รายงานวิจัยฉบับสมบูรณ์

โครงการ

A multicomponent intervention for creating a smoke free home: A randomized controlled trial

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พฤษภาคม 2563

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สนับสนุนโดยสำนักงานคณะกรรมการการอุดมศึกษาและสำนักงานกองทุนสนับสนุนการวิจัย

สารบัญ

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Project Code: MRG6180067

Project Title: การศึกษาโปรแกรมบ้านปลอดบุหรี่โดยมีองค์ประกอบหลายส่วน การศึกษาแบบสุ่มมีกลุ่มควบคุม

Investigator: นิรันดร์ อินทรัตน์, วีระศักดิ์ จงสู่วิวัฒน์วงศ์

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ความเป็นมาและความสำคัญ ควันบุหรี่มือสองเป็นสาเหตุทำให้เกิดการเจ็บป่วยและเสียชีวิตในผู้ที่ไม่สูบบุหรี่และเด็ก โดยเฉพาะอย่างยิ่งในเด็กทารก ดังนั้นในการศึกษานี้ได้ทำการทดสอบผลของสิ่งแทรกแซงของโปรแกรมบ้านปลอดบุหรี่เพื่อที่จะลดการได้รับควันบุหรี่มือสองในบ้านของเด็กอายุ 1 - 5 ปี

วิธีการศึกษา เป็นการศึกษาแบบสุ่มและมีกลุ่มควบคุมโดยแยกตามกลุ่ม ซึ่งทำการทดลองในบ้านนอกเขตเทศบาล จังหวัดร้อยเอ็ด จำนวน 42 หมู่บ้าน ซึ่งบ้านที่เข้าร่วมงานวิจัยประกอบไปด้วย ผู้ปกครองของเด็ก เด็กอายุ 1-5ปี และผู้สูบบุหรี่ที่มีพฤติกรรมสูบบุหรี่ในบ้าน จากนั้นบ้านที่เข้าร่วมการศึกษาจะได้รับโปรแกรมการทดลองประกอบไปด้วยคู่มือการทำบ้านให้ปลอดบุหรี่ สติ๊กเกอร์บ้านปลอดบุหรี่และข้อความสั้นผ่านมือถือของผู้ปกครองเป็นจำนวน 45 ข้อความ ส่วนกลุ่มควบคุมจะได้รับโปรแกรมเหมือนกับกลุ่มทดลองหลังจากสิ้นสุดการทดลอง โดยมีการวัดผลลัพธ์หลักคือ การได้รับควันบุหรี่ในบ้านตนเองใน 7 วันที่ผ่านมาโดยการรายงานด้วยตนเอง และมีการติดตามผลเพื่อประเมินผลลัพธ์ที่ 3 เดือน

ผลการศึกษา พบว่าโปรแกรมบ้านปลอดบุหรี่สามารถลดอัตราการได้รับควันบุหรี่มือสองในบ้านเป็น 1.8 (ช่วงเชื่อมั่นที่ 95%: 1.04, 3.11) เท่าเมื่อเทียบกับกลุ่มทดลอง นอกจากนั้นแล้วยังพบว่า จำนวนวันที่ได้รับควันบุหรี่ในบ้านยังลดลงจำนวน 1.25 (ช่วงเชื่อมั่นที่ 95%: -1.85, -0.66) วัน

สรุปผลการทดลอง: การทดลองมีผลทำให้สามารถลดการได้รับควันบุหรี่มือสองและลดจำนวนวันที่ได้รับควันบุหรี่มือสองในบ้านได้

Abstract

Project Code: MRG6180067

Project Title: A multicomponent intervention for creating a smoke free home: A randomized controlled trial

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Background: Secondhand smoke exposure cause of morbidity and mortality, especially in non-smokers and children. This study tested the effectiveness of an intervention for reducing exposure to SHS in home by creating smoke-free where 1 to 5-year old infants are resident.

Methods: A cluster randomized controlled trial was conducted in a rural geographic area of Thailand, with 42 villages assigned to either an intervention or comparison group. The intervention consisted of self-education and infographic material, together with 45 text messages delivered via Short Message Service. The control group received the self-education after the intervention at 3 months. The primary outcome was assessed by parent's self-reported in exposure to SHS in home. Multiple logistic regression was used to test the effect of the intervention.

Results: The effects of the intervention increased the likelihood of a reducing exposure to SHS in home 1.8-fold (95%CI: 1.04, 3.11). The number of days SHS exposure in the home on average 7 days was also decreased -1.25-fold (95%CI: -1.85, -0.66) in the intervention group.

Conclusion: The effectiveness of an intervention was observed with statistical significance in reducing exposure to SHS at home by a creating a home to be a smoke-free.

Keywords: smoke-free home; secondhand smoke exposure; reducing secondhand smoke exposure

Executive summary

งานวิจัยชิ้นนี้ได้ทำการทดสอบผลของโปรแกรมบ้านปลอดบุหรี่ เพื่อที่จะลดการได้รับควันบุหรี่มือสองในบ้านที่มีเด็กอายุ 1 - 5 ปี อาศัยอยู่ โดยเป็นการศึกษาแบบสุ่มและมีกลุ่มควบคุม โดยแยกตามกลุ่มโรงพยาบาลส่งเสริมสุขภาพประจำตำบล 4 แห่ง (A cluster randomized controlled trial) ซึ่งทำการทดลองในบ้านนอกเขตเทศบาล จังหวัดร้อยเอ็ด จำนวน 42 หมู่บ้าน บ้านเป้าหมายประกอบไปด้วย ผู้ปกครองของเด็ก เด็กอายุ 1-5ปี และผู้สูบบุหรี่ที่มีพฤติกรรมสูบบุหรี่ในบ้าน โดยผู้ปกครองเด็กได้รับคู่มือการทำบ้านให้ปลอดบุหรี่ สติ๊กเกอร์บ้านปลอดบุหรี่และข้อความสั้นผ่านมือถือ ส่วนกลุ่มควบคุมจะได้รับโปรแกรมเหมือนกับกลุ่มทดลองหลังจากสิ้นสุดการทดลอง มีการวัดผลลัพธ์หลักคือ การได้รับควันบุหรี่ในบ้านตนเองใน 7 วันที่ผ่านมาโดยการรายงานด้วยตนเอง และมีการทดสอบความแม่นยำการรายงานผลลัพธ์ดังกล่าวด้วยชุดทดสอบ NicAlert ในการศึกษานำร่อง เมื่อสิ้นสุดโปรแกรมทดลอง 45 วันได้มีการติดตามประเมินผลสุดท้ายที่ 3 เดือน

ผลการศึกษาพบว่าโปรแกรมบ้านปลอดบุหรี่สามารถลดอัตราการได้รับควันบุหรี่มือสองในบ้านได้ นอกจากนั้นแล้วยังพบว่าจำนวนวันที่ได้รับควันบุหรี่ในบ้านยังลดลงด้วย อย่างไรก็ตาม งานวิจัยชิ้นนี้ยังมีข้อที่ควรศึกษาเพิ่มเติมคือการติดตามประเมินผลที่นานขึ้นเช่น 6 เดือน หรือ 1 ปี และควรทดสอบเฉพาะกลุ่มทดลองที่ได้รับเฉพาะข้อความสั้นอย่างเดียว

1. Research

1.1 Introduction

Secondhand smoke (SHS) is comprised of several toxic gases and small particles.[1] Epidemiological evidence shows that exposure to SHS can cause mortality and morbidities in both children and adults.[2, 3] In children, exposure to SHS is linked to low birth weight (LBW), ear infections, sudden infant death and behavioural problems and learning.[4-8] Likewise, heart disease, cancer, and chronic obstructive pulmonary disease are linked to exposure to SHS. [9] 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. [10, 11] 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. [11-14]

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.[15] 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.[16] Thongthai et al. (2004) reported that the prevalence of exposure to SHS at home was more common among people with low socioeconomic status.[17] 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.[18]

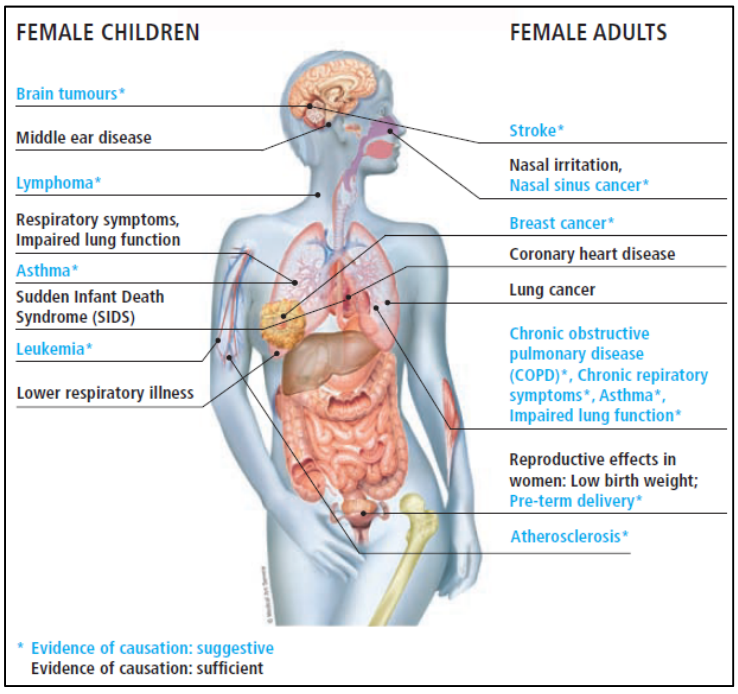
The WHO guidelines (FCTC articles 8) recommend a smoke-free area in all indoor buildings, public places, and public transport. The guidelines do not cover private households. Educational strategies are suggested to be more effective in a household setting. Several studies have been conducted that aimed to reduce exposure to SHS at home by creating a smoke-free home.[19] However, the effectiveness of interventions is still unclear. The effectiveness may differ according to the intervention strategies, population, setting, and outcome measurement.[20] The intervention implementation is a time consuming process and requires specialized personnel such as doctors and psychologists. Because of this reason, it might be impractical to implement an intervention in a hospital or community setting. Studies for reducing exposure to SHS by enhancing parent or caregiver for creating a smoke-free home in community in Thailand are rare. Therefore, this study evaluated a culturally appropriate intervention for enhancing parent (or caregiver) to create a smoke-free home.

1.2 Literature review

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.[21]

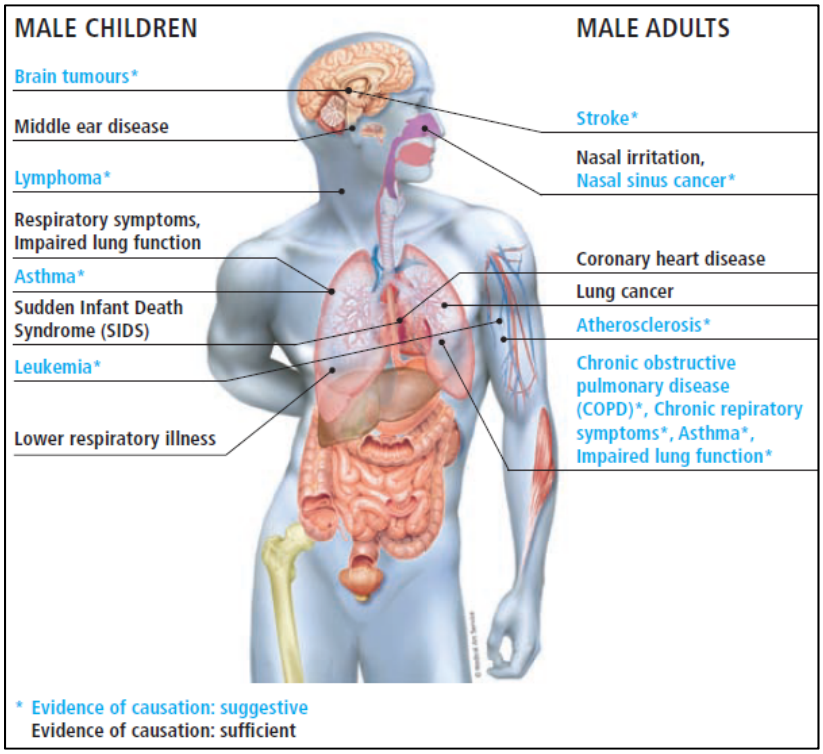
The health effects of smoke exposure on young children have been well established; other factors that strongly influence actual smoke exposure of young children have been explored. Community factors include demographic phenomena, economic costs, social support and cultural norms resulting in expected normative behaviors. 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.[9]

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.

Measures of SHS in Thailand

In Thailand, SHS tobacco controls have been implementing a treaty of smoke-free and “the Health Protection Act of 2553” for protection of non-smokers have been implementing. According to which, indoor public places should be 100% smoke-free or strictly prohibited smoking areas. The areas were divided into 3 groups as follows; group 1, 100% smoke-free such as schools, health facility, religious place, banks, financial institutions and public place; group 2, 100% smoke-free in the building, but prepared areas of outside buildings that can be used for smoking such as government offices, gas stations, universities, educational institutions, private workplaces and bus or public transports; group 3, allowed place for smoking in the restricted area such as international airports. The FCTC Article 8 guidelines have also been implementing for creating 100% smoke-free.

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 [22]. Several studies have been conducted on SHS. There are several factors that are associated with levels of nicotine or cotinine 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			
Age (smoker, children)		[23, 24]	
Socioeconomic status		[24, 25]	
Education			[25]
Race/ethnicity,		[24]	
Region		[24]	
Household income		[25]	
Household structure		[25]	
Duration of smoking in the home	[25]		
Having spouse		[23]	
Living with current smoker		[26]	
Number of cigarettes smoked in home	[27]		
Smoker's mother			[27-29]
Parents smoked in the same room as the child		[30, 31]	
Open ventilation			[32]
Smoking only in restricted home areas	[32]		
Household members smoking		[32]	
Visitors smoking		[33]	
Belief in the harms of exposure to SHS	[30]		
Location (inner-city)		[31]	

Creating a smoke-free home to reduce SHS exposure intervention studies

The interventions for reducing exposure to SHS/creating a smoke free home 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 in Table 2.

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 [34]. 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 / 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) [35]	To assess the effectiveness of a multi-level program (individual, family, and school) to prevent the SHSe	Design CRCT Setting Class, School and Home	-Schoolchildren aged 12–14 years in the metropolitan area of Barcelona, Spain Child health status - Healthy FU time 12 months	Intervention (n=757) -Classroom level, six sessions with the pupils of 1 h each that were conducted by the teacher/tutor. -School level, four types of posters with specific messages directed to students, teachers, and parents. -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. Control (977) Comparison schools did not follow any alternative or special program of lessons.	-Home "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. Biomarker - No	SHSe in intervention group significantly decreased at school (−14.0%), at home (−19.9%), and on transportation (−21.8%). Comparison group, SHSe significantly decreased only at home (−16.9%). 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.
Tyc et al., (2013) [36]	To reduce SHSe among children with cancer	Design RCT Setting Hospital	- age of children < 18 years Inclusion 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,	Intervention (n=69) 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	-Parental, Number of cigarettes smoked over the past 7 days -Parent-reported the number of cigarettes to which the child was exposed by all smoking	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.	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

Author	Objective	Design / Setting	Participants	Intervention / Control	Outcome	Results	Study suggestion
			Exclusion A high risk prognosis or had a medical or family social crisis precluding participation Child health status - Unhealthy (Cancer) FU time: 12 months	of six individual contacts with their counsellor. Control (66) 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.	persons in the home and car for the previous 7 days. Biomarker - Urine cotinine	Child SHSe was significantly lower at 12 months relative to baseline in both groups. Children's cotinine levels did not show significant change over time in either group. 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.	of the paediatric cancer setting. More intensive interventions may be required to achieve greater reductions in SHSe.
Haruty unyan et al., (2013) [37]	To develop and test an intervention to reduce children's SHSe at homes in Yerevan, Armenia	Design RCT Setting Hospital and Household olds	Non-smoking mother having at least 1 child Age 2 to 6 years Residing with at least 1 daily smoker Smoking by parents or other household members Child health status - Healthy FU time 4 months	Intervention (n=125) In-person counselling session at home A tailored educational brochure 2 follow-up counselling telephone sessions The intervention was based on the motivational interviewing technique. Control (n=125) Only a brief educational leaflet on the hazards of SHS	-Knowledge about hazards of smoking and SHS -Smoking restrictions Biomarker - 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). GM of hair nicotine in the intervention group significantly decreased from 0.30 ng/mg to 0.23 ng/mg (p-value =0.024),	Intensive intervention is effective in decreasing children's exposure to SHS through educating mothers and promoting smoking restrictions at home. 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) [38]	To test the impact of education on health belief and environmental tobacco smoke exposure in pregnant women	Design RCT Setting Prenatal care (Isfahan, Iran)	Pregnant women 12weeks gestation or less based on last menstrual period Having ETS exposure from at least six cigarettes per week or more within 2 months before or since pregnancy. Exclusion included termination of pregnancy before the third visit, using illicit substances and suffering from mental disorders. Child health status - FU time 5 sections with 4-week intervals	Intervention (n=47) -Health Belief Model -Education about environmental tobacco smoke (ETS) exposure Control (44) -Education about prevention against infectious diseases	-Weekly number of ETS exposures at home and health belief in ETS exposure by self-report A 15-item questionnaire was developed covering a review of the literature and expert-opinion determinants of health belief model constructs. Biomarker - No	Intervention group, perceived susceptibility/severity and perceived benefits increased Weekly ETS exposure decreased on the third ($P < 0.05$). 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 Health belief model associated with a reduction of ETS exposure, but this is not sufficient for making smoke-free homes.
Wilson et al., (2011) [39]	To test the efficacy of interventions to reduce children's exposure and improve disease outcomes	Design RCT Setting Hospital (Northern California)	Children aged 3 to 12 years Medication use and/or a physician diagnosis suggesting persistent asthma Confirmation of exposure by a urinary cotinine level ≥ 10 ng/mL from ≥ one baseline visit test result - Unhealthy (asthma) FU time 12 months	Intervention (n=178) -Behavioural counselling (SHS reduction intervention based on social cognitive learning theory) 3 follow up interviews by phone (2, 4, and 6 weeks) Control (n=174) Usual care in setting (health care service)	Home smoking policy Caregiver smoking status Exposed in day care Biomarker - 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) 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) [40]	To test an air cleaner and health coach intervention to reduce secondhand smoke exposure	Design RCT (Block randomization) Setting The Johns Hopkins Hospital Children's Center and homes of children.	Age of 6 to 12 year Physician-diagnosed asthma, symptom frequency, and/or controller medication use signifying persistent asthma A smoker in the home who smoked more than 5 cigarettes per day Resided in the home at least 4 days per week Child health status - Unhealthy (Asthma) FU time 6 months	Control (44) 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. Air Cleaner Group (41) 2 air cleaners and the 4 asthma education sessions Air cleaners were placed in the bedroom where the child slept 4 or more nights per week and in the family or living room. Air Cleaner Plus Health Coach Group (41) Air cleaner plus health coach behavioural intervention group received the 2 air cleaners 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 Biomarker - PM(2.5, 2.5-1.0), air nicotine -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/m3; air cleaner only, −19.9 μg/m3; and air cleaner plus health coach, −16.1 μg/m3; P=.003; and PM2.5-10 concentrations: control, 2.4 μg/m3; air cleaner only, −8.7 μg/m3; and air cleaner plus health coach, −10.6 μg/m3; P=.02). 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 The intervention was not enough to prevent exposure to SHS.
Baheiraei et al., (2011) [41]	To assess whether counselling both mothers and fathers reduces	Design RCT Setting	Healthy infants aged less than 12 months At least one smoking parent who smoked at least 1 cigarette/day	Intervention (n=65) Motivational interviewing Mothers were provided three counselling sessions, (face to face and two of telephone). Fathers were provided three counselling sessions by telephone. Parents	Parental Reports Mean number of cigarettes smoked per day Total daily cigarette consumption in presence of the infant	The intervention was effective in reducing infant urinary cotinine levels (p = 0.029). There was a greater decrease in the total daily cigarette consumption in the presence of	Counselling can reduce infant exposure to SHS.

Author	Objective	Design / Setting	Participants	Intervention / Control	Outcome	Results	Study suggestion
	their infants' SHSe	Health centre in southern Tehran (Iran)	The parents also had to be able to speak Persian and have a telephone number. Exclusion Parents who reported the use of other addictive substances or being under a smoking cessation treatment program Child health status - Healthy FU time 3 months	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. Control (n=65). Received usual care but had the opportunity to receive the intervention after completion of the study. The usual care included usual health visits for checking the infants' growth and developmental milestones.	Biomarker - Urinary Cotinine (at baseline and at a 3-month follow-up)	the child in the intervention group compared with the control group The differences of cotinine between the 2 groups were statistically significant (p = 0.03). 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.	
Hovell et al., (2009) [42]	To test a combined intervention to reduce children' s SHSe and help parents quit smoking.	Design RCT Setting Home	Mothers with children aged ≤ 4 years who were exposed to a minimum of 3 of their mothers' cigarettes per day "Exposed " meant the child was in the same room of the home or in the car when any part of a cigarette was smoked. Exclusion 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.	Counsellors were masters-level students or graduates of psychology, social work, and public health. Intervention (n=76) Consisted of 14 biweekly counselling sessions over 6 months: 10 in-person at home and 4 by telephone. Counselled to set SHSe reduction goals, regardless of their interest in or success with quitting. Health education materials to support cessation.	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	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). 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).	Nicotine contamination of the home and resulting thirdhand exposure may have contributed to the failure to obtain a differential decrease in cotinine concentration. Partial exposure to counselling due to dropouts and lack of full participation from all family members and measurement reactivity in both conditions may have

Author	Objective	Design / Setting	Participants	Intervention / Control	Outcome	Results	Study suggestion
			Child health status - Healthy FU time: 18 months	All smokers in the counselling group families were offered free nicotine patches and/or gum to assist with quit attempts. Control (n=74) Not receive SHSe or cessation counselling. Self-help booklet and written materials based on the counselling protocol.	the home, including in the car. Biomarker - Children's urine cotinine	The results showed a significantly greater decrease in reported SHSe and mothers' smoking in the counselled group compared with controls. Reported indoor smoking and children's urine cotinine decreased, yet group differences for changes were not significant.	constrained intervention effects. Secondhand smoke exposure counselling may have been less powerful when combined with smoking cessation.

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.[43]

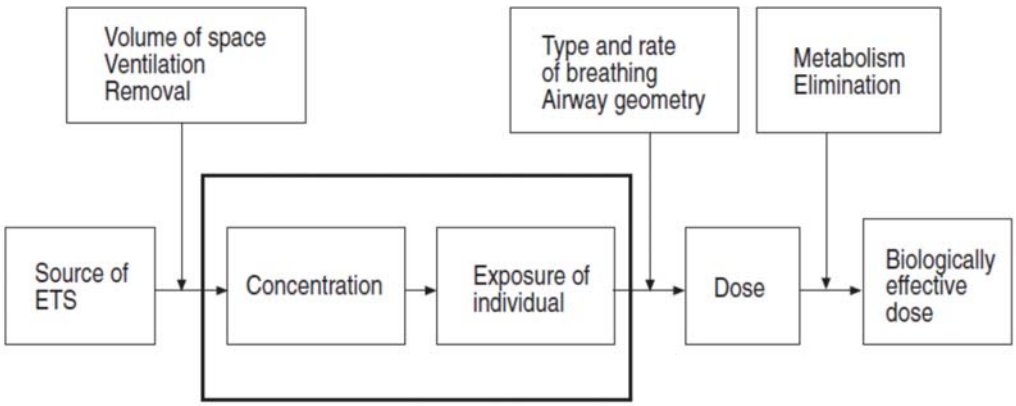
Table 3: The ratio of second-hand smoke; Sidestream (SS); Mainstream (MS)

Constituent	Emissions in MS	SS/MS ratio
Known human carcinogens		
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
Probable human carcinogens		
Formaldehyde	70–100 µg	0.1–50
Hydrazine	32 ng	3
N-Nitrosodimethylamine	10–40 ng	20–100
N-Nitrosodiethylamine	ND–25 ng	<40
N-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
N-Nitrosodiethanolamine	20–70 ng	1.2
Cadmium	110 ng	7.2
Toxic substances		
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 = 3.7×10^{10} Becquerel); ND: nondetectable.

Source: Jaakkola et al. (1997)

Figure 1: Second-hand smoke chain and level of biological samples (ETS = Environmental tobacco smoke)



Source: Jaakkola et al. (1997)

Figure 1 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 can be measured in several ways; reports from environment and biologically.[44] Biological measurement of SHS is expensive, which is a barriers for studies with long follow up, large sample size and a low budget.[45] However, researchers may have concerns about the ability including recall bias of not being able to remember history of exposure to SHS accurately. [46-48] Therefore, randomized controlled studies are planned to measure both biological indicator and self-report in order to confirm the accuracy of those measurements. [49]

Questionnaire

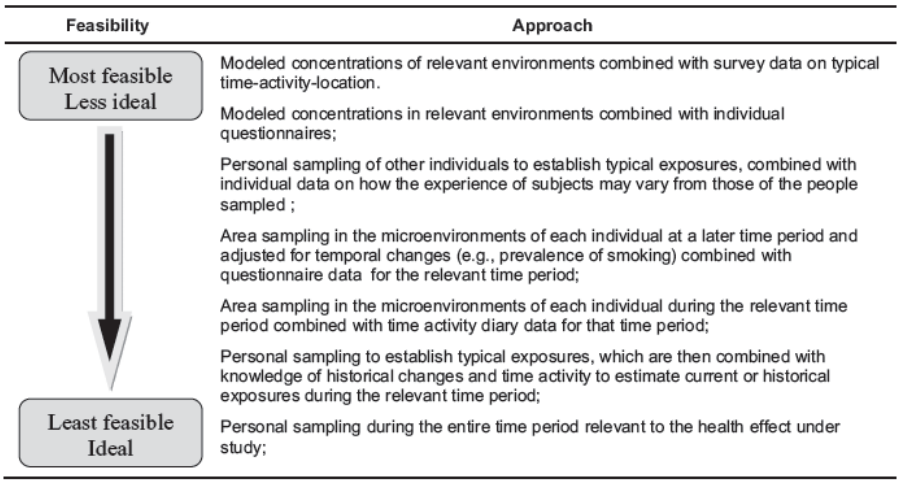
The questionnaire was used to interview the participant about the history of exposure to SHS such as number of smokers in the family, frequency of smoke, duration smoking in home. Assessment exposure to SHS with some confidence as study participants will answer reliably about childhood exposure to SHS 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, childhood and adulthood. Hours per day of exposure during childhood (as well as pack-years of exposure 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.[50]

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 Figure 2 [51]

Figure 2: SHS exposure assessment using environmental markers for epidemiological studies



Source: Apelberg et al. (2013)

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 (in Table 4) [52].

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
Cotinine				Reflects recent SHSe	
Urine	16 h (average)	Non-invasive	50 ng/ml for higher SHSe	Higher concentrations than other matrices (higher sensitivity)	Need of facilities with privacy during collection Difficulty for population-based or children studies Need for creatinine clearance adjustment Collect data on renal disease and some prescription drugs
Blood	16 h (average)	Invasive	12 ng/ml for higher SHSe 3 ng/ml for lower SHSe	No adjustment required for hydration	Pregnant women have increased clearance rate Difficulty for infants and young children 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 Lower sensitivity
Nicotine/cotinine					
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) 0.2 ng/mg (pregnant) 0.2 ng/mg (children)	Easy to collect, ship and store (room temperature ≤5 years) Less affected by daily variability (fluctuating exposure, varying metabolism and nicotine elimination) Represents longer exposure	Scarcity of hair in infants and adults Chemical hair treatments can reduce concentrations by 9% to 30% 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 ≤20 years) Overcomes day-to-day exposure variability Represents longer exposure	Need for further research and population concentrations
NNAL*					
Urine	Up to 3 weeks	Non-invasive	Not available	Related to a lung carcinogen Represents longer exposure than cotinine (urine/blood/saliva)	Analytical expertise Costly equipment NNAL is carcinogenic and mutagenic, special lab handling Further research needed

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

Source: Aviala et al. (2013)

Exposure to SHS of self-reported may not be precise, and might be forgotten [53-55]. Measurements of biological samples have been considering by research question, participants, and budget. In this study, the biological indicator of exposure to SHS will be measured using children's saliva.

1.3 Objectives

To compare the rate of self-reported exposure to secondhand smoke in home between intervention and control group

1.4 Methodology

Design and setting

This study used a cluster randomized control trial design that carried out from on February 2019 to October 2019.

Participants

We began by recruiting the 4 primary health care facilities (PHCFs) in the study setting, then selecting all the villages in the catchment areas of these PHCFs at Roi-Et province in northeast Thailand. In total, 47 villages were selected. Households were considered eligible and invited to participate if they were home to (1) a parent, (2) a child (aged 1-5 years), and (3) a smoker who had smoked in the home in the past 7 days. Figure 1 shows a flow diagram with eligibility criteria together with inclusion and exclusion criteria.

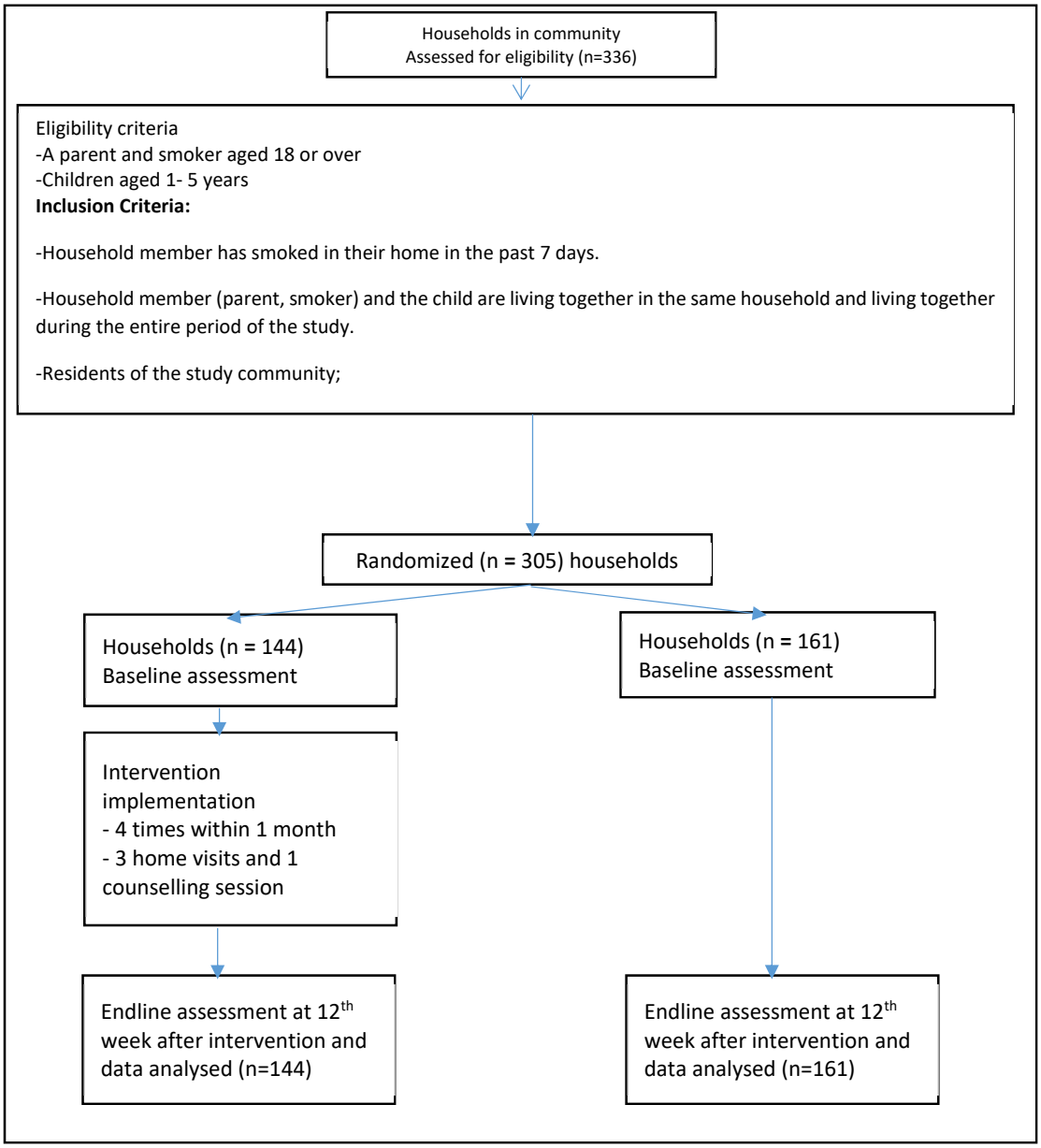


Figure 1. Flow diagram of trial and eligibility criteria

Randomization and blinding

We randomized the PHCFs (Clusters) into the intervention (2 PHCFs; 27 Villages) or control (2 PHCFs; 20 Villages) arm. Four clusters were randomized to either the intervention or the control group. Clusters (PHCFs) and participants (Households) were blinded.

Data collection

Families with a child aged 1-5 years were identified by using records from the Health Data Center of the PHCF. Trained interviewers (CHWs) visited each identified household to explain the study, assess eligibility, and invite them to participate in the study. The CHW continued visiting households until the required sample size was met. Participants received detailed information about the study, signed the consent form, and completed the baseline survey. The intervention group participants received a smoke free home (SFH) intervention. In the comparison group, the participants received an SFH document after the endline assessment. Endline assessment was carried out 12 weeks after the intervention had been implemented, and after baseline for the control group by research teams.

Intervention

This study used an intervention devised by Intarut et al 12 with slight modifications. The intervention consisted of self-learning material (leaflet and infographic) containing information on the harmful effects of SHS exposure, the benefits of creating a smoke-free home, techniques for creating a smoke-free home, and a smoking cessation service. We also sent text messages via short message service (SMS) to parents with SFH tips. The text message included tips and techniques, raising awareness of the risks of SHS exposure. We sent a total of 45 text messages to parents, one each day. The example of text messages was showed. The strategies of this intervention are to give an information of the danger of exposure to SHS in home to parent's child who look after child or children.

Participants received the intervention material at the first visit. The research team explained the content and how to display the infographic in the home where it could be observed by family members, especially the smoker(s). From day 1 to day 45 of the intervention, the parent received messages via SMS from the research team.

Measurements

Primary outcome

The primary outcome was the parent's self-reported SHS exposure in the home within 7 days 13. Assessment of self-reported exposure to SHS used the question: "In the past 7 days, have you seen anyone smoke in your home?" (Response options: no, not at all; yes, estimated days of smoking). In addition, during pilot study, we tested the reliability of this question with biochemical testing using the urine test kit

Secondary outcomes

The number of days of SHS exposure in the home: The number of days of SHS exposure in the home was assessed by asking the question “In the past 7 days, have you seen anyone smoke in your home?” (Response options: no, not at all; yes, estimated days of smoking). If they responded “yes”, the number of days of SHS exposure was estimated.

Confidence avoiding SHS exposure 14: This outcome was assessed by asking parents the 2-consequent question “If a family member started smoking in your home, how confident would you be asking them to stop?” and “if a guest started smoking in your home, how confident would you be asking them to stop?” (Response: from 0 (no confidence) to 10 (highest confidence)). The total scores were ranked from 0 to 20.

The number of quit attempts: This outcome was assessed by asking the questions “In the past 3 months, how many times have you tried to quit smoking?”

The number of cigarettes smoked per day: We assessed by asking the questions “In the past 7 days, how many cigarettes have you smoked per day?”.

Confidence to quit smoking score 15: The Likert scale was designed to assess confidence to quit smoking. Smokers were asked “How much confidence do you have to quit smoking?” (Response option: the scores rank from 0 to 10 (0: no confidence; 10 : highest confidence)).

Demographic variables

For demographic variables, we asked parents their age (years), gender, duration of school attendance, occupation, marital status, income (Thai baht), number of non-smokers in the home, number of smokers in the home, number of children in the home (under 5 years), SHS exposure risk perception, and thirdhand smoke exposure risk perception. The response option of risk perception both SHS and thirdhand smoke risk perception was ranked; 1: definitely agree; 2: Agree; 3: Not Agree; 4: Definitely not agree).

Sample size

The effect size of 25% difference in the rate of exposure to secondhand smoke between the intervention and control groups after the 3-month intervention period was determined. 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 collected. Randomization was generated at the center of study, then assigned to either intervention or control group. This process was operated by a researcher. We also masked participants and CHWs who were assessing outcomes.

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

$Z_{\propto/2}$ = 1.96, Alpha = 0.05, Z_{β} = 0.84, Beta = 0.20

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

Statistical methods

Baseline characteristics were expressed as frequency and percentage. Chi-square statistics were used to test differences in baseline characteristics between the intervention and control. Primary outcomes were presented as frequency and percentage. In addition, we performed multiple logistic regression to test the effect of the intervention, and reported odds ratio (OR) adjusted for all potential confounders. For secondary outcomes, we tested the number of days of SHS exposure in the home, confidence in avoiding SHS exposure score, quit attempts in the last 3 months, the number of cigarettes smoked per day, and confidence to quit smoking, by using mixed linear regression adjusted for baseline characteristics. All statistics were performed by R program version 3.6.1 and epiDisplay version 3.5.0.1 package.

Ethical approval and informed consent

Mahasarakham University Institutional Review Board (IRB) approved the study. The study identification number was 113/2561. Written consent forms were distributed and provided to all participants.

Clinical Trial Registration

This study has been registered at the Thai Clinical Trials Registry (TCTR) with the study identification code TCTR20190213001.

1.5 Results

Data collection began on February 18, 2019 and finished on October 20, 2019. Three hundred and thirty-six households were invited to participate in the study. Of those, thirty-one households did not meet the inclusion criteria, and 305 households did meet the inclusion criteria. Finally, the

analyzed sample consisted of an intervention group (n=144) and a control group (n=161). Table 1 shows the baseline characteristics. Overall, 61.3% of participants were aged 18-40 years; 92.1% were female; 75.7% worked in agriculture; 80% were married; 64.9% of residents were non-smokers; 55.7% of households had one smoker living in family; most households had one child as 82.6%. There was no statistically significant difference between intervention and control group.

Table 1. Baseline characteristics of the 305 participants (parents) by intervention and control groups

Variables	Total (n=305)	Intervention (n=144)	Control (n=161)	P value
Age (years)				0.130
18-40	187 (61.3)	92 (63.9)	95 (59.0)	
40-50	70 (23.0)	26 (18.1)	44 (27.3)	
>50	48 (15.7)	26 (18.1)	22 (13.7)	
Gender				0.156
Male	24 (7.9)	8 (5.6)	16 (9.9)	
Female	281 (92.1)	136 (94.4)	145 (90.1)	
Duration of school attendance (years)				0.610
0-6	172 (56.4)	79 (54.9)	93 (57.8)	
>6	133 (43.6)	65 (45.1)	68 (42.2)	
Occupation				0.093
Agricultural	231 (75.7)	100 (69.4)	131 (81.4)	
Merchant	63 (20.7)	38 (26.4)	25 (15.5)	
Government officer	5 (1.6)	3 (2.1)	2 (1.2)	
No job	6 (2.0)	3 (2.1)	3 (1.9)	
Marital status				0.731
Married	244 (80.0)	114 (79.2)	130 (80.7)	
Divorced/Other	61 (20.0)	30 (20.8)	31 (19.3)	
Income (Thai Baht)				0.821
<10000	161 (52.8)	77 (53.5)	84 (52.2)	
≥10000	144 (47.2)	67 (46.5)	77 (47.8)	
Number of non-smokers in the home				0.119
1-3	107 (35.1)	57 (39.6)	50 (31.1)	
≥4	198 (64.9)	87 (60.4)	111 (68.9)	
Number of smokers in the home				0.373
1	213 (69.8) 92	97 (67.4)	116 (72.0)	
≥2	(30.2)	47 (32.6)	45 (28.0)	
Number of children in the home (under				0.360
5 years)	252 (82.6)	122 (84.7)	130 (80.7)	
1	53 (17.4)	22 (15.3)	31 (19.3)	
≥2				
Secondhand smoke exposure risk				0.366
perception	250 (81.9)	115 (79.9)	135 (83.8)	
Agree	55 (18.1)	29 (20.1)	26 (16.2)	
Disagree				
Thirdhand smoke exposure risk				0.227
perception	256 (83.9)	117 (81.3)	139 (86.3)	
Agree	49 (16.1)	27 (18.7)	22 (13.7)	
Disagree				

Table 2 shows the multiple logistic regression results. We did observe a statistically significant difference in the primary outcome. After adjusting the potential confounders, the adjusted odds ratio for reducing exposure to SHS in home in the intervention group was 1.80 (95%CI: 1.04, 3.11) times higher than the control group. For the secondary outcomes, the results from mixed linear regression adjusted baseline characteristics showed the number of days of SHS exposure in the intervention group was lower than in the control group with -1.25 (95%CI: -1.85, -0.66). In addition, the number of quit attempts of smokers was better than the control group with values of 0.41 (95%CI: 0.12, 0.70). For the number of cigarettes smoked per day, confidence to quit smoking, and confidence to avoid SHS exposure score, the values were not statistically significant, with differences of the mean being 1.20 (95%CI: 0.18, 2.22), 0.77 (95%CI: -0.02,1.53), and 0.06 (95%CI: -1.3, 1.43) respectively.

Table 2. Comparing the primary and secondary outcomes between intervention and control

Primary outcome	Groups	n	Pre	n	Post	Adjusted OR (95%CI)
Parent's self-reported SHS exposure in the home within 7 days [A]	Intervention	144	-	139	44 (31.7)	1.8 (1.04, 3.11)
	Control	161	-	158	39 (24.7)	
Secondary outcomes			**Pre**		**Post**	**Adjusted Coefficient (95%CI)**
Parent						
Number of days SHS exposure in the home on average 7 days [B]	Intervention	144	5.8 (1.6)	95	3.6 (1.7)	-1.25 (-1.85, -0.66)
	Control	161	6.0 (1.5)	119	5.0 (2.3)	
Confidence in avoiding SHS exposure score [B]	Intervention	144	7.9 (6.3)	139	10.1 (5.7)	0.06 (-1.3, 1.43)
	Control	161	8.6 (6.4)	158	9.9 (6.6)	
Smoker						
Quit attempts in the last 3 months [B]	Intervention	144	0.7 (1.1)	139	1.0 (1.4)	0.41 (0.12, 0.70)
	Control	161	0.7 (1.1)	158	0.6 (1.2)	
Number of cigarettes per day in the past 7 days [B]	Intervention	144	12.1 (7.6)	139	10.2 (6.7)	0.59 (-0.91, 2.09)
	Control	161	11.4 (6.8)	158	9.9 (5.5)	
Confidence to quit smoking [B]	Intervention	144	3.0 (2.9)	139	4.5 (3.3)	0.77 (0.02,1.53)
	Control	161	2.9 (2.7)	158	3.6 (3.6)	

Model A was fitted by multiple logistic regression adjusted for gender, number of non-smokers in the home, number of smokers in the home; Model B was fitted by mixed linear regression adjusted for baseline characteristics

1.6 Discussion

This study observed a statistically significant increase in reducing SHS exposure in home by creating a smoke free home (SFH), a reduction in the number of days of SHS exposure, and an increase in the number of attempts to quit smoking. For a reduction in the number of cigarettes smoked per day, confidence to quit smoking, however, there was no significant difference.

Our results show the effectiveness of an intervention to reduce exposure to SHS in home for families with one or more children. As described in the methods, we adopted an intervention developed by Intarut et al [56]. This previous intervention was school-based and did not achieve a statistically significant increase in smoke-free homes. We therefore modified the intervention using recommendations from other studies [57, 58]. Digital technology has been shown to be useful in educating people about health and the prevention of disease [59, 60]. In 2018, the number of mobile phone users in urban areas of Thailand was 91.5% , and the number in rural areas was 87.9% [61]. Because there is evidence that text messages have a positive effect on smoking cessation (both in trial [62-64] and meta-analysis [65, 66]), but this approach has seldom been used in smoke-free home trials, we decided to use text messages as part of our intervention. This study might be the first study in Thailand to use mHealth to promote SFHs for reducing SHS exposure in home.

Our study findings are consistent with the results of Yu et al [67]. They tested the effect of mHealth for creating SFHs for newborns, sending text messages to participants and giving them manuals for creating a smoke-free home. There were some differences between their study and ours however. Our study targeted households with a child or children aged 1- 5 years, and assessed the outcome just 3 months after the intervention finished. However, Yu et al., targeted households with newborn and assessed the long-term effects at the 6- and 12-month. In addition, our study showed that the effect of intervention might also have decreased the number of days of SHS exposure in the home because family members might aware of the danger of exposed to SHS [68-70].

Previous observational studies have shown an association between the number of cigarettes smoked and smoking ban in home [71, 72]. Our intervention was aimed at non-smokers (parents) that look after children and

not observed the effect of the intervention to the number of cigarettes smoked in the home. Parents might be willing to ask smokers not to smoke in the home to improve child health. When unable to smoke in the home, smokers might reduce their use of cigarettes or smoked outside the house [73-75].

The present study has some limitations. Firstly, the intervention relied on self-reported variables such as the number of cigarettes smoked in the home or the number of days of SHS exposure, and this may have led to some recall bias or social desirability bias. Secondly, our study used CHWs with close relationships to the community, and this might have influenced data collection. Although we trained CHWs to collect data according to standard guidelines to reduce interviewing bias, it may not have been eliminated completely. Thirdly, there may have been some uncertainty in the home assessment. When we asked the question “In the past 7 days, have you seen anyone smoking in your home” during the screening phase, there was some uncertainty about the boundaries of the home. We sought to clarify this issue when training the research team, but some confusion may have remained and this could have led to an underestimate of the number of households where smoking took place in the home. Fourthly, there have been several regional and national interventions seeking to raise awareness of the harms of SHS, and we could not control for this contamination bias. Finally, our study sites were located in a rural area, and we cannot assume our findings can be generalized to the wider population. Our study also has a number of strengths. Firstly, we validated the primary outcome with biochemical testing during the pilot phase as mentioned in the primary outcome assessment. Secondly, the intervention has been shown to be an effective way to promote smoke-free homes and is easily delivered from a primary care setting. The intervention is therefore easy to implement.

In summary, this study was effective in reducing exposure to SHS in home by creating a home to be a smoke-free and reducing the number of cigarettes consumed in a short time period. Future studies should assess the long-term impact of the intervention and using biomarkers as the primary outcome.

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2. ผลลัพธ์ที่ได้จากโครงการ

1. ได้ตอบรับเพื่อเผยแพร่ในวารสารนานาชาติชื่อ The International Journal of Tuberculosis and Lung Disease ซึ่งอยู่ในฐาน ISI (Quartile ที่ 1) และมี impact factor 2.0
2. ได้เครือข่ายการทำวิจัยร่วมกันกับชุมชน

4. รายงานสรุปการนำผลงานวิจัยไปใช้ประโยชน์

รายงานสรุปการนำผลงานวิจัยไปใช้ประโยชน์

สัญญาเลขที่ MRG6180067

ชื่อโครงการ A multicomponent intervention for creating a smoke free home: A randomized controlled trial

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สถานะผลงาน ☐ ปกปิด ☑ ไม่ปกปิด

ความสำคัญ / ความเป็นมา ควันบุหรี่มือสองเป็นสาเหตุทำให้เกิดการเจ็บป่วยและเสียชีวิตในผู้ที่ไม่สูบบุหรี่และเด็ก โดยเฉพาะอย่างยิ่งในเด็กทารก ประเทศไทยเป็นประเทศที่ขึ้นชื่อในเรื่องการควบคุมและลดการสูบบุหรี่ได้ดีประเทสหนึ่งแต่สถิติที่ผ่านมายังพบว่านอกจากการสูบบุหรี่แล้วยังมีการได้รับควันบุหรี่มือสองและมีอัตราการได้รับควันบุหรี่ที่สูงอยู่ สถานที่ ที่ได้รับควันบุหรี่มือสองมากและบ่อยที่สุดคือ ตลาดสดและที่บ้าน บ้านเป็นสถานที่อยู่อาศัย รวมตัว ของครอบครัว ดังนั้นบ้านหลังไหนที่มีเด็กอาศัยอยู่ด้วยจะมีความเสี่ยงที่เด็กจะได้รับควันบุหรี่และเกิดโรคต่าง ๆตามมาได้ ดังนั้นในการศึกษานี้ได้ทำการทดสอบผลของสิ่งแทรกแซงโปรแกรมบ้านปลอดบุหรี่เพื่อที่จะลดการได้รับควันบุหรี่มือสองของเด็กอายุ 1 - 5 ปี ในบ้าน

วัตถุประสงค์ของโครงการ เพื่อทดสอบผลของโปรแกรมบ้านปลอดบุหรี่ในบ้านที่มีเด็กอายุ 1-5 ขวบอาศัยอยู่ โดยส่งข้อมูลเกี่ยวกับอัตรายของการได้รับควันบุหรี่และเทคนิคการทำบ้านให้ปลอดบุหรี่ ผ่านทางผู้ปกครองของเด็ก

ผลการวิจัย พบว่าโปรแกรมบ้านปลอดบุหรี่สามารถลดอัตราการได้รับควันบุหรี่มือสองในบ้านได้ เป็น 1.8 (ช่วงเชื่อมั่นที่ 95%: 1.04, 3.11) เท่าเมื่อเทียบกับกลุ่มทดลอง นอกจากนั้นแล้วยังพบว่า จำนวนวันที่ได้รับควันบุหรี่ในบ้านยังลดลงเป็นจำนวน 1.25 (ช่วงเชื่อมั่นที่ 95%: -1.85, -0.66) วัน

คำสืบค้น (Keywords): บ้านปลอดบุหรี่, ควันบุหรี่มือสอง, เด็กทารก

☐ การนำผลงานวิจัยไปใช้ประโยชน์

☐ ด้านนโยบาย ☐ ด้านสาธารณะ ☐ ด้านชุมชนและพื้นที่ ☐ ด้านพาณิชย์

☐ ด้านวิชาการ

☑ ยังไม่มีการนำไปใช้ (โปรดกรอกในกรอบถัดไป)

ผลงานวิจัยมีศักยภาพในการนำไปใช้ประโยชน์

□ ด้านนโยบาย ☑ ด้านสาธารณะ ☑ ด้านชุมชนและพื้นที่ □ ด้านพาณิชย์ ☑ ด้านวิชาการ

ข้อเสนอแนะเพื่อให้ผลงานถูกนำไปใช้ประโยชน์

การเผยแพร่/ประชาสัมพันธ์

1. สิ่งพิมพ์ หรือสื่อทั่วไป

□ หนังสือพิมพ์ ☑ วารสาร □ โทรทัศน์ □ วิทยุ □ เว็บไซต์ □ คู่มือ/แผ่นพับ □ จัดประชุม/อบรม □ อื่น ๆ

2. สิ่งพิมพ์ทางวิชาการ

วารสารนานาชาติชื่อ The International Journal of Tuberculosis and Lung Disease ซึ่งอยู่ในฐาน ISI (Quartile ที่ 1) และมี impact factor 2.0