.6)         |  |  |
| <b>Mothers</b>        |                     |                    |  |  |
| Group 1               | 10.3 (5.8)          | 11.5 (4.8)         | 1.21 (-0.12, 2.55)                         | 0.45 (-0.88, 1.79)                           |
| Group 2               | 10.8 (5.7)          | 11.1 (5.5)         | 0.32 (-1.29, 1.93)                         |  |
| Group 3               |                     | 12.8 (4.7)         |  | 1.95 (0.69, 3.2)                             |
| Group 4               |                     | 10.8 (5.8)         |  |  |

SD=standard deviation; \*difference of mean and 95% confidence interval

#### 4.3.10 Persuading smoker to smoke outside the home confidence score

Table 17 shown the results of persuading smoker to smoke outside the home. The scores of self-confidence in schoolchildren for persuading smokers not to smoke in home in the intervention group slightly improved from baseline to endline in group 1 (difference: 0.38; 95% CI: -0.69, 1.44) and group 2 (difference: 0.01; 95% CI: -1.29, 1.31). The difference of scores between group 1 and 2 was statistically significant (difference: 2.72; 95% CI 1.48, 3.96). Moreover, the scores in group 3 were higher than in group 4 (difference: 1.24; 95% CI: 0.31, 2.17).

Among the mothers, the scores of self-confidence for persuading smoker to smoke outside the home in group 1 (Difference: 2.08; 95%CI: 0.84, 3.32) and group 2 (Difference: 0.96; 95% CI: -0.53, 2.45) improved from baseline to endline. Compared between group 1 and 2, the scores in group 3 were higher than in group 4 (difference: 1.22; 95% CI: -0.01, 2.46). Among without pretesting group, the scores in group 3 was higher than in group 4 without significance (difference: 1.85; 95% CI: 0.64, 3.06).

From the above-results, the scores of each outcome were compared among groups without adjusting for baseline characteristics.

**Table 17: Persuading smoker to smoke outside the home confidence score**

|                       | Before<br>Mean (SD) | After<br>Mean (SD) | Before-After<br>(95% confidence interval)* | Between groups<br>(95% confidence interval)* |
|-----------------------|---------------------|--------------------|--|--|
| <b>Schoolchildren</b> |                     |                    |  |  |
| Group 1               | 13.4 (5.3)          | 13.8 (4.4)         | 0.38 (-0.69, 1.44)                         | 2.72 (1.48, 3.96)                            |
| Group 2               | 11.0 (5.1)          | 11.0 (5.2)         | 0.01 (-1.29, 1.31)                         |  |
| Group 3               |                     | 15.1 (3.3)         |  | 1.24 (0.31, 2.17)                            |
| Group 4               |                     | 13.9 (4.4)         |  |  |
| <b>Mothers</b>        |                     |                    |  |  |
| Group 1               | 9.5 (6.2)           | 11.6 (4.1)         | 2.08 (0.84, 3.32)                          | 1.22 (-0.01, 2.46)                           |
| Group 2               | 9.4 (5.4)           | 10.3 (5.3)         | 0.96 (-0.53, 2.45)                         |  |
| Group 3               |                     | 11.8 (4.8)         |  | 1.85 (0.64, 3.06)                            |
| Group 4               |                     | 10.0 (5.3)         |  |  |

SD=standard deviation; \*difference of mean and 95% confidence interval

#### 4.4 Summary of the results from testing on primary and secondary outcomes

**Table 18: Summary of result from testing on primary and secondary outcomes**

| Variable  | Pretest effect | Main effect (Intervention vs control) |
|---|----------------|---------------------------------------|
| <b>Primary outcomes</b>   |                |                                       |
|   | P value        | Odd ratios (95%CI)                    |
| Smoke-free home   | 0.68           | 1.52 (1.00, 2.26)                     |
| <b>Secondary outcomes</b>   |                |                                       |
| <b>Attitude score</b>   |                | <b>Coefficient (95% CI)</b>           |
| Student   | 0.23           | 0.50 (0.22, 0.78) *                   |
| Mother  | 0.17           | 0.32 (-0.37, 1.00)                    |
| Smoker  | 0.91           | -1.18 (-3.5, 1.14)                    |
| <b>Knowledge score</b>  |                |                                       |
| Student   | 0.08           | 0.50 (0.22, 0.78) *                   |
| Mother  | 0.10           | 0.47 (0.24, 0.69) *                   |
| Smoker  | 0.65           | 0.17 (-0.37, 0.71)                    |
| <b>Creating SFH confidence score</b>                                |                |                                       |
| Student   | 0.84           | 1.22 (0.48, 1.96) *                   |
| Mother  | 0.58           | 0.36 (-0.17, 0.89)                    |
| <b>Avoidance of SHSe in home confidence score</b>                   |                |                                       |
| Student   | 0.57           | 1.64 (0.24, 3.04)                     |
| Mother  | 0.30           | 1.19 (-0.06, 2.44)                    |
| <b>Persuading smoker to smoke outside the home confidence score</b> |                |                                       |
| Student   | 0.99           | 2.04 (0.69, 3.39) *                   |
| Mother  | 0.72           | 1.71 (0.61, 2.80) *                   |
| Number of cigarettes smoked per day                                 | 0.13           | 0.09 (-0.89, 1.07)                    |

\* P value <0.05; All outcomes adjusted for pretest assessment, religion and number of years attended school of mother

##### 4.4.11 Pretesting effect

Table 18 shows the statistical testing of pretesting effects and intervention effects on each outcome. The results show that the pretesting effects were not observed for any outcome.

#### 4.4.12 Primary outcome

After adjusting for religion, mother's education and pretesting, the intervention program was more likely to increased SFH rate 1.52 times than control group (odds ratio: 1.52, 95%:1.00, 2.26). However, this test is not statistically significant.

#### 4.4.13 Secondary outcomes

The knowledge scores in intervention group were significantly higher than in the control group among schoolchildren (coefficient: 0.50, 95% CI: 0.22, 0.78) and their mothers (coefficient: 0.47, 95% CI: 0.24, 0.69). Among smokers, there was no significant difference between intervention and control groups (coefficient: 0.17, 95% CI: -0.37, 0.71).

Attitude scores were significantly in the intervention schoolchildren (coefficient: 0.50; 95% CI: 0.22, 0.78) but not in their mothers (coefficient: 0.32, 95% CI: -0.37, 1.00) nor among the smokers (coefficient: -1.18; 95% CI: -3.5, 1.14)

Creating SFH confidence scores in the intervention group were higher than in the control group among schoolchildren (coefficient: 1.22; 95% CI: 0.48, 1.96). However, in their mothers, the scores were not significantly different between the two groups (coefficient: 0.36, 95% CI: -0.17, 0.89).

For avoidance of SHSe in home confidence score, the scores in the intervention group were significantly higher than in the control group among schoolchildren (Coefficient: 1.64, 95% CI: 0.24, 3.04) but not among their mothers (coefficient: 1.19, 95% CI: -0.06, 2.44).

Persuading the smoker not to smoke in the home confidence scores in the intervention group were higher than in the control group both schoolchildren (coefficient: 2.04, 95% CI: 0.69, 3.39) and their mothers (coefficient: 1.71, 95% CI: 0.61, 2.80).

In addition, the number of cigarettes consumed did not decrease after the intervention (coefficient 0.09, 95% CI: -0.89, 1.07).

Other outcomes, there was no evidence of side-effect for example there was no report on adverse relationship between mother, children and smoker in the home, in which might be a result of SFH campaign.

## **CHAPTER 5**

### **DISCUSSION**

#### **5.1 Overview**

This research examined the effect of a brief school-based smoke-free home intervention program where schoolchildren acted as change agents. This program was found to be ineffective in increasing the percentage of SFH. The intervention was effective in motivating schoolchildren and their family's member. Among schoolchildren, there was observed the attitude towards the harms of SHSe and smoking, self-confidence scores in creating a SFH and avoiding SHSe. There were increased self-confidence scores for knowledge and ability to persuade smokers not smoke in their home in both schoolchildren and their mothers. Among smokers, no effect of the intervention on any outcome was observed. No pretest sensitization was also observed in this study.

#### **5.2 Primary outcome**

This study shows that there was no statistical significance in increasing SFH rates between the intervention and the control. Previous studies that aim to create a SFH and reduce SHSe in home have had mixed results. A school-based intervention that was performed at individual, family, and school levels to prevent the SHSe in schoolchildren had failed the results<sup>80</sup>. Furthermore, one family-based study conducted in Canada failed to detect an intervention effect in reducing the number of cigarettes smoked in the home.<sup>81</sup> On the other hand, two hospital-based studies<sup>42, 82</sup> and one family-based study<sup>83</sup> reported significant effects of their interventions aiming to promote a SFH. Two hospital-based studies, Yilmaz et al., showed that a brief and practical intervention for creating a smoke-free home was effective, and Harutyunyan

et al., examined an hospital-based intervention study aiming to reduce children's SHSe at home. They found that the intervention was effective in decreasing children's exposure to SHS through educating mothers and promoting smoking restrictions at home.

For the family-based study, Kegler et al., conducted a brief intervention for creating a smoke-free home in low-income households. At 6-months, participants in the intervention group reported a higher percentage of full ban on smoking in the home more than the control group (40.0% vs 25.4%;  $P = 0.002$ ). A SFH is, perhaps, too hard to achieve, especially by a sole school-based intervention. Without other enhancements, schoolchildren in general may not be strong change agents.

### 5.3 Secondary outcomes

In this study, schoolchildren and their mothers could be empowered to gain self-confidence in their ability to persuade smokers to not smoke in the home and to avoid SHSe. Since family members had a higher self-confidence in avoiding SHSe, this effect might emerge as a social norm in their family to make their home to be smoke-free in the future. However, in a male-dominated society like rural Southern Thailand<sup>84</sup>, smokers, who mostly have a low education, tend to play down the importance of health and women's and children's right to health. This is consistent with previous findings that low socio-economic status was found to be associated with smoking in the home<sup>85</sup>. Therefore, enhancing self-confidence of non-smoking family members to avoid SHSe in their home is important to protect themselves from the harms associated with SHSe.

In assessment of various psychometric parameters, questions are often employed to the same respondent before and after an intervention is given. Most previous interventions on smoking control, knowledge and attitude were often measured repeatedly<sup>42</sup>. However, this was conducted without consideration of possible pretest effects. We have shown that there was no pretest sensitization effect on



knowledge and attitude, and this reveals that this effect could not modify the effect of the intervention among students and their mother. The implication of this finding is that a pretest can be done without concern about participants remembering the questions at a previous testing which may influence posttest scores.

#### **5.4 Strengths and limitations**

The main limitation of this study is a failure to achieve random allocation of the intervention causing an imbalance of covariates. However, these factors were completely adjusted for in the analysis. The 52% increase in the odds of SFH but without statistical significance may suggest insufficient power of the study.

#### **5.5 Research implications**

This is the first study using the Solomon-four group design for testing the effect of an intervention and pretesting effect in a smoke free home research study. This school-based intervention shows promise in creating their homes to be smoke free, and improving self-confidence to create a smoke free home, to avoid SHSe, and to persuade smokers not to smoke in their home. This effect of this school-based intervention suggests that future smoke free home intervention should be enhanced by other measures. Pretest effect in this study was not observed. Therefore, in a future study, there was no regards for the pretest effect on the posttest after intervention.

#### **5.6 Conclusion**

To conclude, a school-based intervention can improve attitude and knowledge towards the harms of SHSe and smoking and self-confidence in creating a SFH, avoidance of SHSe and persuading smokers not to smoke in the home. However,

it is not as effective in creating a SFH. Pretest sensitization in this context may not lead to changes in posttest scores.

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## **ANNEXES**

## **ANNEX I: Results from the Phase I Study**

**Purpose:** to study the smoking behaviour in home, suggestion in creating a smoke free home

**Results:** This finding shows that a smoker had been mostly smoke at in front of their house, and there have someone smoked in their home. In addition, when there had a drinking in their home, there have to smoking. For creating a smoke free home by children, participants told “yes, I think that it’s possible and children can tell their father who are a smoker or a family member who are a smoker”. They suggested that there should pasted a sticker on the wall of their house or create an area for drinker outside the home.

**Conclusion:** a smoke-free home program, children can create their home to be a smoke free and suggested a children pasting a sticker on the wall in their home.

## **ANNEX II: Results from the Phase II Study**

**Purpose:** to test reliability of attitude and knowledge related to SHSe and smoking and test a smoke-free home program module

**Study design:** cross sectional study

Results:

Fifty-five schoolchildren were included in this study. Table 1 shows the characteristics of participants that were comprised of female 40.7%, Buddhism 76.4%, and relatives more than or equal 2 50%

Smoking behaviour, schoolchildren are currently smoked 3.6% never smoked 20%. There was reported they had seen their father smoked in home in the past 7 days 65.4% that were smoked everyday 34.5%, someday 30.9%.

Table 1. Schoolchildren characteristics

| Variables  | Class grades |             |             | Total<br>N=55 |
|--|--------------|-------------|-------------|---------------|
|  | 4<br>(n=18)  | 5<br>(n=16) | 6<br>(n=21) |               |
| Gender   |              |             |             |               |
| Male   | 9 (50)       | 11 (73.3)   | 12 (57.1)   | 32 (59.3)     |
| Female   | 9 (50)       | 4 (26.7)    | 9 (42.9)    | 22 (40.7)     |
| Religion   |              |             |             |               |
| Buddhism   | 14 (77.8)    | 13 (81.2)   | 15 (71.4)   | 42 (76.4)     |
| Islam  | 4 (22.2)     | 3 (18.8)    | 6 (28.6)    | 13 (23.6)     |
| Christianity   | 0            | 0           | 0           | 0             |
| Other  | 0            | 0           | 0           | 0             |
| Number of relatives                                  |              |             |             |               |
| 1  | 2 (11.1)     | 1 (6.7)     | 1 (4.8)     | 4 (7.4)       |
| 2  | 11 (61.1)    | 7 (46.7)    | 9 (42.9)    | 27 (50)       |
| 3  | 5 (27.8)     | 4 (26.7)    | 7 (33.3)    | 16 (29.6)     |
| 4  | 0 (0)        | 3 (20)      | 3 (14.3)    | 6 (11.1)      |
| 5  | 0 (0)        | 0 (0)       | 1 (4.8)     | 1 (1.9)       |
| Smoking  |              |             |             |               |
| Former smoking                                       | 0 (0)        | 9 (56.2)    | 2 (9.5)     | 11 (20)       |
| Current smoking                                      | 0 (0)        | 1 (6.2)     | 1 (4.8)     | 2 (3.6)       |
| Never smkoing  | 18 (100)     | 6 (37.5)    | 18 (85.7)   | 42 (76.4)     |
| Father smoking                                       |              |             |             |               |
| Ever seen smoking                                    | 13 (76.5)    | 12 (75)     | 16 (76.2)   | 41 (75.9)     |
| No never seen they smoking                           | 4 (23.5)     | 4 (25)      | 5 (23.8)    | 13 (24.1)     |
| In the past 7days, seen someone smoked in their home |              |             |             |               |
| Someday  | 7 (38.9)     | 1 (6.2)     | 9 (42.9)    | 17 (30.9)     |
| Everyday   | 7 (38.9)     | 7 (43.8)    | 5 (23.8)    | 19 (34.5)     |
| No   | 4 (22.2)     | 8 (50)      | 7 (33.3)    | 19 (34.5)     |
| In the past 7days, someone smoked in front of you    |              |             |             |               |
| Father   | 11 (78.6)    | 8 (80)      | 12 (66.7)   | 31 (73.8)     |
| Mother   | 0            | 0           | 0           | 0             |
| Grandfather  | 1 (7.1)      | 2 (20)      | 2 (11.1)    | 5 (11.9)      |
| Grandmother (father)                                 | 0            | 0           | 0           | 0             |
| Grandmother (mother)                                 | 4 (28.6)     | 0 (0)       | 1 (5.6)     | 5 (11.9)      |
| Brother  | 1 (7.1)      | 0 (0)       | 0 (0)       | 1 (2.4)       |
| Other  | 1 (7.1)      | 2 (20)      | 4 (22.2)    | 7 (16.7)      |
|  | 1 (7.1)      | 0 (0)       | 4 (22.2)    | 5 (11.9)      |

Table 2. Creating a smoke free home and self-confidence score in avoiding SHSe

| Variables  | Class grades |             |             | Total<br>N=55 |
|--|--------------|-------------|-------------|---------------|
|  | 4<br>(n=18)  | 5<br>(n=16) | 6<br>(n=21) |               |
| In the past 7 days, had you inhaled smoke?   |              |             |             |               |
| 1-3 day  | 0 (0)        | 1 (6.2)     | 0 (0)       | 1 (1.9)       |
| 4-6 day  | 17 (100)     | 6 (37.5)    | 18 (85.7)   | 41 (75.9)     |
| Everyday   | 0 (0)        | 8 (50)      | 3 (14.3)    | 11 (20.4)     |
| No   | 0 (0)        | 1 (6.2)     | 0 (0)       | 1 (1.9)       |
| A place that you inhaled smoke from cigarettes   |              |             |             |               |
| Home   | 4 (23.5)     | 9 (56.2)    | 5 (23.8)    | 18 (33.3)     |
| Friend's home  | 0 (0)        | 5 (31.2)    | 2 (9.5)     | 7 (13)        |
| School   | 6 (35.3)     | 0 (0)       | 11 (52.4)   | 17 (31.5)     |
| Temple   | 2 (11.8)     | 1 (6.2)     | 1 (4.8)     | 4 (7.4)       |
| Market   | 10 (58.8)    | 7 (43.8)    | 7 (33.3)    | 24 (44.4)     |
| Other  | 0            | 0           | 0           | 0             |
| Avoidance of SHSe in home confidence score from a smoker who are a family member                   | 7.8 (2.4)    | 6.8 (2.2)   | 8.1 (2.2)   | 7.6 (2.3)     |
| Avoidance of SHSe in home confidence score from a guest  | 8.2 (1.8)    | 6.5 (2.1)   | 7 (1.8)     | 7.2 (2.0)     |
| Persuading smoker to smoke outside the home confidence score from a smoker who are a family member | 7.2 (1.9)    | 5.7 (2.9)   | 5.7 (2.2)   | 6.2 (2.4)     |
| Persuading smoker to smoke outside the home confidence score from a guest                          | 6.2 (2.7)    | 4.9 (3.7)   | 5.1 (2.4)   | 5.4 (2.9)     |
| Creating SFH confidence score  | 8.1 (2.3)    | 6.7 (3.2)   | 9 (1.7)     | 8.0 (2.5)     |
| Do you think the questionnaire hard to understand?   |              |             |             |               |
| Yes  | 0 (0)        | 0 (0)       | 2 (9.5)     | 2 (3.7)       |
| No   | 17 (100)     | 16 (100)    | 19 (90.5)   | 52 (96.3)     |

From Table 2. Schoolchildren reported they inhaled a smoke 4-6day 75.9% and every day 20.4%. the area that inhaled a smoke was market 44.4%, their home 33.3%, and at school 31.5%. The understanding questionnaire of schoolchildren was 96.5% who said easy for understanding a question.

In addition, the reliability of attitude, knowledge on harms of SHSe and smoking and family relationship was tested in the schoolchildren, their mother and smokers.

Table 3. Attitude on harms of SHSe and smoking

|  | strongly disagree | disagree | agree | strongly agree | Mean (SD) |
|--|-------------------|----------|-------|----------------|-----------|
| 1. Smoke from other people's cigarettes is harmful for me. | 6                 | 1        | 12    | 27             | 3.3 (1.0) |
| 2. Smoking should be banned in all public places           | 3                 | 3        | 13    | 28             | 3.4 (0.9) |
| 3. Smoking helps exert one's imagination                   | 1                 | 3        | 20    | 23             | 3.4 (0.7) |
| 4. Smoking makes people look cooler                        | 4                 | 0        | 13    | 30             | 3.5 (0.9) |
| 5. Smoking is interesting                                  | 2                 | 0        | 16    | 29             | 3.5 (0.7) |
| 6. Everyone likes to get along with people who smoke       | 2                 | 1        | 14    | 30             | 3.5 (0.7) |
| 7. Parents should forbid children to smoke                 | 2                 | 2        | 11    | 32             | 3.6 (0.8) |
| 8. Parents can smoke in front of children                  | 1                 | 5        | 11    | 29             | 3.5 (0.8) |
| Total score (N=46)   |                   |          |       |                | 18 (2.6)  |
| Average  |                   |          |       |                | 2.2 (0.4) |

Cronbach's alpha = 0.80

strongly disagree            score 1

disagree                        score 2

agree                             score 3

strongly agree                score 4

Total scores: 8 - 32

Reverse scoring: 3<sup>rd</sup>, 6<sup>th</sup>, and 8<sup>th</sup> question

Table 4. Knowledge towards the harms of SHSe and smoking

|  | True | False | I do not know | Mean (SD) |
|--|------|-------|---------------|-----------|
| 1. SHS causes lymphoma   | 26   | 9     | 12            | 2.3 (0.9) |
| 2. SHS is associated with stroke                                     | 7    | 25    | 15            | 1.8 (0.7) |
| 3. SHS is associated with asthma                                     | 38   | 6     | 3             | 2.7 (0.7) |
| 4. SHS causes common cold  | 19   | 10    | 18            | 2.0 (0.9) |
| 5. The younger one starts smoking, the higher the risk is for cancer | 38   | 6     | 3             | 2.7 (0.6) |
| 6. It is possible to be addicted to smoking                          | 29   | 14    | 4             | 2.5 (0.7) |
| 7. Smoking makes one's teeth turn yellow                             | 37   | 4     | 6             | 2.7 (0.7) |
| Total score (N=48)   |      |       |               | 4.3 (1.6) |
| Average scores   |      |       |               | 0.6 (0.2) |

Cronbach's alpha = 0.73

False score 0

True score 1

I don't know score 0

Total scores: 0- 7

Reverse scoring: 2<sup>nd</sup> and 4<sup>th</sup> question



Table 5. family relationship

|  | Often | Sometime | Never | Mean (SD)  |
|--|-------|----------|-------|------------|
| 1. When family member do a good things, there have an appreciate parlance to them.                                       | 3     | 11       | 0     | 2.2 (0.4)  |
| 2. In your family, there have asked about family's welfare   | 6     | 7        | 1     | 2.4 (0.6)  |
| 3. In your family, there have been getting the opinions of people in the family , although not with their own opinions . | 6     | 8        | 0     | 2.4 (0.5)  |
| 4. Your family wad often how do you think or feeling   | 3     | 10       | 1     | 2.1 (0.5)  |
| 5. When there have inconsistency thinks, they have talked to a mutual agreement .  | 3     | 9        | 2     | 2.1 (0.6)  |
| 6. Your family usually do an activity together eg, travel  | 5     | 8        | 1     | 2.3 (0.6)  |
| 7. During your family member are doing some activity, there have often consulted to each other.                          | 8     | 6        | 0     | 2.6 (0.5)  |
| 8. When you have some trouble, you had got the helping from your family member.  | 8     | 6        | 0     | 2.6 (0.5)  |
| N=14   |       |          |       | 18.6 (3.0) |
| Average scores   |       |          |       | 2.3 (0.4)  |

Cronbach's alpha = 0.84

Never                      Score 1

Sometime                Score 2

Never                      Score 3

Total scores: 8- 24

Reverse score: -

**Conclusion:** The Cronbach's alpha of knowledge, attitude and family relationship was 0.80, 0.73, and 0.84, respectively. Therefore, we will use this question for measurement attitude, knowledge and family relationship in the Phase III. sTesting the smoke-free home program, a teacher suggested that the program should be included drawing picture, multi-media related to smoke-free home and avoiding secondhand smoke exposure.

## ANNEX III: Smoke-free home program

### 5.1 Schoolchildren manual


|   |   |
|---|---|
| <p>ปรึกษาสายด่วนเลิกบุหรี่<br/>โทร 1600</p> |  <p>คู่มือบ้านปลอดบุหรี่<br/>สำหรับนักเรียน</p> <p>ชื่อ.....ห้อง.....</p> <p>โรงเรียน.....</p> <p>จัดทำโดย<br/>หน่วยระบาดวิทยา คณะแพทยศาสตร์<br/>มหาวิทยาลัยสงขลานครินทร์</p> |
|---|---|

-แผ่นที่ 1-

|   |  |
|---|--|
| 2   | 7  |
| <p>สารบัญ</p> <ol style="list-style-type: none"> <li>1. คิววันบุหรีมือสองและอันตราย</li> <li>2. ข้อดีของบ้านปลอดบุหรี</li> <li>3. ขั้นตอนทำบ้านปลอดบุหรี</li> <li>4. การหลบหลีกควันบุหรีพิษ</li> <li>5. ปรึกษาสายด่วนเลิกบุหรี</li> </ol> | <p>การหลบหลีกควันบุหรีเป็นพิษ</p> <p>ในกรณีที่ไม่สามารถทำบ้านให้ปลอดบุหรีได้</p> <ol style="list-style-type: none"> <li>1. ทุกครั้งได้กลิ่นควันบุหรี ให้เปิดหน้าต่างและพัดลม รอให้กลิ่นบุหรีหายก่อนเข้าไปในบ้าน</li> <li>2. ติดป้ายห้ามสูบบุหรี ในแต่ละห้องหรือบริเวณที่ห้ามสูบบุหรี</li> <li>3. กำหนดบริเวณนอกตัวบ้าน ให้เป็นที่สามารถสูบบุหรีได้ และอย่าเข้าไปเล่นในบริเวณนั้นเด็ดขาด</li> </ol> |

-แผ่นที่ 2-

6



**ขั้นตอนทำบ้านปลอดบุหรี่**

ขั้นตอนที่ 1. ให้อบรม แม่ แลพ่อ หรือคนในบ้าน  
ว่าจะมีวิธีทำที่บ้านปลอดบุหรี่ได้อย่างไร

ขั้นตอนที่ 2. กำหนดวันบ้านปลอดบุหรี่ปริ่ร่วมกันในครอบครัว


ขั้นตอนที่ 3. เริ่มทำบ้านให้ปลอดบุหรี่

ขั้นตอนที่ 4. รักษาบ้านให้ปลอดบุหรี่ตลอดไป  
(บอกให้สูบบุหรี่นอกบ้าน ทุกครั้งที่เห็น)

3

**ควันบุหรี่มือสอง และ อันตรายของควันบุหรี่**

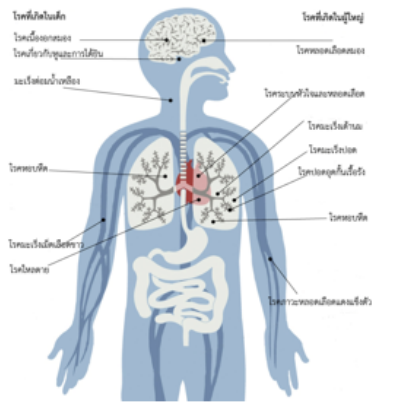
ควันบุหรืมือสองหมายถึง ควันบุหรืที่พ่นออกมาจากคนสูบบุหรื และ ควันที่ออกมาจากการเผาไหม้ของบุหรืเองโดยตรง ควันบุหรืมือสองประกอบด้วยสารเคมีจำนวนมาก จึงก่อให้เกิดโรคมะเร็งและเป็นพิษต่อร่างกาย



-แผ่นที่ 3-

4


**โรคที่เกิดจากการสูดควันบุหรืมือสอง**



5

**ข้อดีของบ้านปลอดบุหรื**

1. ป้องกันการเกิดโรคร้ายจากการสูดควันบุหรื
2. ทำให้มีอากาศที่สดชื่นในบ้านของนักเรียน
3. ทำให้ครอบครัวมีความสุข ยิ้มแย้มมากขึ้น



-แผ่นที่ 4-

## 5.2 Teacher manual



คู่มือแนวทางการสอน สำหรับครู

โครงการบ้านปลอดบุหรี่



โดย หน่วยระบาดวิทยา คณะแพทยศาสตร์ มหาวิทยาลัยสงขลานครินทร์ วิทยาลัยเซตวาดใหญ่

ร่วมกับ

ศูนย์วิจัยและจัดการความรู้เพื่อการควบคุมยาสูบ (ศจย.) และ

สำนักงานกองทุนสนับสนุนการสร้างเสริมสุขภาพ (สสส.)

## สารบัญ

### สัปดาห์ที่ 1. ควันบุหรีมือสองและอันตรายจากควันบุหรีมือสอง

- ความรู้เกี่ยวกับควันบุหรีมือสอง และ อันตรายของควันบุหรีมือสอง
- ข้อดี ของการทำบ้านปลอดบุหรี
- บ้านปลอดบุหรี ชั้นตอนที่ 1 ปรึกษากับผู้ปกครองเพื่อกำหนดวันบ้านปลอดบุหรี
- กิจกรรมกลุ่ม

### สัปดาห์ที่ 2. เตรียมความพร้อมในการทำบ้านปลอดบุหรี

- ทบทวน “บุหรีเป็นสิ่งที่อันตราย ห้ามลองสูบเด็ดขาด”
- บ้านปลอดบุหรี ชั้นตอนที่ 2 เริ่มทำบ้านปลอดบุหรี
- กิจกรรมกลุ่ม

### สัปดาห์ที่ 3. การหลบหลีกควันบุหรีพิษ

- ทบทวน สัปดาห์ที่ 1 และ 2
- เทคนิคการหลีกเลี่ยงควันบุหรีเป็นพิษ และ ดูวิดีโอควันบุหรี
- บ้านปลอดบุหรี ชั้นตอนที่ 3 วิธีรักษาบ้านปลอดบุหรีให้คงอยู่นานๆ

### สัปดาห์ที่ 4. ขั้นตอนทำบ้านปลอดบุหรี

- สรุปการทำบ้านปลอดบุหรี

## สัปดาห์ที่ 1

### คว้นบุนหรีมือสองและอันตรายจากคว้นบุนหรีมือสอง

#### จุดประสงค์

1. ให้เข้าใจ เกี่ยวกับคว้นบุนหรีมือสองและอันตรายของการสูดคว้นบุนหรีเข้าไป
2. ให้เข้าใจถึงอันตรายของการมีผู้สูบบุนหรีในบริเวณตัวบ้าน

กระบวนการเรียนรู้ในห้องเรียน (ระยะเวลาไม่เกิน 30 นาที)

ให้นักเรียน ศึกษาคู่มือบ้านปลอดบุนหรี อันตรายของคว้นบุนหรีมือสอง และอันตรายจากคว้นบุนหรีของการมีผู้สูบบุนหรีในบ้าน

**จุดประเด็น** หลังจากได้อ่านหนังสือ คู่มือบ้านปลอดบุนหรีแล้ว

นักเรียนรู้สึกยังไงถ้าบ้านของเรามีคนสูบบุนหรีในบ้าน?

นักเรียนรู้สึกยังไงถ้าบ้านของเราเป็นบ้านที่ปลอดบุนหรี (ไม่มีคนสูบบุนหรีในบ้าน)?

ความรู้เกี่ยวกับคว้นบุนหรี

คว้นบุนหรีมือสองคืออะไร?

คว้นบุนหรีมือสอง คือคว้นบุนหรีที่ผสมกันระหว่าง **คว้นบุนหรีที่พ่นออกมาจากคนสูบบุนหรี** ผสมกับ **คว้นที่ออกมาจากการเผาไหม้ของบุนหรีโดยตรง** คว้นบุนหรีมือสองประกอบด้วยสารเคมีที่เป็นพิษจำนวนมาก ถึง 250 ชนิด ก่อให้เกิดโรคมะเร็งจำนวนมากถึง 60 ชนิด



สารพิษในควันบุหรี ทำอันตรายต่อร่างกายอย่างไร

1. นิโคติน เป็นสารที่ทำให้เกิดการเสพติด และทำให้เกิดโรคหัวใจ
2. ทาร์ ประกอบด้วยสารก่อมะเร็งหลายชนิด
3. คาร์บอนมอนนอกไซด์ เป็นก๊าซชนิดเดียวกับที่พ่นออกมาจากท่อไอเสียรถยนต์ ก๊าซนี้จะขัดขวางการลำเลียงออกซิเจนของเม็ดเลือดแดง
4. ไฮโดรเจนไซยาไนด์ เป็นก๊าซที่ทำลายเยื่อบุหลอดลม และถุงลม ทำให้เกิดอาการไอ มีเสมหะ และหลอดลมอักเสบ
5. ไนโตรเจนไดออกไซด์เป็นก๊าซที่ทำลายเยื่อบุหลอดลม และถุงลม ทำให้เป็นโรคถุงลมโป่งพอง
6. แอมโมเนีย มีฤทธิ์ระคายเคืองเนื้อเยื่อ ทำให้แสบตา แสบจมูก หลอดลมอักเสบ
7. ไซยาไนด์ เป็นสารพิษที่ใช้เป็นยาเบื่อหนู
8. สารกัมมันตภาพรังสีโพโลเนียม - 210 เป็นสาเหตุหนึ่งของการเกิดโรคมะเร็ง
9. ฟอर्मัลดีไฮด์ เป็นสารที่ใช้ในการดองศพ

ควัณบุหรืมือสองเป็นอันตรายต่อคนไม่สูบบุหรืทั้งต่อเด็กและผู้ใหญ่อย่างไร?

ควัณบุหรืมือสองประกอบไปด้วยสารพิษจำนวนมาก ทั้งนี้ผลกระทบจะเกิดขึ้นทั้งในเด็กและผู้ใหญ่ อย่างไรก็ตามเด็กจะได้รับผลกระทบมากกว่าผู้ใหญ่ เพราะเด็กหายใจได้ลึกและรวดเร็วการสูบบุหรื ดังนั้นถ้าเด็กหายใจเอาควัณบุหรืเข้าไปจะทำให้ได้รับสารพิษ เข้าไปสู่ปอดมากกว่าผู้ใหญ่ ซึ่งโรคที่เกิดจากการได้รับควัณบุหรืมือสอง เกิดได้ทั้งในเด็กและผู้ใหญ่ ดังนี้

ในหญิงมีครรภ์ และทารก

- ทำให้เกิดความเสีงที่ทารกแรกคลอดจะมีน้ำหนักตัวต่ำกว่าปกติ
- มีความเสีงของอาการเกิดโรคไหลตายในเด็กสูงขึ้ (ตายโดยไม่รู้ตัวในขณะนอนหลับ)

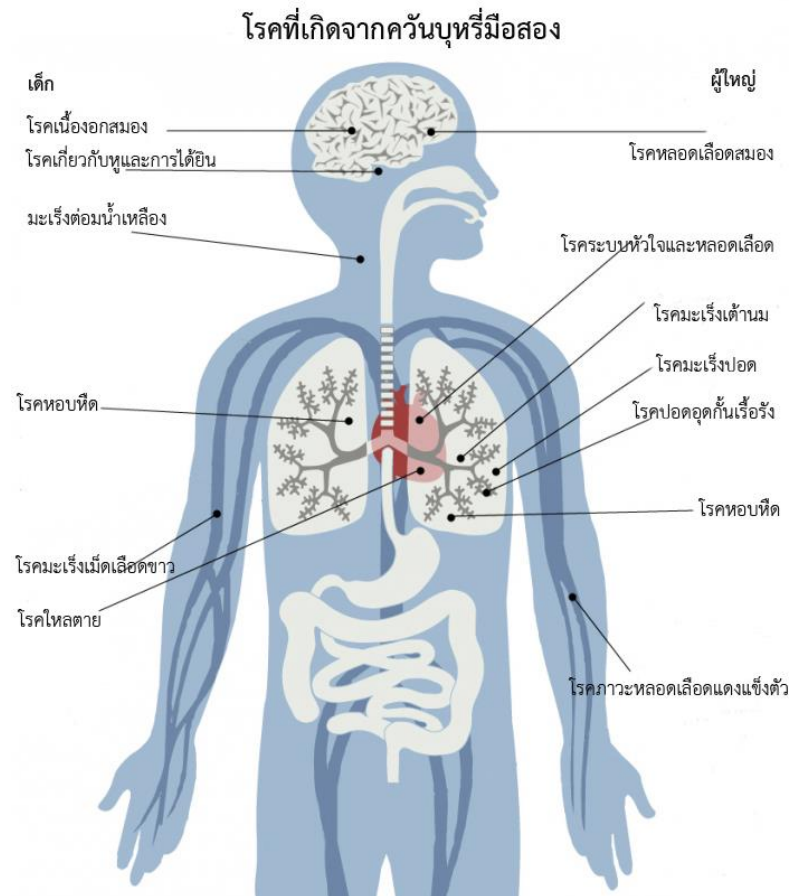
ในเด็กเล็ก

- ทำให้เกิดความเจ็บป่วยด้วย โรคติดเชื้อทางเดินหายใจ เช่น หลอดลมอักเสบ และปอดบวม โรคหอบหืด เกิดการติดเชื้อของหูส่วนกลาง โรคเกี่ยวกับหูและการได้ยิน โรคเนื้องอกสมอง มะเร็งต่อมน้ำเหลืองโรคมะเร็งเม็ดเลือดขาว และในระยะยาว เด็กที่ได้รับควัณบุหรื พัฒนาการของปอดจะน้อยกว่า เด็กที่ไม่ได้รับควัณบุหรื

ในผู้ใหญ่

ทำให้เกิด โรคมะเร็งปอด โรคระบบหัวใจและหลอดเลือด โรคปอดอุดกัันเรื้อรัง โรคหลอดเลือดสมอง โรคภาวะหลอดเลือดแดงแข็งตัว โรคมะเร็งเต้านม





## กิจกรรม

**กิจกรรมที่ 1** (ทำในห้อง) ให้นักเรียนบอกความหมายของคว้นบุหรีมือสอง (ใบงานที่ 1) จากนั้นเติมชื่อโรคที่เกิดจากการหายใจเอาคว้นบุหรีมือสองเข้าไป (ใบงานที่ 2)

**กิจกรรมที่ 2** (การบ้าน) ให้นักเรียนเอาใบเอกสาร บ้านปลอดบุหรี (ใบงานที่ 3) ไปสอบถามคนในครอบครัวที่สูบบุหรี ว่า “ทำไมถึงสูบบุหรี” และ “รู้หรือไม่ว่าคว้นบุหรีมีอันตรายต่อผู้สูบและต่อเด็กอย่างไร” ถ้าใครไม่มีคนสูบบุหรีในบ้าน ให้ถามผู้ปกครอง เฉพาะคำถาม “รู้หรือไม่ว่า คว้นบุหรีมีอันตรายต่อใครได้บ้าง” แล้วส่งกลับครูในวันรุ่งขึ้น

### อุปกรณ์และสื่อ

1. เอกสารความรู้เกี่ยวกับคว้นบุหรีมือสอง
2. ใบงานที่ 1 คว้นบุหรีมือสองคืออะไร
3. ใบงานที่ 2 เติมชื่อโรคที่เกิดจากการสูดเอาคว้นบุหรีมือสองเข้าไป
4. ใบงานที่ 3 กำหนดวันบ้านปลอดบุหรี

### การวัดและประเมินผล

1. ใบงาน ที่ 1 2 และ 3 (เอกสารขอให้คุณครูเก็บจากนักเรียน โดยที่นักวิจัยจะ  
มาเก็บจากคุณครูในภายหลัง)

## สัปดาห์ที่ 2

### กิจกรรมเพื่อเตรียมความพร้อมในการทำบ้านปลอดบุหรี่

#### จุดประสงค์

1. เพื่อทบทวนความรู้และอันตรายจากการสูดควันบุหรี่มือสอง
2. เพื่อให้เข้าใจของข้อดีการทำบ้านปลอดบุหรี่
3. เพื่อสร้างแรงบันดาลใจและสร้างความมั่นใจให้นักเรียนทำบ้านตัวเองให้ปลอดบุหรี่

#### จุดประเด็น หลังจากทบทวนความรู้เรื่องควันบุหรี่มือสองและอันตราย

นักเรียนรู้สึกอย่างไรถ้าบ้านของเรามีคนสูบบุหรี่ในบ้าน?

นักเรียนรู้สึกอย่างไรถ้าบ้านของเราเป็นบ้านที่ปลอดบุหรี่ (ไม่มีคนสูบบุหรี่ในบ้าน)?

กระบวนการเรียนรู้ในห้องเรียน (ระยะเวลาไม่เกิน 30 นาที)

คุณครูอธิบายข้อดีของการทำบ้านปลอดบุหรี่ (แล้วถามนักเรียน เกี่ยวกับการได้รับควันบุหรี่และข้อดีของการมีบ้านปลอดบุหรี่) ดังนี้

ให้คุณครูถามนักเรียนว่า จากการเรียนในช่วงที่ผ่านมา นักเรียนได้ทราบว่าควันบุหรี่มือสองและอันตรายจากการสูดควันบุหรี่เข้าไป จะสามารถทำให้ตนเองและคนไม่สูบบุหรี่เกิดโรคอะไรบ้าง ถามนักเรียนว่า

“ไหนนักเรียนลองบอกครูหน่อยว่า ถ้าสูดควันบุหรี่เข้าไปจะสามารถทำให้เกิดโรคอะไรได้บ้าง?”

“นักเรียนตอบคำถาม.....”

นักเรียนได้ทำการบ้านตามที่ได้รับมอบหมายให้ไปทำแล้ว ไหนลองบอกครูหน่อยว่า “นักเรียนจะสามารถทำบ้านของตนเองให้ปลอดบุหรี่ได้อย่างไร”

“นักเรียนตอบคำถาม.....”

คุณครูอาจจะแนะนำว่า “เช่น บอกให้พ่อหรือคนที่สูบบุหรี่ ออกไปสูบนอกบ้าน ทุกครั้งที่เห็นเขาสูบ”  
หรือ “เขียนป้ายลงบนกระตาด ห้ามนสูบบุหรี่เด็ดขาด แล้วเอาไปติดไว้บริเวณในบ้านที่เขาสูบบุหรี่”

### ความรู้เกี่ยวกับการทำบ้านให้ปลอดบุหรี่

#### วิธีการทำบ้านให้ปลอดบุหรี่

1. บอกถึงภัยจากบุหรี่และภัยจากควันบุหรี่ ให้ผู้สูบบุหรี่ในบ้านทราบ
2. บอกถึงอันตรายหรือผลกระทบ ที่เด็กจะได้รับจากควันบุหรี่มือสอง
3. ติดป้ายห้ามนสูบบุหรี่ในตัวบ้าน
4. จัดพื้นที่ในการสูบบุหรี่ ในกรณีที่ยังเลิกไม่ได้ เช่น ให้สูบบริเวณนอกตัวบ้าน ที่อากาศถ่ายเทได้สะดวก
5. ชักชวนแนะนำให้เลิกสูบบุหรี่ โดยอาจจะปรึกษาศูนย์เลิกสูบบุหรี่ ที่อยู่ใกล้บ้านก็ได้

#### บ้านปลอดบุหรี่มีข้อดีอย่างไร?

ประโยชน์ของการมีบ้านปลอดบุหรี่มีหลายอย่างดังนี้

1. ทำให้มีความเสี่ยงเกิดโรคหอบหืด โรคถุงลมโป่งพอง โรคมะเร็ง น้อยกว่าบ้านที่ไม่ปลอดบุหรี่
2. ทำให้มีอากาศที่สดชื่นในบ้านของนักเรียน
3. ทำให้ครอบครัวมีความอบอุ่น ใกล้ชิดกันมากขึ้น

เราจะทำบ้านให้ปลอดบุหรี่ได้อย่างไร?

- ขั้นตอนที่ 1. ให้ปรึกษา แม่และพ่อ หรือคนในบ้าน ว่าจะมีวิธีทำให้บ้านปลอดบุหรี่ได้อย่างไร
- ขั้นตอนที่ 2. กำหนดวันบ้านปลอดบุหรี่ ร่วมกันในครอบครัว

ขั้นตอนที่ 3. เริ่มทำบ้านให้ปลอดบุหรี่

ขั้นตอนที่ 4. รักษาบ้านให้ปลอดบุหรี่ตลอดไป โดยที่ให้ออกคนสูบบุหรี่ ออกไปสูบนอกบริเวณบ้านทุกครั้งที่ได้กลิ่นควันบุหรี่ หรือ เห็นเขาสูบบุหรี่

### กิจกรรมที่ 1 กิจกรรมวาดรูป

วันนี้เราจะทำกิจกรรมวาดรูป บ้านเราเป็นบ้านปลอดบุหรี่ ให้นักเรียนวาดรูปในใบงานที่ 4 ของแต่ละคน ใช้เวลา 10 นาที จากนั้นเอามานำเสนอให้เพื่อนดูที่หน้าห้อง เมื่อนักเรียนวาดรูปบ้านปลอดบุหรี่แล้ว ให้เขียนคำว่า “ห้ามสูบบุหรี่ในบ้านเด็ดขาด เพราะจะทำให้หนูป่วย” หลังจากนั้นนำเสนอแล้ว ให้ทุกคนแสดงแผ่นที่เขียน ให้คุณครูดู โดยยกขึ้นเหนือศีรษะ จากนั้นให้เอาไปอ่าน ให้คนที่สูบบุหรี่ที่บ้านฟัง ในกรณีที่ไม่มีคนสูบบุหรี่ที่บ้านให้เอาไปติดไว้ในบริเวณในบ้านของตนเอง

กิจกรรมที่ 2 (การบ้าน) ให้นักเรียนเอาใบกำหนดวันบ้านปลอดบุหรี่ (ใบงานที่ 5 บ้านนี้ปลอดบุหรี่) เอาไปให้คนสูบบุหรี่ที่บ้านเซ็นต์ ถ้าใครไม่มีคนสูบบุหรี่ให้แม่เป็นคนเซ็นต์ แล้วส่งกลับครูในวันรุ่งขึ้น

อุปกรณ์และสื่อ

ใบงานที่ 4 รูปภาพวาด บ้านปลอดบุหรี่

ใบงานที่ 5 ระเบิดสี่ สติกเกอร์ บ้านนี้ปลอดบุหรี่

การวัดและประเมินผล (ตรวจใบงาน)

เมื่อนักเรียนทำกิจกรรมระบายสี ใบงานที่ 4 และ 5 แล้ว ให้นักเรียนเอาไปติดไว้ที่

บ้านของตนเอง

### สัปดาห์ที่ 3

#### การหลบหลีกควันบุหรี่เป็นพิษ

##### จุดประสงค์

ให้นักเรียนมีความมั่นใจในการหลบหลีกการสูดเอาควันบุหรี่เข้าไป

##### กระบวนการเรียนรู้ในห้องเรียน (ระยะเวลาไม่เกิน 30 นาที)

นักเรียนได้ทำการบ้านตามที่ได้รับมอบหมายให้ไปทำแล้ว ไหนลองบอกครูหน่อยว่า “จะกำหนดบ้านของตนเองให้ปลอดบุหรี่ตั้งแต่วันไหน กันบ้าง”

หลังจากนักเรียนได้ทำบ้านของตนเองให้ปลอดบุหรี่แล้ว ไหนนักเรียนลองบอกครูอีกครั้งว่า

1. การได้สูดเอาควันบุหรี่ (หรือควันบุหรี่มือสอง) เข้าไปจะทำให้เราเป็นโรคอะไรได้บ้าง?
2. หลังจากนักเรียนได้ทำบ้านของตนเองให้ปลอดบุหรี่แล้ว นักเรียนรู้สึกอย่างไรบ้าง

วันนี้เราจะมาเรียนรู้วิธี ในกรณีที่ยังคงมีการสูบบุหรี่ในบ้านของเราอยู่ โดยให้นักเรียนปฏิบัติตามขั้นตอนเหล่านี้

1. ในกรณีที่เข้าไปในบ้านแล้วได้กลิ่นบุหรี่ ให้เปิดหน้าต่าง และ ถ้ามีพัดลมให้เปิดพัดลม เพื่อระบายอากาศด้วย จากนั้นรอให้กลิ่นบุหรี่หายค่อยเข้าไปอยู่ในบ้าน
2. ติดป้ายห้ามสูบบุหรี่ ในแต่ละห้องหรือบริเวณที่เป็นที่ห้ามสูบบุหรี่
3. จัดบริเวณให้สูบบุหรี่นอกตัวบ้านหรือเลือกห้องสำหรับสามารถสูบบุหรี่ได้ เสนอให้คนที่สูบบุหรี่ สูบบุหรี่เฉพาะในห้องนี้ และเด็กๆอย่าเข้าไปเล่นในบริเวณนั้นเด็ดขาด

## อุปกรณ์และสื่อ

เอกสารอยู่ในคู่มือ บ้านปลอดบุหรี่

วิดีโอเกี่ยวกับความรู้ เรื่องควันบุหรี่ (ในแผ่น ซีดี ที่แนบมาด้วย)

การวัดและประเมินผล -

## สัปดาห์ที่ 4

### สรุปบ้านปลอดบุหรี่

#### จุดประสงค์

เพื่อสรุปให้นักเรียนได้เข้าใจถึงอันตรายของการสูดเอาควันบุหรี่มือสองเข้าไปและข้อดีของบ้านปลอดบุหรี่

#### กระบวนการเรียนรู้ในห้องเรียน (ระยะเวลาไม่เกิน 30 นาที)

ทั้งหมดที่นักเรียนได้เรียนมา จะเห็นได้ว่า ควันบุหรี่เป็นสารพิษที่มีผลต่อสุขภาพของคนที่ไม่ได้สูบบุหรี่เป็นอย่างมาก “วิชาที่นักเรียนเรียนมา เป็นการทำให้บ้านของตนเองให้ปลอดบุหรี่ เน้นให้นักเรียนรู้จักถึงพิษภัยของการได้สูดเอาควันบุหรี่เข้าไป ดังนั้นการจะทำให้บ้านของตนเองให้ปลอดบุหรี่ได้สำเร็จหรือไม่ นั่น นักเรียนไม่ต้องกังวลใจ เสียใจ หรือ หมดหวัง ใดๆเลย ขอเพียงให้นักเรียนได้ตระหนักถึงพิษภัยของการสูบและการได้รับควันบุหรี่ก็พอ”

ดังนั้นถ้าเห็นใครกำลังสูบบุหรี่ อย่าเข้าไปใกล้เด็ดขาด และถ้ามีใครมาชวนทดลองสูบบุหรี่ **ห้ามลองสูบเด็ดขาด** เพราะจะทำให้เราไม่เป็นโรคต่างๆและการทดลองสูบบุหรี่จะติดการสูบบุหรี่ได้ (เลิกสูบบุหรี่ไม่ได้)

#### อุปกรณ์และสื่อ

-

#### การวัดและประเมินผล

-





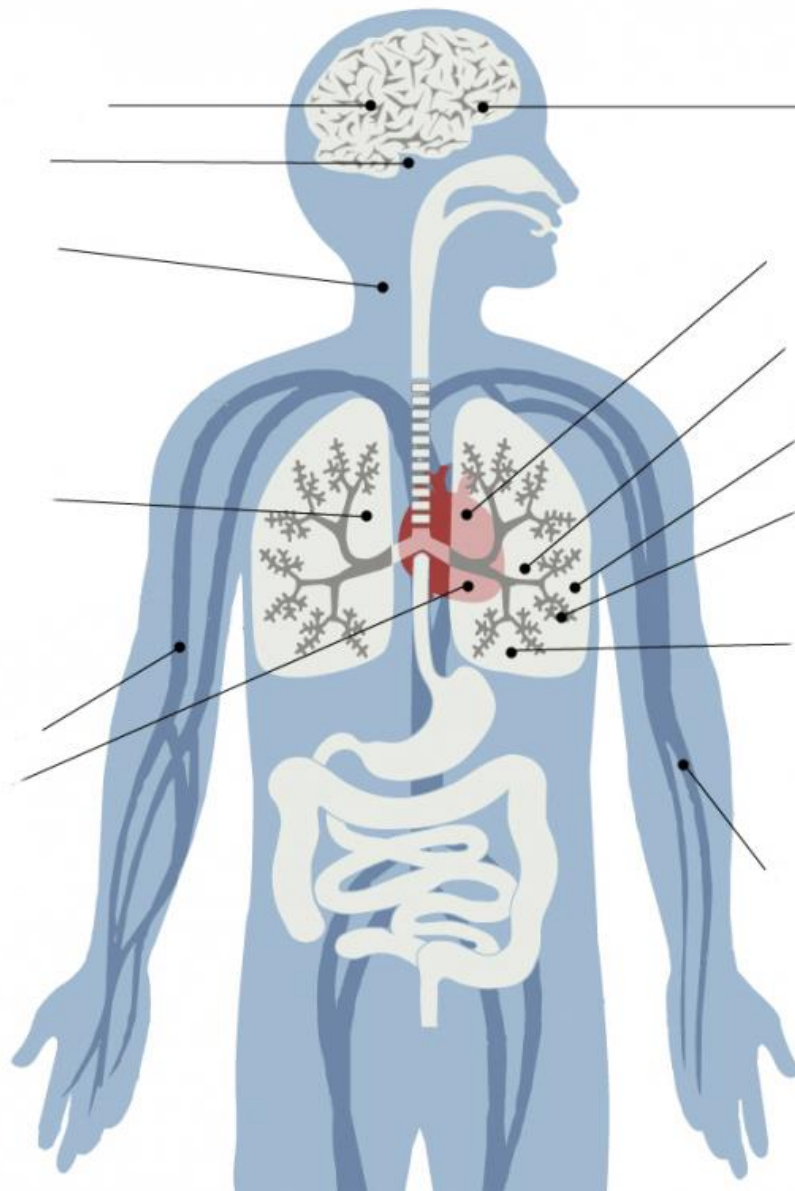
ใบงานที่ 2

ชื่อ.....นามสกุล.....โรงเรียน.....ชั้นปี.....ห้อง.....

โรคที่เกิดจากคว้นบุหรีมือสอง

เด็ก

ผู้ใหญ่



ใบงานที่ 3

ชื่อ.....นามสกุล.....โรงเรียน.....ชั้นปี.....

ห้อง.....

กำหนดวัน บ้านนี้ปลอดบุหรี่

ข้าพเจ้าชื่อ..... ตั้งแต่วันที่.....เดือน.....ปี.....ขอสัญญาว่า

จะปกป้อง ลูก และ ภรรยา ตลอดจนถึงคนไม่สูบบุหรี่ ไม่ให้ได้รับควันบุหรี่จากข้าพเจ้า โดยการไม่สูบบุหรี่ในบ้าน ทำบ้านปลอดจากการสูบบุหรี่ รวมไปถึงรถด้วย และ จะพยายามเลิกบุหรี่ ในเวลา

อันใกล้นี้

## ใบงานที่ 4

ชื่อ.....นามสกุล.....โรงเรียน.....ชั้นปี.....

ห้อง.....

ระบายสีในภาพวาดและเขียนข้อความ

## ANNEX IV: Questionnaire for schoolchildren

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>Part 1 Demographic data</b>   |                          |                          |                          |                          |
| 1. Class..... School.....<br>2. Date of birth ..... Month.....year..... (If you cannot remember)<br>age.....years<br>3. Gender <input type="checkbox"/> 1. Male <input type="checkbox"/> 2. Female<br>4. Religion <input type="checkbox"/> 1. Buddhism <input type="checkbox"/> 2. Islam <input type="checkbox"/> 3. Christianity <input type="checkbox"/> 4. Other, specify.....<br>5. In the present, who are you living?<br><input type="checkbox"/> 1. Father <input type="checkbox"/> 2. Mother <input type="checkbox"/> 3. grandfather <input type="checkbox"/> 4. grandmother<br><input type="checkbox"/> 5. Grandfather(father) <input type="checkbox"/> 6. grandmother (father) <input type="checkbox"/> 7. brother <input type="checkbox"/> 8. Aunt <input type="checkbox"/> 9. Other,<br>specify.....<br>6. The number of relatives..... order..... |                          |                          |                          |                          |
| <b>Part 2 Secondhand smoke exposure</b>  |                          |                          |                          |                          |
| 1. Have you ever been smoking in your life?<br><input type="checkbox"/> 1. Ever but now former smoking, specify the number of cigarettes.....rolls<br><input type="checkbox"/> 2. Current smoking, specify the number of cigarettes.....rolls<br><input type="checkbox"/> 3. Never   |                          |                          |                          |                          |
| 2. <u>In your life</u> , have you ever seen your father or parent smoking?<br><input type="checkbox"/> 1. seen <input type="checkbox"/> 2. never   |                          |                          |                          |                          |
| 3. <u>In the past 7 days</u> , have you seen someone in smoked in your home?<br><input type="checkbox"/> 1. someday <input type="checkbox"/> 2. everyday <input type="checkbox"/> 3. No  |                          |                          |                          |                          |
| 4. <u>In the past 7 days</u> , who are smoking<br><input type="checkbox"/> 1. father <input type="checkbox"/> 2. mother <input type="checkbox"/> 3. grandfather <input type="checkbox"/> 4. grandmother<br><input type="checkbox"/> 5. grandfather(father) <input type="checkbox"/> 6. grandmother (father) <input type="checkbox"/> 7. brother <input type="checkbox"/> 8. aunt <input type="checkbox"/> 9. other, specify.....<br><input type="checkbox"/> 9. no   |                          |                          |                          |                          |
| 5. Where had you often seen him smoke in the house?<br><input type="checkbox"/> 1. living room <input type="checkbox"/> 2. bedroom <input type="checkbox"/> 3. kitchen <input type="checkbox"/> 4. toilet <input type="checkbox"/> 5. basement<br><input type="checkbox"/> 6. At the back of house (in house) <input type="checkbox"/> 7. In front of house (in house) <input type="checkbox"/> 8. other,<br>specify.....<br><input type="checkbox"/> 9. no  |                          |                          |                          |                          |
| <b>Part 3 Knowledge and attitude on harms of SHSe and smoking. Please specify by using ✓ in the box <input type="checkbox"/></b>   |                          |                          |                          |                          |
|  | Strongly disagree        | Disagree                 | Agree                    | Strongly agree           |
| 1.Smoke from other people's cigarettes is harmful for me.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Smoking should be banned in all public places   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Smoking helps exert one's imagination   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Smoking makes people look cooler  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.Smoking is interesting   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Everyone likes to get along with people who smoke   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Parents should forbid children to smoke   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Parents can smoke in front of children  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

|  | True                     | False                    | I do not know            |  |
|--|--------------------------|--------------------------|--------------------------|--|
| 1. SHS causes lymphoma   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 2. SHS is associated with stroke                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 3. SHS is associated with asthma                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 4. SHS causes common cold  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 5. The younger one starts smoking, the higher the risk is for cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 6. It is possible to be addicted to smoking                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 7. Smoking makes one's teeth turn yellow                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |

Part 4 making a smoke free home and self-confidence of avoidance of secondhand smoke exposure

1. In the past 7 days, have you ever been inhaled smoke cigarettes?  
1. 1-3 days    2. 4-6days    3.everyday    4. no

2. In the past 7 days, where have you ever been inhaled smoke?  
1.home    2. friend's home    3.school    4. temple or mosque    5. market    6. public transport  
7.other, specify.....    8.no

3. If there have someone smoking near you, how do you feel?  
1.like    2.dormant    3.dislike

4. Have you ever making a smoke free home?    1.yes    2.no

5. If ever, what did you do?  
 1. no     2. Paste sticker "no smoking" in home     3. tell a smoker go to smoke outside the house  
 4. Take away the ashtrays outside     5. Tell them stop smoking     6. Other,  
specify.....

6. since now, how much confidence do you have in making your home smoke-free? please rate scores

|   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Not confident very confident

7. While you are staying in home, there have a **family member** smoking in home. How much confidence do you have in **avoiding SHSe**? (please mark ✓ over the number)

|   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Not confident very confident 8.

If a **guest** is smoking in home, how much confidence do you have in **avoiding SHSe**?

|   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Not confident very confident

9. While you are staying in home, there have a **family member** smoking in home. How much confidence do you in **stopping them not to smoke in home**?

|   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Not confident very confident

10. If a **guest** is smoking in home, how much confidence do you have in **stopping them not to smoke in home**?

|   |   |   |   |   |   |   |   |   |   |    |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Not confident very confident

## ANNEX V: Questionnaire for mother

|   |
|---|
| Part 1 Demographic data   |
| 1. Date of birth ___ month ___ year ___   |
| 2. Age ___ year   |
| 3. Religion <input type="checkbox"/> 1. Buddhism <input type="checkbox"/> 2. Islam <input type="checkbox"/> 3. Christianity <input type="checkbox"/> 4. Other, specify.....   |
| 4. Education<br><input type="checkbox"/> 1. no <input type="checkbox"/> 2. primary school <input type="checkbox"/> 3. secondary school<br><input type="checkbox"/> 4. high school <input type="checkbox"/> 5. certificate <input type="checkbox"/> 6. diploma<br><input type="checkbox"/> 7. bachelor or higher <input type="checkbox"/> 8. other, specify.....   |
| 5. Occupation<br><input type="checkbox"/> 1. unemployment <input type="checkbox"/> 2. Government employee <input type="checkbox"/> 3. agriculture <input type="checkbox"/> 4. merchant <input type="checkbox"/> 5. Contractors<br><input type="checkbox"/> 6. student <input type="checkbox"/> 7. freelance <input type="checkbox"/> 8. Other, specify.....   |
| 6. Household income per month<br><input type="checkbox"/> 1) น้อยกว่า 2,500 <input type="checkbox"/> 2) 2,501-5000 <input type="checkbox"/> 3) 5,001-7,500 <input type="checkbox"/> 4) 7,501-10,000 <input type="checkbox"/> 5) 10,001- 12,500 <input type="checkbox"/> 6) 12,501-15,000<br><input type="checkbox"/> 7) 15,501-17,500 <input type="checkbox"/> 8) 17,501-20,000 <input type="checkbox"/> 9) 20,001-22,500 <input type="checkbox"/> 10) 22,501-25,000 <input type="checkbox"/> 11) 25,001-27,500 <input type="checkbox"/> 12) 27,501-30,000<br><input type="checkbox"/> 13) 30,001-32,500 <input type="checkbox"/> 14) 32,501-35,000 <input type="checkbox"/> 15) 35,501-37,500 <input type="checkbox"/> 16) 37,501-40,000 <input type="checkbox"/> 17) 40,001-42,500 <input type="checkbox"/> 18) 42,501-45,000<br><input type="checkbox"/> 19) 45,001-47,500 <input type="checkbox"/> 20) มากกว่า 47,500 |
| 7. Household expenditure per month ..... THB  |
| 8. the number of close friends ..... persons<br>Among those, smoker ..... persons   |
| Part 2 smoking behavior and secondhand smoke exposure   |
| 1. Have you ever been smoked in your life?<br><input type="checkbox"/> 1.no<br><input type="checkbox"/> 2. ever but now stopped, specify the number of cigarettes.....rolls<br><input type="checkbox"/> 3. current smoking specify the number of cigarettes.....rolls/weeks   |
| 2. Have you ever been drinking in your life?<br><input type="checkbox"/> 1. Never <input type="checkbox"/> 2. Ever tried but now stop <input type="checkbox"/> 3. Ever drink but stopped time from stopped..... months<br><input type="checkbox"/> 4. current drinking  |
| 3. If current drinking, how often?<br><input type="checkbox"/> 1. everyday <input type="checkbox"/> 2. 3 - 4 days/week <input type="checkbox"/> 3. 1-2 days/week <input type="checkbox"/> 4. 1 - 3 days/month <input type="checkbox"/> 5. <1 day/month  |
| 4. How many smokers in your family?<br><input type="checkbox"/> 1. yes, specify.....person <input type="checkbox"/> 2. No (go to q7)  |
| 5. if yes, who are smoker?<br><input type="checkbox"/> 1. husband <input type="checkbox"/> 2. father <input type="checkbox"/> 3. mother <input type="checkbox"/> 4. brother <input type="checkbox"/> 5. sister <input type="checkbox"/> 6. son <input type="checkbox"/> 7. Other, specify.....  |
| 6. In the past 7 days, have you ever seen someone smoke in your home?<br><input type="checkbox"/> 1. yes, day/week..... <input type="checkbox"/> 2. no  |
| 7. who smoked cigarettes in home<br><input type="checkbox"/> 1. husband <input type="checkbox"/> 2. father <input type="checkbox"/> 3. mother <input type="checkbox"/> 4. brother <input type="checkbox"/> 5. sister <input type="checkbox"/> 6. son <input type="checkbox"/> 7. Other, specify.....  |
| 8. Where had you often seen him smoke in the house?<br><input type="checkbox"/> 1. living room <input type="checkbox"/> 2. bedroom <input type="checkbox"/> 3. kitchen <input type="checkbox"/> 4. toilet <input type="checkbox"/> 5. basement<br><input type="checkbox"/> 6. At the back of house (in house) <input type="checkbox"/> 7. In front of house (in house) <input type="checkbox"/> 8. other, specify.....<br><input type="checkbox"/> 9. No  |
| 9. In the past 7 days, have you ever been inhaled smoke cigarettes? <input type="checkbox"/> 1. Yes ..... day/week <input type="checkbox"/> 2. no   |
| 10. Had your children got sick?<br><input type="checkbox"/> 1. no <input type="checkbox"/> 2 yes, specify a disease.....  |

|   |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|---|---|---|----|---|---|---|---|---|----|
| <b>11. In the past 7 days, had you ever seen someone smoked?</b>  |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| Place   | everyday                 | 4-6days/week             | 13 days/week             | never                    | Don't know               |   |   |   |   |    |   |   |   |   |   |    |
| 1. temple, mosque   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |   |   |    |   |   |   |   |   |    |
| 2. car  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |   |   |    |   |   |   |   |   |    |
| 3. restrurant   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |   |   |    |   |   |   |   |   |    |
| 4. public place   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |   |   |    |   |   |   |   |   |    |
| 5. other's home   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |   |   |    |   |   |   |   |   |    |
| 6. market   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |   |   |    |   |   |   |   |   |    |
| <b>Part 3 protection and avoidance secondhand smoke exposure</b>  |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <b>1. In the past 1 month, had you ever protected or avoided SHSe in your home?</b>   |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <input type="checkbox"/> 1. No (go to Q2)<br><input type="checkbox"/> 2. Open window <input type="checkbox"/> 3. Paste sticker "no smoking"<br><input type="checkbox"/> 4. Open window when there has smoked smell<br><input type="checkbox"/> 5. Telling the smoker stop smoking in home <input type="checkbox"/> 6. Telling the smoker reduce consumption<br><input type="checkbox"/> 7. Telling the smoker top smoking before go to children<br><input type="checkbox"/> 8. Telling the smoker don't smoke near children<br><input type="checkbox"/> 9. Take children away from the area that have been smoking <input type="checkbox"/> 10. Other, specify..... |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <b>2. In the past 1 month, had you heard the news or promotion about a smoke free home?</b>   |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <input type="checkbox"/> 1. no <input type="checkbox"/> 2. ever - infrequently <input type="checkbox"/> 3. Ever-often <input type="checkbox"/> 4. Ever-very often   |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <b>3. In the past 1 month, have they drinking in your home?</b> <input type="checkbox"/> 1. yes <input type="checkbox"/> 2. no  |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| If yes, have there a drinking? <input type="checkbox"/> 1.yes, sometime <input type="checkbox"/> 2.yes, every time <input type="checkbox"/> 3.no  |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <b>4. While you are staying in home, there have a <b>family member</b> smoking in home. How much confidence do you have in <b>avoiding SHSe</b>? (please mark ✓ over the number)</b>  |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <table border="1" style="width:100%; text-align:center;"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> </tr> </table> <p style="text-align:center;">Not confident <span style="float:right;">very confident</span></p>  |                          |                          |                          |                          |                          | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 |
| 0   | 1                        | 2                        | 3                        | 4                        | 5                        | 6 | 7 | 8 | 9 | 10 |   |   |   |   |   |    |
| <b>5. If a <b>guest</b> is smoking in home, how much confidence do you have in <b>avoiding SHSe</b>?</b>  |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <table border="1" style="width:100%; text-align:center;"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> </tr> </table> <p style="text-align:center;">Not confident <span style="float:right;">very confident</span></p>  |                          |                          |                          |                          |                          | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 |
| 0   | 1                        | 2                        | 3                        | 4                        | 5                        | 6 | 7 | 8 | 9 | 10 |   |   |   |   |   |    |
| <b>6. While you are staying in home, there have a <b>family member</b> smoking in home. How much confidence do you have in <b>stopping them not to smoke in home</b>?</b>   |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <table border="1" style="width:100%; text-align:center;"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> </tr> </table> <p style="text-align:center;">Not confident <span style="float:right;">very confident</span></p>  |                          |                          |                          |                          |                          | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 |
| 0   | 1                        | 2                        | 3                        | 4                        | 5                        | 6 | 7 | 8 | 9 | 10 |   |   |   |   |   |    |
| <b>7. If a <b>guest</b> is smoking in home, how much confidence do you have in <b>stopping them not to smoke in home</b>?</b>   |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <table border="1" style="width:100%; text-align:center;"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> </tr> </table> <p style="text-align:center;">Not confident <span style="float:right;">very confident</span></p>  |                          |                          |                          |                          |                          | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 |
| 0   | 1                        | 2                        | 3                        | 4                        | 5                        | 6 | 7 | 8 | 9 | 10 |   |   |   |   |   |    |
| <b>8. Sine now, how much confidence do you have in helping your child to make your home to be a smoke-free?</b>   |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
| <table border="1" style="width:100%; text-align:center;"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> </tr> </table> <p style="text-align:center;">Not confident <span style="float:right;">very confident</span></p>  |                          |                          |                          |                          |                          | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 |
| 0   | 1                        | 2                        | 3                        | 4                        | 5                        | 6 | 7 | 8 | 9 | 10 |   |   |   |   |   |    |
| <b>Part 4 Knowledge and attitude on harms of SHSe and smoking. Please specify by using ✓ in the box <input type="checkbox"/></b>  |                          |                          |                          |                          |                          |   |   |   |   |    |   |   |   |   |   |    |
|   | Strongly disagree        | Disagree                 | Agree                    | Strongly agree           |                          |   |   |   |   |    |   |   |   |   |   |    |
| 1.Smoke from other people's cigarettes is harmful for me.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |   |   |   |   |    |   |   |   |   |   |    |
| 2. Smoking should be banned in all public places  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |   |   |   |   |    |   |   |   |   |   |    |
| 3. Smoking helps exert one's imagination  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |   |   |   |   |    |   |   |   |   |   |    |
| 4. Smoking makes people look cooler   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |   |   |   |   |    |   |   |   |   |   |    |
| 5.Smoking is interesting  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |   |   |   |   |    |   |   |   |   |   |    |



|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 6. Everyone likes to get along with people who smoke                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Parents should forbid children to smoke                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Parents can smoke in front of children                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|  | True                     | False                    | I do not know            |                          |
| 1. SHS causes lymphoma   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 2. SHS is associated with stroke                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 3. SHS is associated with asthma                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 4. SHS causes common cold  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 5. The younger one starts smoking, the higher the risk is for cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 6. It is possible to be addicted to smoking                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 7. Smoking makes one's teeth turn yellow                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |

## Part 5 Family relationships

|   | often                    | sometime                 | never                    |
|---|--------------------------|--------------------------|--------------------------|
| 1. When family member do a good things, there have an appreciate parlance to them.                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. In your family, there have asked about family's welfare  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. In your family, there have been getting the opinions of people in the family , although not with their own opinions. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Your family wad often how do you think or feeling  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. When there have inconsistency thinks, they have talked to a mutual agreement .                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Your family usually do an activity together eg, travel   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. During your family member are doing some activity, there have often consulted to each other.                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. When you have some trouble, you had got the helping from your family member.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## ANNEX VI: Questionnaire for smoker

|   |  |
|---|--|
| <b>Part 1 Demographic data</b>  |  |
| 1. Date of birth ___ month ___ year ___   |  |
| 2. Age ___ year   |  |
| 3. Religion <input type="checkbox"/> 1. Buddhism <input type="checkbox"/> 2. Islam <input type="checkbox"/> 3. Christianity <input type="checkbox"/> 4. Other, specify.....   |  |
| 4. Education<br><input type="checkbox"/> 1. no <input type="checkbox"/> 2. primary school <input type="checkbox"/> 3. secondary school<br><input type="checkbox"/> 4. high school <input type="checkbox"/> 5. certificate <input type="checkbox"/> 6. diploma<br><input type="checkbox"/> 7. bachelor or higher <input type="checkbox"/> 8. other, specify.....   |  |
| 5. Occupation<br><input type="checkbox"/> 1. unemployment <input type="checkbox"/> 2. Government employee <input type="checkbox"/> 3. agriculture <input type="checkbox"/> 4. merchant <input type="checkbox"/> 5. Contractors<br><input type="checkbox"/> 6. student <input type="checkbox"/> 7. freelance <input type="checkbox"/> 8. Other, specify.....   |  |
| <b>Part 2 smoking behavior</b>  |  |
| 1. In the past 7 days, have you ever seen someone smoke in your home?<br><input type="checkbox"/> 1. yes, day/week..... <input type="checkbox"/> 2. no  |  |
| 2. the place that you smoked in home<br><input type="checkbox"/> 1. living room <input type="checkbox"/> 2. dinning <input type="checkbox"/> 3. bedroom <input type="checkbox"/> 4. kitchen <input type="checkbox"/> 5. toilet <input type="checkbox"/> 6. basement<br><input type="checkbox"/> 7. At the back of house (in house) <input type="checkbox"/> 8. In front of house (in house) <input type="checkbox"/> 9. private car <input type="checkbox"/> 10. Public car<br><input type="checkbox"/> 11. Other, specify..... |  |
| 3. in the past 7 days, have you ever smoked near children?<br><input type="checkbox"/> 1. ใกล้ ประมาณ.....วันต่อสัปดาห์ <input type="checkbox"/> 2. ไม่ใกล้ <input type="checkbox"/> 3. จำไม่ได้  |  |
| 4. the number of close friend..... among those how many are smoker..... person  |  |
| 5. When did you start smoking? age ..... years  |  |
| 6. In the past week, how many cigarettes you smoked per day in average? .....   |  |
| 7. On average, how much do you spend money for cigarettes? .....  |  |
| 8. How soon after you wake up do your smoke your first cigarette?<br><input type="checkbox"/> 1. Within 5 mins <input type="checkbox"/> 2. 6-30 mins <input type="checkbox"/> 3. 31-60 mins <input type="checkbox"/> 4. After 60 mins   |  |
| 9. Do you find it difficult to refrain from smoking in places where it is forbidden? <input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No   |  |
| 10. Which cigarettes would you hate most to give up? <input type="checkbox"/> 1. The first one in the morning <input type="checkbox"/> 2. All others  |  |
| 11. Do you smoke more frequently during the first hours after waking than during the rest of the day?<br><input type="checkbox"/> 1. yes <input type="checkbox"/> 2. no   |  |
| 12. Do you smoke if you are so ill that you are in bed most of the day? <input type="checkbox"/> 1. yes <input type="checkbox"/> 2. no  |  |
| 13. What kind of tobacco that you have smoked frequent;y?<br><input type="checkbox"/> 1. factory <input type="checkbox"/> 2. Hand-roll <input type="checkbox"/> 3. Illegal tobacco <input type="checkbox"/> 4. Other, specify.....  |  |
| 14. Under which of the following situation that you usually smoke?<br><input type="checkbox"/> 1. Working <input type="checkbox"/> 2. Free time <input type="checkbox"/> 3. Boring or killing time <input type="checkbox"/> 4. Feeling nervous <input type="checkbox"/> 5. When children are not around<br><input type="checkbox"/> 6. After meals <input type="checkbox"/> 7. Drinking alcohol <input type="checkbox"/> 8. other, specify .....  |  |
| <b>Part 3 smoking cessation behavior</b>  |  |
| 1. In the past 1 month, have you ever stopped your smoking? <input type="checkbox"/> 1. ever no.....time <input type="checkbox"/> 2. no   |  |
| 2. What were your reasons for quitting in the recent attempts?<br><input type="checkbox"/> 1. Smoke-free legislation <input type="checkbox"/> 2. Person health reason <input type="checkbox"/> 3. Smoking is hazardous to family<br><input type="checkbox"/> 4. Advice from healthcare professionals <input type="checkbox"/> 5. Child told to quit <input type="checkbox"/> 6. Child told to smoke outside the home<br><input type="checkbox"/> 7. Smoking is risk <input type="checkbox"/> 8. Other, specify.....             |  |

|   |   |   |                          |                          |
|---|---|---|--------------------------|--------------------------|
| 3. Have your child influence to quit smoking?   | <input type="checkbox"/> 1.yes  | <input type="checkbox"/> 2.no                       |                          |                          |
| 4. Have your child influence not to smoke in home?  | <input type="checkbox"/> 1.yes  | <input type="checkbox"/> 2.no                       |                          |                          |
| 5. in the past 1 month, have your child ever request you not to smoke in home?  | <input type="checkbox"/> 1.yes  | <input type="checkbox"/> 2.no                       |                          |                          |
| 6. Have you decide to quit smoking and when?  | <input type="checkbox"/> 1. Sine now (preparation/contemplation) <input type="checkbox"/> 2. Within 7 days (preparation/contemplation)<br><input type="checkbox"/> 3. Within 30 day (preparation/contemplation) <input type="checkbox"/> 4. Within 6 months (contemplation)<br><input type="checkbox"/> 5. After 6 months (pre-contemplation) <input type="checkbox"/> 6. Un-decide (pre-contemplation) |   |                          |                          |
| 7. DO you know hot line quit smoking  | <input type="checkbox"/> 1. Yes, where.....   | <input type="checkbox"/> 2. no                      |                          |                          |
| 8. Have you ever been drinking in your life?  | <input type="checkbox"/> 1. Never   | <input type="checkbox"/> 2. Ever tried but now stop |                          |                          |
|   | <input type="checkbox"/> 3. Ever drink but stopped time from stopped..... months  | <input type="checkbox"/> 4.current drinking         |                          |                          |
| 9. How often do you have a drink containing alcohol?  | <input type="checkbox"/> 0. never<br><input type="checkbox"/> 1) < 1 /month <input type="checkbox"/> 2) 2-4 time/month <input type="checkbox"/> 3) 2-3 time/week <input type="checkbox"/> 4) 4 time/week ormore   |   |                          |                          |
| 10. How many standard drinks do you have on a typical day when you are drinking   | <input type="checkbox"/> 0) 1 or 2 <input type="checkbox"/> 1) 3 or 4 <input type="checkbox"/> 2) 5 or 6 <input type="checkbox"/> 3) 7-9 <input type="checkbox"/> 4) 10 or more   |   |                          |                          |
| 11. How often do you have six or more drinks on one occasion?   | <input type="checkbox"/> 0) never <input type="checkbox"/> 1) Less than monthly <input type="checkbox"/> 2) Monthly <input type="checkbox"/> 3) Weekly <input type="checkbox"/> 4) Daily or almost daily  |   |                          |                          |
| 12. How often during the last year have you found that you were not able to stop drinking once you had started?                       | <input type="checkbox"/> 0) never <input type="checkbox"/> 1) Less than monthly <input type="checkbox"/> 2) Monthly <input type="checkbox"/> 3) Weekly <input type="checkbox"/> 4) Daily or almost daily  |   |                          |                          |
| 13. How often during the last year have you failed to do what was normally expected from you because of drinking?                     | <input type="checkbox"/> 0) never <input type="checkbox"/> 1) Less than monthly <input type="checkbox"/> 2) Monthly <input type="checkbox"/> 3) Weekly <input type="checkbox"/> 4) Daily or almost daily  |   |                          |                          |
| 14. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session? | <input type="checkbox"/> 0) never <input type="checkbox"/> 1) Less than monthly <input type="checkbox"/> 2) Monthly <input type="checkbox"/> 3) Weekly <input type="checkbox"/> 4) Daily or almost daily  |   |                          |                          |
| 15. How often during the last year have you had a feeling of guilt or remorse after drinking?   | <input type="checkbox"/> 0) never <input type="checkbox"/> 1) Less than monthly <input type="checkbox"/> 2) Monthly <input type="checkbox"/> 3) Weekly <input type="checkbox"/> 4) Daily or almost daily  |   |                          |                          |
| 16. How often during the last year have you been unable to remember what happened the night before because you had been drinking?     | <input type="checkbox"/> 0) never <input type="checkbox"/> 1) Less than monthly <input type="checkbox"/> 2) Monthly <input type="checkbox"/> 3) Weekly <input type="checkbox"/> 4) Daily or almost daily  |   |                          |                          |
| 17. Have you or someone else been injured as a result of your drinking?   | <input type="checkbox"/> 0) No <input type="checkbox"/> 2) Yes, but not in the last year <input type="checkbox"/> 4) Yes, during the last year  |   |                          |                          |
| 18. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?       | <input type="checkbox"/> 0) No <input type="checkbox"/> 2) Yes, but not in the last year <input type="checkbox"/> 4) Yes, during the last year  |   |                          |                          |
| 19.in the past 1 month, have you ever heard news or promotion that related to smoke-free home?  |   |   |                          |                          |
|   | Source  | Ever  | Never                    |                          |
|   | Television  | <input type="checkbox"/>                            | <input type="checkbox"/> |                          |
|   | Radio   | <input type="checkbox"/>                            | <input type="checkbox"/> |                          |
|   | Poster  | <input type="checkbox"/>                            | <input type="checkbox"/> |                          |
|   | News paper  | <input type="checkbox"/>                            | <input type="checkbox"/> |                          |
|   | In front of shop  | <input type="checkbox"/>                            | <input type="checkbox"/> |                          |
|   | Cover tobacco product   | <input type="checkbox"/>                            | <input type="checkbox"/> |                          |
|   | From my child/children  | <input type="checkbox"/>                            | <input type="checkbox"/> |                          |
|   | Other, specify.....   | <input type="checkbox"/>                            | <input type="checkbox"/> |                          |
| Part 4 Knowledge and attitude on harms of SHSe and smoking. Please specify by using ✓ in the box <input type="checkbox"/>             |   |   |                          |                          |
|   | Strongly disagree   | Disagree  | Agree                    | Strongly agree           |
| 1.Smoke from other people's cigarettes is harmful for me.   | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Smoking should be banned in all public places  | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Smoking helps exert one's imagination  | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Smoking makes people look cooler   | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/> | <input type="checkbox"/> |

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 5.Smoking is interesting   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Everyone likes to get along with people who smoke                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Parents should forbid children to smoke                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Parents can smoke in front of children                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|  | True                     | False                    | I do not know            |                          |
| 1. SHS causes lymphoma   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 2. SHS is associated with stroke                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 3. SHS is associated with asthma                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 4. SHS causes common cold  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 5. The younger one starts smoking, the higher the risk is for cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 6. It is possible to be addicted to smoking                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| 7. Smoking makes one's teeth turn yellow                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |

## **ANNEX VII: Manuscript**

### **Effects of a school-based intervention program on attitude and knowledge of household members towards a smoke-free home: a cluster controlled trial**

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#### **ABSTRACT**

**Background:** A school-based smoke free home (SFH) program is useful in empowering the mother and child to reduce secondhand smoke exposure but the effects of pretesting on knowledge and attitude has been largely ignored. We aimed to test whether such a program can be effective in Southern Thailand with an additional assessment of the net effect of the pretest.

**Methods:** A Solomon four-group design was used. Twelve rural primary schools were assigned to one of the four conditions (each with 3 schools): intervention

with and without a pretest, control with and without the same pretest. The intervention was performed in the classroom and home over a period of 1 month. Outcomes were assessed at baseline and 3 months after the intervention on whether the home was smoke free and related knowledge and attitude.

**Results:** The intervention could lead to a smoke-free home without statistical significance. Attitude, knowledge and self-confidence on creating a smoke-free home, and self-confidence in avoidance of secondhand smoke exposure and persuading smokers to not smoke in their home were significantly improved. No pretest effect was observed.

**Conclusions:** Gain in attitude, knowledge and self-confidence among family members from the brief school-based education should be enhanced by other measures.

**Keywords:** Smoke-free home, school-based educational intervention, Solomon four-group

## BACKGROUND

Secondhand smoke exposure (SHSe) can cause many health problems such as respiratory disease, cancer, and cardiovascular disease in non-smokers, especially in infants and children (World Health Organization, 2009; Oberg et al., 2011; Gao et al., 2013; Pimhanam et al., 2014; Zulkifli et al., 2014; Lee et al., 2015). The two main strategies for SHSe reduction are legislation and public education. Public education has been used to increase awareness of the dangers of SHSe on health consequences, and legislation has been used for controlling smoking in public places (World Health Organization, 2013). Smoking in the home cannot be prohibited by law, however it has been shown that one way to reduce SHSe is by promotion of a smoke-free home (SFH) (Greenberg et al., 1994). The effectiveness of education programs for a SFH vary depending on the intervention strategy, population, setting, and health conditions of the target population (Gehrman and Hovell, 2003). Several education programs to reduce SHSe and to create a SFH have been implemented in clinical

settings with a child's chronic illness (Task Force on Community Preventive, 2001). In a school-based program (Blanch et al., 2013), students were used to be a change agent in creating a SFH where they gain knowledge through health education in classrooms. Educating students about creating a SFH might be an effective way to reduce SHSe and to improve the health of non-smokers among family members. Therefore, this study used students to be a change agent in creating a SFH.

In an evaluation of an education program, one often compares knowledge and attitudes pre- and post- intervention (Crone et al., 2003; Tahlil et al., 2013). The pretesting process itself may unknowingly stimulate the participants, to seek the knowledge or subsequently change their attitude. The pretest may also modify the effect of an intervention. Thus, a simple pre- and post- test comparison may overestimate the effect of the intervention. The Solomon four-group design can overcome these effects (Solomon, 1949). Although this design has been used in many studies (McCambridge et al., 2011), it has rarely been used in studies assessing the effect of an intervention to reduce SHSe in the home.

Despite continuous smoking prevention activities, the prevalence of secondhand smoke exposure (SHSe) in homes in Thailand is 36%, especially in Southern Thailand where the prevalence of smoking and SHSe is the highest in the country (Tobacco Control Research and Knowledge Management Center, 2012). While antismoking education has been implemented at the school level, attempts to encourage SFH has never been done. Thailand as a whole has reformed basic education for over a decade to enhance student creativity, a so called “child-centered education” (Israsena and Texas, 2007). We hypothesized that combining school education on smoking with parental concurrent education can lead to SFH environment both knowledge and attitude and lead to SFH. Evaluation in this study was done with and without pretest for the above reason. The aim of this study was to evaluate whether the aforementioned intervention is effective and whether pretesting has an independent effect on the intervention.

## METHODS

### Study design and participants

The Solomon four-group design used in this study is summarized in Figure 1. Each group contained 3 schools (clusters). Group 1 (G1) and Group 3 (G3) were given the intervention with and without pretesting, respectively. Group 2 (G2) and Group 4 (G4) acted as the control with and without pretesting, respectively. The pretesting period was August-September, 2014. The intervention was given in September 2014, and the post-testing period was January-February, 2015. Pre-testing was assessed only in G1 and G2 while the post-test was assessed in all the groups.

-----Figure 1 here-----

All public schools in Hatyai district were eligible for the study. Of 50 schools invited to participate, 12 (24%) agreed to join and were included in the study. We conducted a cluster controlled trial in which participating schools were assigned into the above-mentioned four groups. Initially, a school, which is the primary unit under intervention, was considered to be randomly allocated into one of the four groups. Randomized allocation was, however, not possible because all schools demanded the intervention. Finally, the first 6 schools were allocated to the intervention arm (3 with and without pretest) and the remaining were given the intervention after the endline data collection was completed. In each school, all 4th- to 6th-grade students aged between 9 and 12 years were recruited. After giving consent, students were requested to complete a baseline questionnaire. Additionally, sealed envelopes containing an invitation letter, consent form, assent form, and a questionnaire were sent to the student's mother. If another family member currently smoked, they were also requested to complete the questionnaire. As the project aimed to create a SFH environment within the whole community, regardless of whether the household contained a current smoker or not, the mother was also requested to complete the questionnaire. However, if the mother was a smoker, the family was excluded from the study. Informed consent was obtained from all participants.



### Intervention program

This study adopted the intervention modules described by Kegler and Alwan (Alwan et al., 2011; Kegler et al., 2012). The conceptual model in Kegler's study is based on social cognitive theory and the Transtheoretical Model. The intervention targets proximal determinants of behavioral capacity, self-efficacy, and outcome expectations related to creating a SFH and smoking behaviors. For Alwan's study, the SFH intervention was designed to encourage families to implement a SFH, and was delivered over a period of 6 months by students and trained health professionals.

The above modules were modified and applied to the classroom (students), and in the family (students, mothers and smokers). The intervention in the classroom consisted of four sessions each with the students and conducted by the teacher. The teachers were trained by a research team for 2 hours. The details of these sessions are summarized in Table 1. We provided a teachers' guide, and we also gave a SFH booklet to each student.

-----Table 1 here-----

### Endline data collection

Endline information was collected at the end of the intervention in a similar fashion to that at the baseline. In addition, for the intervention, the research team visited the participant's house to obtain the parent's feedback on the activities and observed whether the distributed media (sticker and poster) were placed as suggested.

### Outcomes measurement

The primary outcome was assessed by asking the question: "In the past 7 days, did you see anybody smoke in your home" (Kegler et al., 2012). As the mother was considered more reliable, her answer was used if there was any discordance between the mother-child pair. The answers were reported as "yes, some days", "yes, everyday" and "no". The first two choices were combined into "yes" in the analysis. The mother was also asked the same question with only a "yes" or "no" answer. If the

answer was “yes” then the number of days per week that the smoker smoked in the home was asked.

#### Knowledge and attitude toward the harms of smoking and exposure to SHS

Eight items on knowledge and 7 items on attitudes toward exposure to SHS were included in a self-completed questionnaire to assess these secondary outcomes (Kurtz et al., 2003; Huang et al., 2012). The details of these questions are shown in Annex I. The total scores ranged from 0 to 7 for knowledge and from 8 to 32 for attitude.

Self-confidence score in creating a SFH, avoidance of SHSe in the home and persuading smoker to not smoke in the home To assess the creating a SFH self-confidence score, students and their mother were asked, “How much confidence do you have in making your home smoke-free?”. A Likert scale was used to measure this outcome, with scores ranging from 0 (no confidence) to 10 (highest confidence).

To assess the avoidance of SHSe in the home and any action to persuade the smoker to not smoke in the home, the students and their mother were asked “How much confidence do you have in avoiding SHSe from smokers in your home?” and “When someone is smoking in the home, how much confidence do you have in telling/persuading them to not smoke in the home?” The level of confidence ranged from 0 (no confidence) to 10 (highest confidence) for each question.

#### Number of cigarettes consumed per day

The cigarette consumption of the smoker was assessed by asking the smoker: “On average, on the days you smoke, how many cigarettes do you smoke?”

#### Sample size calculation

We assumed there would be a 25% difference in the SFH status between the intervention and control groups after the 3-month intervention period. With a power of 80 %, a significance level of 5 %, a two-tailed, a design effect of 1.5 and a loss to follow-up rate of 20 %, at least 110 participants per group were needed. As there were 4 groups, 440 households were required in total.

## Statistical analysis

The strategy of analysis was modified from the Braver and Braver algorithm (Braver, 1988) for testing the independent effects of the pretest and the intervention in the Solomon four-group design. A 2 (Group: Intervention, Control) x 2 (Condition: Pretest assessment, no pretest assessment) of the four posttest scores, and on interaction term between Group x Condition, was constructed for testing those effects. For the primary outcome, McNemar's chi square test for testing the increase in rate of SFH within groups 1 and 2 was performed. Multiple logistic regression was used to test the main effect of the intervention on SFH status. For secondary outcomes, multiple linear regression was used. All statistical assessments were two sided and evaluated at the 0.05 level of statistical significance. All statistical analyses were performed using R version 3.0.1 with epicalc package version 2.15.1. As students were clustered by school, we used the survey package to cope with the clustered nature in the final model. This was done using School ID as the primary sampling unit.

## RESULTS

Figure 2 shows the details of the flow diagram of participating schools and households in the study. In summary, a total of 12 out of 50 primary schools in Hatyai district, Songkhla province were invited and agreed to participate in the study. A total of 482 households (482 students and mothers; 285 smokers) participated and completed the study, 129 in the intervention with pretest group and without 98 group without pretest, 130 the control with pretest group and 125 in the control without pretest group.

-----Figure 2 here-----

Table 2 shows baseline characteristics of participants at the household and individual level. There were no differences in the number of smokers in the home, family relationship scores, school grade, student gender, age of mother and smoker, occupation status of mother, and number of years attended school by the smoker. However, there were differences in religion and number of years attended school by the mother. Due to the low school response rate and high socioeconomic clustering within

a community, a balance of subject characteristics could not be achieved among the intervention groups.

-----Table 2 here-----

Primary outcome: the effect of intervention on SFH

The percentage of smoke-free homes in the 4 groups at the baseline and endline (O1 to O6 in Figure 1) are shown in the top row of Table 3. The distribution of percentage of SFH and 95% confidence interval of participants in each school is shown in Fig 3.

In G1, the rate of SFH was non-significantly increased from (O1) 41.9% at baseline to (O2) 46.5 % at endline (Difference: 4.65%, 95% CI: -0.13, 9.43, P value: 0.06). Similarly a non-significant increased rate of SFH was seen in the control group (G2) from (O3) 31.6 % to (O4) 36.7% (Difference: 5.1%, 95% CI: -1.5, 11.7, P value: 0.13).

Results based on survey regression analysis is shown in Table 4. After adjusting for religion and mothers schooling years, there was non-significant effect of the intervention on SFH (OR: 1.52, 95% CI: 1.00, 2.26).

Secondary outcomes

The pretesting effect was not statistically significant on any testing on group of subject. There was a positive effect of knowledge toward exposure to SHS and smoking among the students (Difference: 0.50, 95% CI: 0.22, 0.78) and their mother (Difference: 0.47, 95% CI: 0.24, 0.69). Students in the intervention group had higher knowledge than those in the control group. No significant differences were observed for the smokers (Difference: 0.17, 95% CI: -0.37, 0.71). Attitude toward the harms of SHSe and smoking. A positive effect of intervention was observed among students (Difference: 0.50, 95% CI: 0.22, 0.78). No significant effect was found on attitude toward the harms of SHSe and smoking among the student's mother (Difference: 0.32, 95% CI: -0.37, 1.00), and smokers (-1.18, 95% CI: -3.5, 1.14).

There was a significant positive effect of the intervention on self-confidence scores in creating a SFH among students (Difference: 1.22, 95% CI: 0.48, 1.96) but not among their mothers (Difference: 0.36, 95% CI: -0.17, 0.89). For avoiding SHSe in home confidence scores, a significant positive effect of the intervention was observed among the students (Difference: 1.64, 95% CI: 0.24, 3.04) but not among their mothers (Difference: 1.19, 95% CI: -0.06, 2.44). For persuading smoker to smokes outside the home confidence scores, there were significant positive effects of the intervention among students (Difference: 2.04, 95% CI: 0.69, 3.39) and their mothers (Difference: 1.71, 95% CI: 0.61, 2.80).

Among households containing smokers, there was no significant difference in the number of cigarettes smoked by smokers between the intervention and control groups (Difference: 0.09, 95% CI: -0.89, 1.07).

## DISCUSSION

Our findings show that the intervention improved attitude towards the harms of SHSe and smoking and self-confidence scores in creating a SFH and avoiding SHSe among schoolchildren. Both schoolchildren and their mother increased their self-confidence scores for knowledge and ability to persuade smokers not smoke in their home. Pretest sensitization was not observed. Among smokers, there was no effect of the intervention on any outcome. This school-based intervention program could not improve SFH status. Of various outcomes taken on the students and their mother, those on attempts to avoid SHSe and self-confidence scores to persuade smokers to not smoke inside the home are most promising.

Previous interventions to create a SFH and reduce SHSe in home in the past have given mixed results. One school-based study (Blanch et al., 2013) and one family-based study (Herbert et al., 2011) failed to detect a difference between the intervention and control groups. On the other hand, two hospital-based studies (Harutyunyan et al., 2013; Yilmaz et al., 2013) and one family-based study (Kegler et al., 2015) reported significant effects of their interventions aiming to promote a SFH.

A SFH is, perhaps, too hard to achieve, especially by a sole school-based intervention without other enhancements. Students in general may not be a strong change agent.

However, students and their mothers can be empowered to gain self-confidence in their ability to persuade smokers to not smoke in the home and to avoid SHSe. Since family members had a higher self-confidence in avoiding SHSe, this effect might emerge as a social norm in their family to make their home to be smoke-free in the future. However, in a male-dominated society like rural Southern Thailand (Romanow, 2012), smokers, who mostly have a low education, tend to play down the importance of health and women's and children's right to health. This is consistent with previous findings that low socio-economic status was found to be associated with smoking in the home (King et al., 2013). Therefore, enhancing self-confidence of non-smoking family members to avoid SHSe in their home is important to protect themselves from the harms associated with SHSe.

In assessment of various psychometric parameters, questions are often employed to the same respondent before and after an intervention is given. Most previous interventions on smoking control, knowledge and attitude were often measured repeatedly (Harutyunyan et al., 2013). However, this was conducted without consideration of possible pretest effects. We have shown that there was no pretest sensitization effect on knowledge and attitude, and this reveals that this effect could not modify the effect of the intervention among students and their mother. The implication of this finding is that a pretest can be done without concern about participants remembering the questions at a previous testing which may influence posttest scores.

This intervention suggests that education about the dangers of exposure to secondhand smoke and smoking to students in a short period may be useful in helping their family members to improve attitude, knowledge and self-confidence in avoiding SHSe and persuading smokers to not smoke in their home.

The main limitation of this study is a failure to achieve random allocation of the intervention causing an imbalance of covariates, but were completely

adjusted for on analysis. Another limitation, a 52% increase in the odds of SFH but without statistical significance may suggest insufficient power of the study.

### Conclusion

A school-based intervention can improve attitude and knowledge towards the harms of SHSe and smoking and self-confidence in creating a SFH, avoidance of SHSe and persuading smokers not to smoke in the home but is ineffective in creating a SFH. Pretest sensitization in this context may not lead to changes in posttest scores.

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### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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### Ethical considerations

The study protocol was approved by the institutional review board of the Faculty of Medicine, Prince of Songkla University. The trial has also been registered in the registry at [clinicaltrials.in.th](http://clinicaltrials.in.th) (TCTR2014102400).

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Table 1. Session of Smoke-free home intervention in the classroom

|                      | Learning objectives and materials   | Activity  |
|----------------------|---|---|
| 1 <sup>st</sup> week | <p><b>Objective:</b> To recognize the harms of second-hand smoke exposure and smoking; the danger of smoking in their home</p> <p><b>Materials:</b> Smoke-free home (booklet); included an information about SHSe, reducing SHS in home; avoidance SHSe, Steps of creating SFH, and quit line; Steps to create a smoke-free home sheet, Stickers and embed quit line; Worksheet; (1) disease related to SHSe; (2) SFH sheet</p> | <p><b>Classroom</b></p> <p>Teaching about the harms of exposure to SHS and smoking</p> <p>Negotiation with their family for creating SFH</p> <p>Fill the name of disease related to exposure to SHS on the worksheet (1)</p> <p><b>Family</b></p> <p>Take the home sheet and discuss with family members about set up the date of creating SFH</p>  |
| 2 <sup>nd</sup> week | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>• To be able to initiate activities leading to SFH</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• Booklet</li> <li>• Game and role-play</li> <li>• SFH stickers</li> <li>• Promise form for creating SFH</li> </ul>   | <p><b>Classroom</b></p> <p>Teaching about techniques to reduce SHS in their home; Drawing a picture and take it to paste on a door or wall in their house. With quotation “Don’t smoke in home, it can hurt me” ; Playing a game and role-play</p> <p>Painting the colour on the SFH sticker</p> <p><b>Family</b></p> <p>Setting up the date of SFH and let smoker or mother sign up on the promise form; if no smoker, mother will sign up on the form.</p> <p>Paste sticker “Smoke-free home”</p> |
| 3 <sup>rd</sup> week | <p><b>Objective</b></p> <p>To gain direct experience on avoiding SHSe and refusing of tobacco use</p> <p><b>Materials</b></p> <p>Booklet</p> <p>Video about avoidance SHSe, creating a smoke free home, and the danger of tobacco use</p>   | <p><b>Classroom</b></p> <p>Teaching on how to avoid SHSe and refusing tobacco use; Sharing the experience with family members to set up smoke-free home</p> <p>Watching video</p> <p><b>Family</b></p> <p>-</p>   |
| 4 <sup>th</sup> week | To get feedback about smoke-free home program   | <b>Classroom;</b> Summarize the activities, feedback from students  |

Table 2 Baseline characteristics of participants

| Variables  | With pretest                  |                         | Without pretest               |                          | Total<br>(N= 482)  |
|--|-------------------------------|-------------------------|-------------------------------|--------------------------|--------------------|
|  | Intervention (O1)<br>(N= 129) | Control (O2)<br>(N=98 ) | Intervention (O5)<br>(N= 130) | Control (O6)<br>(N= 125) |                    |
| <b>Household</b>                                     |                               |                         |                               |                          |                    |
| Religion**   |                               |                         |                               |                          |                    |
| Buddhist   | 102 (79.1)                    | 43 (43.9)               | 36 (27.7)                     | 115 (92.0)               | 296 (61.4)         |
| Muslim   | 27 (20.9)                     | 55 (56.1)               | 94 (72.3)                     | 10 ( 8.0)                | 186 (38.6)         |
| <b>Household income (Thai Baht)</b>                  |                               |                         |                               |                          |                    |
| ≤15,000  | 106 (82.2)                    | 73 (74.5)               | 81 (62.3)                     | 101 (81.5)               | 361 (75.1)         |
| >15,000  | 23 (17.8)                     | 25 (25.5)               | 49 (37.7)                     | 23 (18.5)                | 120 (24.9)         |
| <b>Number of smokers in home</b>                     |                               |                         |                               |                          |                    |
| One  | 66 (85.7)                     | 56 (77.8)               | 56 (84.8)                     | 71 (79.8)                | 249 (81.9)         |
| Two or more  | 11 (14.3)                     | 16 (22.2)               | 10 (15.2)                     | 18 (20.2)                | 55 (18.1)          |
| <b>Family relationship score</b>                     |                               |                         |                               |                          |                    |
| Mean (SD)  | 11.6 (3.1)                    | 11.7 (3.1)              | 11.1 (3.2)                    | 11.1 (3.3)               | 11.3 (3.2)         |
| <b>Student</b>                                       |                               |                         |                               |                          |                    |
| Grade  |                               |                         |                               |                          |                    |
| 4 <sup>th</sup> grade                                | 27 (20.9)                     | 32 (32.7)               | 46 (35.4)                     | 43 (34.4)                | 148 (30.7)         |
| 5 <sup>th</sup> grade                                | 47 (36.4)                     | 35 (35.7)               | 52 (40.0)                     | 34 (27.2)                | 168 (34.9)         |
| 6 <sup>th</sup> grade                                | 55 (42.6)                     | 31 (31.6)               | 32 (24.6)                     | 48 (38.4)                | 166 (34.4)         |
| Gender   |                               |                         |                               |                          |                    |
| Male   | 57 (44.2)                     | 54 (55.1)               | 68 (52.3)                     | 69 (55.2)                | 248 (51.5)         |
| Female   | 72 (55.8)                     | 44 (44.9)               | 62 (47.7)                     | 56 (44.8)                | 234 (48.5)         |
| <b>Mother</b>  |                               |                         |                               |                          |                    |
| Age (years); Mean (SD)                               | 39.2 (7.4)                    | 38 (7.4)                | 39.2 (7)                      | 39.1 (8.0)               | 38.9 (7.4)         |
| <b>Number of years attended school **</b>            |                               |                         |                               |                          |                    |
| <7   | 57 (44.2)                     | 42 (42.9)               | 42 (32.3)                     | 66 (52.8)                | 207 (42.9)         |
| ≥7   | 72 (55.8)                     | 56 (57.1)               | 88 (67.7)                     | 59 (47.2)                | 275 (57.1)         |
| <b>Occupation status</b>                             |                               |                         |                               |                          |                    |
| Unemployed   | 16 (12.4)                     | 18 (18.4)               | 13 (10)                       | 19 (15.2)                | 66 (13.7)          |
| Employed   | 113 (87.6)                    | 80 (81.6)               | 117 (90)                      | 106 (84.8)               | 416 (86.3)         |
| <b>Smoker (All males)</b>                            |                               |                         |                               |                          |                    |
| Age (years); Mean (SD)                               | N=75<br>39.1 (10.7)           | N=67<br>39 (9.5)        | N=66<br>38.2 (11.3)           | N=77<br>38.8 (9.1)       | 285<br>38.8 (10.1) |
| <b>Number of years attended school</b>               |                               |                         |                               |                          |                    |
| <7   | 31 (41.3)                     | 33 (49.3)               | 38 (57.6)                     | 44 (57.1)                | 146 (51.2)         |
| ≥7   | 44 (58.7)                     | 34 (50.7)               | 28 (42.4)                     | 33 (42.9)                | 139 (48.8)         |
| <b>Occupation status</b>                             |                               |                         |                               |                          |                    |
| Unemployed   | 9 (12.0)                      | 16 (23.9)               | 8 (12.1)                      | 6 ( 7.8)                 | 39 (13.7)          |
| Employed   | 66 (88.0)                     | 51 (76.1)               | 58 (87.9)                     | 71 (92.2)                | 246 (86.3)         |
| <b>Fagerstrom test for nicotine dependence score</b> |                               |                         |                               |                          |                    |
| Low  | 53 (70.7)                     | 53 (79.1)               | 57 (86.4)                     | 48 (62.3)                | 211 (74.0)         |
| Moderate/high  | 22 (29.3)                     | 14 (20.9)               | 9 (13.6)                      | 29 (37.7)                | 74 (26.0)          |

\*\* P value < 0.05 (testing between group O1+O5 and group O3+O6)

Table 3 Descriptive outcomes by pre-post assessment

| Outcome                                      | Before                               |                                 | After                                |                                 |   |                                    |
|--|--------------------------------------|---------------------------------|--------------------------------------|---------------------------------|---|------------------------------------|
|  | Intervention<br>with pretest<br>(O1) | Control<br>with pretest<br>(O3) | Intervention<br>with pretest<br>(O2) | Control<br>with pretest<br>(O4) | Intervention<br>without<br>pretest (O5) | Control<br>without<br>pretest (O6) |
| Primary outcome (%)                          |                                      |                                 |                                      |                                 |   |                                    |
| Smoke-free home<br>(yes)                     | 41.9<br>(54 / 129)                   | 31.6<br>(31 / 98)               | 46.5<br>(60 / 129)                   | 36.7<br>(36 / 98)               | 49.2<br>(64 / 130)                      | 38.4<br>(48 / 125)                 |
| Secondary outcomes                           |                                      |                                 |                                      |                                 |   |                                    |
| Knowledge on harms of SHSe                   |                                      |                                 |                                      |                                 |   |                                    |
| Student                                      | 4.2 (1.5)                            | 4.0 (1.8)                       | 4.7 (1.3)                            | 4.0 (1.8)                       | 5.3 (1.2)                               | 4.8 (1.4)                          |
| Mother                                       | 4.4 (1.4)                            | 4.1 (3.5)                       | 4.6 (1.3)                            | 3.9 (1.8)                       | 4.4 (1.5)                               | 4.3 (1.6)                          |
| Smoker                                       | 2.7 (2.4)                            | 3.1 (2.3)                       | 3.3 (2.5)                            | 3.2 (2.3)                       | 2.5 (2.6)                               | 2.3 (2.2)                          |
| Attitude on harms of SHSe                    |                                      |                                 |                                      |                                 |   |                                    |
| Student                                      | 28.0 (4.0)                           | 26.8 (3.6)                      | 28.6 (3.2)                           | 27.4 (4.2)                      | 28.4 (3.3)                              | 27.5 (3.5)                         |
| Mother                                       | 27.5 (3.9)                           | 26.5 (4.3)                      | 28.2 (2.9)                           | 28.2 (3.4)                      | 28.1 (3.5)                              | 27.4 (3.7)                         |
| Smoker                                       | 16.1 (4.1)                           | 19.1 (4.6)                      | 17.7 (3.4)                           | 19.1 (4.2)                      | 14.2 (3.8)                              | 15.5 (4.2)                         |
| Confidence                                   |                                      |                                 |                                      |                                 |   |                                    |
| -to create a SFH                             |                                      |                                 |                                      |                                 |   |                                    |
| Student                                      | 7.3 (2.3)                            | 7.0 (2.4)                       | 7.6 (1.9)                            | 6.1 (2.9)                       | 7.7 (2.2)                               | 6.9 (2.6)                          |
| Mother                                       | 6.3 (3.4)                            | 6.4 (3.0)                       | 6.7 (2.9)                            | 6.6 (3.0)                       | 6.8 (2.8)                               | 6.2 (3.3)                          |
| - to avoid of SHSe                           |                                      |                                 |                                      |                                 |   |                                    |
| Student                                      | 14.8 (4.6)                           | 14.3 (4.4)                      | 15.7 (3.8)                           | 13.8 (4.9)                      | 16.6 (3.1)                              | 15.3 (3.6)                         |
| Mother                                       | 10.3 (5.7)                           | 10.7 (5.7)                      | 11.4 (5)                             | 11 (5.5)                        | 12.7 (4.5)                              | 10.9 (5.8)                         |
| -to persuade smoker not to smoke in the home |                                      |                                 |                                      |                                 |   |                                    |
| Student                                      | 13.3 (5.3)                           | 11.1 (5.1)                      | 13.7 (4.4)                           | 11.1 (5.2)                      | 15.2 (3.3)                              | 14.2 (4.3)                         |
| Mother                                       | 9.5 (6.1)                            | 9.4 (5.4)                       | 11.6 (4.2)                           | 10.1 (5.3)                      | 12.0 (4.6)                              | 10.1 (5.3)                         |
| Number of cigarettes<br>smoked per day       | 7.9 (5.8)                            | 7.0 (5.3)                       | 6.2 (4.3)                            | 6.6 (4.7)                       | 8.7 (5.8)                               | 8.3 (5.5)                          |

Table 4 Summary of result from testing on primary and secondary outcomes

| Variable   | Pretest effect | Main effect (Intervention vs control) |
|--|----------------|---------------------------------------|
| Primary outcomes   | P value        | Odd ratios (95%CI)                    |
| Smoke-free home  | 0.68           | 1.52 (1.00, 2.26)                     |
| Secondary outcomes   |                |                                       |
| Attitude score   |                | Difference of mean (95% CI)           |
| Student  | 0.23           | 0.50 ( 0.22 , 0.78 ) *                |
| Mother   | 0.17           | 0.32 ( -0.37 , 1.00 )                 |
| Smoker   | 0.91           | -1.18 ( -3.5 , 1.14 )                 |
| Knowledge score  |                |                                       |
| Student  | 0.08           | 0.50 ( 0.22 , 0.78 ) *                |
| Mother   | 0.10           | 0.47 ( 0.24 , 0.69 ) *                |
| Smoker   | 0.65           | 0.17 ( -0.37 , 0.71 )                 |
| Creating SFH confidence score                                |                |                                       |
| Student  | 0.84           | 1.22 ( 0.48 , 1.96 ) *                |
| Mother   | 0.58           | 0.36 ( -0.17 , 0.89 )                 |
| Avoidance of SHSe in home confidence score                   |                |                                       |
| Student  | 0.57           | 1.64 ( 0.24 , 3.04 )                  |
| Mother   | 0.30           | 1.19 ( -0.06 , 2.44 )                 |
| Persuading smoker to smoke outside the home confidence score |                |                                       |
| Student  | 0.99           | 2.04 ( 0.69 , 3.39 ) *                |
| Mother   | 0.72           | 1.71 ( 0.61 , 2.80 ) *                |
| Number of cigarettes smoked per day                          | 0.13           | 0.09 ( -0.89 , 1.07 )                 |

Figure 1. Solomon four-group design lay out

| Group | Baseline assessment<br>(Pretest score) | Intervention | Endline assessment<br>(Posttest score) |
|-------|--|--------------|--|
| G1    | O1                                     | X            | O2                                     |
| G2    | O3                                     |              | O4                                     |
| G3    |  | X            | O5                                     |
| G4    |  |              | O6                                     |

G1,G2,G3,G4 were 4 groups of primary schools, each with 3 members (schools)

O1 and O3 presented baseline assessment at G1 and G2.

O2, O4, O5 and O6 presented endline assessment at G1, G2, G3, and G4, respectively.

X presented intervention

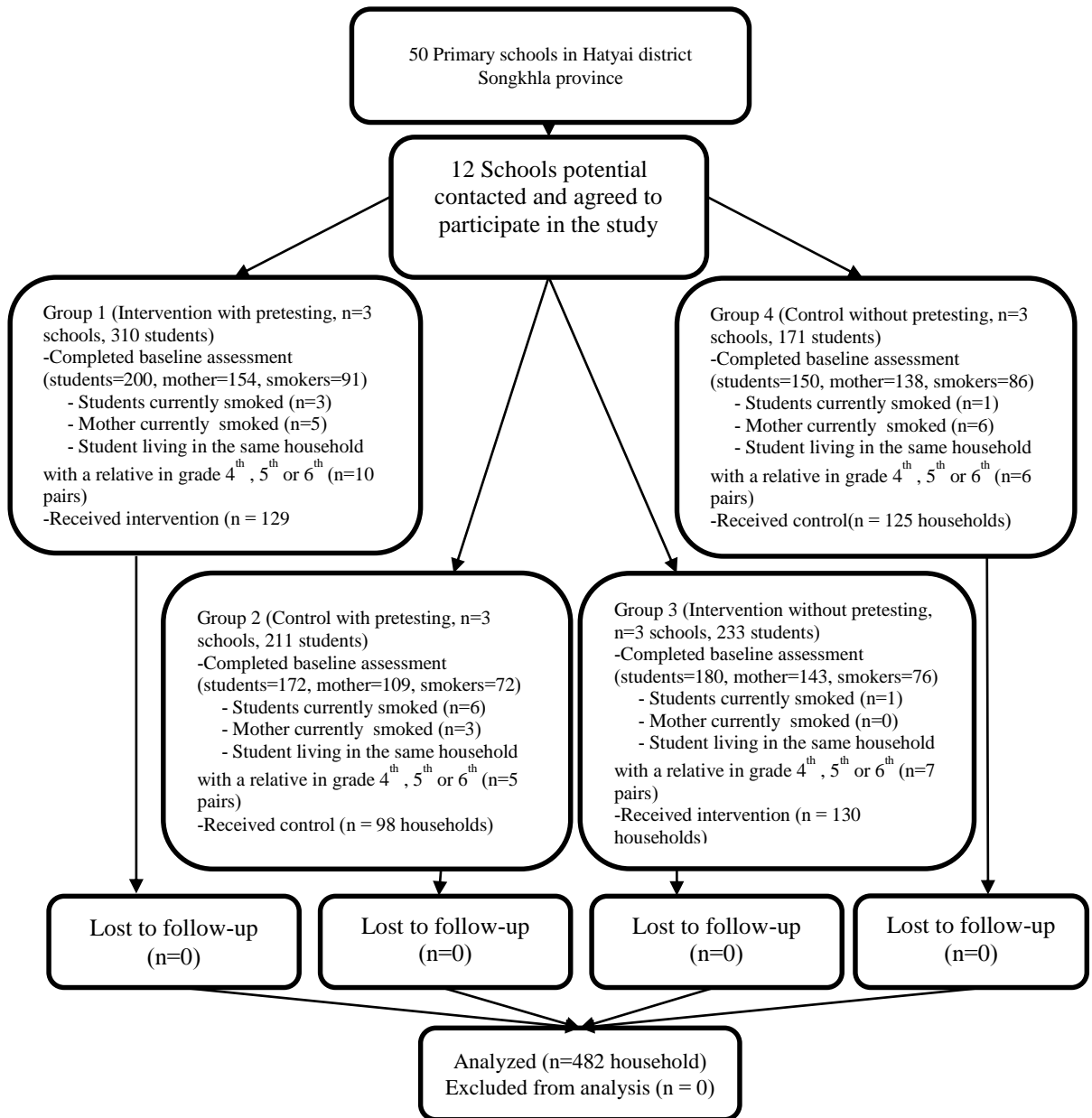
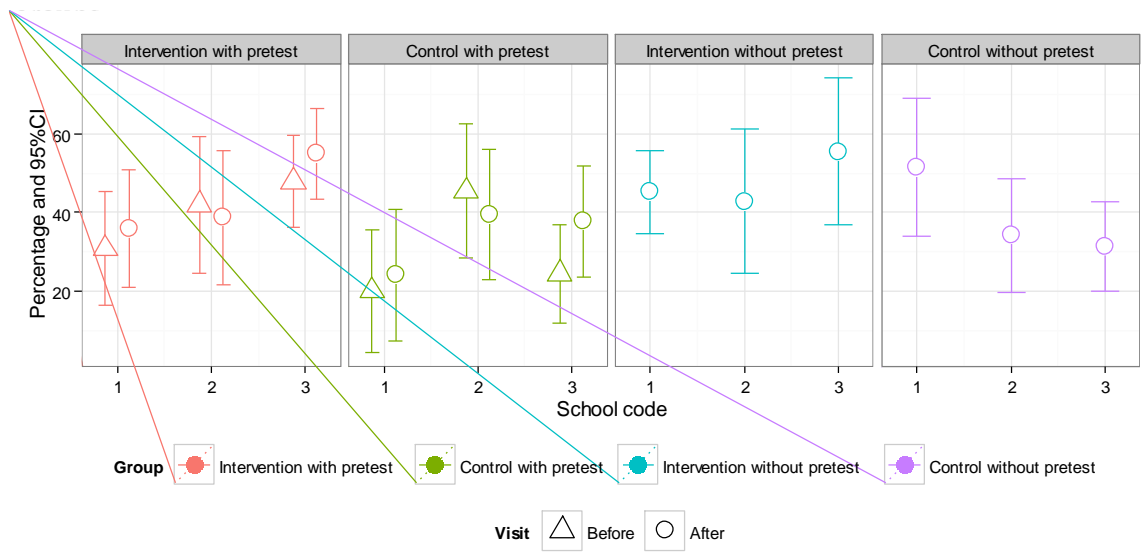


Figure 2. Study flow diagram



Figure 3. Percentage of smoke-free home status by schools and intervention



## ANNEX VIII: Ethical approval



Faculty of Medicine, Prince of Songkla University

This document is to certify that

- 
- REC Number: 57-0110-18-5
- Project entitled: Effects of an intervention program with and without pretest assessment on schoolchildren's self-efficacy to create a smoke-free home
- Principle Investigator: Mr.Nirun Intarut
- Affiliation: Epidemiology Unit, Faculty of Medicine, Prince of Songkla University
- Sub-Investigator: Prof.Virasakdi Chongsuivatwong, MD,PhD
- Affiliation: Epidemiology Unit, Faculty of Medicine, Prince of Songkla University
- Document acceptance:
1. Submission form version 3.0 date 13 August 2014
  2. Study protocol version 3.0 date 13 August 2014
  3. Participant information sheet for non-smoker phase 1 version 2.0 date 9 July 2014
  4. Informed consent form for non-smoker phase 1 version 2.0 date 9 July 2014
  5. Participant information sheet for smoker phase 1 version 2.0 date 9 July 2014
  6. Informed consent form for smoker phase 1 version 2.0 date 9 July 2014
  7. Participant information sheet for mother or parents phase 2 version 2.0 date 9 July 2014
  8. Informed consent form for mother or parents phase 2 version 2.0 date 9 July 2014
  9. Participant information sheet for smoker phase 2 version 2.0 date 9 July 2014
  10. Informed consent form for smoker phase 2 version 2.0 date 9 July 2014
  11. Participant information sheet for student phase 2 version 3.0 date 13 August 2014
  12. Informed consent form for student phase 2 version 2.0 date 9 July 2014
  13. Participant information sheet for mother or parents or smoker phase 3 version 2.0 date 9 July 2014
  14. Informed consent form for mother or parents or smoker phase 3 version 2.0 date 9 July 2014
  15. Participant information sheet for smoker phase 3 version 2.0 date 9 July 2014
  16. Informed consent form for smoker phase 3 version 2.0 date 9 July 2014
  17. Participant information sheet for student phase 3 version 3.0 date 13 August 2014
-

18. Informed consent form for student phase 3 version 2.0 date 9 July 2014
19. Questionnaire for student (Baseline) version 3.0 date 13 August 2014
20. Questionnaire for student (Endline) version 3.0 date 13 August 2014
21. Questionnaire for mother (Non-smoker Baseline) version 3.0 date 13 August 2014
22. Questionnaire for mother (Non-smoker Endline) version 3.0 date 13 August 2014
23. Questionnaire for smoker (Baseline) version 3.0 date 13 August 2014
24. Questionnaire for smoker (Endline) version 3.0 date 13 August 2014
25. Curriculum Vitae

have been reviewed by the Research Ethics Committee (meeting date 18 July 2014, agenda 4.4.03) is in full compliance with the Declaration of Helsinki and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP) Guidelines. Please submit the progress report every 12 month



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(Assoc.Prof. Boonsin Tangtrakulwanich, M.D.)

Vice Chairman of Ethics Committee,

Vice Dean in Research Affairs

## VITAE

**Name** Mr. Nirun Intarut

**Student ID** 5510330018

### **Educational Attainment**

| <b>Degree</b> | <b>Name of Institution</b> | <b>Year of Graduation</b> |
|---------------|----------------------------|---------------------------|
| Science       | Chinagmai University       | 2546                      |
| Public health | Khon kaen University       | 2550                      |

### **Scholarship Awards during Enrolment**

Tobacco Control Research and Knowledge Management Center scholarship