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Title of Doctoral Thesis

Effectiveness of Preventing Second-hand Smoke for Pregnant Women at Home Using an Educational Comic Booklet in Indonesia: A Randomized Controlled Trial

インドネシアの妊娠中の女性の家庭内受動喫煙を予防する コミック教材を用いた介入の効果：ランダム化比較試験

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Abstract

Background: Second-hand smoke (SHS) exposure has a negative impact on both a pregnant woman and her fetus. This study in Indonesia seeks to determine the effectiveness of preventing second-hand smoke for pregnant women at home using an educational comic booklet. **Methods**: We recruited 286 couples to a randomized controlled trial during 17 months in Tomohon and Manado city, Indonesia. An educational comic booklet based on Health Belief Model (HBM) and a sticker as reminder was provided for experimental group. All couples received the usual care. Student's t-test was selected to check significance difference of outcome between the experimental group and the control group. Ethical approval has been obtained from Sam Ratulangi University, and St. Luke's International University. **Results**: We allocated 140 couple to the experimental group, and 146 couple to the control group. Self-reported data from 214 couples were analyzed as outcomes at three months post-intervention. There were significant difference in experimental group pregnant women's behavior intervention: pregnant women distanced from smoker (*MD* =0.18, 95%CI = [0.01- 0.37]), requested a nonsmoking seat in some transportations (*MD* = 0.24, 95%CI = [0.05 -0.43]), separated from tobacco smoke outdoor (*MD* = 0.25, 95%CI = [0.08 - 0.41]), and not to place where smoking was prevalent (*MD*= 0.02, 95%CI = [0.03 - 0.39]). Their husband assessed that most of pregnant women in both groups had moved away from smoking husband, remind their husband smoking partner not to smoke in their home in both groups, and moved away from smoker. On impacts for husbands' smoking behavior, husbands reported that rate of smoking partner in experimental group who did not intend to quit smoking decreased from 54.0% to 29.0% (*MD* = 0.24, 95%*CI* = [0.02-0.47]). Pregnant women perceived that smoking husbands in experimental group had taken distance from pregnant women (*MD* = 0.24, 95%*CI* = [0.02-0.46]), smoked outdoor with the door closed (*MD* = 0.38, 95%*CI* = [0.17-0.59]), and increased number of husbands intending to quit smoking (*MD* = 0.30, 95%*CI* = [0.08-0.51]). **Conclusion:** A HBM based educational comic booklet with a reminding sticker was effective in SHS prevention by several cue to actions through hidden knowledge, perceptions including disease susceptibility, disease severity, benefit, and self-efficacy.

Keywords: behavior change techniques, couple intervention, educational comic booklet, Health Belief Model, Indonesia, pregnant women, randomized controlled trial, second-hand smoke

抄録

背景: 受動喫煙は妊娠した女性とその胎児の両方に悪影響を与える。本研究は、インドネシアにおいてコミック教材を使う事が家庭内での受動喫煙予防に効果があるかどうかを検証する事を目的としている。

方法: 我々は、インドネシアのトモホン市とマナド市において 17 か月の間でと 286 カップルをリクルートし、ランダム化比較試験を行った。研究に参加する全てのカップルに対して、通常のケアが提供され、教育教材であるコミックとリマインダーの役割をするステッカーは、介入群にのみ配布された。両群の成果の違いを検証するためにスチューデントの t 検定が選択された。本研究は、インドネシアのサムラトランギ大学と聖路加国際大学の倫理委員会から許可を得て行われた。

結果: 140 カップルを介入群へ、146 カップルを比較群へ割り付けた。介入から 3 か月後に 214 カップルの自己評価データを分析した。その結果、介入群に属している妊娠している女性の受動喫煙予防行動に有意な差が得られた:妊娠している女性はたばこの煙から距離を取った(*MD* =0.18, 95%CI = [0.01- 0.37]), 公共交通機関の中で、禁煙シートをリクエストした(*MD* = 0.24, 95%CI = [0.05 -0.43]), 屋外でたばこの煙から離れた(*MD* = 0.25, 95%CI = [0.08 - 0.41]), たばこの煙があるところにいない(*MD*= 0.02, 95%CI = [0.03 - 0.39])と報告した。妊娠している女性の夫は、両群ともに妻はたばこを吸っている夫から離れる、家の中でたばこを吸わない様に夫にリマインドする、たばこの煙から遠ざかっていると報告した。夫の喫煙行動については、介入群に属する夫の中でベースラインでは禁煙予定がなかった夫が 54.0%いたが、その値が介入後 3 か月後には 29.0%まで減少した(*MD* = 0.24, 95%*CI* = [0.02-0.47])。介入群に属す妊娠している女性は、夫は煙草を吸うときに妻から離れた(*MD* = 0.24, 95%*CI* = [0.02-0.46]), 部屋の扉を閉めて外でたばこを吸った(*MD* = 0.38, 95%*CI* = [0.17-0.59]), 喫煙を予定している夫の数が上昇した(*MD* = 0.30, 95%*CI* = [0.08-0.51])と報告した。

結論: ヘルスビリーフモデルを元に作成したコミック教材とリマインダーは、潜在している知識、ヘルスビリーフ、自己効力感を通していくつかの行動変容のきっかけによって受動喫煙予防に効果が発揮された。

キーワード: インドネシア、カップルインターベンション、行動変容テクニック、コミック教材、妊娠している女性、ヘルスビリーフモデル、ランダム化比較試験、 受動喫煙

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INTRODUCTION

Background

Second-hand smoke (SHS), "a mixture of ~85% diluted side stream and 15% exhaled mainstream smoke" (Hang et al., 2013. p. 381) is formed from the side stream smoke emitted between puffs into the environment from the smoking of cigarettes and other tobacco products and from the mainstream smoke exhaled by the smoker (World Health Organization, 2011). More than 4,000 chemical compounds in the form of gases as a human carcinogen and an air pollutant were contained in SHS (Matt et al., 2011). The terms "passive smoking", "involuntary smoking", and "environmental tobacco smoke" are also frequently used to express exposure to SHS. People living with an indoor smoker are exposed third-hand smoke (THS). "THS consists of tobacco smoke pollutants that remain on surfaces and in dust after tobacco has been smoked, are remitted and re-suspended back into the air, or react with oxidants and other compounds in the environment to yield secondary pollutants" (Matt et al., 2011, p. 13).

The effects of SHS. The harmful effects of SHS have been recorded since 1928. In the 1970s, scientific interest in the potential adverse health effects of second-hand smoke expanded (Öberg, Jaakkola, Woodward, Peruga, & Prüss-Ustün, 2011). From the end of the 1980s to the early 2000s, researchers were identifying diseases that were associated with environmental tobacco smoke, especially asthma (Dales, Choi, Chen, & Tang, 2002; Murray & Morrison, 1988; Polosa, Al-Delaimy, Russo, Piccillo, & Sarva, 2005), breast

cancer (Johnson, 2005; Lash & Aschengrau, 1999) and heart diseases (He et al., 1999; Law & Wald, 2003).

Epidemiological overview of SHS. Among epidemiological samples, Öberg, Jaakkala, Woodward, Peruga, and Prüss-Ustün (2011) found that: 40% of children, 33% of male non-smokers, and 35% of female non-smokers were exposed to SHS in 2004. This exposure was estimated to have caused 379,000 deaths from ischemic heart disease, 165, 000 from lower respiratory infections, 36,900 from asthma, and 21,400 from lung cancer. 603,000 deaths were attributable to second-hand smoke in 2004, which was about 1% of worldwide mortality. Of those 47% of deaths from SHS occurred in women, 28% in children, and 26% in men (Öberg et al., 2011, p. 139).

The effects of second-hand smoking exposure for pregnant women and fetuses.

Maternal exposure to SHS in pregnancy has a negative impact on both the pregnant woman and the fetus. For instance, women experienced premature birth (Goel, Radotra, Singh, Aggarwal, & Dua, 2004), decreased placenta weight (Abdullah et al., 2017), perinatal depression, and suicidal ideation (Weng, Huang, Huang, Lee, & Chen, 2016). The influence on the fetus from passive smoking increases the risk of stillbirth, congenital malformation (Leonardi-Bee, Britton, & Venn, 2011), low birth weight (Martin & Bracken, 1986), smaller head circumference, shorter length (Abdullah et al., 2017) and small for gestation (Goel, et al., 2004, p. 14). The developmental origins of health and disease theory (Gluckman & Hanson, 2004) posits that the onset risk of non-communicable diseases is influenced by the environment during the fetal development period and was supported by

various studies (Baker, 1990); Smith et al., 2016). Those two researchers substantiated that premature birth, and low birth weight were linked with the onset of coronary heart diseases, and its risk factors including arteriosclerosis-related lesion, diabetes, and high blood pressure.

Current smoking and SHS epidemics in Indonesia. Male smokers living in middle-income countries are by far the largest group of smokers in the world, numbering 765 million-or 68% of all smokers (World Health Organization, 2017b, p.57). However, tobacco companies have gradually shifted their market from high- to low- income countries, where people are less informed about the health risks of tobacco use and antismoking policies are relatively weak (de Beyer, & Waverly, 2003). Indonesia is one of the lower-middle income countries and has 67% of male daily smokers (Centers for Disease Control and Prevention, 2012). Among 74,039 urban families, the prevalence of paternal smoking was 70.8% whereas maternal smoking was only 0.7%. Among 286,982 rural families, the prevalence of paternal smoking was 73.2% and maternal smoking was 0.5% (Semba et al., 2008).

Exposure to SHS is widespread. In restaurants, 85.4% of adults (44 million adults) were exposed to tobacco smoke. In homes, 78.4% of adults (133.3 million adults) were exposed to SHS. In the workplace, 51.3% of adults who worked indoors (14.6 million adults) were exposed to tobacco smoke (Center for Disease Control and Prevention, 2012). Even though smoking is prohibited on public transport and in public places, it is unregulated in homes (Southeast Asia Tobacco Control Alliance, n.d.; World Health Organization, 2017a). The

Indonesian Ministry of Health used health education advertising about the harmful effects of smoking for pregnant mothers and their unborn babies by showing shadow puppet theatre. Dangers of passive smoking for women and children were highlighted in Indonesian's posters (Barraclough, 1999). However, there was less promotion and education for the prevention of second-hand smoking in women during pregnancy and their partners.

Basic information and maternal second-hand smoke exposure in Tomohon city, Indonesia (Table 1). Tomohon (population estimated at 91,553) and Manado (population estimated at 1.2 million) are cities in the North Sulawesi state with a total population of 103,711 with its 147.21 square kilometers. The percent of the population for major ethnic groups living in North Sulawesi are 30% Minahasa, 19.8% Sangri, and 11.3% Mogondow. Most of the people are Protestant (66%) or Catholic (22%). The total number of pregnant women was 1,656 in 2017.

In 2017, a population-based retrospective cross-sectional study found that 69.2 % of pregnant women in Tomohon city. A study reported that 69.2% of pregnant women who reported smoke exposure are exposed by husband smoking in their home (Suzuki, 2018). In other words, most of the participants were exposed to SHS from their husband smoking at their home. Seventy-four percent of participants' and 79% of their husbands' educational level was less than high school.

Table 1

Background Information of Tomohon City

Basic Information of Tomohon city, Indonesia		
Area [a]	147.21km²	
Total population (2017) [a]	103,711	
Religion (2017) [b]	Protestant	67,939 (66%)
	Catholic	22,579 (22%)
	Islam	2,414 (2%)
	Buddhist	32
	Hindu	8
	Other	158
Race (2010) [c]	Minahasa	(30%)
	Sangir	(19.8%)
	Mogondow	(11.3%)
	Gorontalo	(7.4%)
	Tinghoa	(3%)
	Others (Jawa, Sunda, Bugis, Makasar,Bari,Etnis China dan kaum pendatang, 29.5%)	
Total number of pregnant women (2017) [d]	1,656	
Information on Maternal second hand smoke exposure in Tomohon city, Indonesia.[e]		
Total number of participants (non smoking pregnant women)	234	
Exposure status of participants	SHS exposure	162 (69.2%)
	Non SHS exposure	66 (28.2%)
Maternal age (%)	Median [SD]	27 [24.0-31.0]
	20-34	193 (89.4)
	Over 35	23 (10.6)
Maternal education level (%)	Primary school	3 (1.3)
	Secondary school	34 (15.1)
	High school	130 (57.8)
	University / College	58 (25.8)
Marital status (%)	Married	197 (88.3)
	Single	26 (11.7)
Maternal occupation (%)	Housewife	155 (69.2)
	Working mother	69 (30.8)
Paternal age (%)	Median [SD]	30 [26.0.35.0]
	20-34	156 (73.9)
	Over 35	55 (26.1)
Paternal education level (%)	Primary school	12 (5.4)
	Secondary school	43 (19.3)
	High school	121 (54.3)
	University / College	47 (21.1)
Paternal occupation (%)	Private employee	49(21.7)
	Government employee	22 (9.7)
	Entrepreneur	45 (19.9)
	Farmer	32 (14.2)
	Laborer	28 (12.4)
	Others	50 (22.1)

Note. a:Tomohon Municipality in Figures 2018, b:Ministry of Religious Affairs of Tomohon Municipality, c:North Sulawesi Demography, d:Ministry of Health of Tomohon Municipality, e:Suzuki's study(2018). Health Effects of Secondhand Smoke on Maternal and Perinatal Outcomes in Tomohon City, North Sulawesi.2017 St.Luke's International University Master's Thesis

Effective interventions for preventing SHS in the world. The first intervention for preventing SHS was conducted as a non-randomized controlled trial for 1,015 infants from 1985 to 1986 in Italy (Vineis et al., 1993). By 2006 at least ten randomized controlled trials (RCTs) for reducing children's SHS exposure were found (Baxter et al., 2011).

Since 2004, seven RCTs, and three before and after studies for pregnant and the fetus had been confirmed (Dherani et al., 2017; Tong et al., 2015; Zhang et al., 2015). There have been four theoretically based RCTs for SHS prevention: (a) health belief model (HBM) (Chi et al., 2015; Kazemi, Ehsanpour, & Nekoei-Zahraei, 2012), (b) trans-theoretical model (Huang, Wu, Huang, Chien, & Guo, 2013), (c) integrated behavioral intervention (El-Mohandes, Kiely, Blake, Gantz, & El-Khorazaty, 2010), and (d) theory of reasoned action (Loke & Lam, 2005). Each study showed statistical significance of some outcomes, but not for all of the chosen outcomes.

Chi et al.'s (2015) study, based on the HBM, did show significant differences for each outcome (SHS knowledge, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, self-efficacy, rejecting SHS behavior, SHS exposure) and SHS exposure (intervention = 1.5 ± 1.53, control = 4.9 ± 2.11, $p < .001$). The research did not confirm long-term effects, only short-term effects at one month from the intervention. The study noted the limitation that a large sample size was needed to ascertain the validity of outcome results (Chi et al., 2015). Couples who were treated together presented a better long-term adjustment dealing with health problems. "There was a positive association between the quality of the relationship and the patient's adjustment"

(Baucom, Porter, Kirby, & Hudepohl, 2012, p. 68). The World Health Organization urged health-care providers to provide couple-focused interventions for prevention of SHS exposure for pregnant women in their home (World Health Organization, 2013). Hence, the husband who smokes in the trial is required for successful outcomes.

Current educational material for reduction of SHS exposure in pregnancy. World Health Organization (WHO) (2013) reported on a structured program for the prevention of SHS exposure. Materials were a mix of contents about tobacco use in pregnancy and were written in English (Centers for Disease Control and Prevention, 2017; National Health Service, 2018; National Health Service, n.d.; National Health Service,2019; New South Wales Health, n.d.; Victoria, n.d.). Utilizing comic books, which were becoming culturally acceptable and have been adopted in the Indonesian culture (Febriani, 2016). They could be used for preventing second-hand smoke for pregnant women at home because Japanese comics are familiar to Indonesian and liked by Indonesian since 1985 (Febriani, 2016). However, there are no educational materials utilizing visual with storytelling, comic style educational material for promoting SHS prevention in pregnancy.

Purpose

The purpose of this study is to determine the effectiveness of preventing second-hand smoke for pregnant women at home in order to reduce SHS exposure in pregnancy.

Goals

1. To define the educational comic's contents following the framework of the HBM for a preliminary study two.
2. To assess the suitability in a draft of an educational comic booklet as a preliminary study
3. Based on the evaluation findings for suitability, modify the developed educational comic booklet.
4. To determine the effectiveness of preventing second-hand smoke for pregnant women at home using an educational comic booklet in Indonesia.

Significance and the Novelty of the Research

Conducting couple-focused health behavior change intervention for preventing second-hand smoke exposure at home for Indonesian pregnant women using an educational comic booklet, may be useful for reducing second-hand smoke for pregnant women in Tomohon city, Indonesia. Indonesia is one of the highest smoking rate countries: 67.4% of men, 4.5% of women, and 36.1% overall (World Health Organization, 2012). Tomohon city in Indonesia has a high second hand smoking exposure rate: 69.2% of pregnant women exposed to SHS by husband smoking in their home (Suzuki, 2018).

The novelty of the research is using couples-focused intervention utilizing several behavior change techniques (BCTs) based on some RCTs where HBM is applied. This research is unique for two reasons. First the previous trials provided intervention for preventing SHS for pregnant women or their husband, but not for couples, as this research

will do. Secondly, the educational material of a comic booklet designed by Japanese manga artist for preventing second hand smoke is distinctive. There are several reasons for applying comics as educational intervention in this study. First, Japanese comics are familiar to Indonesian and likely to be used by Indonesian since 1985 (Febriani, 2016). Second, it was found that learners remembered more information if a text was followed by key illustrations (Mayer, 2009; Cuevas, 2002).

LITERATURE REVIEW

Current Randomized Controlled Trials for Preventing Second-hand Smoke for Pregnant Women at Home (Table 2)

Six studies in this review used an RCT design with the earliest published in 2004 (Chi et al., 2015; El-Mohandes et al., 2010; Huang et al., 2013; Kazemi et al., 2012; Loke & Lam, 2005; Stanton, Lowe, Moffatt, & Del Mar, 2004). Five studies were from high-income countries: USA, Taiwan, China, and Australia (Chi et al., 2015; El-Mohandes et al., 2010; Huang et al., 2013; Loke & Lam, 2005; Stanton et al., 2004). The sample size ranged from 91 to 758. All studies recruited participants at antenatal venues. Details for each trial, and assessed quality of studies were based on quality rating criteria (Ⅰ = randomized controlled trials; Ⅱ - 1 = well-designed controlled trial without randomization; Ⅱ - 2 = well-designed cohort or case control study; Ⅱ - 3 = multiple time series with or without the intervention; and Ⅲ = opinions of respected authorities, based on clinical experience, descriptive studies and case reports, or reports of expert committees and a separate grade for internal validity: good, fair, or poor, developed by the US Preventive Services Task Force (Harris et al., 2001) are mentioned below.

Chi's and colleague's study (2015) was a RCT providing an educational program based on the HBM and used a booklet for five months. Biweekly 10-minute follow-up phone calls occurred following the intervention. Standard counseling care was given to comparison group. All measured contents of health belief components and exhaled carbon monoxide

were statistically different (SHS knowledge: intervention = 16.1 ± 4.06, comparison = 4.1 ± 5.02, $p < 0.001$; perceived susceptibility: intervention = 51.7 ± 1.86, comparison = 20.7 ± 6.17, $p < 0.001$; perceived severity: intervention = 52.0 ± 0, comparison = 21.9 ± 5.52, $p < 0.001$, perceived benefits: intervention = 36.0 ± 0, comparison = 16.2 ± 3.86, $p < 0.001$, perceived barriers: intervention = 10.3 ± 3.10, comparison = 33.7 ± 3.30, $p < 0.001$, cues to action: intervention = 7.8 ± 2.13, comparison =3.8 ± 0.96, $p < 0.001$, self-efficacy: intervention = 37.8 ± 4.10, comparison = 8.2 ± 0.82, $p < 0.001$, rejecting SHS behavior: intervention = 87.0 ± 6.40, comparison = 20.7 ± 5.68, $p < 0.001$, SHS exposure: intervention = 1.5 ± 1.53, comparison = 4.9 ± 2.11, $p < 0.001$). Retention rate is 84%. Quality was marked as I-fair because researchers did not use intention-to-treat analysis and unsure about how or if randomization was accomplished.

Huang et al. (2003) conducted a RCT in Taiwan using educational materials (booklets and DVD), and reminder tools (stickers, bibs and door hangers for reinforcement of the intervention) based on trans-theoretical model. Participants were 135 nonsmoking pregnant women who attended the obstetrics/gynecology department. Participants received two follow-up telephone calls at two weeks after the first call. For the comparison group, routine care without any intervention was given (Huang et al., 2003). Stage of change (pre-contemplation, contemplation, action), determinants of change (knowledge, experimental and behavioral process), decisional balance, self-efficacy, and stage movement were examined. Stages of change ($F = 6.689$, $p = .035$), knowledge change (intervention = 15.04 ± 0.18, comparison = 12.46 ± 0.24, $p < .001$), self-efficacy (intervention = 16.28 ± .8,

comparison = 13.29 ± .43, $p < .001$) were defined as statistically different on ANOVA result. However, the experimental process, behavioral process, decisional balance, and stage movement had no significant differences. Drop-out rate (23%) of the intervention group was higher than the comparison group (14%) because of disrupted phone contact, refusing phone counselling, and inability to complete post-test. Quality was marked as I-fair because this trial did not use intention-to-treat analysis.

Kazemi et al. (2012) carried out a RCT based on the HBM for 91 married nonsmoking pregnant women. The intervention group received education at the first ANC visit. There were five sessions with four-week intervals of the education package (booklet, poster and slide slow for 15-20 min for two times) including a picture of newborns with low birth weight, and ways the toxic substances from SHS impacted the body. The comparison group was provided education about prevention against infectious diseases (Kazemi et al, 2012). Health beliefs (perceived susceptibility, perceived severity, perceived benefits of avoiding SHS, perceived barriers to avoiding SHS), and weekly environmental tobacco smoke exposure (ETSE), were calculated as the mean number of cigarettes smoked by the husband in proximity to the pregnant woman. All indicators except perceived barriers to avoiding SHS at final ANC visit showed statistical differences (perceived susceptibility: intervention = 17.93 ± 2.23, comparison = 16.29 ± 3.27, $p < .0001$, perceived severity: intervention = 17.85 ± 2.24, comparison=16.83 ± 2.76, $p < .0001$, perceived benefits of avoiding SHS: intervention = 22.8 ± 2.1, comparison = 21.14 ± 2.94, $p < .001$). Moreover, weekly ETSE was also statistically different (intervention = 12.28 ± 15.1, comparison = 25.39 ± 13.2, *p*

< .0001). Kazemi et al (2012) mentioned that lack of empowerment for pregnant women is one cause for less change in the perceived barrier in the intervention group (Kazemi et al., 2012). Total drop-out rate was "70%; 15.38% dropped out (because of abortion and lack of interest in continuing with the study) and 14.62% were lost in the follow-up at the third section" (Kazemi et al., 2012, p. 152). Quality was marked as I-fair because this trial did not use intention-to-treat analysis. Retention rate was 10% higher.

El-Mohande' trial provided blocked RCT for 520 smoking and nonsmoking African American pregnant women with confirming ETSE by salivary cotinine levels (SCLs) at six ANC. Based on integrated behavioral intervention, the intervention provided tailored counseling sessions with role play and skills practice to build negotiation skills with partners and other smoking family members, and to increase knowledge of SHS harm (El-Mohande et al., 2010). As follow-up, telephone interviews were conducted in second- and third-trimesters (22 - 26 and 34 - 38 weeks of gestation). Routine prenatal care was given to the comparison group. Self-reported ETSE, birth-weight and gestational age at delivery were measured. According to logistic regression analysis, odds ratio of ETSE non-smokers mothers (n = 520) with baseline SCL <20 ng/ml was significantly reduced before delivery (OR = 0.57, 95% CI [0.38-0.84]). Moreover, for infant outcomes, only very preterm birth (VPTB < 34 weeks) was significantly reduced in the intervention group (intervention = 0.5%, comparison = 5.5%, p = .01). The total drop-out rate was not found. Quality was marked as I - fair because this trial did not show the data lost to follow-up.

The Loke and Lam study (2005) conducted a RCT for 758 nonsmoking pregnant women attending the ANC. Based on theory of reasoned action, the obstetricians gave simple advice on health risks of SHS and helped husbands to quit using an educational booklet for pregnant women in the intervention group at the first ANC. Routine prenatal care was given to pregnant women in the comparison group. Husband smoking cessation at seven days and 30 days and husband's attempts to stop and decrease the number of cigarettes smoked was measured. Attempts to give-up smoking in the last 7 days ($X^2 = 10.45$, $df = 3$, $p = .02$), changes in number of cigarettes smoked decrease ($X^2 = 45.1$, $df = 2$, $p < .0001$), and abstinence from cigarettes in the last 7 days ($X^2 = 4.1$, $df = 1$, $p = .04$) were statistically different. Unfortunately, smoking abstinence for the last 30 days or longer was not different. Total dropout rate was 29.2% of pregnant women in the intervention group, and 30.2% of the control group. Reasons for dropouts were because of study number were missing and no repeated consultation for follow-up examination or for the delivery. Quality was marked as I–poor because this trial did not use a valid measurement. Retention rate was 10% higher.

Santon et al. (2004) conducted a RCT using an educational package, which included an educational video, nicotine patches with information pack with explanation after the baseline interview. Then, as follow-up, additional support material was sent two times. A brochure providing contact details for the available smoking cessation options was provided to the comparison group. Quit smoking was confirmed by self-report and validated by carbon monoxide test. Quit rate was reduced statistically ($p = .011$, $OR = 0.52$,

95% CI [0.03, 0.86]) at six months after the baseline. Quality was marked as I–poor because this trial did not present the randomization method. Retention rate was 15% or higher.

In summary, based on the result of outcomes (statistically significant) and quality of trial (I - fair), Chi's trial following HBM was the most effective intervention strategy. However, the low predictive capacity of the causal factors of (a) perceived susceptibility, and severity, and (b) benefits, and barriers were the two main limitations of the HBM. The rule on combination of the variables and the relationships of them was shortage (Armitage & Conner, 2000; Norman & Brain, 2005). Orji, Vassileva, and Mandryk (2012) mentioned that:

> "However, this weakness on the low predictive capacity and the shortage of rules can also be viewed as strengthen, because lack of strict rules of combination offers flexibility that makes the HBM adaptable and applicable to many health behavior and population groups" (p.8).

Small effect size of perceived severity (r = .16) and susceptibility (r = .06), and middle effect size of benefit (r = .42) and barriers (r = .33) were presented for prevention (Carpenter, 2010). For resolving small effect size, *cue to action* and *self-efficacy* which was adapted by Rosenstock, Strecher, & Becker, (1988) in addition to previous HBM improved the predictor powers. Cue to action provide how-to information, promote awareness, employ reminder systems (Borrelli et al., 2016). For instance, postcard, telephone call, direct person-to-person, text message via social media and so on are categorized in

reminder systems. Sanmarti et al. (1993) had confirmed the effectiveness of reminder plus health education: phone call plus health education vs usual care (*RR* = 0.18, 95% CI [0.07, 0.44]) and home visit plus health education vs usual care (*RR* = 0.14, 95% CI [0.05, 0.39]).

Each study showed statistically differences on some main outcomes. Each trial followed different theories, and used different outcome measures. Intervention for preventing SHS used the multiple strategies; educational intervention (doctor's advice, counseling, educational sessions), several follow-ups (2 weeks, 1.5 months, 3 months, 5 months, 6.5 months and 9.5 months), educational tools (educational booklets, video program, poster, and slide shows) and health reminders (sticker, and reminder form medical staffs). Recently, main contents of intervention employed multiple strategies, which were named by behavior change interventions (BCI). BCI is a package of well-defined multiple strategies designed to address human behavior in complex settings (World Health Organization, 2008).

Behavioral supports for preventing SHS are complex and include multiple potentially interacting BCTs (Dherani et al., 2017; Tong et al., 2015; Zhang et al., 2015). The result of labeling seven effective behavior support interventions for smoking in pregnant women into Standardized BCTs (Michie et al., 2013) mentioned that seven effective interventions utilized the following eight BCTs: "provide information on consequences of smoking and smoking cessation (*n* = 7), provide rewards contingent on successfully stopping smoking (*n* = 4), measure carbon monoxide (CO) (*n* = 6), facilitate action planning development plan (*n* = 5), facilitate goal setting (*n* = 6), assess current and past smoking behavior (*n* = 7),

assess current readiness and ability to quit (n = 5), and offer/direct toward appropriate written materials (n = 7) (Lorencatto, West, & Michie, 2012, p. 1022).

Behavior change interventions that include a broad range of health messages to target audiences can be challenging. For example, nearly nine out of ten adults do not have proficient health literacy skills (Kutner, Greenburg, Jin, & Paulsen, 2006). For supporting communication between educator and the target, visual aids such as photographs, illustrations, line drawings, and cartoons can improve the communication (Centers for Disease Control and Prevention, 2009). Visual aids with evidence-based storytelling promote a clearer understanding for educational targets. One example of visual storytelling is comic books.

For preventing and reducing SHS for pregnant women at home, pregnant women have to avoid tobacco smoke at home. Then, husband and family members also have to smoke outside of their home. Quit smoking is the best way for preventing SHS at home. Couples should have an explanation of the risk factors for disease at the household level for disease prevention (Wilson, 2002). However, four trials' target population were nonsmoking pregnant women (Huang et al., 2013; Kazemi et al., 2012; Loke & Lam, 2005). One study's population was smoking and nonsmoking pregnant women (El-Mohandes et al., 2010). One study provided intervention to just men who are husbands of pregnant women (Stanton et al., 2004). WHO strongly recommended improvement of psychosocial support for the pregnant woman by the partner (World Health Organization, 2013). The future research should invite pregnant women and their partners together as participants. We should

consider the negative impact on couple-focused intervention and prepare the resources for preventing some negative impact such as marital discord between pregnant women and smoking husbands. Discomfort with asking husband or others to smoke outside of their home, could influence their health outcomes (Christensen & Heavey, 1999).

Table 2

Characteristics of The Studies on Current RCTs for Preventing Second Hand Smoke for Pregnant Women at Home.

1st author , Year , Country , study	Participants(Drop out rate)	Intervention Group 1. Intervention type(timing, tyeory and model type) 2. Follow-up type	Comparison Group	Measure (intention-to-treat analysis:ITT or not)	Outcomes	Quality
Chi, 2015, Taiwan, RCT	110 (I=55, C=65) nonsmoking pregnant women attending ANC(I=9 %, 23%)	1. Educational program for 5months(second ANC, Health Belief Model) using the booklet 2. biweekly 10 minute follow-up phone calls the first and second weeks following the intervention	Standard counseling care	·Health belief 1. Knowledge, 2. Perceived SHS-related disease susceptibility, 3. Perceived SHS-related disease severity 4. Perceived benefit of rejecting SHS exposure, 5.Perceived barriers to rejecting SHS exposure 6.Cues to action for rejecting SHS exposure 7. self-efficacy for rejecting SHS exposure 8. rejection of SHS behavior ·Exhaled carbon monoxide	One month post intervention ·Health belief (ANCOVA result) 1. statistically significant (p <0.001) 2. statistically significant (p<0.001) 3. statistically significant (p<0.001) 4. statistically significant (p<0.001) 5. statistically significant (p<0.001) 6. statistically significant (p<0.001) 7. statistically significant (p<0.001) 8. statistically significant (p<0.001) ·Exhaled carbon monoxide statistically significant (p<0.001)	I- fair ·did not ITT ·using validated measure (validity index: 0.8) ·Retention rate is 84% ·unsure randomization
Huang 2013, Taiwan, RCT	135(I=65, C=70) nonsmoking pregnant women attended obstetrics/gyaecology department (I=23%, C=14%)	1. Educational materials (DVD, booklet) and reminder tools,(NA, Transtheoretical model) 2.2weeks and 1.5 month follow-up :Two follow-up telephone calls at 2 weeks after the intervention, and 1 week after the first call,	Routine care without any intervention	· Stages of change i)pre-contemplation ii)contemplation/preparation iii)action/maintenance · Determinants of change i)knowlegde ii)Experiential process iii)Behavioural process · Decisional Balance i)Pros ii)Cons · Self-efficacy · Stage movement	Intervention vs Comparison (Anova result) · Stages of change (F =6.689, p =0.035) i) 3 (4.6%) vs 8(11.4%) ii)4(6.2%) vs 12(17.4%) iii)58(89.2%) vs 50(71.4%) · Determinants of change i)15.04± 0.18 vs 12.46± 0.24 (p <0.001) ii) 44.32± 0.43 vs 40.39 ±0.51 iii)38.86±0.74 vs 31.83 ±0.78 · Decisional Balance i)19.27± 0.18 vs 18.27± 0.21 ii) 12.02 ± 0.51 vs 13.23± 0.46 · Self-efficacy 16.28± 0.8)vs 13.29±0.43 (F =24.682, p <0.001) · Stage movement 4.167(p =0.244) vs 2.778(p =0.427)	I- fair ·did not ITT ·using validated measure (validity index: 0.89) ·Retention rate is 83%

Kazemi 2012,Iran,RCT	91 (I=47, C=44)married nonsmoking pregnant women recruited at 10 health centers(15.38%,C=14.62%)	1. Education using educational package(picture of low birth weight newborns and ways for the toxic substances from second hand smoke to cross to fetus), booklet, poster and slide shows for 15-20 min in 2 times(first ANC, Health Belief Model), 2.Five-month follow-up with the systematic reinforcement of the messages (section 2-5) by staff every 4 week interval	Education about preventio n against infectious diseases	·Health beliefs 1.Perceived susceptibility, 2.Perceived severioty 3.Perceived benefits of avoiding SHS 4.Perceived barriers to avoiding SHS ·Weekly Enviromental Tobocco Smoke Exposure definedas mean number of cigrettes smoked close to pregnant woman each week by husband (N/A)	Intervention vs Comparison of Score at final visit ·Health beliefs 1. 17.93±2.23 vs 16.29± 3.27 (p <0.0001) 2.17.85 ± 2.24 vs 16.83 ± 2.76 (p<0.0001) 3.22.8 ±2.1 vs 21.14± 2.94 (p <0.001) 4.6.57±1.75 vs 6.93 ±1.47 ·Weekly Enviromental Tobocco Smoke Exposure 12.28± 15.1vs 25.39±13.2 F-stat 8.68, (p <0.0001)	I ·fair · did not ITT ·using validated measure (validity index: 0.76-0.82) ·Retention rate is 70%
El-Mohandes ,2010, USA, Blocked RCT	520 (I=247, C=273) smoking and nonsmoking African American pregnant women at 6 ANC(NA)	1. Tailored counseling sessions with role play and skills practice to build negotiation skills with partner and other smoking family members, and to increase knowledge of SHS harm (Integrated behavioral intervention) 2.6.5 and 9.5 month follow-up with telephone interviews conducted in the 2nd and 3rd trimesters (22-26 and 34-38 weeks of gestation, respectively)	Routine prenatal care	·Self-reported environmental tobacco smoke exposure ·Birth weight and gestational age at delivery ·Saliva cotinine used to represent median number with no.cigarett (ITT)	Logistic regression analysis: ETSE OR <20 ng/ml: 0.57(0.38,0.84). LBW: I = 11.3%, C = 12.9%, (p = 0.59); VLBW: I = 0.5%, C = 2.6%, (p = 0.07); Pre-term birth: I = 11.8%, C = 13.5%,(p = 0.59); Very pre-term: I = 0.5%, C = 5.5%, (p = 0.01)	I ·fair · no data on lost to follow-up
Loke ,2005, China, RCT	758 (I=380, C=378) non-smoking pregnant women attending ANC(I=29.2%, C=30.2%)	1. Obstetrician's simple advice on recognizing health risks of exposure and helping husbands to quit, and Education booklet (at first antinatal visit, Theory of Reasoned Action) 2.3 to 5 months : Reminder (during subsequent visits)	no interventi on, as usual in prenatal clinics	· Husband smoking cessation (7 and 30days) · Husband's attempts to stop and decrease the number of smoked (ITT)	· Attempts to give up smoking in the last 7 days (p =0.02) · Changes in number of cigarettes smoked decrease (p < 0.0001) · Abstinence from cigarettes in the last 7days (p = 0.04) · Abstinence for last 30 days or longer (p = 0.26, not statistically significant)	I ·poor ·30% of participants were lost to follow-up ·did not use invalid measurement
Santon, 2004, Australia,RCT	561(I=291, C=270) men having pregnant women	1.Sending first educational package including Video, Nicotine patches with information pack with explanation after the baseline interview (N/A) 2.Sending second educationla support material at one week later from first sending, a third package was send one month later with similar material	A brochure providing contact details for the available smoking cessation options	Self-report on quit smoking with carbon monoxide test using cut off <8 ppm to identify nonsmoker status(ITT)	At 6 month after the baseline ·Quit rate of self report I:48/291 (16.5%) vs C:25/270 (9.3%) (p =0.011, OR=0.52, 95%CI 0.031-0.86)	I ·poor ·Retention rate is 65.4% ·unsure randomization

Effectiveness of Couple-focused Intervention for Prevention

A number of couple-focused interventions have been conducted in multiple countries since the early 1970s and have focused on changing couple functioning in order to benefit their relationship intrinsically for relationship distress and relationship education to prevent the development of relationship discord or to enhance currently healthy relationships because marriage rates have been declining in most Western countries (Baucom et al., 2012; Hahlweg, Grawe-Gerber, & Baucom, 2010). At that time, the intervention that was named by "couple therapy" was not for addressing medical problems.

In disease prevention, Arden-Close & McGrath's, (2017) systematic review reviewed two studies about couple-focused interventions on smoking in pregnancy (McBride et al., 2004; Oien, Storro, Jenssen, & Johnsen, 2008). The overall risk of bias was assessed using the Cochrane Collaboration Risk of Bias tool and judged as unclear because of low risk of attrition bias and unclear of selection biases, performance bias, detection bias, and reporting bias (Arden-Close & McGrath, 2017).

McBride conducted a RCT in the USA. There were three-groups: 198 couples in usual care (brief advice with mail) in a comparison, 192 couples in woman-only intervention (usual care, a late-pregnancy relapse-prevention kit including a booklet and gift items, six counseling calls) as a second comparison, and 193 couples in partner assisted intervention. Women in partner-assisted intervention received woman-only intervention, partner assisted adjunct, which described how her partner became a coach for maintaining pregnant woman's confidence to quit smoking, and booklet with companion video. Partners in

partner assisted intervention received six separate calls guided by a motivational interviewing protocol from the woman's health advisor. McBride showed women in all groups reported a reduction of positive partner's support from baseline to 12-month later from providing these interventions (F = 81.43, df = 1322, p = .001). There were no differences of abstinent rate by groups at 28 weeks' pregnancy (usual care = 60 %, woman-only intervention = 59%, partner-assisted intervention = 61%) and at 12 months postpartum (usual care = 29%, women-only intervention = 32%, partner-assisted intervention = 35%). There was no RCT marked as overall low risk of biases plus statistically significant, especially RCT for couple-focused intervention for pregnant women who were exposed to health risk factors from husband's behavior.

There are some recommendations and issues in several reviews on couple-focused intervention. First, trials should reference the models as to use a couple-based approach and observational research for confirming the specific aspects of the marital relationship. Second, research should evaluate the change in marital or spouse factors. Third, assessing outcomes, for instance, behavior change and perceptions for the partner as well as for the patient. Fourth, compare couple- and patient-oriented approaches to intervention (Martire, Schulz, Helgeson, Small, & Saghafi, 2010).

Educational Comic Material for Health Education

Infographics have become a popular tool to communicate complex ideas to learners. Illustrations, images, symbols, diagrams, graphs, charts also are categorized in infographics. Moll (1986) compared five types of infographics (representational,

matchstick, cartoon, symbolic, photographic) in educational booklets for the effects of booklet pictorial and textual factors. He founds that the cartoon-and matchstick-illustrated booklets presented significantly higher questionnaire scores (mean of scored as "*Good"*: patients not exposed to booklet (n = 31) = 35.5 (± 6.35), patients exposed to booklet (n = 373) = 63.7(± 2.69), $p < .001$) (Moll, 1986). **"**The rationale for a comic book format was to visually attract, illustrate graphically, and use storytelling as methods of generating interest while educating" (Dworkin et al., 2013, p.2). Comics provide narrative experiences for learners and present what is essential. Thus, the educational comic such as a leaflet with illustration is considered as one of infographics.

In health settings, using illustrated story-based style (comic) material not only for children with low levels of literacy and for immigrants speaking a different language, but also for adults is becoming a common step by step approach (Ashwal & Thomas, 2018; Branscum, Sharma, Wang, Wilson, & Rojas-Guyler, 2013; Green & Myers, 2010; King, 2017; McNicol, 2017; Myers & Goldenberg, 2018). For instance, effectiveness of comic books which were used for food-safety education to 150 persons living with HIV learned about risky food handling behavior: correct response pre-intervention = 35%, correct response post-intervention = 55%, (p-value = <.0001) (Dworkin et al., 2013). The strength of using a comic format is that learners remembered more information if a text was followed by key illustrations (Mayer, 2009; Cuevas, 2002). The weakness of using the comic is that the format is more difficult for differentiating between image details, especially positional and size differences. Therefore, Moll recommended using multiple

colors for educational booklets (Moll, 1986). In addition, comic format material should keep key ideas simple with limited words (Lamb & Johnson, 2014).

Several studies have shown effectiveness of educational comic as health education material (Green & Myers, 2010; King, 2017; McNicol, 2017). However, these materials are effective only if the target population can read, understand and apply the information for behavior change. As a result, many health care instructions fall far short of being suitable and thus are not understood and accepted by patients (Doak, Doak, & Root, 1996; Ryan et al., 2014). Inadequate health literacy (HL) is associated with impaired healthcare choices leading to poor quality-of-care (MacLeod et al., 2017). Hence this study begins by first assessing the readability and suitability of developed educational material.

Effectiveness of Expression of Risk Information for Risk Perception

Risk information in disease prevention is presented in several ways, quantitative explanations such as “percentage” and “rate”, and qualitative explanations of risk such as “large” and “often”. Two elements: the probability of health damage happening and the actual harm for interpreting health risks must be provided (Edwards & Elwyn, 2001). Two studies for determining the type of risk language presented found that mothers preferred risk information in numerical terms (Freeman & Bass, 1992; Shaw & Dear, 1990). However, the impact of framing on risk perception was affected by low numeracy (Bramwell, West, & Salmon, 2006; Edwards, Elwyn, & Mulley, 2002; Gordon-Lubitz, 2003; Sabaté, 2003).

Paling (2003) mentioned several ways for communicating the numbers easily, which were: “(1) avoid using descriptive terms only, (2) use consistent denominator (e.g., 40 out of 1000), (3) use visual aids for probabilities, (4) use absolute numbers ” (p.746).

A study examined the influence of numeracy on interpreting various risk formats including pictogram, the ratio, and The Paling Perspective Scale for Swiss women (n = 266, mean age = 47.7 years) for the difference in risk perception between formats. The pictogram (M = 2.08) resulted in significantly lower risk ratings compared with the other formats (main effect $F_{2,2254} = 38.21$, $p < .001$, Tukey’s HSD test $p < .001$). The Paling Perspective Scale (M = 3.53) and the ratio with numerate 1 (M = 3.28) were not significantly different (Tukey’s HSD test $p > 0.40$) (Keller & Siegrist, 2009).

In difference in risk perception between risk level and format and numeracy skills, risk perception of low-numerate individuals did not show statistical differences with using three formats (pictogram, the rate, and The Paling Perspective Scale) in spite of risk levels (low-risk level and high-risk level). In risk perception of high-numerate individuals, using pictograms presented a statistical difference between high- and low-risk level ($t_{37} = -2.28$; $P = .03$), “perceiving the high-risk level as lower risk and the low-risk level as higher risk.” (Keller & Siegrist, 2009, p.487). Using the Paling Perspective Scale showed significant differences between high- and low-risk levels for a Down syndrome scenario ($t_{44} = 4.08$; $P < .001$) and Colon cancer scenario ($t_{44} = 6.49$; $p < .001$), “perceiving the high-risk level as higher risk and the low-risk level as lower risk (Keller & Siegrist, 2009, p.487)” Based on these results, the Paling Perspective Scale interpreted properly for women having high

numeracy. A study for determining effectiveness of combination pictograms and rate scale for risk of medication intake for driving presented that a significant interaction effect between risk perception and risk information was found (F (1.116) = 4.448, p = .037, η2 = .04) (Monteiro, Huiskes, Dijk, Van Weert, & De Gier, 2013) but not for the combination between pictogram and risk scale such as the Paling Perspective Scale.

Smoking and Indonesian Culture

Kaufman Merritt, Rimbatmaja, and Cohen (2015) reported on the Indonesian perception on tobacco smoke and SHS based on results of qualitative in-depth interviews and focus group discussions for smokers and non-smokers. Indonesians were aware of the dangers of tobacco smoke and SHS, such as the cause of lung cancer, heart and throat diseases (Kaufman, Merritt, Rimbatmaja, & Cohen, 2015, p.998). Some smokers living in a place with smoke-free regulations may feel that a smoke-free policy is an infringement on human rights.

However, most people agree that the health of the non-smoker is more important. Social norms about smoking indicated that smokers were regarded as impolite when non-smoker did not consider the needs of the non-smoker (Kaufman, Merritt, Rimbatmaja, & Cohen, 2015). However, Kaufman's study and Nichter et al. (2009) study also mentioned that smoking was of great importance among Indonesian men; it was a presentation of a masculine image, and facilitated friendship. Many Indonesians held the impression that a man who does not smoke was suspected as being a transvestite (Kaufman et al., 2015;

Nichter et al., 2009). Moreover, a smoker was helped to control his emotions, specifically anger control (Nichter et al., 2009).

Prohibiting tobacco smoke nearby pregnant women and children was easy to accept by smokers. Non-smokers encourage smokers not to smoke with humor or gently pointing out. Women rather than men were better at asking smokers to stop or move away from non-smokers (Kaufman et al., 2015).

PRELIMINARY STUDY

Preliminary Study 1

Effectiveness of Promoting Smoking Cessation Education in Patients with Cardiovascular Diseases Patients: Systematic Review and Meta-Analysis.

Relationship between preliminary study and main doctoral study. Smoking cessation is one of the risk factors to control for preventing non-communicable disease, especially cardiovascular diseases (CVDs). Therefore, during the first year of the doctoral course, the author conducted a review and meta-analysis on smoking cessation education in patients with CVDs in anticipation for future experimental study. However, after conducted this systematic review, the author found another neglected risk factor mentioned by Developmental Origins of Health and Disease (DOHaD) Theory, which found relation between preterm birth and low birth weight in pregnancy, and higher risk for developing atherosclerosis, diabetes, hypertension, and ischemic heart disease in adulthood (Baeker, 1990; Smith, 2016).

One research study verified that second-hand smoke exposure for pregnant women caused preterm birth (24.1% vs. 16.1%; $p = .027$) and small-for-gestation babies (31.9% vs. 17.2%; $p < .001$) as compared with unexposed pregnant women (Goel, Radotra, Singh., & Dua, 2004). In the same way for fetuses, congenital anomalies, low birth weight infants, and stillbirths have been clarified that it becomes a risk factor of CVDs.

For reducing CVDs health risks in the future for fetus and higher prevalence of smokers in Indonesia, we changed the doctoral topic to examining the effectiveness of preventing second-hand smoke for pregnant women at home using an educational comic booklet in Indonesia by conducting a randomized controlled trial.

Preliminary Study 2 and 3:

Preventing Pregnant Women's Exposure to Secondhand Smoke: Development and Suitability Assessment of an Educational Comic Booklet (Inaoka, Octawijaya, Wariki, & Ota, 2020).

Aim. The aim of this mixed methods research was to develop an educational comic booklet to prevent pregnant women's exposure to secondhand smoke.

Methods. We assessed the suitability of the comic booklet by measuring participant response to content, literacy demand, graphics, layout and typography, learning stimulation, motivation, and cultural appropriateness. The participants were 17 Indonesians living in Japan who were recruited through Respondent-Driven-Sampling and met all criteria for the survey. Means and standard deviations were used to determine the suitability of the educational comic.

Results. About 80% of participants rated the comic as "superior" on a rating scale with options of "superior," "adequate," "not suitable," or "not applicable." The most successful aspects of the comic were content and cultural appropriateness, as it provided clear contents and the graphics showed realistic Indonesian smoking behavior. The least

successful aspect of the comic was the literacy demand because there were long sentences using difficult words.

Conclusions. The results of this study may be used to conduct a randomized controlled trial using this comic booklet with some modifications.

Keywords comic booklet, health education, Indonesia, pregnant women, secondhand smoke.

Suggestion for the Randomized Controlled Trial Using the Educational Comic Booklet from Preliminary Study 2 and 3

Health promoters and researchers who plan to create ECB should consider (1) the reading order, and (2) the health care situation of the target group and their culture to accurately depict the comic's content and graphic panel. The "know-do" gap would be reduced using an understandable educational comic booklet with actionable messages and the context of a target audience's information needs. The revised material could reduce the harmful influence of secondhand smoke on pregnant women and fetuses in Indonesia.

METHODOLOGY

Study Design

A two-armed longitudinal randomized controlled trial was conducted for preventing second-hand smoke at home for Indonesian pregnant women using an educational comic booklet (**Appendix F**). This research was carried out after receiving permission from the ethical review in St Luke's International University, Japan (January 25th, 2019:**18-A078**) and Sam Ratulangi University, Indonesia (September 17th, 2018: **7383/UN12/LL/2018**: **Appendix A**). Moreover, the Indonesian government (November 23rd, 2018: **Appendix B**), Manado city (March 13rd, 2019: **Appendix C**), and Tomohon city (March 27th, 2019: **Appendix D**) also gave their permission for this research. The research endpoint, for gathering questionnaires for evaluation, at three months' post-intervention was August, 2020.

Theoretical Framework

This trial had, as its theoretical basis, the HBM (**Figure 1**), which has been one of the most widely used conceptual frameworks in health behavior (Chi, Sha, Yip, Chen, & Chen, 2016). The HBM contains the proposition that a person, who perceives a *susceptibility* to disease and the *severity* of disease, then perceives a *threat* of the disease. The *cues to action* include advice from others, illness of family members or friends etc. to stimulate or to trigger the decision-making process. *Demographic variables* affect the individual's health motivations and subjective perceptions, rather than functioning as cause of health

behaviors. *Perceived benefits* regarding the effectiveness of the various actions available to reduce disease threat and the potential negative aspects of a health action (*perceived barriers*) affect the undertaking of the recommended behavior. (Glanz, Rimer, & Viswanath, 2015).

Several interventions for promoting smoke-free homes and preventing second-hand smoke in pregnancy have been conducted following the HBM (Chi et al., 2015; Kazemi et al., 2012).

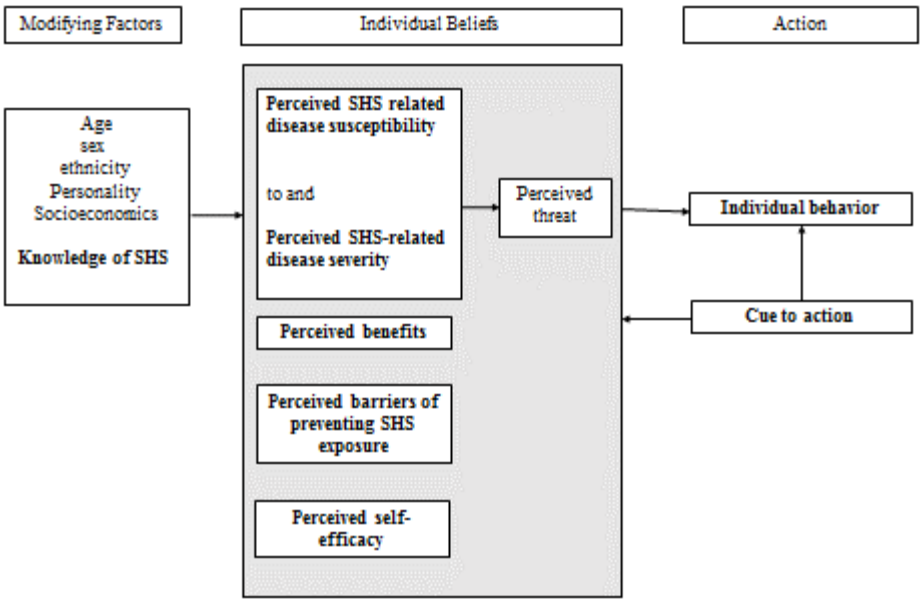

***Figure 1*. Components of the Health Belief Model**

Setting and Participants

Non-smoking pregnant women and their partners were recruited in Tomohon city (rural area) and Manado city (urban area) of North Sulawesi, Indonesia. Inclusion criteria

were married pregnant women, 18 years of age or older, non-smoking in their first-trimester pregnancy, up to 12 weeks' gestation attending their prenatal visit to the public health center or health post reporting that they have never smoked cigarettes and having SHS exposure from their husband. Inclusion criteria for husband/partner was 19 years of age or older, smoking at least six cigarettes per week or more within two months before or since pregnancy based on the inclusion criteria of Kazemi et al. (2012). Their husbands living in the same household were eligible for inclusion in the trial. The term husband indicates husband or unmarried partner who has met the inclusion criteria. Wife will be used for either relationship (husband or unmarried partner). All participants provided written informed consent. The criteria for exclusion included termination of pregnancy, active smoking pregnant women, high risk pregnant women having clinical diseases, gestational diabetes, pregnancy-induced hypertension or suffering from mental disorders (Kazemi et al., 2012).

The settings were public health centers. There were seven public health centers (*puskesmas*) having several health posts *(posyandu),* for a total of 83 *posyandu,* but only 34 were active in Tomohon city. Manado city had 16 public health centers (*puskesmas*) having several health posts *(posyandu),* for a total of 305 *posyandu, but only* 25 (8.2%) were active.

Procedures

Appendix O and Appendix P provide the details of the procedures and are outlined as follows:

(1) Research assistants identified potentially eligible pregnant women in their first-trimester (up to 12 weeks) of pregnancy who visit the *posyandu* or *puskesmas* for first antenatal care (ANC) based on records of the *posyandu* or *puskesmas*. Research assistants determined the eligibility for the study based on inclusion criteria, and informed eligible couples about objectives, terms, common requests and expected benefits and risks of the study. Pregnant women and their partners received a request form (**Appendix G**: English version and **Appendix H**, Indonesian version) and written informed consent form (**Appendix I**) to become research participants at *posyandu* or *puskesmas*. Research assistants informed that they had the right of withdrawal from the study (**Appendix J**), baseline demographic data (20 items for pregnant women [Section A], eight items for husband [Section B], **Appendix L**), including age, education, marital status, employment status of pregnant women and their partners, monthly family income, gestational week, the smoking status of the participant's partner, as well as whether the participant's home and work environment allowed smoking were collected. Then, eligible couples that agreed with participating in the research were listed in a participants list. One Indonesian researcher received each name lists of eligible couples.

(2) All eligible, and interviewed participants were randomly assigned based on central randomization into the experimental group or the control group (usual-care group). One Indonesian researcher conducted a simple random assignment using a computer random number generator.

(3) Pregnant women and their partners in the experimental group received an educational comic booklet and a sticker as a reminder from a research assistant. Participants in control group received nothing as intervention from the research assistant.

(4) Three months after the intervention (third antenatal care visit), participants including pregnant women and their husband in both groups submitted self-reports on the follow-up form.

(5) Birth weight, height, gestation age at delivery and baby's gender confirmed by research assistants via record in each *posyandu* or *puskesmas.*

(6) When research participants wanted to stop participation in the research, their research activities were stopped.

Intervention: An Educational Comic Booklet on Preventing Second-hand Smoke for Pregnant Women at Home

Pregnant women and their partners in the experimental group received an educational comic booklet (**Appendix F**) on preventing second-hand smoke at home, a sticker as reminder (**Appendix K**) to their partners that indicated that they had a smoke-free home. If their partners were not able to come to the *posyandu* or *puskesmas*, they received the educational comic booklet from their wives upon returning home, which explained the importance of preventing SHS exposure for the health of pregnant women and the future babies.

An educational comic booklet on preventing second-hand smoke at home (Appendix F). The printed educational comic booklet, composed of four full color pages,

kept the educational content uniformly written materials to align with BCTs). It was written in Indonesian and contained standardized information including the components of the HBM. The special features of this educational comic are utilizing BCTs and HBM. In the comic, a midwife for prenatal care, a pregnant woman, and her husband are the characters. When a couple visits the prenatal care clinic, the midwife provides education on what is SHS, and how to prevent SHS in their home. There are eight selections utilizing BCTs and the component of HBM: (a) explanation of what is SHS, (b) prevalence of SHS for pregnant women in Tomohon city, (c) how SHS brings hazardous substance to pregnant woman and her fetus (provide information on consequences of SHS as BCTs), (d) health risks for pregnant women and fetus (susceptibility in HBM), (e) characteristic of smoke, (f) benefits of preventing SHS (benefit in HBM), (g) barriers to preventing SHS (barriers of preventing), and (h) several levels of countermeasures for the barrier and preventing SHS in the home (facilitate action planning development plan , and facilitate goal setting in BCTs). At the same time for handing out the educational comic booklet, the sticker as a reminder was mentioned for a smoke-free home in the text with illustration (cue to action in HBM: **Appendix K**)

Comparison: Usual Care

All pregnant women in Tomohon city and Manado city were provided with education for preventing SHS provided by health staff at their prenatal care visit. Health workers provided pregnant women advice on how to avoid smoke and how to distance themselves

from smokers. Usual care for pregnant women means this regular brief advice to pregnant women in both the experimental and control group.

Primary Outcome Measures

Self-report on behavior changes from pregnant women and their partner. There were two self-report questionnaires (**Appendix M**-Section A and B for pregnant women, **Appendix N** -Section A and B for husband) for measuring behavioral responses of pregnant women when facing their partner who smoked: (a) Martinelli Scale (19 items in **Appendix M** Section A) from *Avoidance of Environmental Tobacco Smoke (Martinelli, 1998)*; (b) Self-report on their partner's behavior change evaluated by pregnant women (9 items in **Appendix M** Section B), and (c) Self-report on husband behaviors change (9 items in **Appendix N** Section A) and wife's behavior evaluated by husband (3 items in **Appendix N** Section B). The research prepared the questionnaire based on contents of an educational comic booklet and contain a total of 28 items for pregnant women and of 12 items for husband to complete.

The Martinelli scale (**Appendix M** Section A) asks about the extent to which SHS could be avoided in certain situations, and included items such as permitting smoking in the wife's home and car, staying around someone who lights up, associating with smokers, and remaining in a smoking section of a restaurant. The respondents indicated their level of agreement with each statement on a four-point Likert scale ranging from 4 = *almost never true* to 1 = *almost always true*. An average of the responses for each item produced a composite score to be used in the analysis, creating an index ranging from one to four (total

score from 19 to 76), with higher values indicating more avoidance of SHS exposure (**Appendix Q** for Score list of each question). The alpha reliability ranged from 0.90 to 0.93, and the stability coefficient was 0.93. Martinelli, (1008) developed construct validity by comparing the scores of smokers to nonsmokers (1998). The questionnaire was validated in a sample of 95 mothers (mean age = 36) and yielded an internal consistency of 0.81 (Martinelli, 1998).

Self-report on husband behaviors and their wife behaviors. Self-report of husband's behavior change (9 items in **Appendix N** Section A) and wife's behavior which was evaluated by her husband (3 items in **Appendix N** Section B) asked the respondents to indicate their level of agreement with each statement on a four-point Likert scale ranging from 1 = *almost never true* to 4 = *almost always true*. An average of the responses for each item produced a composite score to be used in the analysis, creating an index ranging from one to four, with higher values indicating more avoidance of SHS exposure (**Appendix R** for Score list of each question).

Two questionnaires were first designed in English and then translated into Indonesian with the cooperation of faculty at a University of Sam Ratulangi, North Sulawesi, Indonesia. The questionnaires were also independently back-translated to English to check the quality of translation before being used for field implementation.

Biochemical SHS Exposure such as saliva cotinine, and exhaled carbon monoxide (CO) were not measured with the aid of a carbon monoxide meter and used as a proxy for SHS exposure in this study. This was because a sufficient correspondence between self-

report of exposure to smoking and cotinine levels measured by urine and blood sample which was found by a leading researcher (Hsien-Tsai Chiu, 2008) who it was determined to be unnecessary. Birth weight, height, baby's gender and gestational age at delivery were confirmed by study assistant via records in *posyandu* or *puskesmas*.

Secondary Outcome Measures

Self-report on health beliefs and self-efficacy. In the HBM model, self-reported questionnaires (**Appendix M** from C to I for pregnant women, **Appendix N** from C to I for husbands) measuring knowledge of SHS, health beliefs, and self-efficacy were prepared by the researcher based on extant theoretical and research findings (Glanz et al., 2015); then it was given to five health improvement experts and modified based on their opinions. This resulted in a 38-item questionnaire for pregnant women and 40-item questionnaire for husbands.

For knowledge of SHS (eight items, **Appendix M** Section C for pregnant women, **Appendix N** Section C for husbands), tapped into participant understandings of the effect of SHS exposure. Correct responses were given a one (1) score, while wrong responses received no (0) score. The range of scores was 0 to 8. Higher scores showed higher knowledge.

Using health beliefs constructed on the HBM model are as follows: perceived SHS related disease susceptibility (three items, **Appendix M** Section D for pregnant women, **Appendix N** Section D for husbands), perceived SHS-related disease severity (two items, **Appendix M** Section E for pregnant women, **Appendix N** Section E for husbands),

perceived benefits (four items, **Appendix M** Section F for pregnant women, **Appendix N** Section F for husbands) or barriers of preventing SHS exposure (four items: **Appendix M** Section G for pregnant women, five items: **Appendix N** Section G for husbands), cue to action for preventing SHS exposure (seven items: **Appendix M** Section H for pregnant women, eight items : **Appendix N** Section H for husbands), and self-efficacy (ten items, **Appendix M** Section I for pregnant women, **Appendix N** Section I for husbands). A four - point Likert scale was used for measuring the constructs of the HBM model.

The General Self-Efficacy Scale (GSES) (Jerusalem, 1995) was used. The GSES scale was used in many studies (Schwarzer et al., 2010; Warner et al., 2011) and can be used without explicit researcher permission when used for research studies. It was validated in a sample of East German migrants in 1989 and 1991 (Schwarzer, 2014). The reliability of the GSES was tested at two times within a two-year period, and alphas ranged from 0.82 to 0.93 among German participants in 1989 (Schwarzer, 2014, p. 35). The retest reliability was 0.47 for men and 0.63 for women in 1991 (Schwarzer, 2014, p. 36). Concurrent validity and predictive validity was assessed for the GSES (Schwarzer, 2014, p. 36).

The self-report questionnaire, except self-efficacy, was first designed in English and then translated into Indonesian by the faculty at a University of Sam Ratulangi, North Sulawesi, Indonesia. The questionnaire was also independently back-translated to English to check the quality of translation before being used for field implementation. Indonesian Adaptation of the General Self-Efficacy Scale has been translated into Indonesian by Born, Schwarzer, & Jerusalem (1995).

Statistical Analysis

Demographic variables were the independent variables, which were listed as background characteristics (**Appendix L**). There were confounding factors and were initially examined using descriptive statistics. Descriptive statistics such as mean, standard deviation, and percentage were generated.

Dependent variables in this study that meant behavior changes of pregnant women and their partner, health beliefs, knowledge, self-efficacy. Student's *t*-test was used to check for significance differences of primary outcomes and secondary outcomes between experimental group and control group without checking for normality based on central limit theorem (Kwak & Kim, 2017). At 95% CI value with $p < .05$ was considered as statistically significant. Interim analysis was performed because the COVID−19 pandemic mitigation policy precluded data collection. All statistical analyses were performed using Statistical Package for Social Sciences version 25 for Windows.

Sample Size

Sample size was determined using G* power 3.1.9.3 (G power) software with using t-test difference between two independent means (two groups), effect size d set at .30 for primary outcomes of couple's behavior (pregnant women's avoiding SHS exposure, and husband's smoking behavior); the critical alpha value set at .05 (type Ⅰ error), and a power (1-β) of .8 (type Ⅱ error) (Cohen, 1988; Cohen, 1992). The minimum sample size was 176 couples per group, for a total of 352 couples. Based on previous studies (Chi et al., 2016; Chi et al., 2015; Kazemi et al., 2012), 15% contingency for loss to follow-up ($n = 52$) was

added into the total. Therefore, the number of participants in each group was 202: The total final sample size included in this study was 404 couples.

Ethical Considerations

This researcher collaborated with Sam Ratulangi University (**Appendix E**), North Sulawesi, Indonesia after obtaining ethical approval from St. Luke's International University, Tokyo, Japan (18-A078) and Sam Ratulangi University (7383/UN12/LL/2018: **Appendix 1**), the North Sulawesi, Indonesia. This research was conducted following *Ethical Principles for Medical Research Involving Human Subjects* (World Medical Association Declaration of Helsinki, 2013), and *Ethical Guidelines for Medical and Health Research Involving Human Subjects* (Ministry of Education, Culture, Sports, Science and Technology, & Ministry of Health, Labor and Welfare, 2014).

Voluntary participation. Before beginning data collection, the researcher explained the purpose, method, and contents of this study to eligible participants in both verbal and written format of request for research participation (**Appendix G** in Japanese and **H** in Indonesia). Written consent form (**Appendix I**) for research participation was obtained from participants prior to their participation in the study. The participants were advised that they could withdraw from the study without any negative consequences (**Appendix J**). The research target included pregnant women who are considered a vulnerable population. Therefore, this study used anonymous self-report questionnaires, which could be answered easily using the scales. These could be carried out within 30 minutes. In request forms (**Appendix G**), voluntary participation, protecting privacy, and data security are mentioned.

Participation in this research was completely voluntary; therefore, participants were informed they could stop answering the questions if they did not want to answer at any time for any reason. Also, by discontinuing the answer, no disadvantage occurred to participants.

Expected benefit and expected risk of this research. There was no adverse event, any unfavorable and unintended injury, and illness to participants. The educational material's contents included health risk information on exposure of second-hand smoke for pregnant women and fetus. If participants had a stronger threat more than necessary, Indonesian research collaborator, Dr. Wariki and I could support them. Therefore, her contact number was mentioned on consent form, which was distributed to all participants (**Appendix I**). A couple's intervention might instigate a conflict or quarrel between husband and wife. Therefore, educational comics demonstrate how to avoid couple's conflicts for smoke free homes. Basically, the health risk information was informed for preventing possible health damages for pregnant women and fetus. Expected benefits of the research were larger than expected risks.

Countermeasure for adverse reaction. This research was a RCT using educational material, therefore adverse reactions, any unfavorable or unintended injury, and illness of participants were considered unlikely. If participants had an unexpected adverse reaction, an adequate countermeasure was provided by me as I conducted this research.

Privacy protection and data security. The data gathered in this research was handled so that individuals could not be identified, and data was stored in a locked safe place and confidentially managed. Doctoral student Ms. Inaoka, Professor Ota, and

Associate Professor Wariki reviewed the completed questionnaires and after inputting the questionnaire data on a personal computer, they shared the questionnaire and discarded it after the research was completed. All data will be destroyed after five years after study completion. Audio-record will not be used in this study. The obtained data of this study may be used in the future research in Sam Ratulangi University. However, if the data is used, we will apply to the ethical clearance committee again and only implement it after approval. All documents, which relate with this research, will be kept under strict surveillance properly.

Information provision. Participants can request and get or read the research protocol and documents dealing with the method of the research, to the limits, which do not interfere with the protection of personal information of other research participants.

Publication. This researcher registered this research proposal on an UMIN-CTR Clinical Trial Registration System. St. Luke's International University and Sam Ratulangi University have the ownership of obtained data. The results of this research intend to be published as a doctoral dissertation and academic papers.

Conflict of interest. This research does not meet the certain requirements of the conflict of interest.

Incentive. A small Japanese gift was given to all participants in Indonesia after their participation (**Appendix G**).

Fund resources. Expenses of this research was covered by the researcher's income, the Research Grant by K. Matsushita Foundation【19-G04】, and Mext Kakenhi Grant

Number 【20K10868】 which reported status of research-related conflicts of interest the research implementing entity.

Reporting to head of organizations. This researcher reports research summary to each head of the organizations for investigation of ethical committees when the ethical committees require.

Readiness of the researcher. This researcher has enough experience for conducting research in low- or middle-income countries because of working as an expert with Japan International Cooperation Agency (JICA) in Vietnam, Cambodia, and Mongolia, and a researcher in Vietnam, and Laos. This researcher made an on-site inspection of the hospital and some lower-level hospitals and health fields.

RESULTS

Participants

The participant flow diagram is shown in Figure 1. For the first interim analysis, of the 348 couples that were eligible to be participants, 286 couples gave consent. They were randomly assigned, by using the central randomization process, to either the experimental group or the control group: 140 couples were assigned to the experimental group and 146 couples were assigned to the control group. Sixty-two couples were excluded for the following reasons: not meeting inclusion criteria (n = 50), consent withdrawal (n = 11), and other reason (n = 1).

Of the 140 couples in the intervention group, 30 couples dropped out. The reasons for dropped out were as follows: moved to other places (n = 21), participants could not visit the health facility because of COVID-19 restrictions (n = 8), and discontinued because of abortion (n = 1). Finally, 110 couples participated in the experimental group; the drop-out rate was 21%.

Of the 146 couples assigned to the control group, 42 couples dropped out. The reasons for dropping out were: moved to other places (n = 30), and participants could not visit the health facility because of COVID-19 restrictions (n = 12). Finally, 104 couples participated in the control group; the drop-out rate was 28%.

The final number of couples was 214. Data for the primary and secondary outcomes came from 110 couples in the experimental group and 104 couples in the control group.

This trial was stopped because of COVID-19 restrictions.

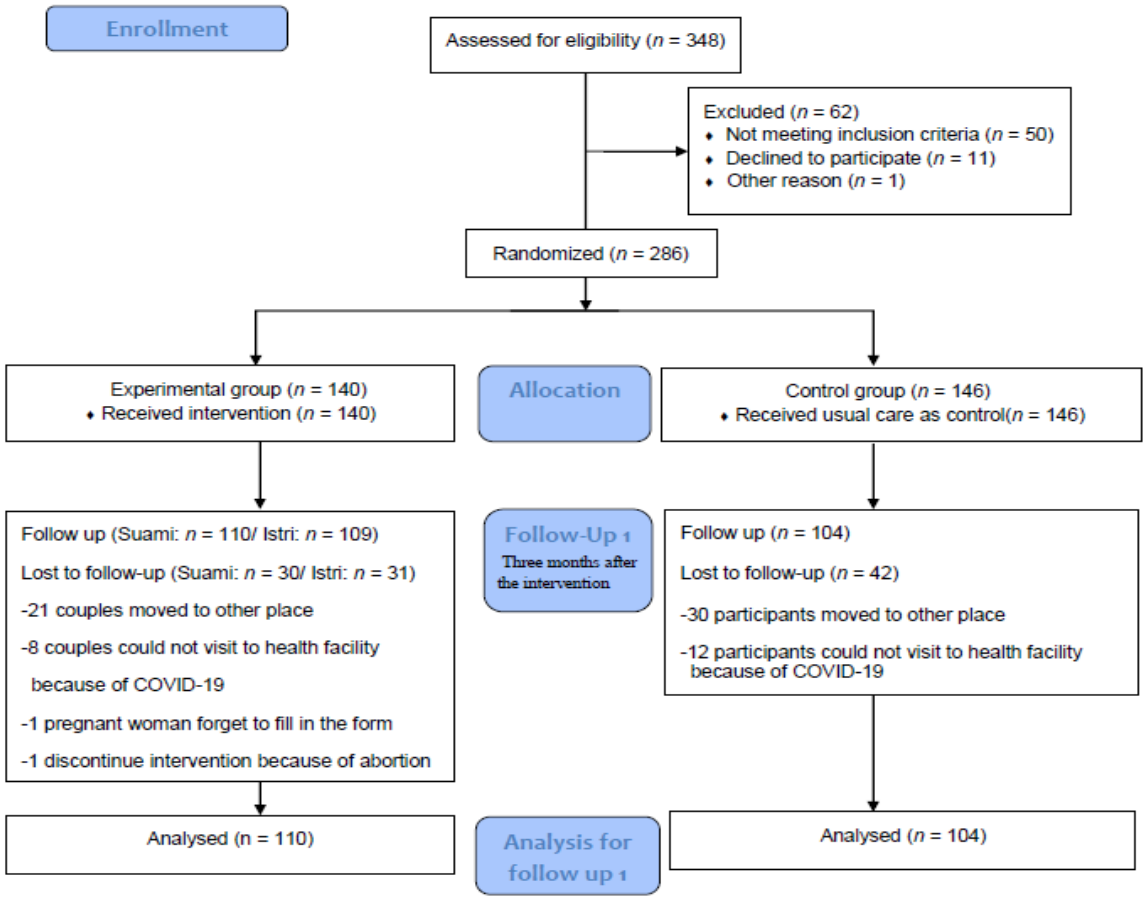

Figure 2. Flow diagram of participants

Baseline Data

Characteristics of the couples. Characteristics of the couples are shown in **Table 3** for pregnant women and **Table 4** for their husbands. The majority of couples was Minahasan, had completed high school and were protestant. Secondhand smoke in the home (82%) was a daily occurrence for a majority (75.7%) of the women. Pregnant women's mean ages were 27.01 (*SD*: 6.41) in the experimental group, and 26.89 (*SD*: 6.06) in the control group.

Gestational week was 15.13 (*SD*: 6.73) in the experimental group, and 15.00 (*SD*: 6.04) in the control group. Husbands' mean ages were 30.03 (*SD*: 6.90) in the experimental group, and 30.22 (*SD*: 6.55) in the control group. Number of cigarettes husbands smoked were 10.28 (*SD*: 6.23) in the experimental group, and 10.75 (*SD*: 7.47) in the control group. There was a difference in "type of your house" between the two groups (p = .002), however the difference may not affect the outcomes because most Indonesian smoked in the dining room on the first floor chatting or outside of their house with other smokers. On frequency of smoking in the house, as inclusion criteria, we recruited husbands who smoked at least six cigarettes in a week. However, there was a husband who smoked less than one in a month.

Table 3

Pregnant Women's Characteristics at Baseline

Characteristic		Experimental group (n = 140)			Control group (n = 146)			*t*	*p-value*
		M	*SD*	*95%CI*	*M*	*SD*	*95%CI*		
Age [a, u]		27.01	6.41	[25.92, 28.10]	26.89	6.06	[25.89, 27.89]	0.16	.874
Gestational week [g, u]		15.13	6.73	[13.96, 16.30]	15.00	6.07	[14.44, 16.45]	-0.41	.684
		n	%		*n*	%			*p-value*
Ethnicity [b,x]	Minahasan	77	(55.0)		76	(52.1)			.782
	Sangir	24	(17.1)		21	(14.4)			
	Mogondow	4	(2.9)		4	(2.7)			
	Gorontalo	16	(11.4)		21	(14.4)			
	Tinghoa	1	(0.7)		0	(0)			
	Other	15	(10.7)		21	(14.4)			
Religion [c,x]	Protestant	82	(58.6)		91	(62.3)			.718
	Catholic	11	(7.9)		8	(5.5)			
	Islam	44	(31.4)		45	(30.8)			
Married [d,x]		125	(89.3)		133	(91.1)			.889
Living with partner [e,x]		136	(97.1)		143	(97.9)			.514
Smoking status [f,x]	Never smoked	117	(83.6)		125	(85.6)			.870
	Quit before pregnancy	6	(4.3)		5	(3.4)			
	Quit after pregnancy	8	(5.7)		10	(6.8)			
Number of gestation [h,x]	1	43	(30.7)		38	(26.0)			.300
	2	43	(30.7)		61	(41.8)			
	3	33	(23.6)		30	(20.5)			
	4 or more	18	(12.9)		15	(10.3)			
Number of birth [i,x]	0	11	(7.9)		10	(6.8)			.980
	1	46	(32.9)		53	(36.3)			
	2	36	(25.7)		40	(27.4)			
	3	18	(12.9)		20	(13.7)			
	4 or more	12	(8.6)		11	(7.5)			
Number of children [j,x]	0	20	(14.3)		26	(17.8)			.804

	1	53	(37.9)	58	(39.7)	
	2	34	(24.3)	36	(24.7)	
	3	13	(9.3)	9	(6.2)	
	4 or more	7	(5.0)	6	(4.1)	
Completed level of education [k.,x]						.547
	Elementary school	8	(5.7)	12	(8.2)	
	Junior high school	25	(17.9)	28	(19.2)	
	Senior high school	85	(60.7)	91	(62.3)	
	University/College	19	(13.6)	13	(8.9)	
Occupation during pregnancy [l., x]						.945
	Housewife	108	(77.1)	114	(78.1)	
	Working pregnant women	32	(22)	32	(21)	
Household earnings [m., x]						.639
	Over Rp. 2,600,000 per month	58	(41.4)	66	(45.2)	
	Rp.2,600,000 per month or less	71	(50.7)	72	(49.3)	
Main work place [n., x]	Indoor	75	(53.6)	83	(56.8)	.734
	Outdoor	13	(9.3)	12	(8.2)	
	Both	46	(32.9)	47	(32.2)	
Frequency of second-hand exposure [o., x]						.349
	Daily	106	(75.7)	100	(68.5)	
	Weekly	15	(10.7)	20	(13.7)	
	Monthly	1	(0.7)	1	(0.7)	
	Less than monthly	12	(8.6)	17	(11.6)	
Place of secondhand exposure [p., x]						
	In your home	115	(82.1)	113	(77.4)	.297
	In workplace	11	(7.9)	8	(5.5)	.407
	In a restaurant	8	(5.7)	5	(3.4)	.344
	In public transportation	20	(14.3)	13	(8.9)	.146
	In a car	5	(3.6)	2	(1.4)	.203
	Other	7	(5.0)	15	(10.3)	.098
Type of your house [q., x]	Stilt house	46	(32.9)	26	(17.8)	**.002**
	Flatland house	87	(62.1)	116	(79.5)	
Type of your household [r., x]	Nuclear family	72	(51.4)	70	(47.9)	.583
	Joint family	64	(45.7)	71	(48.6)	
Non smoke-free home [s., x]		88	(62.9)	95	(65.1)	.871
Who smoke in your home [t., x]	Husband	121	(86.4)	120	(82.2)	.136
	Grandfather	4	(2.9)	6	(4.1)	.412
	Grandmother	1	(0.7)	3	(2.1)	.333
	Brother	19	(13.6)	32	(21.9)	.075
	Sister	5	(3.6)	4	(2.7)	.868
	Other	16	(11.4)	13	(8.9)	.148

Note.a.: Experimental group *n*=135, Control group *n*= 144
b.: Experimental group *n*= 137, Control group *n*=143
c.: Experimental group *n*=137, Control group *n*=144
d.: Experimental group *n*=136, Control group *n*=144
e.: Experimental group *n*=136, Control group *n*=144
f.: Experimental group *n*=131, Control group *n*=140
g.: Experimental group *n*=130, Control group *n*=141
h.: Experimental group *n*=137, Control group *n*=144
i.: Experimental group *n*=123, Control group *n*=134
j.: Experimental group *n*=127, Control group *n*=135
k.: Experimental group *n*=137, Control group *n*=144
l.: Experimental group *n*=137, Control group *n*=144
m.: Experimental group *n*=129, Control group *n*=138
n.: Experimental group *n*=134, Control group *n*=142
o.: Experimental group *n*=134, Control group *n*=138
p.: Experimental group *n*=134, Control group *n*=141
q.: Experimental group *n*=133, Control group *n*=142
r.: Experimental group *n*=136, Control group *n*=141
s.: Experimental group *n*=134, Control group *n*=143
t.: Experimental group *n*=133 , Control group *n*=141
u *:* t-test was conducted
x:chi-square test was conducted

Table 4

Husbands' Characteristics at Baseline

Characteristic		Experimental group (n = 140)			Control group (n = 146)			*t*	*p-value*
		M	*SD*	*95%CI*	*M*	*SD*	*95%CI*		
Age		30.03	6.90	[28.85, 31.21]	30.22	6.55	[29.14, 31.31]	-0.24	.811[a]
Number of tobaccos smoked/day		*M*	*SD*	*95%CI*	*M*	*SD*	*95%CI*	*t*	*p-value*
		10.28	6.23	[9.20, 11.36]	10.75	7.47	[9.49, 12.00]	-0.05	.962[b]
		n	%		n	%			p-value
Ethnithity	Minahasan	78	(66.7)		78	(53.4)			.262[c]
	Sangir	14	(10.0)		16	(11.0)			
	Mogondow	7	(5.0)		3	(2.1)			
	Gorontalo	21	(15.0)		19	(13.0)			
	Tinghoa	2	(1.4)		0	(0)			
	Other	15	(10.7)		26	(17.8)			
Religion	Protestant	77	(55.0)		89	(61.0)			.619 [c]
	Catholic	13	(9.3)		11	(7.5)			
	Islam	47	(33.6)		44	(30.1)			
Completed level of education									.098 [c]
	Elementary school	17	(12.1)		14	(9.6)			
	Junior high school	30	(21.4)		20	(13.7)			
	Senior high school	74	(52.9)		99	(67.8)			
	University/College	15	(10.7)		11	(7.5)			
Occupation	Private employee	42	(30.0)		49	(33.6)			.187 [c]
	Government employee	4	(2.9)		2	(2.1)			
	Entrepreneur	35	(25.0)		22	(15.1)			
	Farmer	3	(2.1)		8	(5.5)			
	Labor	29	(20.7)		29	(19.9)			
	Other	23	(16.4)		33	(22.6)			
Smoking status	Smoked as usual	100	(71.4)		109	(74.7)			.644 [c]
	Smoked less after pregnancy	30	(21.4)		28	(19.2)			
	Smoked more after pregnancy	1	(0.7)		3	(2.1)			
Frequency of smoking in the home									.259 [c]
	Daily	116	(82.9)		115	(78.8)			
	Weekly	11	(7.9)		20	(13.7)			
	Monthly	0	(0)		1	(0.7)			
	Less than monthly	8	(5.7)		6	(4.1)			

Note.a::t-test was conducted, , c:chi-square test was conducted

Comparison of avoidance of environmental tobacco smoke and husband Smoking behaviors as evaluated by pregnant women at baseline. Individual t-test was conducted for avoidance of environmental tobacco smoke and husband smoking behaviors. Total score, and each items' scores on avoidance of environmental tobacco smoke as evaluated by pregnant women was shown in **Table 5**. There was no different between the two groups for total score (*MD* = -0.13, 95%*CI* [-1.57, 1.32]) and each items' score except item A16 (*MD* = -0.19, 95%*CI* [-0.37, 0.01]) and item A17 (*MD* = 0.19, 95%*CI* [0.01, 0.38]).

Table 5

Comparison of Total Score and Each Item Score on Avoidance of Environmental Tobacco Smoke as Evaluated by Pregnant Women at Baseline

	Experimental group (n = 140)	Control group (n = 146)	*MD*	95% *CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
Total score of avoidance of environmental tobacco smoke [a]	50.96 (6.29)	51.09 (6.09)	-0.13	[-1.57, 1.32]	0.56	.865
A1. When I encounter someone who is smoking, I distance myself to unsure that I will not be exposed to smoke.[a]	3.01 (0.93)	3.04 (0.87)	-0.05	[-0.26, 0.16]	-0.45	.650
A2. I allow people to smoke in my home.[a]	2.36 (0.89)	2.45 (0.87)	-0.09	[-0.29, 0.11]	-0.86	.390
A3. If I am with a group of people, and someone beings to smoke, I will remain with the group. [a]	2.70 (0.87)	2.79 (0.86)	-0.07	[-0.26, 0.13]	-0.66	.513
A4. If I encounter a friend or relative who is smoking, I will sit and talk with him/her while he/she is smoking. [a]	2.71 (0.83)	2.89 (0.80)	-0.13	[-0.32, 0.06]	-1.39	.166
A5. When I am in public place such as restaurant or offices or clinic, I will leave if unable to sit in the nonsmoking section. [a]	2.67 (0.90)	2.57 (1.02)	0.09	[-0.13, 0.31]	0.79	.431
A6. When I trip by bus, or any other public transportation I would request a nonsmoking seat. [a]	2.59 (0.87)	2.62 (0.90)	-0.03	[-0.24, 0.17]	-0.30	.768
A7. When I trip by taxi, I will ask the driver not to smoke. [a]	2.72 (0.79)	2.79 (0.81)	-0.05	[-0.24, 0.13]	-0.56	.578
A8. I allow people smoking in the car. [a]	2.77 (0.85)	2.81 (0.77)	-0.03	[-0.22, 0.16]	-0.31	.756
A9. If my friends or relatives are gathering in a designated smoking area to smoke, I will join them rather than be alone. [a]	2.77 (0.80)	2.82 (0.73)	-0.01	[-0.19, 0.17]	-0.09	.925
A10. If I am with people who are smoking and I cannot leave, I will ask them to refrain from smoking. [a]	2.70 (0.78)	2.82 (0.79)	-0.11	[-0.29, 0.07]	-1.17	.243
A11. I will sit in the smoking section of a public place or bus station if there are no seats available elsewhere. [a]	2.39 (0.83)	2.49 (0.86)	-0.07	[-0.26, 0.13]	-0.66	.508
A12. When an outdoor functions where smoking is present, I will move away to avoid it. [a]	2.89 (0.74)	2.92 (0.74)	-0.03	[-0.20, 0.14]	-0.36	.720
A13. When an outdoor functions where waterpipe smoking is present, I will move a way to avoid it. [a]	2.88 (0.72)	2.91 (0.74)	-0.03	[-0.20, 0.14]	-0.35	.724
A14. When exposed to SHS, I wash my clothes solely to remove the smell of smoke from them even if they are otherwise clean [a]	2.48 (0.82)	2.46 (0.83)	0.04	[-0.16, 0.23]	0.39	.699
A15. I find it unpleasant to be around SHS. [a]	3.11 (0.61)	2.97 (0.68)	0.13	[-0.02, 0.28]	1.68	.094
A16. I routinely associate with people who smoke. [a]	2.23 (0.72)	2.45 (0.74)	-0.19	[-0.37, 0.02]	-2.16	.031
A17. When eating out, I always sit in the nonsmoking section. [b]	2.80 (0.74)	2.60 (0.83)	0.19	[0.01, 0.38]	-2.16	.031
A18. I don't frequently places where smoking is prevalent. [a]	2.86 (0.76)	2.75 (0.75)	0.12	[-0.06, 0.30]	1.34	.181
A19. I do not find SHS offensive. [b]	2.39 (0.94)	2.24 (0.81)	0.13	[-0.08, 0.34]	1.22	.224

Note. a: *t*- test was conducted., b:Welch test was conducted

Cross-tabulation table of avoidance of environmental tobacco smoke (**Table 6**) as evaluated by pregnant women at baseline.

Table 6

Cross-tabulation Table of Avoidance of Environmental Tobacco Smoke as *Evaluated by Pregnant Women at Baseline*

	Experimental group (*n* = 140)				Control group (n = 146)			
	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)
A1. When I encounter someone who is smoking, I distance myself to unsure that I will not be exposed to smoke.	11.5	10.8	46.0	31.7	8.9	10.3	50.0	30.8
A2. I allow people to smoke in my home.	12,1	25.7	47.1	15.0	11.6	32.9	43.2	12.3
A3. If I am with a group of people, and someone beings to smoke, I will remain with the group.	17.1	45.7	28.6	8.6	23.3	37.0	34.2	5.5
A4. If I encounter a friend or relative who is smoking, I will sit and talk with him/her while he/she is smoking.	17.1	45.0	31.4	6.4	23.3	44.5	28.1	4.1
A5.When I am in public place such as restaurant or offices or clinic, I will leave if unable to sit in the nonsmoking section.	11.4	27.9	42.9	17.9	19.2	22.6	39.0	19.2
A6. When I trip by bus, or any other public transportation I would request a nonsmoking seat.	12.9	28.6	45.7	12.9	11.6	30.8	41.8	15.8
A7. When I trip by taxi, I will ask the driver not to smoke.	6.4	28.6	50.7	14.3	7.5	22.6	54.1	15.8
A8. I allow people smoking in the car.	18.6	47.9	25.0	8.6	16.4	52.7	24.7	6.2
A9. If my friends or relatives are gathering in a designated smoking area to smoke, I will join them rather than be alone.	18.6	47.1	29.3	5.0	14.4	55.5	26.0	4.1
A10. If I am with people who are smoking and I cannot leave, I will ask them to refrain from smoking.	7.1	26.4	54.3	12.1	5.5	24.7	52.1	17.8
A11. I will sit in the smoking section of a public place or bus station if there are no seats available elsewhere.	11.4	28.6	49.3	10.7	13.0	30.8	46.6	9.6
A12. When an outdoor functions where smoking is present, I will move away to avoid it.	5.7	16.4	61.4	16.4	4.1	19.3	57.2	19.3
A13. When an outdoor functions where waterpipe smoking is present, I will move a way to avoid it.	5.0	17.9	60.7	16.4	4.2	19.4	56.9	19.4
A14. When exposed to SHS, I wash my clothes solely to remove the smell of smoke from them even if they are otherwise clean	12.1	34.3	45.0	8.6	11.7	40.7	37.2	10.3
A15. I find it unpleasant to be around SHS.	0.7	11.4	65.0	22.9	4.1	11.7	66.9	17.2
A16. I routinely associate with people who smoke.	5.7	26.4	56.4	11.4	11.0	28.3	55.9	4.8
A17. When eating out, I always sit in the nonsmoking section	7.1	19.3	60.7	12.9	9.7	32.4	46.2	11.7
A18. I don't frequently places where smoking is prevalent.	3.6	25.7	51.4	19.3	4.8	29.0	53.1	13.1
A19. I do not find SHS offensive.	18.8	38.3	29.3	13.5	16.2	50.0	26.8	7.0

Each items' score on husband smoking behaviors as evaluated by pregnant women were shown in **Table 7**. There was no different between the two groups for husband's smoking behaviors except B1 (*MD* = 0.25, 95%*CI* [0.00, 0.51]).

Table 7

Comparison of Each Item Score on Husband Behaviors as Evaluated by Pregnant Women at Baseline

	Experimental group (*n* = 140)	Control group (*n* = 146)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
B1. Your partner read educational comic on preventing second-hand smoke at home[a]	1.93 (1.13)	1.69 (1.03)	0.25	[0.00, -0.51]	1.98	.049
B2. Your partner move away from wife when he smokes[a]	2.90 (0.78)	2.87 (0.86)	0.04	[-0.15, 0.23]	0.39	.698
B3. Your partner smokes near an open door or window.[a]	2.98 (0.72)	2.88 (0.82)	0.10	[-0.08, 0.28]	0.02	.266
B4. Your partner smokes near the kitchen fan.[a]	2.38 (0.87)	2.24 (0.84)	0.01	[-0.19, 0.21]	0.06	.951
B5. Your partner smokes outdoors with the door closed.[a]	2.57 (0.80)	2.44 (0.91)	0.15	[-0.05, 0.35]	1.51	.132
B6. Your partner smokes out-side of the home.[a]	2.91 (0.73)	2.90 (0.82)	0.02	[-0.17, 0.20]	0.18	.858
B7. Your partner intend to quitting smoking.[b]	1.70 (0.90)	1.60 (0.74)	0.13	[-0.07, 0.32]	0.13	.195
B8. Your partner stop to smoke.[a]	1.66 (0.88)	1.56 (0.84)	0.08	[-0.13, 0.28]	0.75	.454

Note. a:*t*- test was conducted. b:Welch test was conducted

Cross-tabulation table of husband behaviors (**Table 8**) as evaluated by pregnant women at baseline.

Table 8

Cross-tabulation Table of Husband Behaviors as *Evaluated by Pregnant Women at Baseline*

	Experimental group (*n* = 140)				Control group (n = 146)			
B1. Your partner read educational comic on preventing second-hand smoke at home	Never (%)	Perceived an educational comic (%)	Read partly (%)	Read completely (%)	Never (%)	Perceived an educational comic (%)	Read partly (%)	Read completely (%)
	52.9	13.9	20.0	13.6	64.1	11.7	15.2	9.0
	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)
B2. Your partner move away from wife when he smokes	6.4	16.4	57.9	19.3	7.6	22.1	46.9	23.4
B3. Your partner smokes near an open door or window.	3.6	16.4	59.3	20.7	6.9	20.7	51.0	21.4
B4. Your partner smokes near the kitchen fan.	16.4	37.9	37.1	8.6	15.2	40.7	35.9	8.3
B5. Your partner smokes outdoors with the door closed.	7.9	38.6	42.1	11.4	15.1	42.5	28.1	14.4
B6. Your partner smokes outside of the home.	5.0	17.1	60.0	17.9	7.5	17.8	52.7	21.9
B7. Your partner intends to quit smoking.	Not yet (%)	Inform an intention to stop smoking (%)	Make the decision to quit (%)	Set a quit date within one month (%)	Not yet (%)	Inform an intention to stop smoking (%)	Make the decision to quit (%)	Set a quit date within one month (%)
	52.1	30.7	10.0	7.1	53.1	37.2	6.9	2.8
B8. Your partner stopped smoking.	Not yet (%)	Reduce number of cigarettes per day (%)	Avoid smoking triggers (%)	Stopped smoke completely (%)	Not yet (%)	Reduce number of cigarettes per day (%)	Avoid smoking triggers (%)	Stopped smoke completely (%)
	54.3	31.9	7.2	6.5	59.6	29.5	4.1	6.8

Comparison of husband smoking behaviors and pregnant women's avoiding SHS behavior as evaluated by husbands at baseline. Individual *t*-test was conducted for husbands' smoking behavior. Each item score of husbands' smoking behavior as evaluated by husband are shown in **Table 9**. There was no different between the two groups for husbands' smoking behavior except A1(*MD* = 0.42, 95%*CI* [0.16 - 0.67]).

Table 9

Comparison of Each Item Score on Husband Behaviors as Evaluated by Husband at Baseline

	Experimental group (*n* = 140)	Control group (*n* = 146)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
A1. I read educational comic on preventing second-hand smoke at home. [b]	2.09 (1.17)	1.67 (1.00)	0.42	[0.16, 0.67]	3.23	.001
A2. I move away from my wife when I smoke. [b]	2.89 (0.81)	2.73 (0.90)	0.16	[-0.04, 0.36]	1.60	.112
A3. I smoke near an open door or window. [a]	2.99 (0.74)	2.89 (0.80)	0.10	[-0.08, 0.28]	1.13	.258
A4. I smoke near the kitchen fan. [a]	2.58 (0.90)	2.46 (0.86)	0.12	[-0.09, 0.37]	1.15	.250
A5. I smoke outdoors with the door closed. [a]	2.65 (0.88)	2.54 (0.87)	0.11	[-0.10, 0.31]	1.06	.292
A6. I smoke outside of the home. [a]	2.97 (0.80)	2.90 (0.80)	-0.02	[-0.21, 0.17]	0.72	.473
A7. I intend to quitting smoking. [a]	1.64 (0.82)	1.66 (0.78)	-0.02	[-0.21, 0.17]	-0.23	.819
A8. I stop to smoke. [a]	1.60 (0.82)	1.72 (0.93)	-0.11	[-0.32, 0.09]	-1.09	.276

Note. a:*t*- test was conducted. b:Welch test was conducted

Cross-tabulation table of husbands' smoking behavior (**Table 10**) as evaluated by husband at baseline.

Table 10

Cross-tabulation Table of Husband Smoking Behaviors as Evaluated by Husband at Baseline

	Experimental group (*n* = 140)				Control group (n = 146)			
A1. I read an educational comic on preventing second-hand smoke at home.	Never (%)	Perceived an educational comic (%)	Read partly (%)	Read completely (%)	Never (%)	Perceived an educational comic (%)	Read partly (%)	Read completely (%)
	48.6	10.0	25.7	15.7	64.6	11.8	16.0	7.6
	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)
A2. I move away from my wife when I smoke.	7.1	17.1	55.0	20.7	12.4	20.0	49.7	17.9
A3. I smokes near an open door or window.	3.6	16.4	57.1	22.9	6.9	17.2	55.9	20.0
A4.I smokes near the kitchen fan.	10.0	40.0	32.1	17.9	13.9	36.8	38.9	10.4

A5.I smokes outdoors with the door closed.	7.9	38.1	35.3	18.7	11.0	38.6	35.9	14.5
A6.I smokes outside of the home.	4.3	20.0	50.0	25.7	6.2	18.6	53.8	21.4
A7. I intend to quitting smoking.	Not yet (%)	Inform an intention to stop smoking (%)	Make the decision to quit (%)	Set a quit date within one month (%)	Not yet (%)	Inform an intention to stop smoking (%)	Make the decision to quit (%)	Set a quit date within one month (%)
	54.0	31.7	10.8	3.6	50.3	35.9	11.0	2.8
A8.I stop to smoke.	Not yet (%)	Reduce number of cigarettes per day (%)	Avoid smoking triggers (%)	Stop to smoke completely (%)	Not yet (%)	Reduce number of cigarettes per day (%)	Avoid smoking triggers (%)	Stop to smoke completely (%)
	55.1	35.5	3.6	5.8	51.5	35.4	3.5	9.7

Individual *t*-test was conducted for pregnant women's avoiding SHS behavior. The item scores of pregnant women's avoiding SHS behavior as evaluated by husband are shown in **Table 11**. There was no difference between the two groups for pregnant women's avoiding SHS behavior.

Table 11

Comparison of Each Item Score on Pregnant Women's Avoiding SHS Behavior as Evaluated by Husband at Baseline

	Experimental group (n = 140)	Control group (n = 146)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
B1. My wife move away from me when I smoke	3.06(0.72)	3.01(0.70)	0.05	[-0.12, 0.22]	0.60	.549
B2. My wife remind me not to smoke in our home when I smoke near my wife or in home	3.04(0.70)	3.06(0.70)	- 0.03	[-0.19, 0.14]	-0.32	.751
B3. My wife move away from smoker	3.03 (.72)	3.03 (.69)	<.01	[-0.16, 0.17]	0.01	.751

Note. *t*- test was conducted.

Cross-tabulation table of pregnant women's avoiding SHS behavior (**Table 12**) as evaluated by husband at baseline.

Table 12

Cross-tabulation Table of Pregnant Women's Avoiding SHS Behavior as Evaluated by Husband at Baseline

	Experimental group (n = 140)				Control group (n = 146)			
	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)
B1. My wife move away from me when I smoke	4.3	10.1	60.4	25.2	2.8	15.9	58.6	22.8
B2. My wife remind me not to smoke in our home when I smoke near my wife or in home	2.9	13.7	60.4	23.0	2.1	14.5	58.6	24.8
B3. My wife move away from smoker	4.3	11.4	61.4	22.9	2.8	13.8	61.4	22.1

Comparison of health beliefs and self-efficacy for couples at baseline. Individual *t*-test was conducted for health beliefs and self-efficacy for pregnant women, which were evaluated by pregnant women (**Table 13** for pregnant women**)**. For pregnant women, the only differences between the two groups were the following four items: D3 (*MD* = 0.04, 95%*CI* [0.01, 0.36]), E1 (*MD* = 0.01, 95%*CI* [0.04, 0.32]), E2 (*MD* = 0.02, 95%*CI* [0.03, 0.31]), and H7 (*MD* = 0.05, 95%*CI* [-0.09, 0.18]).

Table 13

Comparison of Each Item Score on Health Beliefs and Self-Efficacy as Evaluated by Pregnant Women at Baseline

Knowledge of SHS	Experimental group (n = 140)	Control group (n = 146)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
C1. Smoke from the cigarettes of my partner is harmful to me and my baby. [b]	2.00 (0.00)	1.99 (0.12)	0.01	[-0.01, 0.03]	1.39	.166
C2. Smoke from a burning cigarette contains dangerous chemicals to me and my baby. [b]	2.00 (0.00)	1.99 (0.12)	0.53	[-0.04, 0.07]	1.39	.166
C3. The smoke chemicals is transferred via my partner's mouth. [a]	1.95 (0.22)	1.93 (0.25)	0.02	[-0.04, 0.07]	0.63	.530
C4. Things (closes, and furniture etc..) in rooms where my partner smoked are coated. [b]	1.86 (0.35)	1.80 (0.40)	0.06	[-0.03, 0.14]	1.25	.212
C5. Staying for long time with a person who smokes may increase my health risks. [a]	1.96 (0.19)	1.98 (0.14)	-0.02	[-0.05, 0.02]	-0.78	.439
C6. Smoking by my partner in the home can have a harmful effect on me and my unborn baby. [a]	1.99 (0.12)	1.98 (0.14)	0.01	[-0.02, 0.04]	0.40	.688
C7. Cigarette butts include toxic substances. [a]	1.96 (0.19)	1.95 (0.21)	0.01	[-0.04, 0.06]	0.51	.608
C8. Smoke including toxic substances go into closed rooms. [a]	1.95 (0.22)	1.93 (0.25)	0.02	[-0.04, 0.07]	0.66	.510
Perceived SHS-related disease susceptibility						
D1. Breathing in a room where partner's cigarette can affect fetal development and my health risk. [a]	3.27 (0.62)	3.23 (0.65)	0.04	[-0.11, 0.19]	0.52	.606
D2. Smoke from the cigarette of smokers in a room is harmful to me and my unborn baby. [a]	3.31 (0.59)	3.33 (0.63)	-0.01	[-0.15, 0.13]	-0.10	.919

D3. You and your unborn baby breathe toxic substances which are released from things (closes, and furniture) in rooms where your partner smoked. [b]	3.01 (0.68)	2.83 (0.79)	0.18	[0.01, 0.36]	2.08	.039
Perceived SHS-related disease severity						
E1. The effect of SHS exposure is a very serious condition for pregnant women. [a]	3.32 (0.55)	3.14 (0.63)	0.18	[0.04, 0.32]	2.50	.013
E2. The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women. [a]	3.36 (0.56)	3.19 (0.62)	0.17	[0.03, 0.31]	2.43	.016
Perceived benefits of preventing SHS exposure						
F1. It is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth. [a]	3.21 (0.68)	3.07 (0.72)	0.13	[-0.03, 0.29]	1.59	.113
F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health. [a]	3.19 (0.69)	3.05 (0.66)	0.13	[-0.03, 0.29]	1.62	.106
F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation. [a]	3.19 (0.71)	3.02 (0.75)	0.17	[-0.00, 0.34]	1.92	.056
F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes. [a]	3.19 (0.72)	3.14 (0.66)	0.06	[-0.11, 0.22]	0.68	.499
Perceived barriers to preventing SHS exposure						
G1. I disapproved of my partner's smoking outside the home. [a]	2.49 (0.84)	2.52 (0.79)	-0.04	[-0.23, 0.15]	-0.40	.692
G2. There is no-smoking norm or policy in our home. [a]	2.55 (0.73)	2.63 (0.70)	-0.08	[-0.24, 0.09]	-0.92	.360
G3. It is difficult to ask my partner not to smoke in the home. [a]	2.32 (0.68)	2.39 (0.70)	-0.07	[-0.23, 0.09]	-0.88	.382
G4. Smoke-free home is a risk to routine harmonious social relations. [a]	2.16 (0.71)	2.31 (0.71)	-0.15	[-0.32, 0.01]	-1.82	.071
Cue to action for preventing SHS exposure						
H1. I know what is second-hand smoke (SHS). [a]	2.46 (1.02)	2.43 (1.05)	0.03	[-0.21, 0.27]	0.27	.789
H2. I know risks of second-hand smoke (SHS) for mother. [a]	2.54 (1.02)	2.63 (1.09)	-0.10	[-0.34, 0.15]	-0.76	.446
H3. I know risks of second-hand smoke for fetus. [a]	2.61 (1.02)	2.64 (1.06)	-0.05	[-0.29, 0.12]	-0.38	.706
H4. I know how to prevent second hand smoke exposure in my home. [a]	2.50 (1.06)	2.43 (1.04)	0.04	[-0.20, 0.29]	0.33	.742
H5. I have conflict with my partner over his smoking in the room. [a]	2.44 (0.98)	2.48 (1.03)	-0.03	[-0.26, 0.21]	-0.22	.826
H6. Brief advice on preventing second-hand smoke from research staff is a cue to action. [a]	2.87 (0.86)	2.79 (0.88)	0.07	[-0.13, 0.27]	0.68	.496
H7. Sticker on preventing second hand smoke is a cue to action. [b]	2.94 (0.83)	2.59 (0.92)	0.35	[0.15, 0.56]	3.40	.001
The General Self-efficacy scale						
Total score of Self-efficacy I [a]	31.49 (4.19)	30.92 (5.33)	0.57	[-0.55, 1.69]	1.00	.319
I1. I can always manage to solve difficult problems if I try hard enough. [a]	3.33 (0.63)	3.27 (0.68)	0.06	[-0.09, 0.21]	0.77	.443
I2. If someone opposes me, I can find the means and ways to get what I want. [a]	3.06 (0.64)	3.06 (0.72)	<.01	[-0.16, 0.16]	0.02	.984
I3. It is easy for me to stick to my aims and accomplish my goals. [a]	3.10 (0.58)	2.99 (0.65)	0.11	[-0.04, 0.25]	1.46	.145
I4. I am confident that I could deal efficiently with unexpected events. [a]	3.16 (0.57)	3.06 (0.64)	0.12	[-0.03, 0.26]	1.16	.107
I5. Thanks to my resourcefulness, I know how to handle unforeseen situations. [a]	3.11 (0.58)	3.04 (0.64)	0.07	[-0.08, 0.21]	0.90	.371
I6. I can solve most problems if I invest the necessary effort. [a]	3.16 (0.59)	3.13 (0.61)	0.03	[-0.11, 0.17]	0.37	.713
I7. I can remain calm when facing difficulties because I can rely on my coping abilities. [a]	3.14 (0.53)	3.10 (0.62)	0.05	[-0.09, 0.18]	0.68	.498
I8. When I am confronted with a problem, I can usually find several solutions. [a]	3.19 (0.53)	3.20 (0.62)	-0.01	[-0.14, 0.13]	-0.11	.914
I9. If I am in trouble, I can usually think of a solution. [a]	3.12 (0.59)	3.23 (0.64)	-0.11	[-0.25, 0.04]	-1.46	.145
I10.I can usually handle whatever comes my way.[b]	3.13 (0.52)	3.14 (0.64)	-0.02	[-0.15, 0.12]	-0.24	.813

Note. a:*t*-test was conducted., b:Welch test was conducted., SHS = second hand smoke; I refers to related appendices

Cross-tabulation table of Health Beliefs, and Self-Efficacy for pregnant women

(**Table 14**) as evaluated by pregnant women at baseline.

Table 14

Cross-tabulation Table of Health Beliefs and Self-Efficacy for Pregnant Women as Evaluated by Pregnant Women at Baseline

Knowledge of SHS	Experimental group (*n* = 140)		Control group (n = 146)	
	Yes (%)	No (%)	Yes (%)	No (%)
C1. Smoke from the cigarettes of my partner is harmful to me and my baby.	100	0	98.6	1.4
C2. Smoke from a burning cigarette contains dangerous chemicals to me and my baby.	100	0	98.6	1.4
C3. The smoke chemicals is transferred via my partner's mouth.	94.9	5.1	93.2	6.8
C4. Things (closes, and furniture etc.) in rooms where my partner smoked are coated.	85.0	15.0	80.1	19.9
C5. Staying for long time with a person who smokes may increase my health risks.	96.4	3.6	97.9	2.1
C6. Smoking by my partner in the home can have a harmful effect on me and my unborn baby.	98.6	1.4	97.9	2.1
C7. Cigarette butts include toxic substances.	96.4	3.6	95.2	4.8
C8. Smoke including toxic substances go into closed rooms.	95.0	5.0	93.2	6.8

Perceived SHS-related disease susceptibility	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
D1. Breathing in a room where partner's cigarette can affect fetal development and my health risk	2.1	2.9	60.0	35.0	2.1	5.5	58.9	33.6
D2.Smoke from the cigarette of smokers in a room is harmful to me and my unborn baby	1.4	2.1	59.3	37.1	2.1	2.1	56.8	39.0
D3. You and your unborn baby breathe toxic substances which are released from things (closes, and furniture) in rooms where your partner smoked	2.2	15.9	60.1	21.7	6.3	21.8	54.2	17.6

Perceived SHS-related disease severity	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
E1. The effect of SHS exposure is a very serious condition for pregnant women	0.7	2.1	61.4	35.7	2.8	5.5	66.2	25.5
E2. The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women	0.7	2.1	57.9	29.0	1.4	7.6	62.1	29.0

Perceived benefits of preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
F1. It is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth.	2.1	7.9	57.1	32.9	4.8	7.6	62.8	24.8
F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health.	2.1	9.3	56.4	32.1	2.8	11.1	63.0	22.2
F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation.	2.9	8.6	55.0	33.6	4.8	11.7	59.3	24.1
F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes.	3.6	7.2	55.4	33.8	2.8	6.9	63.9	26.4

Perceived barriers to preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
G1. I disapproved of my partner's smoking outside the home.	12.9	32.9	44.3	10.0	9.7	42.1	39.3	9.0
G2. There is no-smoking norm or policy in our home.	8.6	43.6	42.1	5.7	7.6	52.4	35.2	4.8
G3. It is difficult to ask my partner not to smoke in the home.	5.0	29.3	58.6	7.1	4.1	39.3	48.3	8.2
G4. Smoke-free home is a risk to routine harmonious social relations	4.3	21.4	60.0	14.3	4.1	33.1	52.4	10.3
Cue to action for preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
H1. I know what is second-hand smoke (SHS).	Do not know (%)	Informed what is SHS, but I do not remember (%)	Know what is SHS (%)	Understand what is SHS (%)	Do not know (%)	Informed what is SHS, but I do not remember (%)	Know what is SHS (%)	Understand what is SHS (%)
	22.9	23.6	37.9	15.7	24.7	25.3	32.2	17.8
H2. I know risks of second-hand smoke (SHS) for mother.	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for mother (%)	Do not know (%)	Informed risks of SHS but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for mother (%)
	20.0	25.7	35.7	18.6	19.9	24.7	28.8	26.7
H3. I know risks of second-hand smoke for fetus.	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for fetus (%)	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for fetus (%)
	18.0	25.2	35.3	21.6	17.8	25.3	30.8	26.0
H4. I know how to prevent second hand smoke exposure in my home.	Do not know (%)	Informed how to prevent SHS, but I do not remember (%)	Know how to prevent SHS (%)	Understand how to prevent SHS (%)	Do not know (%)	Informed how to prevent SHS, but I do not remember (%)	Know how to prevent SHS (%)	Understand how to prevent SHS (%)
	23.6	22.9	34.3	19.3	24.0	24.0	34.9	17.1
H5. I have conflict with my partner over his smoking in the room.	Never (%)	Hardly ever (%)	Some of the time (%)	All of the time (%)	Never (%)	Hardly ever (%)	Some of the time (%)	All of the time (%)
	20.0	30.7	34.3	15.0	24.1	20.7	39.3	15.9
H6. Brief advice on preventing second-hand smoke from research staff is a cue to action	Have not received brief advice (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Have not received brief advice (%)	Disagree (%)	Agree (%)	Strongly agree (%)
	14.3	1.4	67.9	16.4	15.1	4.8	65.8	14.4
H7. Sticker on preventing second hand smoke is a cue to action	Have not received the sticker (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Have not received the sticker (%)	Disagree (%)	Agree (%)	Strongly agree (%)
	10.8	4.3	64.7	20.1	22.2	4.2	66.0	7.6
The General Self-efficacy scale	Experimental group (*n* = 140)				Control group (n = 146)			
	Not at all true (%)	Hardly true (%)	Moderately true (%)	Exactly true (%)	Not at all true (%)	Hardly true (%)	Moderately true (%)	Exactly true (%)
I1. I can always manage to solve difficult problems if I try hard enough.	1.4	4.3	54.3	40.0	2.1	6.9	53.1	37.9
I2. If someone opposes me, I can find the means and ways to get what I want.	0	17.9	58.6	23.6	2.1	16.7	54.9	26.4
I3. It is easy for me to stick to my aims and accomplish my goals.	1.4	7.9	70.0	20.7	2.1	15.2	64.1	18.6
I4. I am confident that I could deal efficiently with unexpected events.	0.7	7.1	67.1	25.0	2.1	11.7	65.5	20.7

I5.Thanks to my resourcefulness, I know how to handle unforeseen situations.	2.1	5.7	71.4	20.7	2.1	11.9	65.7	20.3
I6. I can solve most problems if I invest the necessary effort.	1.4	6.4	67.1	25.0	1.4	8.3	66.2	24.1
I7. I can remain calm when facing difficulties because I can rely on my coping abilities.	0.7	5.7	72.1	21.4	2.1	8.3	67.6	22.1
I8.When I am confronted with a problem, I can usually find several solutions.	0.7	4.3	70.7	24.3	2.1	4.8	64.8	28.3
I9. If I am in trouble, I can usually think of a solution.	1.4	7.9	67.9	22.9	2.1	4.8	61.4	31.7
I10.I can usually handle whatever comes my way.	1.4	3.6	75.7	19.3	1.4	9.7	62.1	26.9

Individual *t*-test was conducted for health beliefs and self-efficacy for husband, which were evaluated by husband (**Table 15** for husband**)**. For the husband, there were no differences for most of items between the two groups except item G4 (*MD* = -0.16, 95%*CI* [-0.32, 0.00]), H6 (*MD* = 0.32, 95%*CI* [0.11, 0.53]).

Table 15

Comparison of Each Item Score on Health Beliefs and Self-Efficacy as Evaluated by Husband at Baseline

Knowledge of SHS	Experimental group (*n* = 140) *M* (*SD*)	Control group (*n* = 146) *M* (*SD*)	*MD*	*95%CI*	*t*	*p-value*
C1. Smoke from my cigarettes is harmful to my wife and baby. [a]	1.99 (0.09)	1.99 (0.08)	<.01	[-0.02, 0.02]	-0.03	.980
C2. Smoke from a burning cigarette contains dangerous chemicals to my wife and unborn baby. [b]	2.00 (0.00)	1.99 (0.08)	0.01	[-0.01, 0.02]	1.00	.319
C3. The smoke chemicals are transferred via my mouth. [a]	1.93 (0.26)	1.92 (0.28)	0.01	[-0.05, 0.08]	0.37	.709
C4. Things (closes, and furniture etc..) in rooms where I smoked are coated. [a]	1.83 (0.38)	1.81 (0.39)	0.02	[-0.07, 0.11]	0.35	.725
C5. Staying for long time with a person who smokes may increase health risks of my wife and unborn baby. [a]	1.95 (0.22)	1.94 (0.23)	0.01	[-0.05, 0.06]	0.20	.846
C6. Smoking by me in the home can have a harmful effect on my wife and unborn baby. [b]	1.99 (0.12)	1.97 (0.18)	0.02	[-0.02, 0.06]	1.11	.269
C7. Cigarette butts include toxic substances. [a]	1.93 (0.26)	1.91 (0.29)	0.02	[-0.05, 0.08]	0.55	.586
C8. Smoke including toxic substances go into closed rooms. [b]	1.90 (0.30)	1.86 (0.35)	0.05	[-0.03, 0.12]	1.16	.249
Perceived SHS-related disease susceptibility						
D1. Breathing in a room where my cigarette can affect fetal development and wife's health risk [a]	3.18 (0.65)	3.06 (0.73)	0.12	[-0.05, 0.28]	1.42	.156
D2. Smoke from the cigarette of smokers in a room is harmful to my wife and my unborn baby [a]	3.22 (0.61)	3.21 (0.66)	0.02	[-0.13, 0.16]	0.19	.847
D3. My wife and unborn baby breathe toxic substances which are released from things (closes, and furnitures in rooms where I smoked [b]	2.94 (0.61)	2.85 (0.75)	0.09	[-0.07, 0.25]	1.09	.277
Perceived SHS-related disease severity						
E1. The effect of SHS exposure is a very serious condition for pregnant women [a]	3.17 (0.48)	3.15 (0.59)	0.01	[-0.11, 0.14]	0.22	.830
E2. The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women [a]	3.17 (0.55)	3.19 (0.60)	-0.02	[-0.16, 0.11]	-0.32	.752
Perceived benefits of preventing SHS exposure						
F1. It is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth. [a]	3.13 (0.62)	3.07 (0.73)	0.06	[-0.10, 0.22]	0.74	.462
F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health. [a]	3.11 (0.61)	3.07 (0.66)	0.04	[-0.11, 0.19]	0.49	.622
F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation. [a]	3.06 (0.67)	2.99 (0.70)	0.08	[-0.08, 0.24]	0.96	.337

F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes. [a]	3.08 (0.67)	3.10 (0.68)	-0.02	[-0.18, 0.14]	-0.23	.815
Perceived barriers to preventing SHS exposure for pregnant women						
G1. Other smokers (visitor) do not accept smoke-free home. [a]	2.44 (0.72)	2.50 (0.74)	-0.06	[-0.24, 0.11]	-0.74	.459
G2. There is no-smoking norm or policy in our home. [a]	2.36 (0.79)	2.52 (0.75)	0.07	[-0.34, 0.16]	-1.80	.073
G3. It is difficult to ask other smokers (visitors) not to smoke in the home. [b]	2.16 (0.61)	2.31 (0.74)	-0.14	[-0.30, 0.02]	-1.76	.080
G4. Smoke-free home is a risk to routine harmonious social Relations. [b]	2.16 (0.63)	2.33 (0.72)	-0.16	[-0.32, 0.04]	-2.02	.044
G5. I lost social communication with other smoker (visitor) in my house. [a]	2.43 (0.77)	2.49 (0.73)	-0.06	[-0.24, 0.11]	-0.73	.469
Cue to action for preventing SHS exposure						
H1. I know what is second-hand smoke. [a]	2.29 (1.04)	2.37 (1.00)	-0.08	[-0.32, 0.16]	-0.68	.497
H2. I know risks of second-hand smoke for mother. [a]	2.40 (1.09)	2.52 (0.99)	-0.12	[-0.36, 0.13]	-0.95	.341
H3. I know risks of second-hand smoke for fetus. [a]	2.49 (1.08)	2.56 (0.99)	-0.07	[-0.31, 0.17]	-0.57	.570
H4. I know how to prevent second hand smoke exposure in my home. [a]	2.34 (1.05)	2.41 (1.01)	-0.07	[-0.32, 0.17]	-0.60	.546
H5. I have conflict with other smokers (visitors) over their smoking in the room. [a]	2.22 (0.91)	2.19 (0.98)	0.03	[-0.19, 0.25]	0.24	.810
H6. I have already received the educational comic and a sticker on smoke-free home. [a]	1.89 (0.92)	1.58 (0.87)	0.32	[0.11, 0.53]	2.98	.003
H7. Brief advice on preventing second-hand smoke from research staff is a cue to action. [a]	2.74 (1.00)	2.60 (0.93)	0.14	[-0.09, 0.36]	1.17	.242
H8. Sticker for smoke-free home is a cue to action. [b]	2.89 (0.85)	2.61 (0.97)	0.28	[0.07, 0.50]	2.60	.010
The General Self-efficacy scale						
Total score of Self-efficacy I [b]	31.36 (3.78)	31.35 (4.74)	0.11	[-0.91, 1.124]	0.21	.835
I1. I can always manage to solve difficult problems if I try hard enough. [a]	3.25 (0.61)	3.21 (0.66)	0.04	[-0.11, 0.19]	0.55	.581
I2. If someone opposes me, I can find the means and ways to get what I want. [a]	3.04 (0.64)	2.97 (0.73)	0.07	[-0.09, 0.23]	0.87	.386
I3. It is easy for me to stick to my aims and accomplish my goals. [a]	3.09 (0.55)	3.00 (0.72)	0.09	[-0.06, 0.24]	1.22	.225
I4. I am confident that I could deal efficiently with unexpected events. [b]	3.08 (0.51)	3.11 (0.63)	-0.03	[-0.17, 0.10]	-0.49	.625
I5. Thanks to my resourcefulness, I know how to handle unforeseen situations. [a]	3.09 (0.54)	3.13 (0.61)	-0.03	[-0.17, 0.10]	2.57	.619
I6. I can solve most problems if I invest the necessary effort.	3.17 (0.56)	3.20 (0.65)	0.02	[-0.17, 0.11]	-4.14	.679
I7. I can remain calm when facing difficulties because I can rely on my coping abilities. [b]	3.17 (0.49)	3.15 (0.63)	0.02	[-0.11, 0.15]	2.77	.782
I8. When I am confronted with a problem, I can usually find several solutions. [b]	3.16 (0.47)	3.23 (0.58)	-0.07	[-0.19, 0.06]	-1.04	.300
I9. If I am in trouble, I can usually think of a solution. [a]	3.18 (0.48)	3.25 (0.54)	-0.07	[-0.19, 0.05]	-1.16	.246
I10.I can usually handle whatever comes my way. [b]	3.13 (0.46)	3.12 (0.65)	0.01	[-0.12, 0.14]	0.16	.875

Note. a: *t*- test was conducted., b:Welch test was conducted. , SHS = second hand smoke; I refers to related appendices

Cross-tabulation table of Health Beliefs, and Self-Efficacy for husbands (**Table 16**) as evaluated by husbands at baseline.

Table 16

Cross-tabulation Table of Health Beliefs and Self-Efficacy as Evaluated by Husbands at Baseline

Knowledge of SHS	Experimental group (*n* = 140)		Control group (n = 146)	
	Yes (%)	No (%)	Yes (%)	No (%)
C1. Smoke from my cigarettes is harmful to my wife and baby.	99.3	0.7	99.3	0.7
C2. Smoke from a burning cigarette contains dangerous chemicals to my wife and unborn baby.	100	0.0	99.3	0.7
C3. The smoke chemicals is transferred via my mouth.	92.9	7.1	91.7	8.3
C4. Things (closes, and furniture etc.) in rooms where I smoked are coated.	82.9	17.1	81.3	18.8
C5. Staying for long time with a person who smokes may increase health risks of my wife and unborn baby.	95.0	5.0	94.5	5.5
C6. Smoking by me in the home can have a harmful effect on my wife and unborn baby.	98.6	1.4	96.6	3.4
C7. Cigarette butts include toxic substances.	92.8	7.2	91.0	9.0
C8. Smoke including toxic substances go into closed rooms.	90.0	10.0	85.5	14.5

Perceived SHS-related disease susceptibility	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
D1. Breathing in a room where my cigarette can	3.6	2.9	65.7	27.9	5.5	6.9	63.4	24.1

affect fetal development and wife's health risk								
D2.Smoke from the cigarette of smokers in a room is harmful to my wife and my unborn baby	2.9	1.4	66.4	29.3	3.4	2.8	63.4	30.3
D3.My wife and unborn baby breathe toxic substances which are released from things (closes, and furniture) in rooms where I smoked	2.2	15.1	69.1	13.7	5.6	19.4	59.0	16.0
Perceived SHS-related disease severity	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
E1.The effect of SHS exposure is a very serious condition for pregnant women	0.7	2.2	77.0	20.1	2.1	4.8	69.0	24.1
E2.The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women	1.4	3.6	71.4	23.6	2.1	4.1	66.2	27.6
Perceived benefits of preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
F1. It is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth.	2.1	7.1	66.4	24.3	4.9	8.3	61.8	25.0
F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health .	2.1	7.1	68.6	22.1	3.5	7.7	67.1	21.7
F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation.	2.9	10.7	63.6	22.9	3.5	14.6	61.8	20.1
F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes.	2.9	10.1	63.3	23.7	2.8	9.8	62.2	25.2
Perceived barriers to preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
G1. Other smokers (visitor) do not accept smoke-free home	8.6	31.4	55.0	5.0	9.0	36.8	48.6	5.6
G2. There is no-smoking norm or policy in our home	7.1	33.6	47.1	12.1	9.0	39.6	45.1	6.3
G3. It is difficult to ask other smokers (visitors) not to smoke in the home	2.1	21.4	67.1	9.3	7.6	23.6	59.7	9.0
G4. Smoke-free home is a risk to routine harmonious social relations	2.9	20.0	67.1	10.0	4.9	32.6	52.8	9.7
G5. I lost social communication with other smoker (visitor) in my house	7.9	36.4	46.4	9.3	8.3	38.2	47.9	5.6

Cue to action for preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
H1. I know what is second-hand smoke.	Do not know (%)	Informed what is SHS, but I do not remember (%)	Know what is SHS (%)	Understand what is SHS (%)	Do not know (%)	Informed what is SHS, but I do not remember (%)	Know what is SHS (%)	Understand what is SHS (%)
	27.1	33.6	22.9	16.4	22.9	32.6	29.2	15.3
H2. I know risks of second-hand smoke for mother.	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for mother (%)	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for mother (%)
	25.0	31.4	22.1	21.4	16.1	35.7	28.7	19.6
H3. I know risks of second-hand smoke for fetus.	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for fetus (%)	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for fetus (%)	Understand risks of SHS for fetus (%)
	22.9	28.6	25.7	22.9	14.6	36.8	27.1	21.5
H4. I know how to prevent second hand smoke expoure in my home.	Do not know (%)	Informed how to prevent SHS, but I do not remember (%)	Know how to prevent SHS (%)	Understand how to prevent SHS (%)	Do not know (%)	Informed how to prevent SHS, but I do not remember (%)	Know how to prevent SHS (%)	Understand how to prevent SHS (%)
	26.4	30.7	25.7	17.1	20.8	35.4	25.7	18.1
H5. I have conflict with other smokers (visitors) over their smoking in the room.	Never (%)	Hardly ever (%)	Some of the time (%)	All of the time (%)	Never (%)	Hardly ever (%)	Some of the time (%)	All of the time (%)
	25.7	32.9	35.0	6.4	31.3	27.1	32.6	9.0
H6. I have already received the educational comic and a sticker on smoke-free home.	Not yet (%)	Received an educational comic and a reminder (%)	Read the comic or use the sticker (%)	Read the comic and use the sticker (%)	Not yet (%)	Received an educational comic and a reminder (%)	Read the comic or use the sticker (%)	Read the comic and use the sticker (%)
	39.3	40.7	11.4	8.6	63.2	20.8	11.1	4.9
H7. Brief advice on preventing second-hand smoke from research staff is a cue to action	Have not received brief advice (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Have not received brief advice (%)	Disagree (%)	Agree (%)	Strongly agree (%)
	21.7	0.7	59.4	18.1	22.9	2.1	66.7	8.3
H8. Sticker for smoke-free home is a cue to action	Have not received the sticker (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Have not received the sticker (%)	Disagree (%)	Agree (%)	Strongly agree (%)
	12.9	3.6	65.0	18.6	24.1	1.4	63.8	10.6
The General Self-efficacy scale	Experimental group (*n* = 140)				Control group (n = 146)			
	Not at all true (%)	Hardly true (%)	Moderately true (%)	Exactly true (%)	Not at all true (%)	Hardly true (%)	Moderately true (%)	Exactly true (%)
I1. I can always manage to solve difficult problems if I try hard enough.	2.1	2.9	62.9	32.1	2.8	4.9	61.1	31.3
I2. If someone opposes me, I can find the means and ways to get what I want.	3.6	7.9	70.0	18.6	3.5	17.5	58.0	21.0
I3. It is easy for me to stick to my aims and accomplish my goals.	1.4	6.4	73.6	18.6	4.2	13.3	60.8	21.7
I4. I am confident that I could deal efficiently with unexpected events.	0.7	7.1	75.7	16.4	2.1	8.4	65.7	23.8

I5.Thanks to my resourcefulness, I know how to handle unforeseen situations.	0.7	7.9	72.9	18.6	1.4	8.5	66.2	23.9
I6. I can solve most problems if I invest the necessary effort.	2.1	2.1	72.1	23.6	3.5	2.8	63.9	29.9
I7. I can remain calm when facing difficulties because I can rely on my coping abilities.	0.7	2.9	75.0	21.4	2.1	6.9	64.6	26.4
I8.When I am confronted with a problem, I can usually find several solutions.	0.7	2.1	77.1	20.0	1.4	3.5	66.0	29.2
I9. If I am in trouble, I can usually think of a solution.	0.7	2.9	74.3	22.1	0.7	2.8	67.4	29.2
I10.I can usually handle whatever comes my way.	0.7	2.9	79.3	17.1	2.1	9.7	62.5	25.7

Primary Outcomes:

Comparison of avoidance of environmental tobacco smoke, and husband behaviors as evaluated by pregnant women in the experimental and control groups. The independent *t*-test was conducted for the total score and each item score on avoidance of environmental tobacco smoke between the experimental group (n = 109) and control group (n = 103) based on the central limit theorem (Kwak & Kim, 2017). The outcome is shown in **Table 17** (avoidance of environmental tobacco smoke). Total mean score for avoidance of environmental tobacco smoke was 52.17 (*SD*: 5.20) in the experimental group and 51.38 (*SD*: 7.25) in the control group. There was no difference between the two groups (*MD* =0.786, 95% *CI* [-0.93, 2.51]). The mean score of item A1 was 3.28 (*SD*: 0.56) in the experimental group and 3.09 (*SD*: 0.74) in the control group with a difference between two groups (*MD* = 0.19, 95%*CI* [0.01, 0.37]). The mean score of item A6 was 2.72 (*SD*: 0.68) in the experimental group and 2.48 (*SD*: 0.75) in the control group with a difference between the two groups (*MD* = 0.24, 95%*CI* [0.05, 0.43]). The mean score of item A12 was 3.00 (*SD*: 0.51) in the experimental group and 2.75 (*SD*: 0.70) in the control group with a difference between two groups (*MD* = 0.25, 95%*CI* [0.08, 0.41]). The mean score of item

A13 was 3.04 (*SD*: 0.53) in the experimental group and 2.80 (*SD*: 0.72) in the control group with a difference between two groups (*MD* = 0.23, 95%*CI* [0.06, 0.41]). The mean score of item A18 was 2.94 (*SD*: 0.55) in the experimental group and 2.73 (*SD*:0.76) in the control group with a difference between two groups (*MD* = 0.02, 95%*CI* [0.03, 0.39]). For two items (A16, A17) which showed differences between two groups at baseline, there were no differences between the two groups: A16 (*MD* = 0.12, 95% *CI* [-0.04, 0.30]), A17 (*MD* = 0.87, 95% *CI* [-0.18, 0.21]).

Table 17

Comparison of Each Items' Score on Avoidance of Environmental Tobacco Smoke as Evaluated by Pregnant women at Three Months' Post-intervention

	Experimental group (*n* = 109)	Control group (*n* = 103)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
Total score of avoidance of environmental tobacco smoke [b]	52.17 (5.20)	51.38 (7.25)	0.79	[-0.93, 2.51]	0.90	.368
A1. When I encounter someone who is smoking, I distance myself to unsure that I will not be exposed to smoke.[a]	3.28 (0.56)	3.09 (0.74)	0.19	[0.01, 0.37]	2.09	.038
A2. I allow people to smoke in my home.[a]	2.58 (0.87)	2.69 (0.83)	-0.11	[-0.34, 0.12]	-0.95	.343
A3. If I am with a group of people, and someone beings to smoke, I will remain with the group. [a]	2.72 (0.76)	2.85 (0.73)	-0.14	[-0.34, 0.63]	-1.35	.178
A4. If I encounter a friend or relative who is smoking, I will sit and talk with him/her while he/she is smoking. [a]	2.80 (0.76)	2.84 (0.79)	-0.05	[-0.25, 0.16]	-0.45	.651
A5. When I am in public place such as restaurant or offices or clinic, I will leave if unable to sit in the nonsmoking section. [a]	2.62 (0.72)	2.50 (0.79)	0.13	[-0.08, 0.33]	1,24	.215
A6. When I trip by bus, or any other public transportation I would request a nonsmoking seat. [a]	2.72 (0.68)	2.48 (0.75)	0.24	[0.05, 0.43]	2.44	.016
A7. When I trip by taxi, I will ask the driver not to smoke. [b]	2.86 (0.67)	2.79 (0.79)	0.08	[-0.12, 0.28]	0.76	.450
A8. I allow people smoking in the car. [a]	2.82 (0.70)	2.91 (0.67)	-0.10	[-0.28, 0.09]	-1.02	.308
A9. If my friends or relatives are gathering in a designated smoking area to smoke, I will join them rather than be alone. [a]	2.80 (0.66)	2.86 (0.70)	-0.07	[-0.25, 0.12]	-0.70	.483
A10. If I am with people who are smoking and I cannot leave, I will ask them to refrain from smoking. [b]	2.79 (0.56)	2.67 (0.72)	0.12	[-0.06, 0.29]	1.35	.179
A11. I will sit in the smoking section of a public place or bus station if there are no seats available elsewhere. [a]	2.51 (0.68)	2.62 (0.69)	-0.11	[-0.29, 0.08]	-1.15	.252
A12. When an outdoor functions where smoking is present, I will move away to avoid it. [b]	3.00 (0.51)	2.75 (0.70)	0.25	[0.08, 0.41]	2.92	.004
A13. When an outdoor functions where waterpipe smoking is present, I will move a way to avoid it. [b]	3.04 (0.53)	2.80 (0.72)	0.23	[0.06, 0.41]	2.69	.008
A14. When exposed to SHS, I wash my clothes solely to remove the smell of smoke from them even if they are otherwise clean [a]	2.57 (0.66)	2.44 (0.80)	0.19	[-0.07, 0.33]	1.31	.190
A15. I find it unpleasant to be around SHS. [a]	3.12 (0.54)	2.99 (0.70)	0.13	[-0.07, 0.33]	1.52	.131
A16. I routinely associate with people who smoke. [a]	2.54 (0.77)	2.71 (0.80)	0.12	[-0.04, 0.30]	-1.56	.121
A17. When eating out, I always sit in the nonsmoking section. [a]	2.73 (0.68)	2.72 (0.72)	0.87	[-0.18, 0.21]	0.16	.870
A18. I don't frequently places where smoking is prevalent. [b]	2.94 (0.55)	2.73 (0.76)	0.02	[0.03, 0.39]	2.30	.023
A19. I do not find SHS offensive. [a]	2.06 (0.76)	2.21 (0.79)	0.16	[-0.37, 0.06]	-1.41	.160

Note. a: *t*- test was conducted., b: Welch test was conducted, *95% CI for difference*: mean differences between the experimental group and control group *MD*: mean differences between the experimental group and control group

Cross-tabulation table of avoidance of environmental tobacco smoke (**Table 18**) as evaluated by pregnant women at three months' post-intervention. On pregnant women's avoidance of environmental tobacco smoke, especially items A1 (*MD* = 0.19, 95% *CI* [0.01, 0.37]), A6 (*MD* = 0.24, 95% *CI* [0.05, 0.43]), A12 (*MD* = 0.25, 95% *CI* [0.08, 0.41]), A13 (*MD* = 0.23, 95% *CI* [0.06, 0.41]), A18 (*MD* = 0.02, 95% *CI* [0.03, 0.39]) showed statistical differences.

When pregnant women encountered someone who was smoking (Item A1), almost all pregnant women in the experimental (94.5%) and in the control group (82.5%) distanced themselves to ensure that they would not be exposed to smoke. The experimental group was 12% higher than the control group. When pregnant women traveled by bus, or any other public transportation, (Item A6) 66.4% of pregnant women in the experimental group, and 45.6% of pregnant women in control group would request a nonsmoking seat. The experimental group was 20.8% higher than the control group. During an outdoor function where smoking is present, (Item A12) 87.1 % of pregnant women in the experimental group and 68.6% of pregnant women in the control group would move away to avoid it. The experimental group was 18.5% higher than the control group. For Item A13, during an outdoor function where water-pipe smoking is present, 87.9% of pregnant women in the experimental group, and 70.6% of pregnant women in the control group would move away to avoid it. The experimental group was 17.3% higher than the control group. Item A18, I don't frequent the place where smoking is prevalent, 85.2% of pregnant women in the

experimental group, and 65.6% of pregnant women in the control group could prevent SHS exposure.

Table 18

Cross-tabulation Table of Avoidance of Environmental Tobacco Smoke as *Evaluated by Pregnant Women at Three Months' Post-intervention*

	Experimental group (*n* = 109)				Control group (n = 103)			
	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)
A1. When I encounter someone who is smoking, I distance myself to unsure that I will not be exposed to smoke.	0.0	5.5	61.5	33.0	2.9	14.6	53.4	29.1
A2. I allow people to smoke in my home.	11.0	50.5	23.9	14.7	15.5	45.6	31.1	7.8
A3. If I am with a group of people, and someone beings to smoke, I will remain with the group.	11.9	54.1	27.5	6.4	18.4	50.5	29.1	1.9
A4. If I encounter a friend or relative who is smoking, I will sit and talk with him/her while he/she is smoking.	14.7	56.0	23.9	5.5	18.4	49.5	30.1	1.9
A5.When I am in public place such as restaurant or offices or clinic, I will leave if unable to sit in the nonsmoking section.	3.7	40.0	45.9	10.1	7.8	45.6	35.9	10.7
A6. When I trip by bus, or any other public transportation I would request a nonsmoking seat.	1.8	35.8	51.4	11.0	6.8	47.6	36.9	8.7
A7. When I trip by taxi, I will ask the driver not to smoke.	0.9	27.5	56.0	15.6	3.9	32.0	45.6	18.4
A8. I allow people smoking in the car.	10.1	67.9	15.6	6.4	14.6	66.0	15.5	3.9
A9. If my friends or relatives are gathering in a designated smoking area to smoke, I will join them rather than be alone.	9.2	66.1	20.2	4.6	17.5	52.4	29.1	1.0
A10. If I am with people who are smoking and I cannot leave, I will ask them to refrain from smoking.	0.0	28.4	64.2	7.3	3.9	35.9	49.5	10.7
A11. I will sit in the smoking section of a public place or bus station if there are no seats available elsewhere.	2.8	53.2	36.7	7.3	8.7	47.6	40.8	2.9
A12. When an outdoor functions where smoking is present, I will move away to avoid it.	0.0	13.0	74.1	13.0	3.9	27.5	57.8	10.8
A13. When an outdoor functions where waterpipe smoking is present, I will move a way to avoid it.	0.0	12.0	72.2	15.7	3.9	25.5	56.9	13.7
A14. When exposed to SHS, I wash my clothes solely to remove the smell of smoke from them even if they are otherwise clean	1.9	46.3	44.4	7.4	7.8	52.0	28.4	11.8
A15. I find it unpleasant to be around SHS.	0.9	6.5	72.2	20.4	2.0	18.6	57.8	21.6
A16. I routinely associate with people who smoke.	5.6	53.7	29.6	11.1	12.7	53.9	24.5	8.8
A17. When eating out, I always sit in the nonsmoking section	5.6	23.1	63.9	7.4	4.9	29.4	54.9	10.8
A18. I don't frequent places where smoking is prevalent.	1.9	13.0	75.0	10.2	5.9	28.4	52.9	12.7
A19. I do not find SHS offensive.	21.6	54.9	19.6	3.9	16.2	52.5	25.3	6.1

Independent *t*-test was conducted for total score and each item scores on husbands' behavior between the experimental group (*n* = 109) and control group (*n* = 103) based on central limit theorem (Kwak & Kim, 2017). These are shown in **Table 19 (**husbands' behavior).

For the husbands' behavior's score, the mean score of item B2 was 3.02 (*SD*: 0.78) in the experimental group and 2.78 (*SD*: 0.83) in the control group. There was a difference

between two groups for item B2 (*MD* = 0.24, 95%*CI* [0.02, 0.46]). The mean score of item B5 was 2.69 (*SD*: 0.79) in the experimental group and 2.31 (*SD*: 0.73) in the control group with a difference between the two groups for item B5 (*MD* = 0.38, 95%*CI* [0.17, 0.59]). The mean score of item B7 was 2.04 (*SD*: 0.84) in the experimental group and 1.74 (*SD*: 0.73) in the control group with a difference between two groups for item B7 (*MD* = 0.30, 95%*CI* [0.08, 0.51]). One item (B1) showed a difference between the two groups at baseline (experimental group: *M = 1.93 (SD:* 1.13*)*, control group*: M = 1.69 (SD:* 1.03*)*, *MD* = 0.62, 95%*CI* [0.325, 0.919]), the mean score of item B1 was 2.76 (*SD*: 1.09) in experimental group and 2.14 (*SD*: 1.09) in control group. There was a difference between the two groups for item B1 (*MD = 0*.62, 95%*CI* [0.33, -0.92]).

Table 19

Comparison of Each Item's Score on Husbands' Behavior as Evaluated by Pregnant Women at Three Months' Post-intervention

	Experimental group (*n* = 108)	Control group (*n* = 102)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
B1. Your partner read educational comic on preventing second-hand smoke at home [a]	2.76 (1.09)	2.14 (1.09)	0.62	[0.33, 0.92]	4.13	<.001
B2. Your partner moves away from wife when he smokes[a]	3.02 (0.78)	2.78 (0.83)	0.24	[0.02, 0.46]	2.11	.036
B3. Your partner smokes near an open door or window. [a]	2.83 (0.82)	2.76 (0.71)	0.07	[-0.14, 0.28]	0.63	.527
B4. Your partner smokes near the kitchen fan. [b]	2.38 (0.81)	2.11 (0.72)	0.27	[0.06, 0.48]	2.52	.012
B5. Your partner smokes outdoors with the door closed. [a]	2.69 (0.79)	2.31 (0.73)	0.38	[0.17, 0.59]	3.58	<.001
B6. Your partner smokes out-side of the home. [a]	2.94 (0.76)	2.76 (0.75)	0.18	[-0.02, 0.39]	1.74	.083
B7. Your partner intends to quit smoking. [a]	2.04 (0.84)	1.74 (0.73)	0.30	[0.08, 0.51]	2.72	.007
B8. Your partner stopped smoking. [a]	1.95 (0.98)	1.90 (0.89)	0.05	[-0.21, 0.31]	0.40	.691

Note. a:*t*- test was conducted. b:Welch test was conducted, *95% CI for difference*: mean differences between the experimental group and control group, *MD*: mean differences between the experimental group and control group

Cross-tabulation table of husbands' behavior (**Table 20**) as evaluated by pregnant women at three months' post-intervention. On husbands' behavior, especially item B1 (*MD* = 0.62, 95% *CI* [0.33, 0.92]), B2 (*MD* = 0.24, 95% *CI* [0.02, 0.46]), B5 (*MD* = 0.38, 95%

CI [0.17, 0.59]), B7 (*MD* = 0.30, 95%*CI* [0.08, 0.51]) with showing statistical difference. Item B1: 61.1 % of pregnant women's partner in the experimental group read educational comic on preventing second-hand smoke at home and 21.3% of partners in the experimental group perceived the educational comic. Item B2: 85.9% of partners in the experimental group moved away from their wife during smoking, and 78.2% of partners in the control group move away from their wife when he smokes. There was a 7.7% difference between the two groups. Item B5: 69.2% of partners in the experimental group, and 47% of partners in the control group smoked outdoors with the door closed. There was a 22.2% difference between two groups. Item B7: In the experimental group, 5.6% of partners set a quit date within one month. 19.6% of partners made the decision to quit and 47.7% of partners informed their intention to stop smoking. In the control group, 2.0% of partners set a quit date within one month. 11.0% of partners made the decision to quit and 46.0% of partners informed intention to stop smoking.

Table 20

Cross-tabulation Table of Husbands' Behavior as *Evaluated by Pregnant Women at Three Months' Post-intervention*

	Experimental group (*n* = 108)				Control group (n = 102)			
B1. Your partner read educational comic on preventing second-hand smoke at home	Never (%)	Perceived an educational comic (%)	Read partly (%)	Read completely (%)	Never (%)	Perceived an educational comic (%)	Read partly (%)	Read completely (%)
	17.6	21.3	28.7	32.4	37.3	27.5	19.6	15.7
	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)
B2. Your partner move away from wife when he smokes	7.5	6.6	62.3	23.6	12.9	8.9	65.3	12.9
B3. Your partner smokes near an open door or window.	11.3	9.4	64.2	15.1	7.9	15.8	68.3	7.9
B4. Your partner smokes near the kitchen fan.	13.2	43.4	35.8	7.5	19.8	50.5	28.7	1.0
B5. Your partner smokes outdoors with the door closed.	10.3	20.6	58.9	10.3	16.0	37.0	47.0	0.0
B6. Your partner smokes outside of the home.	8.4	6.5	67.3	17.8	9.0	16.0	65.0	10.0

B7. Your partner intend to quitting smoking.	Not yet (%)	Inform an intention to stop smoking (%)	Make the decision to quit (%)	Set a quit date within one month (%)	Not yet (%)	Inform an intention to stop smoking (%)	Make the decision to quit (%)	Set a quit date within one month (%)
	27.1	47.7	19.6	5.6	41.0	46.0	11.0	2.0
B8. Your partner stop to smoke.	Not yet (%)	Reduce number of cigarettes per day (%)	Avoid smoking triggers (%)	Stop to smoke completely (%)	Not yet (%)	Reduce number of cigarettes per day (%)	Avoid smoking triggers (%)	Stop to smoke completely (%)
	37.9	41.7	7.8	12.6	37.4	42.4	13.1	7.1

Comparison of husbands' behavior and pregnant women's behavior as evaluated by husbands in the experimental and control groups. The *t*- test was conducted between the experimental group (n = 110) and control group (n = 104) based on the central limit theorem (Kwak &Kim, 2017). Husbands' behaviors as evaluated by husbands are shown in **Table 21**.

On husbands' behavior, the mean score of item A1 was 2.78 (*SD*: 1.11) in the experimental group and 2.12 (*SD*: 1.09) in the control group. There was a significant difference between the two groups for item A1 (*MD* = 0.66, 95%*CI* [0.36, 0.96]). The mean score of item A7 was 1.98 (*SD*: 0.80) in the experimental group and 1.74 (*SD*: 0.86) in the control group. There was a significant difference between two groups (*MD* = 0.24, 95%*CI* [0.02, 0.47]).

Table 21

Comparison of Each Item's Score on Husbands' Behavior as Evaluated by Husband at Three Months' Post-intervention

	Experimental group (n = 108)	Control group (n = 102)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
A1. I read educational comic on preventing second-hand smoke at home.	2.78 (1.11)	2.12 (1.09)	0.66	[0.36, 0.96]	4.33	<.001
A2. I move away from my wife when I smoke.	3.10 (0.57)	2.94 (0.73)	0.15	[-0.03, 0.96]	1.68	.095
A3. I smokes near an open door or window.	2.93 (0.67)	2.91 (0.69)	0.01	[-0.17, 0.20]	0.15	.880
A4.I smokes near the kitchen fan.	2.49 (0.80)	2.30 (0.68)	0.19	[-0.01, 0.39]	1.84	.067
A5.I smokes outdoors with the door closed.	2.78 (0.77)	2.56 (0.81)	0.05	[-0.00, 0.43]	1.96	.051
A6.I smokes outside of the home.	3.03 (0.71)	3.03 (0.66)	<-.01	[-0.19, 0.19]	-0.01	.991
A7.I intend to quitting smoking.	1.98 (0.80)	1.74 (0.86)	0.24	[0.02, 0.47]	2.12	.035
A8.I stop to smoke.	2.04 (0.99)	1.85 (0.86)	0.18	[-0.07, 0.44]	1.44	.153

Note. *t*- test was conducted., *95% CI for difference*: mean differences between the experimental group and control group
M for difference: mean differences between the experimental group and control group

Cross-tabulation table of Husbands' Behavior (**Table 22**) as evaluated by husbands at three months' post-intervention. On husbands' behavior, item A1 (*MD* = 0.66, 95% *CI* [0.36, 0.96]), and A7 (*MD* = 0.*24*, 95% *CI* [0.02, 0.47]) showed statistical differences. Item A1: 56.4% of pregnant women's partner in the experimental group read educational comic on preventing second-hand smoke at home and 27.8% of partner in the experimental group perceived the educational comic. Item B7: In the experimental group, 3.7% of partners set a quit date within one month and 19.6% of partners made the decision to quit. There were 47.7% of partners informing their intention to stop smoking. In the control group, 3.9% of partners set a quit date within one month; 15.50% of partners made the decision to quit and 31.1% of partners informed their intention to stop smoking.

Table 22

Cross-tabulation Table of Husbands' Behavior as *Evaluated by Husband at Three Months' Post-intervention*

	Experimental group (*n* = 108)				Control group (n = 102)			
A1. I read educational comic on preventing second-hand smoke at home.	Never (%)	Perceived an educational comic (%)	Read partly (%)	Read completely (%)	Never (%)	Perceived an educational comic (%)	Read partly (%)	Read completely (%)
	15.7	27.8	19.4	37.0	38.2	27.5	18.6	15.7
	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)
A2. I move away from my wife when I smoke.	0.9	9.2	69.7	20.2	4.9	14.6	62.1	18.4
A3. I smokes near an open door or window.	1.9	20.4	61.1	16.7	2.9	19.6	60.8	16.7
A4.I smokes near the kitchen fan.	9.3	42.6	38.0	10.2	6.8	62.1	25.2	5.8
A5.I smokes outdoors with the door closed.	4.6	29.6	49.1	16.7	10.7	32.0	47.6	9.7
A6.I smokes outside of the home.	3.7	12.1	61.7	22.4	1.9	14.6	62.1	21.4
A7. I intend to quitting smoking.	Not yet (%)	Inform an intention to stop smoking (%)	Make the decision to quit (%)	Set a quit date within one month (%)	Not yet (%)	Inform an intention to stop smoking (%)	Make the decision to quit (%)	Set a quit date within one month (%)
	29.0	47.7	19.6	3.7	49.5	31.1	15.5	3.9
A8.I stop to smoke.	Not yet (%)	Reduce number of cigarettes per day (%)	Avoid smoking triggers (%)	Stop to smoke completely (%)	Not yet (%)	Reduce number of cigarettes per day (%)	Avoid smoking triggers (%)	Stop to smoke completely (%)
	32.7	44.9	8.4	14.0	38.2	45.1	9.8	6.9

The *t*- test was conducted between the experimental group (*n* = 110) and control group (*n* = 104) based on the central limit theorem (Kwak &Kim, 2017). Pregnant women's behaviors as evaluated by their husbands are shown in **Table 23**.

In pregnant women's behaviors, there was no difference between the two groups for item B1 (*MD* =0.14, 95% *CI* [-0.02, 0.30]), B2 (*MD* = 0.12, 95% *CI* [-0.04, 0.27]), and B3 (*MD* = 0.07, 95% *CI* [-0.08, 0.22]).

Table 23

Comparison of Each Items' Score on Pregnant Women's Avoiding SHS Behavior as Evaluated by Husband at Three Months' Post-intervention

	Experimental group (n = 108)	Control group (*n* = 102)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
B1. My wife move away from me when I smoke	3.14 (0.57)	3.00 (0.63)	0.14	[-0.02, 0.30]	1.68	.095
B2. My wife remind me not to smoke in our home when I smoke near my wife or in home	3.17 (0.52)	3.05 (0.62)	0.12	[-0.04, 0.27]	1.49	.137
B3. My wife move away from smoker	3.11 (0.50)	3.04 (0.58)	0.07	[-0.08, 0.22]	0.97	.335

Note. *t*- test was conducted., *95% CI for difference*: mean differences between the experimental group and control group, *95% CI for difference*: mean differences between the experimental group and control group, *MD*: mean differences between the experimental group and control group

Cross-tabulation table of pregnant women's behavior (**Table 24**) as evaluated by husband at three months' post-intervention shows that for pregnant women's behavior, item B1, 93.5% of pregnant women in the experimental group, and 82.3% of pregnant women in the control group moved away from their smoking partner when they smoked. Item B2: 95.3% of pregnant women's in the experimental group, and 87.2 % of pregnant women reminded husband not to smoke in the home when he smoked near his wife or in home. There were 92.6 % of pregnant women in the experimental group, and 89.2% of pregnant women in the control group who moved away from the smoker.

Table 24

Cross-tabulation Table of Pregnant Women's Avoiding SHS Behavior as Evaluated by Husband at *Three Months' Post-intervention*

	Experimental group (*n* = 108)				Control group (n = 102)			
	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)	Almost never true (%)	Usually not true (%)	Usually true (%)	Almost always true (%)
B1. My wife move away from me when I smoke	1.9	4.6	71.3	22.2	1.0	16.7	63.7	18.6
B2. My wife remind me not to smoke in our home when I smoke near my wife or in home	0.9	3.7	73.1	22.2	2.0	10.8	67.6	19.6
B3. My wife move away from smoker	0.0	7.4	74.1	18.5	2.0	8.8	72.5	16.7

Secondary Outcomes:

Comparison of each item's score, health beliefs and self-efficacy, as evaluated by pregnant women. The between group comparison of the mean score of pregnant women's health beliefs and self-efficacy are shown in **Table 25**. The individual *t*-test between the experimental group (n = 109) and control group (n = 104) was conducted based on the central limit theorem (Kwak & Kim, 2017). Most of the items' scores showed no significant difference between the two groups. However, the mean score of item I3 in self-efficacy was 3.20 (*SD*: 0.47) in the experimental group and 3.05 (*SD*: 0.56) in control. There was a difference between the two groups (*MD* = 0.15, 95%*CI* [0.01, 0.29]).

Table 25

Comparison of Each Items' Score on Health Beliefs and Self-Efficacy as Evaluated by Pregnant Women at Three Months' Post-intervention

Knowledge of SHS	Experimental group (n = 109)	Control group (n = 101)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
C1. Smoke from the cigarettes of my partner is harmful to me and my baby. [a]	1.99 (0.10)	2.00 (0.00)	-0.01	[-0.03, 0.01]	-0.96	.337
C2. Smoke from a burning cigarette contains dangerous chemicals to me and my baby. [a]	1.99 (0.10)	2.00 (0.00)	-0.01	[-0.03, 0.01]	-0.96	.337
C3. The smoke chemicals is transfered via my partner's mouth. [a]	1.96 (0.19)	1.98 (0.14)	-0.02	[-0.06, 0.29]	-0.73	.465
C4. Things (closes, and furnitures etc..) in rooms where my partner smoked are coated.[a]	1.92 (0.28)	1.92 (0.27)	<-.01	[-0.08, 0.71]	-0.09	.929
C5. Staying for long time with a person who smokes may increase my health risks. [a]	1.99 (0.10)	2.00 (0.00)	<-.01	[-0.03, 0.01]	-0.96	.337
C6. Smoking by my partner in the home can have a harmful effect on me and my unborn baby. [a]	1.99 (0.10)	1.99 (0.10)	<.01	[-0.03, 0.03]	0.05	.957
C7. Cigarette butts include toxic substances. [b]	1.96 (0.19)	1.99 (0.10)	-0.03	[-0.07, 0.01]	-1.30	.196
C8. Smoke including toxic substances go into closed rooms. [b]	1.92 (0.28)	1.96 (0.20)	-0.04	[-0.11, 0.02]	-1.31	.193
Perceived SHS-related disease susceptibility	Experimental group (n = 109)	Control group (n = 101)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
D1. Breathing in a room where partner's cigarette can affect fetal development and my health risk. [a]	3.19 (0.63)	3.18 (0.54)	0.01	[-0.15, 0.17]	0.18	.859
D2. Smoke from the cigarette of smokers in a room is harmful to me and my unborn baby. [a]	3.18 (0.53)	3.23 (0.53)	-0.04	[-0.19, 0.10]	0.43	.545
D3. You and your unborn baby breathe toxic substances which are released from things (closes, and furnitures) in rooms where your partner smoked. [a]	2.63 (0.65)	2.54 (0.72)	0.09	[-0.10, 0.27]	0.91	.366

Perceived SHS-related disease severity	Experimental group (n = 108)	Control group (n = 102)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
E1. The effect of SHS exposure is a very serious condition for pregnant women. [a]	3.20 (0.51)	3.20 (0.55)	0.05	[-0.14, 0.15]	0.11	.917
E2. The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women. [a]	3.24 (0.49)	3.25 (0.55)	0.05	[-0.15, 0.14]	-0.03	.977
Perceived benefits of preventing SHS exposure	Experimental group (n = 108)	Control group (n = 102)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
F1. It is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth. [a]	3.13 (0.50)	3.14 (0.60)	-0.01	[-0.16, 0.14]	-0.10	.920
F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health. [a]	3.07 (0.49)	3.16 (0.50)	-0.08	[-0.22, 0.05]	-1.21	.227
F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation. [a]	3.05 (0.55)	3.07 (0.62)	-0.02	[-0.18, 0.14]	-0.28	.783
F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes. [a]	3.13 (0.63)	3.11 (0.56)	0.02	[-0.14, 0.18]	0.25	.803
Perceived barriers to preventing SHS exposure	Experimental group (n = 106)	Control group (n = 101)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
G1. I disapproved of my partner's smoking outside the home. [a]	2.58 (0.75)	2.58 (0.73)	<.01	[-0.20, 0.20]	0.01	.994
G2. There is no-smoking norm or policy in our home. [a]	2.67 (0.70)	2.56 (0.73)	0.11	[-0.09, 0.30]	1.06	.289
G3. It is difficult to ask my partner not to smoke in the home. [a]	2.60 (0.70)	2.71 (0.70)	-0.11	[-0.30, 0.08]	-1.12	.263
G4. Smoke-free home is a risk to routine harmonious social relations. [a]	2.39 (0.73)	2.37 (0.77)	0.02	[-0.19, 0.23]	0.20	.844
Cue to action for preventing SHS exposure	Experimental group (n = 108)	Control group (n = 102)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
H1. I know what is second-hand smoke (SHS). [a]	2.80 (0.87)	2.70 (0.82)	0.10	[-0.13, 0.33]	0.86	.392
H2. I know risks of second-hand smoke (SHS) for mother. [a]	2.94 (0.86)	2.75 (0.84)	0.18	[-0.05, 0.41]	1.54	.125
H3. I know risks of second-hand smoke for fetus. [a]	3.00 (0.80)	2.84 (0.87)	0.16	[-0.07, 0.38]	1.37	.173
H4. I know how to prevent second hand smoke expoure in my home. [a]	2.95 (0.85)	2.75 (0.87)	0.20	[-0.04, 0.43]	1.68	.095
H5. I have conflict with my partner over his smoking in the room. [a]	2.20 (1.05)	2.20 (1.12)	0.01	[-0.29, 0.30]	0.05	.959
H6. Brief advice on preventing second-hand smoke from research staff is a cue to action. [b]	3.03 (0.60)	2.85 (0.88)	0.18	[-0.03, 0.38]	1.68	.094
H7. Sticker on preventing second hand smoke is a cue to action. [b]	2.93 (0.68)	2.84 (0.96)	0.09	[-0.14, 0.32]	0.79	.431
The General Self-efficacy scale	Experimental group (n = 108)	Control group (n = 102)	*MD*	*95%CI*	*t*	*p-value*
	M(*SD*)	*M*(*SD*)				
Total score of Self-efficacy I [a]	31.47 (4.19)	31.23 (4.26)	0.24	[-0.91, 1.38]	0.41	.686
I1. I can always manage to solve difficult problems if I try hard enough. [a]	3.25 (0.60)	3.24 (0.53)	0.02	[-0.14, 0.17]	0.19	.851
I2. If someone opposes me, I can find the means and ways to get what I want. [a]	3.09 (0.59)	3.02 (0.63)	0.07	[-0.09, 0.24]	0.86	.393
I3. It is easy for me to stick to my aims and accomplish my goals. [a]	3.20 (0.47)	3.05 (0.56)	0.15	[0.01, 0.29]	2.16	.032
I4. I am confident that I could deal effeciently with unexected events. [a]	3.15 (0.45)	3.12 (0.52)	0.03	[-0.10, 0.16]	0.44	.661
I5. Thanks to my resourcefulness, I know how to handle unforceseen situations. [a]	3.14 (0.46)	3.12 (0.60)	0.02	[-0.12, 0.17]	0.29	.774
I6. I can solve most problems if I invest the necessary effort. [a]	3.19 (0.50)	3.18 (0.50)	0.01	[-0.13, 0.14]	0.13	.899
I7. I can remain calm when facing difficulties because I can rely on my coping abilities. [b]	3.17 (0.46)	3.14 (0.53)	0.03	[-0.10, 0.17]	0.45	.652
I8. When I am confronted with a problem, I can usually find several solutions. [a]	3.14 (0.40)	3.19 (0.44)	-0.06	[-0.17, 0.06]	-0.95	.341

I9. If I am in trouble, I can usually think of a solution. [a]	3.20 (0.45)	3.20 (0.45)	<.01	[-0.12, 0.12]	<-.01	.998
I10.I can usually handle whatever comes my way .[a]	3.18 (0.43)	3.14 (0.51)	0.04	[-0.09, 0.17]	0.62	.535

Note. a:*t*-test was conducted., b: Welch test was conducted., SHS=second hand smoke; C – I refers to related appendices, *95% CI for difference*: mean differences between the experimental group and control group, *MD* : mean differences between the experimental group and control group

The cross-tabulation table of Women's Health Beliefs and Self-Efficacy (**Table 26**) as evaluated by pregnant women at three months' post-intervention indicated for the knowledge of SHS, almost all pregnant women (91.7~100%) in both groups selected correct answer for all questions.

In perceived SHS-related disease susceptibility, almost all pregnant women in both group (experimental group: 95.4%, control group: 95.1%) perceived "Breathing in a room where partner's cigarette can affect fetal development and my health risk". Around 97% of pregnant women in both groups agreed with "Smoke from the cigarette of smokers in a room is harmful to me and my unborn baby". More than half of pregnant women in both groups (experimental group: 60.7%, control group: 57.0%) perceived toxic substances, which are released from things (closes, and furniture) in rooms where the partner smoked. Almost of pregnant women in both groups perceived the effect of SHS for pregnant women (E1: experimental group: 97.2%, control group: 95.1%) and fetus (E2: experimental group: 99.1%, control group: 96.1%).

Most of pregnant women in both group perceived benefits of preventing SHS exposure including "F1: the fetus for better growth (experimental group: 93.5 %, control group: 92.1 %)", "F2: better mental health for pregnant women (experimental group: 91.6 %, control group: 96.1 %)", "F3: pregnant women's normal gestation (experimental group: 90.7%, control group: 88.2%)", and "F4: reducing newborn baby's risks of heart disease and diabetes (experimental group: 89.8%, control group: 93.1%)".

Less than half of pregnant women in both groups perceived barriers to preventing SHS exposure including “G2: no-smoking norm or policy in home (experimental group: 42.5%, control group: 43.5%)”, and “G3: difficulty in asking partner not to smoke in the home (experimental group: 40.6%, control group: 34.7%)”. However, more than half of pregnant women in both group perceived barriers: “G4: Smoke-free home is a risk to routine harmonious social relations (experimental group: 56.6%, control group: 55.5%)”

More than half of pregnant women in both groups perceived cue to action including “H1: Knowing what is SHS (experimental group: 66.7%, control group: 58.9%)”, “H2: Knowing risks of SHS for mother (experimental group: 73.2%, control group: 59.8%)”, “H3: Knowing risks of SHS for fetus (experimental group: 77.8%, control group: 61.8%)”, and “H4: Knowing how to prevent SHS exposure in their home (experimental group: 73.2%, control group: 58.8%)”.

In the experimental group, almost all pregnant women (94.5%) perceived that “H6: Brief advice on preventing second-hand smoke from research staff is a cue to action”. Also, 90.5% of pregnant women thought that “H7: Sticker on preventing second hand smoke is a cue to action”.

On general self-efficacy. almost all pregnant women (89.1% - 98.1%) in both groups marked “moderately true” or “exactly true”

Table 26

Cross-tabulation Table of Health Beliefs and Self-Efficacy as Evaluated by Pregnant Women at Three Months' Post-intervention

Knowledge of SHS	Experimental group (*n* = 109)		Control group (n = 101)	
	Yes (%)	No (%)	Yes (%)	No (%)
C1. Smoke from the cigarettes of my partner is harmful to me and my baby.	99.1	0.9	100	0
C2. Smoke from a burning cigarette contains dangerous chemicals to me and my baby.	99.1	0.9	100	0
C3. The smoke chemicals is transferred via my partner's mouth.	96.3	3.7	98.0	2.0
C4. Things (closes, and furniture etc..) in rooms where my partner smoked are coated.	91.7	8.3	92.1	7.9
C5. Staying for long time with a person who smokes may increase my health risks.	99.1	0.9	100	0
C6. Smoking by my partner in the home can have a harmful effect on me and my unborn baby.	99.1	0.9	99.0	1.0
C7. Cigarette butts include toxic substances.	96.3	3.7	99.0	1.0
C8. Smoke including toxic substances go into closed rooms.	91.7	8.3	92.8	6.2

Perceived SHS-related disease susceptibility	Experimental group (*n* = 109)				Control group (n = 101)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
D1. Breathing in a room where partner's cigarette can affect fetal development and my health risk	3.7	0.9	67.9	27.5	1.0	4.0	71.3	23.8
D2.Smoke from the cigarette of smokers in a room is harmful to me and my unborn baby	1.8	0.9	74.3	22.9	1.0	2.0	70.3	26.7
D3.You and your unborn baby breathe toxic substances which are released from things (closes, and furniture) in rooms where your partner smoked	3.7	35.5	55.1	5.6	8.0	35.0	52.0	5.0

Perceived SHS-related disease severity	Experimental group (*n* = 108)				Control group (n = 102)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
E1.The effect of SHS exposure is a very serious condition for pregnant women	0.9	1.9	73.1	24.1	1.0	3.9	69.6	25.5
E2.The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women	0.9	0.0	72.9	26.2	1.0	2.9	66.7	29.4

Perceived benefits of preventing SHS exposure	Experimental group (*n* = 108)				Control group (n = 102)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
F1. It is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth.	0.0	6.5	74.1	19.4	2.0	5.9	68.6	23.5
F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health.	0.0	8.3	75.9	15.7	1.0	2.9	75.5	20.6
F3. It is a benefit that preventing SHS exposure during pregnancy can help the	1.9	7.4	75.0	15.7	2.0	9.8	67.6	20.6

pregnant women for normal gestation.								
F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes.	1.9	8.3	64.8	25.0	2.0	5.0	73.3	19.8
Perceived barriers to preventing SHS exposure	Experimental group (n = 106)				Control group (n = 101)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
G1. I disapproved of my partner's smoking outside the home.	11.3	40.6	43.4	4.7	7.9	48.5	37.6	5.9
G2. There is no-smoking norm or policy in our home.	11.3	46.2	40.6	1.9	6.9	49.5	36.6	6.9
G3. It is difficult to ask my partner not to smoke in the home.	6.6	52.8	34.9	5.7	9.9	55.4	30.7	4.0
G4. Smoke-free home is a risk to routine harmonious social relations	4.7	38.7	47.2	9.4	5.0	39.6	42.6	12.9
Cue to action for preventing SHS exposure	Experimental group (n = 108)				Control group (n = 101)			
	Do not know (%)	Informed what is SHS, but I do not remember (%)	Know what is SHS (%)	Understand what is SHS (%)	Do not know (%)	Informed what is SHS, but I do not remember (%)	Know what is SHS (%)	Understand what is SHS (%)
H1. I know what is second-hand smoke (SHS).	8.3	25.0	45.4	21.3	5.9	35.3	42.2	16.7
H2. I know risks of second-hand smoke (SHS) for mother.	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for mother (%)	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for mother (%)
	6.5	20.4	46.3	26.9	4.9	35.3	39.2	20.6
H3. I know risks of second-hand smoke for fetus.	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for fetus (%)	Understand risks of SHS for fetus (%)	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for fetus (%)	Understand risks of SHS for fetus (%)
	4.6	17.6	50.9	26.9	3.9	34.3	35.3	26.5
H4. I know how to prevent second hand smoke exposure in my home.	Do not know (%)	Informed how to prevent SHS, but I do not remember (%)	Know how to prevent SHS (%)	Understand how to prevent SHS (%)	Do not know (%)	Informed how to prevent SHS, but I do not remember (%)	Know how to prevent SHS (%)	Understand how to prevent SHS (%)
	5.6	21.3	45.4	27.8	5.9	35.3	36.3	22.5
H5. I have conflict with my partner over his smoking in the room.	Never (%)	Hardly ever (%)	Some of the time (%)	All of the time (%)	Never (%)	Hardly ever (%)	Some of the time (%)	All of the time (%)
	35.2	20.4	33.3	11.1	36.3	25.5	20.6	17.6
H6. Brief advice on preventing second-hand smoke from research staff is a cue to action	Have not received brief advice (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Have not received brief advice (%)	Disagree (%)	Agree (%)	Strongly agree (%)
	5.6	0.0	80.6	13.9	15.7	0.0	67.6	16.7
H7. Sticker on preventing second hand smoke is a cue to action	Have not received the sticker (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Have not received the sticker (%)	Disagree (%)	Agree (%)	Strongly agree (%)
	8.5	0.9	79.2	11.3	17.6	2.0	58.8	21.6
The General Self-efficacy scale	Experimental group (n = 108)				Control group (n = 102)			
	Not at all true (%)	Hardly true (%)	Moderately true (%)	Exactly true (%)	Not at all true (%)	Hardly true (%)	Moderately true (%)	Exactly true (%)
I1. I can always manage to solve difficult problems if I try hard enough.	1.9	2.8	63.9	31.5	1.0	2.0	69.6	27.5
I2. If someone opposes me, I can find the means	1.8	7.3	70.6	20.2	4.0	6.9	72.3	16.8

and ways to get what I want.								
I3. It is easy for me to stick to my aims and accomplish my goals.	0.0	2.8	74.3	22.9	3.0	4.0	78.2	14.9
I4. I am confident that I could deal efficiently with unexpected events.	0.0	3.7	77.8	18.5	2.0	2.0	78.2	17.8
I5.Thanks to my resourcefulness, I know how to handle unforeseen situations.	0.0	4.6	76.9	18.5	2.0	6.9	68.6	22.5
I6. I can solve most problems if I invest the necessary effort.	0.9	1.9	75.0	22.2	1.0	2.0	75.5	21.6
I7. I can remain calm when facing difficulties because I can rely on my coping abilities.	0.0	3.7	75.9	20.4	1.9	1.9	76.7	19.4
I8.When I am confronted with a problem, I can usually find several solutions.	0.0	1.9	82.4	15.7	0.0	1.9	76.7	21.4
I9. If I am in trouble, I can usually think of a solution.	0.0	1.9	75.9	22.2	0.0	1.9	75.7	22.3
I10.I can usually handle whatever comes my way.	0.0	1.9	78.7	19.4	1.0	3.9	75.7	19.4

Comparison of each item's score, health beliefs and self-efficacy, as evaluated by husband. Between group comparison of the mean score of husbands' health beliefs and self-efficacy are shown in **Table 27**. An independent *t*-test between the experimental group (n = 110) and control group (n = 104) was conducted central limit theorem (Kwak & Kim, 2017). Most of the items had no difference between the two groups. However, four items in cue to actions showed a difference. The mean score of item H1 was 2.86 (*SD*: 0.83) in the experimental group and 2.59 (*SD*: 0.84) in the control group. There was a difference between two groups (*MD* = 0.28, 95%*CI* [0.05, 0.50]). The mean score of item H2 was 2.93 (*SD*: 0.85) in the experimental group and 2.63 (*SD*: 0.88) in the control group. There was a difference between the two groups (*MD* = 0.30, 95%*CI* [0.07, 0.54]). The mean score of item H6 was 2.51 (*SD*: 1.06) in the experimental group and 1.97 (*SD*: 1.07) in the control group. There was a difference between the two groups (*MD* = 0.54, 95%*CI* [0.25, 0.83]). The mean score of item H7 was 3.02 (*SD*: 0.69) in the experimental group and 2.77 (*SD*:

0.92) in the control group. There was a difference between the two groups (*MD* = 0.25, 95%*CI* [0.03, 0.47]).

Table 27

Comparison of Each Items' Score on Health Beliefs and Self-Efficacy as Evaluated by Husband at Three Months' Post-intervention

Knowledge of SHS	Experimental group (*n* = 109)	Control group (*n* = 103)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
C1. Smoke from my cigarettes is harmful to my wife and baby.[a]	1.99 (0.10)	1.99 (0.10)	<.01	[-0.03, 0.03]	0.34	.973
C2. Smoke from a burning cigarette contains dangerous chemicals to my wife and unborn baby.[b]	2.00 (0.00)	1.99 (0.10)	0.01	[-0.01, 0.03]	1.00	.320
C3. The smoke chemicals is transfered via my mouth.[a]	1.95 (0.20)	1.94 (0.24)	0.01	[-0.05, 0.07]	0.40	.686
C4. Things (closes, and furniture etc..) in rooms where I smoked are coated.[a]	1.91 (0.29)	1.88 (0.32)	0.03	[-0.06, 0.11]	0.59	.557
C5. Staying for long time with a person who smokes may increase health risks of my wife and unborn baby.[b]	2.00 (0.00)	1.97 (0.17)	0.03	[-0.00, 0.06]	1.75	.083
C6. Smoking by me in the home can have a harmful effect on my wife and unborn baby.[b]	2.00 (0.00)	1.97 (0.17)	0.03	[-0.00, 0.06]	1.75	0.83
C7. Cigarette butts include toxic substances.[a]	1.94 (0.25)	1.95 (0.22)	-0.02	[-0.08, 0.05]	-0.49	.623
C8. Smoke including toxic substances go into closed rooms.[b]	1.94 (0.23)	1.94 (0.24)	<.01	[-0.06, 0.07]	0.08	.933
Perceived SHS-related disease susceptibility	Experimental group (*n* = 109)	Control group (*n* = 103)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
D1. Breathing in a room where my cigarette can affect fetal development and wife's health risk[a]	3.13 (0.51)	3.13 (0.48)	<.01	[-0.13, 0.14]	0.03	.973
D2.Smoke from the cigarette of smokers in a room is harmful to my wife and my unborn baby[b]	3.25 (0.45)	3.14 (0.45)	0.10	[-0.02, 0.22]	1.64	.103
D3.My wife and unborn baby breathe toxic substances which are released from things (closes, and furnitures) in rooms where I smoked[a]	2.91 (0.63)	2.94 (0.56)	-0.03	[-0.20, 0.13]	-0.40	.690
Perceived SHS-related disease severity	Experimental group (*n* = 110)	Control group (*n* = 104)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
E1.The effect of SHS exposure is a very serious condition for pregnant women[b]	3.26 (0.52)	3.16 (0.44)	0.10	[-0.03, 0.23]	1.52	.130
E2.The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women[b]	3.27 (0.52)	3.15 (0.50)	0.12	[-0.02, 0.26]	1.70	.090
Perceived benefits of preventing SHS exposure	Experimental group (*n* = 110)	Control group (*n* = 104)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
F1. It is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth.[a]	3.09 (0.74)	3.12 (0.63)	-0.02	[-0.21, 0.16]	-.26	.794
F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health.[a]	3.01 (0.66)	3.06 (0.50)	-0.05	[-0.21, 0.16]	-.61	.544

F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation. [a]	3.00 (0.77)	2.93 (0.58)	0.07	[-0.12, 0.25]	.72	.471
F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes. [b]	3.09 (0.61)	3.06 (0.44)	0.04	[-0.11, 0.18]	.48	.630
Perceived barriers to preventing SHS exposure for pregnant women	Experimental group (n = 110)	Control group (n = 104)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
G1. Other smokers (visitor) do not accept smoke-free home. [a]	2.61 (0.73)	2.69 (0.66)	-0.09	[-0.28, 0.10]	-0.91	.364
G2. There is no-smoking norm or policy in our home. [a]	2.60 (0.68)	2.70 (0.64)	-0.11	[-0.28, 0.07]	-1.17	.245
G3. It is difficult to ask other smokers (visitors) not to smoke in the home. [a]	2.65 (0.69)	2.53 (0.56)	0.12	[-0.05, 0.29]	1.36	.175
G4. Smoke-free home is a risk to routine harmonious social Relations. [b]	2.40 (0.69)	2.36 (0.57)	0.04	[-0.13, 0.22]	0.51	.611
G5. I lost social communication with other smoker (visitor) in my house. [a]	2.67 (0.67)	2.70 (0.63)	-0.03	[-0.21, 0.15]	-0.33	.743
Cue to action for preventing SHS exposure	Experimental group (n = 110)	Control group (n = 104)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
H1. I know what is second-hand smoke. [a]	2.86 (0.83)	2.59 (0.84)	0.28	[0.05, 0.50]	2.40	.017
H2. I know risks of second-hand smoke for mother. [a]	2.93 (0.85)	2.63 (0.88)	0.30	[.068, 0.54]	2.55	.012
H3. I know risks of second-hand smoke for fetus. [a]	2.87 (0.88)	2.67 (0.87)	0.20	[-.032, 0.44]	1.70	.090
H4. I know how to prevent second hand smoke expoure in my home. [a]	2.74 (0.89)	2.59 (0.87)	0.15	[-.084, 0.39]	1.28	.203
H5. I have conflict with other smokers (visitors) over their smoking in the room. [a]	2.13 (1.04)	2.04 (1.11)	0.09	[-0.20, 0.38]	0.61	.544
H6. I have already received the educational comic and a sticker on smoke-free home. [a]	2.51 (1.06)	1.97 (1.07)	0.54	[0.25, 0.83]	3.71	<.001
H7. Brief advice on preventing second-hand smoke from research staff is a cue to action. [b]	3.02 (0.69)	2.77 (0.92)	0.25	[0.03, 0.47]	2.25	.025
H8. Sticker for smoke-free home is a cue to action. [b]	2.89 (0.77)	2.73 (0.98)	0.16	[-0.08, 0.40]	1.32	.185
The General Self-efficacy scale	Experimental group (n = 109)	Control group (n = 103)	*MD*	*95%CI*	*t*	*p-value*
	M (*SD*)	*M* (*SD*)				
Total score of Self-efficacy [a] I	31.39 (3.68)	31.51 (3.80)	-0.02	[-1.04, 0.99]	-0.04	.966
I1. I can always manage to solve difficult problems if I try hard enough. [a]	3.31 (0.57)	3.22 (0.59)	0.09	[-0.07, 0.25]	1.14	.256
I2. If someone opposes me, I can find the means and ways to get what I want. [a]	3.00 (0.62)	3.11 (0.56)	-0.11	[-0.27, 0.05]	-1.30	.194
I3. It is easy for me to stick to my aims and accomplish my goals. [a]	3.03 (0.52)	3.13 (0.47)	-0.10	[-0.23, 0.04]	-1.43	.155
I4. I am confident that I could deal effeciently with unexected events. [a]	3.05 (0.44)	3.06 (0.55)	-0.01	[-0.15, 0.12]	-0.17	.863
I5. Thanks to my resourcefulness, I know how to handle unforceseen situations. [a]	3.06 (0.45)	3.11 (0.56)	-0.05	[-0.19, 0.09]	-0.74	.463
I6. I can solve most problems if I invest the necessary effort.	3.22 (0.48)	3.18 (0.54)	0.04	[-0.10, 0.17]	0.54	.590
I7. I can remain calm when facing difficulties because I can rely on my coping abilities. [b]	3.14 (0.46)	3.10 (0.55)	0.04	[-0.10, 0.18]	0.60	.550
I8. When I am confronted with a problem, I can usually find several solutions. [a]	3.24 (0.45)	3.16 (0.49)	0.08	[-0.05, 0.20]	1.20	.231
I9. If I am in trouble, I can usually think of a solution. [a]	3.32 (0.50)	3.25 (0.48)	0.07	[-0.06, 0.21]	1.11	.266
I10. I can usually handle whatever comes my way. [a]	3.19 (0.48)	3.17 (0.47)	0.01	[-0.12, 0.14]	0.19	.853

Note. a: *t*- test was conducted., b: Welch test was conducted. SHS = second hand smoke; C-I = related to corresponding appendices,
95% CI for difference: mean differences between the experimental group and control group,
MD: mean differences between the experimental group and control group

Cross-tabulation table of husband's health beliefs and self-efficacy (**Table 28)** as evaluated by husband at three months' post-intervention. On knowledge of SHS, almost of husbands (89.3-100%) in both groups selected the correct answer.

In perceived SHS-related disease susceptibility, almost all husbands in both groups (experimental group: 96.4%, control group: 96.1%) perceived "D1: Breathing in a room where partner's cigarette can affect fetal development and my health risk". From 98.1% (control group) to 99.1% (experimental group) of husbands in both groups agree with "D2: Smoke from the cigarette of smokers in a room is harmful to me and my unborn baby". Almost all husbands in both groups (experimental group: 84.4%, control group: 85.3%) perceived "D3: toxic substances which are released from things (closes, and furniture) in rooms where partners smoked". Almost all husbands in both groups perceived the effect of SHS for pregnant women (E1: experimental group: 98.1%, control group: 99.1%) and fetus (E2: experimental group: 98.2%, control group: 98%).

Most husbands in both groups perceived benefits of preventing SHS exposure including "F1: the fetus for better growth (experimental group: 88.2 %, control group: 93.3 %)", "F2: better mental health for pregnant women (experimental group: 84.6 %, control group: 92.3 %)", "F3: pregnant women's normal gestation (experimental group: 83.6%, control group: 87.5%)", and "F4: reducing newborn baby's risks of heart disease and diabetes (experimental group: 89.7%, control group: 93.2%)".

Less than half of husbands in both groups perceived barriers to preventing SHS exposure including "G1: Other smokers (visitor) do not accept smoke-free home

(experimental group: 44.6%, control group: 40.4%)", "G2: no-smoking norm or policy in home (experimental group: 40.4%, control group: 36.5%)", "G3: difficulty in asking partner not to smoke in the home (experimental group: 40.9%, control group: 47.1%)", and "G5: I lost social communication with other smoker (visitor) in my house (experimental group: 31.5%, control group: 38.3%)". However, more than half of husbands in both groups perceived barriers: "G4: Smoke-free home is a risk to routine harmonious social relations (experimental group: 68.5%, control group: 61.7%)"

On cue to action, there were three items with statistical differences: item H1 (*MD* = 0.28, 95%*CI* [0.05, 0.50]), H2 (*MD* = 0.30, 95%*CI* [0.07, 0.54]), H7 (*MD* = 0.25, 95% *CI* [0.03, 0.47]). More than half of husbands in both groups perceived cue to action including "H1: Knowing what is SHS (experimental group: 68.5%, control group: 51%)", "H2: Knowing risks of SHS for mother (experimental group: 69.1%, control group: 52.9%)", "H3: Knowing risks of SHS for fetus (experimental group: 65.5%, control group: 53.4%)", and "H4: Knowing how to prevent SHS exposure in their home (experimental group: 59.2%, control group: 49.0%)".

In the experimental group, on item H6, 24.8% of husbands read the educational comic booklet using the sticker (reminder). 20.2% of husbands read the educational comic booklet or use the sticker (reminder). 36.7% of husbands received an educational comic with the sticker (reminder). Almost all husbands (90.7%) perceived that "Brief advice on preventing second-hand smoke from research staff is a cue to action". Also, 85.2% of husbands thought that "Sticker on preventing second hand smoke is a cue to action".

On general self-efficacy, almost all pregnant women (89.9% - 99.1%) in both groups marked “moderately true” or “Exactly true”.

Table 28

Cross-tabulation Table of Health Beliefs and Self-Efficacy as Evaluated by Husband at *Three Months’ Post-intervention*

Knowledge of SHS	Experimental group (*n* = 140)		Control group (n = 146)	
	Yes (%)	No (%)	Yes (%)	No (%)
C1. Smoke from my cigarettes is harmful to my wife and baby.	99.1	0.9	100	0.0
C2. Smoke from a burning cigarette contains dangerous chemicals to my wife and unborn baby.	99.1	0.9	100	0.0
C3. The smoke chemicals is transferred via my mouth.	95.4	4.6	95.1	4.9
C4. Things (closes, and furniture etc..) in rooms where I smoked are coated.	90.8	9.2	89.3	10.7
C5. Staying for long time with a person who smokes may increase health risks of my wife and unborn baby.	100	0.0	98.1	1.9
C6. Smoking by me in the home can have a harmful effect on my wife and unborn baby.	100	0.0	98.1	1.9
C7. Cigarette butts include toxic substances.	93.6	6.4	95.1	4.9
C8. Smoke including toxic substances go into closed rooms.				

Perceived SHS-related disease susceptibility	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
D1. Breathing in a room where my cigarette can affect fetal development and wife's health risk	1.8	1.8	78.2	18.2	1.0	2.9	78.8	17.3
D2.Smoke from the cigarette of smokers in a room is harmful to my wife and my unborn baby	0.0	0.9	73.6	25.5	1.0	1.0	80.8	17.3
D3. My wife and unborn baby breathe toxic substances which are released from things (closes, and furniture) in rooms where I smoked	4.6	11.0	73.4	11.0	2.0	12.7	74.5	10.8

Perceived SHS-related disease severity	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
E1. The effect of SHS exposure is a very serious condition for pregnant women	0.9	0.9	69.1	29.1	1.0	0.0	80.8	18.3
E2. The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women	0.9	0.9	68.2	30.0	1.9	0.0	78.8	19.2

Perceived benefits of preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
F1. It is a benefit that preventing SHS exposure during	5.5	6.4	61.8	26.4	3.8	2.9	71.2	22.1

pregnancy can help the fetus for better growth.								
F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health .	2.7	12.7	65.5	19.1	1.0	6.7	77.9	14.4
F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation.	6.4	10.0	60.9	22.7	3.8	8.7	77.9	9.6
F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes.	1.9	8.4	68.2	21.5	0.0	6.8	80.6	12.6
Perceived barriers to preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Strongly disagree (%)	Disagree (%)	Agree (%)	Strongly agree (%)
G1. Other smokers (visitor) do not accept smoke-free home	10.1	45.0	40.4	4.6	9.6	50.0	39.4	1.0
G2. There is no-smoking norm or policy in our home	5.5	54.1	34.9	5.5	7.7	55.8	34.6	1.9
G3. It is difficult to ask other smokers (visitors) not to smoke in the home	4.5	54.5	33.6	7.3	1.0	51.9	45.2	1.9
G4. Smoke-free home is a risk to routine harmonious social relations	2.7	43.6	44.5	9.1	1.0	37.5	57.7	3.8
G5. I lost social communication with other smoker (visitor) in my house	4.6	63.9	25.0	6.5	7.8	53.9	37.3	1.0
Cue to action for preventing SHS exposure	Experimental group (*n* = 140)				Control group (n = 146)			
	Do not know (%)	Informed what is SHS, but I do not remember (%)	Know what is SHS (%)	Understand what is SHS (%)	Do not know (%)	Informed what is SHS, but I do not remember (%)	Know what is SHS (%)	Understand what is SHS (%)
H1. I know what is second-hand smoke.	5.5	25.7	45.9	22.9	7.7	41.3	35.6	15.4
H2. I know risks of second-hand smoke for mother.	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for mother (%)	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for mother (%)
	4.5	26.4	40.9	28.2	8.7	38.5	34.6	18.3
H3. I know risks of second-hand smoke for fetus.	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for mother (%)	Understand risks of SHS for fetus (%)	Do not know (%)	Informed risks of SHS, but I do not remember (%)	Know risks of SHS for fetus (%)	Understand risks of SHS for fetus (%)
	5.5	29.1	38.2	27.3	5.8	40.8	34.0	19.4
H4. I know how to prevent second hand smoke exposure in my home.	Do not know (%)	Informed how to prevent SHS, but I do not remember (%)	Know how to prevent SHS (%)	Understand how to prevent SHS (%)	Do not know (%)	Informed how to prevent SHS, but I do not remember (%)	Know how to prevent SHS (%)	Understand how to prevent SHS (%)
	7.4	33.3	37.0	22.2	7.7	43.3	31.7	17.3
H5. I have conflict with other smokers	Never (%)	Hardly ever (%)	Some of the time (%)	All of the time (%)	Never (%)	Hardly ever (%)	Some of the time (%)	All of the time (%)

(visitors) over their smoking in the room.	35.8	27.5	24.8	11.9	46.6	15.5	25.2	12.6
H6. I have already received the educational comic and a sticker on smoke-free home.	Not yet (%)	Received an educational comic and a reminder (%)	Read the comic or use the sticker (%)	Read the comic and use the sticker (%)	Not yet (%)	Received an educational comic and a reminder (%)	Read the comic or use the sticker (%)	Read the comic and use the sticker (%)
	18.3	36.7	20.2	24.8	45.1	25.5	16.7	12.7
H7. Brief advice on preventing second-hand smoke from research staff is a cue to action	Have not received brief advice (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Have not received brief advice (%)	Disagree (%)	Agree (%)	Strongly agree (%)
	6.5	2.8	72.9	17.8	18.4	1.0	66.0	14.6
H8. Sticker for smoke-free home is a cue to action	Have not received the sticker (%)	Disagree (%)	Agree (%)	Strongly agree (%)	Have not received the sticker (%)	Disagree (%)	Agree (%)	Strongly agree (%)
	10.2	4.6	71.3	13.9	20.4	3.9	58.3	17.5
The General Self-efficacy scale	Experimental group (n = 140)				Control group (n = 146)			
	Not at all true (%)	Hardly true (%)	Moderately true (%)	Exactly true (%)	Not at all true (%)	Hardly true (%)	Moderately true (%)	Exactly true (%)
I1. I can always manage to solve difficult problems if I try hard enough.	0.9	2.8	60.6	35.8	1.0	5.8	63.5	29.8
I2. If someone opposes me, I can find the means and ways to get what I want.	0.9	16.5	64.2	18.3	1.0	7.7	71.2	20.2
I3. It is easy for me to stick to my aims and accomplish my goals.	0.9	9.2	76.1	13.8	1.0	2.9	78.8	17.3
I4. I am confident that I could deal efficiently with unexpected events.	0.0	7.3	80.7	11.9	1.9	6.7	75.0	16.3
I5.Thanks to my resourcefulness, I know how to handle unforeseen situations.	0.0	7.3	79.8	12.8	1.0	7.7	71.2	20.2
I6. I can solve most problems if I invest the necessary effort.	0.0	2.8	72.5	24.8	1.0	3.8	71.2	24.0
I7. I can remain calm when facing difficulties because I can rely on my coping abilities.	0.0	4.6	77.1	18.3	1.9	4.8	75.0	18.3
I8.When I am confronted with a problem, I can usually find several solutions.	0.0	0.9	74.1	25.0	1.0	1.9	76.9	20.2
I9. If I am in trouble, I can usually think of a solution.	0.0	0.9	65.7	33.3	0.0	1.9	71.2	26.9
I10.I can usually handle whatever comes my way.	0.0	3.7	74.1	22.2	0.0	3.8	75.0	21.2

The Cronbach's alpha of scales was showed in **Table 29.** On avoidance of environmental tobacco smoke for pregnant women, the Cronbach's alphas were over 0.7 (0.78 at baseline, and 0.75 at three months' post-intervention). On the general self-efficacy for pregnant women, alpha was over 0.9 (0.92 at baseline, and 0.91 at three months' post-

intervention). On the general self-efficacy for husbands, alpha reliability was over 0.8 (0.90 at baseline, and 0.83 at three months' post-intervention).

Table 29

The Cronbach's Alpha of Scales: Avoidance of Environmental Tobacco Smoke and The General Self-Efficacy Scale

	α at baseline (*n*)	α at three months post-intervention (*n*)
Avoidance of Environmental Tobacco Smoke	0.78 (273)	0.75 (201)
The General Self-Efficacy for pregnant women	0.92 (282)	0.91 (208)
The General Self-Efficacy for husbands	0.90 (282)	0.83 (212)

Note: α: Cronbach's alpha

DISCUSSION

In this two-armed longitudinal randomized controlled trial, we assessed impact of an educational comic booklet based on the conceptual framework of the HBM (**Figure 1, Appendix F**) and a sticker as an intervention reminder (**Appendix K**) which were adopted for preventing SHS at home as long-term effect to their smoking partner. A reminder indicated that they have a smoke-free home. We used a self and peer-evaluation questionnaires at baseline and three months' post-intervention for measuring the primary outcomes (scores of pregnant women's avoidance of SHS exposure and scores of their husbands' smoking behavior), and secondary outcomes (scores of health beliefs and self-efficacy).

Impacts of The Educational Comic and The sticker

The research results from both the experimental group and the control group using the educational comic booklet as a couple intervention with a sticker indicated following that pregnant women's behavior, pregnant women in experimental group distanced from smoker by 12% more than control, requested a nonsmoking seat in some transportations by 20.8 % more than control. They moved away from tobacco smoke outdoor by 18.5% more than control and not a place where smoking is prevalent by 19.6 % more than control. In the peer-evaluation by their husband, almost all of the pregnant women in the experimental group (and control group had moved away from smoking husband, and reminded their husband smoking partner not to smoke in their home in both groups and moved away from

smoker. Therefore, this study detected that pregnant women in the experimental group successfully avoided their SHS exposure at home, in public transportation, and outdoors as measured by self-and peer evaluation. In health beliefs, we thought that almost all of the couples in both groups have enough knowledge on SHS, perceive SHS-related disease susceptibility, perceive SHS-related disease severity, and perceive benefits of preventing SHS exposure.

According to both self- and peer-evaluation of husbands' smoking behavior, pregnant women perceived that husbands had distanced from pregnant women and smoked outdoor with the door closed. Moreover, pregnant women in the experimental group reported that smoking partner who did not intend to quit smoking decreased from 52.1% at baseline to 27.1% at three months' post-intervention. Husbands in the experimental group reported that smoking partners who did not intend to quit smoking decreased from 54.0% at baseline to 29.0% at three months' post-intervention Therefore, this study also detected that smoking husbands belonging to experimental groups successfully changed behaviors at home, and intended to quit tobacco as measured by self-and peer evaluation.

Hochbaum (1958) reported that "cues touch off behavior of when the individual is ready to behave", and "in the external situation, such as posters, articles, and a variety of other things which would focus a person's attention and feelings" on SHS in this case (Hochbaum, 1958, p.8). Most couples belong to experimental groups have enough knowledge of health risks of SHS (Kaufman, Merritt, Rimbatmaja, & Cohen, 2015, p.998), and perceived all of key components of health beliefs which supports our study. Also, as

with our study the educational comic, and the sticker (reminder) as cue to action accelerated well-prepared couples' desired behavior changes through perceived threat (Strecher & Rosenstock,1997) which "is the construct formed by the combination of susceptibility and severity" (Glanz et al., 2015, p.79).

Recently, main contents of intervention employed multiple strategies, which were named as behavior change interventions (BCI). BCI is a package of well-defined multiple strategies designed to address human behavior in complex settings (World Health Organization, 2008). Health reminders, such as stickers are one of the BCI, which is used with educational tools. The two similar studies (Huang et al., 2003; Chi et al., 2015) for preventing SHS for pregnant women at home in the literature adapted *cue to action* such as telephone call reminders for resolving small effect size (Rosenstock, Strecher, & Becker, 1988). Our study also showed statistical differences for some pregnant women's avoiding SHS and husbands smoking behaviors. However, the small effect size of our study was not resolved because some couples in the experimental group read before self-reporting at baseline. Therefore, we were unable to confirm the real effects size for our interventions. Other suspected factors for reducing effect size are remaining barriers such as risk to routine harmonious social relations in the community (Nichter M, Nichter M, Padmawati, & NG, 2010) which over 50% of husbands in each of our groups mentioned. As next steps, a communitywide intervention with supportive local leaders will be required (Trisnowati, Kusuma, Ahsan, Kuiniasih, & Padmawati, 2019).

The Educational Comic Booklet Enhancing Tailoring Behavior Change Messages on Cultural Characteristic

"An in-depth understanding of the target audience's subjective culture is one of the central elements in designing effective materials" (Sabogal, Otero-Sabogal, Pasick, Jenkins, & Pérez-Stable, 1996, p.S125). For attracting attention and interest from the target, we adopted a comic created by a Japanese manga artist because Japanese comics are familiar with Indonesians and liked by Indonesians since 1985 (Febriani, 2016). Therefore, on the compliance of reading the educational comic, smoking husbands in experimental group reported that husbands perceived (27.8%) or read the educational comic booklet (56.4%) at three months' post-intervention. Pregnant women confirmed that smoking husbands perceived (21.3%) or read the educational comic booklet (61.1%) at three months' post-intervention. On the compliance of using the sticker, 24.8% of smoking husbands use the sticker. 20.2% of smoking husbands use the sticker or read the educational comic and 36.7% of husbands just received both.

Moreover, to increase identification with the comic figure, "skin color, and hair color of target group were adapted into the comic character" (Inaoka et al., 2020, p.1189). These were *peripheral strategies* for enhancing cultural appropriateness to address our first concern, which was that pregnant women and their husbands in experimental groups might not show interest in the booklet. Using Indonesian language secured the target's accessibility (*linguistic strategies*). For providing evidence to the targets as *evidential strategies*, we used eight behavior change techniques: (a) explanation of what is SHS, (b)

prevalence of SHS for pregnant women in Tomohon city, (c) bringing hazardous substance to pregnant woman and her fetus (provide information on consequences of SHS as BCTs), (d) health risks for pregnant women and fetus (susceptibility in HBM), (e) detrimental characteristics of smoke, (f) benefits of preventing SHS (benefit in HBM), (g) barriers to preventing SHS (barriers of preventing), and (h) several levels of countermeasures to barriers and preventing SHS in the home (facilitate action planning, development plan, and facilitate goal setting in BCTs). "Health-related information, motivation, and behavior skills are fundamental determinants of performance of health behaviors" (Fisher, Fisher, & Harman, 2003, p. 84). By applying these behavior change techniques, this cultural appropriate educational comic booklet might be able to inform specific action plans for avoiding SHS at home (*behavior skills*) with *health-related information* (e.g., explanation of SHS, consequences of SHS, and risk for pregnant women and fetus), and motivation (e.g., describing benefits of SHS minus barriers of SHS), then pregnant women and their husband had behavior changes.

Generalizability (external validity, applicability)

Rothwell (2005) stated that, "RCTs' are the most reliable methods of determining the effects of treatment. However, the external validity is often poor because definable group patients in a particular setting" (p. 82). This study also invited definable pregnant women and their husbands. We supposed that this study result could apply to following targets: (a) adult couple (non-smoking pregnant women, and smoking husband living together), and (b) all pregnant women during health education because the effect of comic booklet's contents

is not harmful for high-risk pregnant women. The comic intervention is also effective when the comics are accepted by children as well as adults.

Limitations and Future Studies

There were several limitations that threatened this study's outcomes. First, couples in the control group did not receive a placebo-like intervention in addition to the usual care, which might have affected the follow-up rate: losing 30 couples (21%) from the experimental group and 42 couples (28%) from the control group. Second, only pregnant women's and husband s' behavior changes as outcomes were confirmed. However, other planned outcomes were for (a) fetuses' (birth weight, height, gestation age at delivery and baby's gender), which we intended to gather as outcome as described in our research protocol, and (b) future disease risks (e.g., risk of respiratory disease by age five) were not available in this study because we could not reach each health centers under the restrictions to prevent the spread of COVID 19. Third, the sample size was smaller than the targeted original number (404 including experimental group and control group) because of the spread of COVID-19 in Indonesia since February 2020. Fourth, in the experimental group, only around 15% of husbands read the educational comic completely and about 25.7% of husbands read partly at the baseline. Moreover, at baseline and three months' post-intervention, even if husbands belonging to the control group and did not received the educational comic and sticker, they still selected "read the educational comic completely or partly". It is quite likely that they read other things, such as the pictures in the maternal and child health handbook, instead of the intervention comic book, and mistakenly answered

yes to the question as to whether they read the intervention comic book. Therefore, we did not analyze the changes of baseline to post intervention, and analyzed post-intervention effects only in our analysis. Fifth, in the future we will conduct a factor analysis for examining the reliability and validity of the self- and peer-evaluation questionnaires at baseline and three months' post-intervention for the primary outcomes (scores of their husbands' smoking behavior change), and secondary outcomes (scores of health beliefs) which were developed by the researcher for this study. Unfortunately, this study could not confirm strong linkages between couple's behavior change for preventing SHS of pregnant women and their beliefs. Therefore, we will analyze the effectiveness of couple intervention in the future follow up study. In the further analysis, we will check correlations between couples' behavior and the four beliefs of HBM using multiple regressions models. In the future study, we plan to collect the data of the fetus (e.g., birth weight, height, gestation age at delivery and baby's gender). Moreover, further study should confirm the reasons why the educational comics and sticker only led to husbands' behavior changes, and did not lead to behavior changes for couples. Moreover, we investigated effectiveness of the comic intervention for pregnant women's and husbands' behavior changes. As a future investigation, effects on the fetus (e.g., birth weight, height, gestation age at delivery and baby's gender), and future disease risks (e.g. risk of respiratory disease by age five) should be confirmed over time.

Despite the above mentioned limitations, this RCT provides initial quantitative results for preventing SHS for pregnant women at home. The authors hope that

policymakers and medical personnel will use the interventions for reducing pregnant women's and fetus SHS exposure in Indonesia. Returning the results of research to the society in research fields include three future activities: 1) Distribute printed comic booklets to health facilities for pregnant women in the future; 2) Explain how to use comic booklet as health education to health workers who take care pregnant women and 3) Recommend that the educational comic booklet with the sticker should be provided with maternal and child book to heads of health offices. When using the paper-based comic during COVID-19 mitigation efforts, we have to change the medium of distribution from paper base to using Internet devices (e.g. online distribution, web distribution, and video distribution and so on) to conform to social distancing requirements.

CONCLUSIONS

A HBM based educational comic booklet with a sticker was directly and trifling effective in SHS prevention by several cues to actions through hidden knowledge, perceptions including disease susceptibility, disease severity, benefit, and self-efficacy. For resolving small effect size, we have to address barriers to preventing SHS exposure such as risk of losing social relations. This RCT study can be generalized for (a) adult couples (non-smoking pregnant women, and smoking husbands living together), and (b) all pregnant women during health education. The comic interventions are also effective when children as well as adults accept the comics.

In this study, we investigated the effectiveness of the comic intervention for pregnant women's and husbands' behavior changes. For future investigations, the effects on the fetus (e.g., birth weight, height, gestation age at delivery and baby's gender), and the future disease risks (e.g., risk of respiratory disease by age five) should be confirmed.

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Table of Contents (Appendix)

Appendix A. Ethical approval letter from Sam Ratulangi University

KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI
UNIVERSITAS SAM RATULANGI
Kampus UNSRAT, Bahu, Manado 95115 - Telp. 0431-863886, Fax. 822568
Laman: www.unsrat.ac.id - Surel: rektorat@unsrat.ac.id

September 17, 2018

ETHICAL APPROVAL
Reff. No.: 7383/UN12/LL/2018

On behalf of Rector of Sam Ratulangi University, I hereby declare this certificate for approving the research-mentioned below after the study proposal was thoroughly reviewed from the ethical point of view:

Title: **Effectiveness of Promoting Smoke-free Homes in Pregnancy Using Educational Comic in Indonesia**

Principle investigator:
Name : **Kimiko Inaoka**
Nationality : Japan
Affiliation : St. Luke's International University, Tokyo, Japan

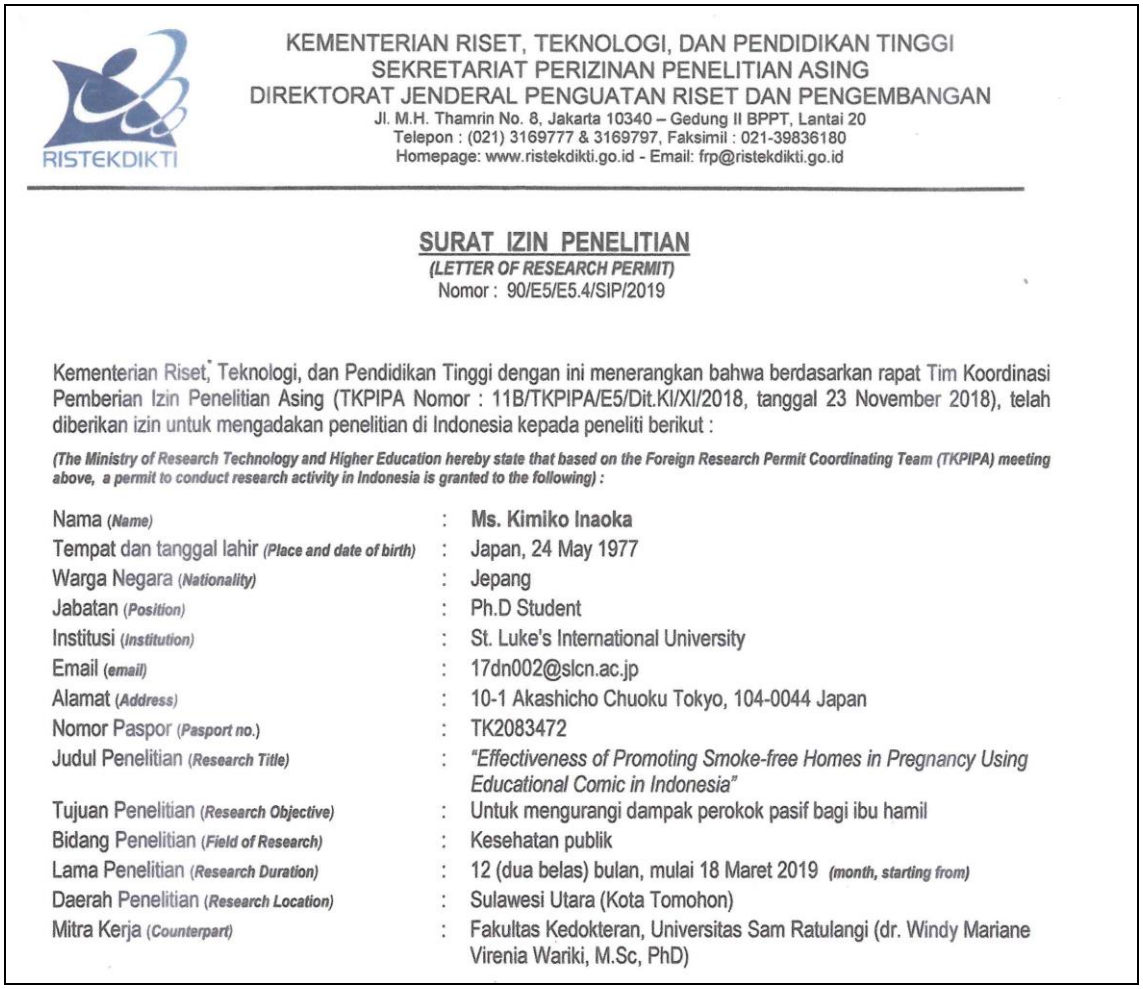
Research Team:
1. Erika Ota, PhD, Professor
   Graduate School of Nursing Science, St. Luke's International University, Tokyo, Japan
2. Windy Mariane Virenia Wariki, PhD, Lecturer
   Faculty of Medicine, Sam Ratulangi University, North Sulawesi, Indonesia

As a collaboration research, the following forms of cooperation will be pursued to promote contact and understanding:
1. Sam Ratulangi University will provide the study site and research assistants, and St. Luke's International University will provide the study design/research proposal and analyze the data.
2. Authorship of publication of this research will decide on the basis of contribution in study design, study searches, data analysis and writing of the manuscript.
3. This certificate is subject to review every two years.

Sincerely,

Prof. dr. Jimmy Posangi, M.Sc, Ph.D, SpFK
Vice Rector for Academic Affairs

Appendix B. Research permission (Indonesian government)



KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI
SEKRETARIAT PERIZINAN PENELITIAN ASING
DIREKTORAT JENDERAL PENGUATAN RISET DAN PENGEMBANGAN
Jl. M.H. Thamrin No. 8, Jakarta 10340 – Gedung II BPPT, Lantai 20
Telepon : (021) 3169777 & 3169797, Faksimil : 021-39836180
Homepage: www.ristekdikti.go.id - Email: frp@ristekdikti.go.id

RISTEKDIKTI

SURAT IZIN PENELITIAN
(LETTER OF RESEARCH PERMIT)
Nomor : 90/E5/E5.4/SIP/2019

Kementerian Riset, Teknologi, dan Pendidikan Tinggi dengan ini menerangkan bahwa berdasarkan rapat Tim Koordinasi Pemberian Izin Penelitian Asing (TKPIPA Nomor : 11B/TKPIPA/E5/Dit.KI/XI/2018, tanggal 23 November 2018), telah diberikan izin untuk mengadakan penelitian di Indonesia kepada peneliti berikut :

(The Ministry of Research Technology and Higher Education hereby state that based on the Foreign Research Permit Coordinating Team (TKPIPA) meeting above, a permit to conduct research activity in Indonesia is granted to the following) :

Nama *(Name)*	:	**Ms. Kimiko Inaoka**
Tempat dan tanggal lahir *(Place and date of birth)*	:	Japan, 24 May 1977
Warga Negara *(Nationality)*	:	Jepang
Jabatan *(Position)*	:	Ph.D Student
Institusi *(Institution)*	:	St. Luke's International University
Email *(email)*	:	17dn002@slcn.ac.jp
Alamat *(Address)*	:	10-1 Akashicho Chuoku Tokyo, 104-0044 Japan
Nomor Paspor *(Pasport no.)*	:	TK2083472
Judul Penelitian *(Research Title)*	:	*"Effectiveness of Promoting Smoke-free Homes in Pregnancy Using Educational Comic in Indonesia"*
Tujuan Penelitian *(Research Objective)*	:	Untuk mengurangi dampak perokok pasif bagi ibu hamil
Bidang Penelitian *(Field of Research)*	:	Kesehatan publik
Lama Penelitian *(Research Duration)*	:	12 (dua belas) bulan, mulai 18 Maret 2019 *(month, starting from)*
Daerah Penelitian *(Research Location)*	:	Sulawesi Utara (Kota Tomohon)
Mitra Kerja *(Counterpart)*	:	Fakultas Kedokteran, Universitas Sam Ratulangi (dr. Windy Mariane Virenia Wariki, M.Sc, PhD)

Appendix C. Research permission (Manado city)

PEMERINTAH KOTA MANADO
BADAN KESATUAN BANGSA, POLITIK
DAN PERLINDUNGAN MASYARAKAT
Jalan Balai Kota No. 1 Tikala Ares Manado.

REKOMENDASI

Nomor : B.05/BKBP-LINMAS/Rek-P/382/VIII/2019

Membaca : Surat dari Lembaga Penelitian Dan Pengabdian Kepada Masyarakat (UNSRAT), Nomor : 122/UN12.13/LT/2019 Tanggal : 13 Maret 2019 , Perihal : Permohonan Melaksanakan Penelitian.

Mengingat :

1. Undang-Undang No. 23 Tahun 2014 tentang Pemerintahan Daerah sebagaimana telah diubah beberapa kali terakhir dengan Undang-Undang No. 9 Tahun 2015 tentang perubahan Kedua atas Undang-Undang No. 23 Tahun 2014 tentang Pemerintahan Daerah.
2. Peraturan Menteri Dalam Negeri No. 7 Tahun 2014 tentang Perubahan Atas Peraturan Menteri dalam Negeri Republik Indonesia Nomor 64 Tahun 2011 tentang Pedoman Penerbitan Rekomendasi Penelitian.
3. Peraturan Daerah Kota Manado No. 2 Tahun 2016 tentang Pembentukan dan Susunan Perangkat Daerah Kota Manado.
4. Peraturan Walikota Manado Nomor 63 Tahun 2017 tentang Kedudukan, Susunan Organisasi, Tugas Dan Fungsi serta Tata Kerja Badan Kesatuan Bangsa, Politik dan Perlindungan Masyarakat.

Merekomendasikan Bahwa:

Nama – Nama Terlampir

Untuk melakukan Penelitian Dengan Judul :" ***Dampak Paparan Asap Rokok Selama Kehamilan Terhadap Risiko Kejadian Bayi Lahir Mati, Bayi Berat Lahir Rendah Dan Kelahiran Prematur di Sulawesi Utara".***

Lokasi : Puskesmas Di Kota Manado
Waktu (Lamanya) : 19 Agustus – 19 November 2019
Penanggung Jawab : dr. Windy M.V. Wariki, MSc,PhD

Demikian Rekomendasi Penelitian ini diberikan kepada yang bersangkutan dengan ketentuan sebagai berikut :

1. Menjaga keamanan dan ketertiban serta menghormati tata tertib yang berlaku selama mengadakan penelitian.
2. Tidak dibenarkan melaksanakan kegiatan menyimpang dari maksud diatas.
3. Selesai mengadakan penelitian agar melapor kembali dan menyerahkan hasil penelitian secara tertulis pada Badan Kesbang, Politik dan Linmas Kota Manado.
4. Kepada Pejabat yang berwenang kiranya dapat memberikan bantuan seperlunya.
5. Rekomendasi penelitian ini akan dicabut dan dinyatakan tidak berlaku lagi, apabila ternyata pemengang surat rekomendasi penelitian ini tidak mentaati / mengindahkan ketentuan tersebut diatas.

Dikeluarkan : di Manado
Pada tanggal : 21 Agustus 2019

KEPALA BADAN KESBANG POLITIK DAN LINMAS
KOTA MANADO

Drs. HANNY D. SOLANG
PEMBINA UTAMA MUDA
NIP. 19671208 199401 1 001

Tembusan Yth. :
1. Walikota Manado

PEMERINTAH KOTA MANADO
BADAN KESATUAN BANGSA, POLITIK
DAN PERLINDUNGAN MASYARAKAT
Jalan Balai Kota No. 1 Tikala Ares Manado.

REKOMENDASI

Nomor : B.05/BKBP-LINMAS/Rek-P/ 126 /VIII/2020

Membaca : Sura dari St. Luke's International University., Tanggal 13 Juli 2020. Perihal : Permohonan Izin Penelitian.

Mengingat :
1. Undang-Undang No. 23 Tahun 2014 tentang Pemerintahan Daerah sebagaimana telah diubah beberapa kali terakhir dengan Undang-Undang No. 9 Tahun 2015 tentang perubahan Kedua atas Undang-Undang No. 23 Tahun 2014 tentang Pemerintahan Daerah.
2. Peraturan Menteri Dalam Negeri No. 7 Tahun 2014 tentang Perubahan Atas Peraturan Menteri dalam Negeri Republik Indonesia Nomor 64 Tahun 2011 tentang Pedoman Penerbitan Rekomendasi Penelitian.
3. Peraturan Daerah Kota Manado No. 2 Tahun 2016 tentang Pembentukan dan susunan Perangkat Daerah Kota Manado.
4. Peraturan Walikota Manado Nomor 63 Tahun 2017 tentang Kedudukan, Susunan Organisasi, Tugas Dan Fungsi serta Tata Kerja Badan Kesatuan Bangsa, Politik dan Perlindungan Masyarakat.

Merekomendasikan Bahwa:

Nama – Nama Terlampir

Untuk melaksanakan Penelitian dengan Judul :***"Evektifitas Mencegah Perokok Pasif bagi Wanita Hamil di Rumah Menggunakan Komik Pendidikan di Indonesia: Uji Coba Terkendali Secara Acak"***

Lokasi : Puskesmas di Kota Manado
Waktu (Lamanya) : 13 Agustus 2020 – 13 November 2020
Penanggung Jawab : **Dr. dr. Windy M. V. Wariki**

Demikian Rekomendasi Penelitian ini diberikan kepada yang bersangkutan dengan ketentuan sebagai berikut :
1. Menjaga keamanan dan ketertiban serta menghormati tata tertib yang berlaku selama mengadakan penelitian.
2. Tidak dibenarkan melaksanakan kegiatan menyimpang dari maksud diatas.
3. Selesai mengadakan penelitian agar melapor kembali dan menyerahkan hasil penelitian secara tertulis pada Badan Kesbang, Politik dan Linmas Kota Manado.
4. Kepada Pejabat yang berwenang kiranya dapat memberikan bantuan seperlunya.
5. Rekomendasi penelitian ini akan dicabut dan dinyatakan tidak berlaku lagi, apabila ternyata pemengang surat rekomendasi penelitian ini tidak mentaati / mengindahkan ketentuan tersebut diatas.

Dikeluarkan : di Manado
Pada tanggal : 13 Agustus 2020

KEPALA BADAN KESBANG POLITIK DAN LINMAS
KOTA MANADO

BADAN KESATUAN BANGSA POLITIK DAN PERLINDUNGAN MASYARAKAT

Drs. HANNY D. SOLANG
PEMBINA UTAMA MUDA
NIP. 19671208 199401 1 001

Tembusan Yth. :
1. Walikota Manado
2. Wakil Walikota manado
3. Sekretarias Daerah Kota Manado
4. Camat dan Lurah Setempat
5. Yang bersangkutan

Appendix D. Research permission (Tomohon city)

PEMERINTAH KOTA TOMOHON

DINAS KESEHATANDAERAH

Alamat : Kompleks Pekantoran Pemerintah KotaTomohon Kel. Woloan II Kecamatan Tomohon Barat 95422

Email : dinkestomohon@yahoo.com dinkes@tomohon.go.id website;tomohon.go.id

REKOMENDASI

No : 440/Dinkes/III/335

Yang bertanda tangan dibawah ini :

Nama	: dr. Deesje V. Liuw, M.Biomed
NIP	: 19610521 199011 2 001
Pangkat/Gol.Ruang	: Pembina Utama Muda, IV/c
Jabatan	: Kepala Dinas Kesehatan Daerah Kota Tomohon

Dengan ini merekomendasikan kepada :

Nama	: Kimiko Inaoka
Jurusan	: Mahasiswa Program Doktor
	St.Luke"s International University, Tokyo, Jepang

Untuk melakukan Penelitian Bidang Ilmu Kesehatan dengan Judul " Effectiveness of Promoting Smoke-free Homes in Pregnancy Using Educational Comic In Indonesia " di Puskesmas Se Kota Tomohon Selama 12 (Dua Belas) Bulan terhitung Mulai bulan Maret 2019.

Demikian surat rekomendasi ini dibuat, untuk dipergunakan sebagaimana mestinya.

Tomohon, 27 Maret 2019

KEPALA DINAS KESEHATAN DAERAH
KOTA TOMOHON

dr. DEESJE V. LIUW, M.Biomed
PEMBINA UTAMA MUDA
NIP. 19610521 199011 2 001

Appendix E. Approval letter on research collaboration from Sam Ratulangi University

KEMENTERIAN RISET, TEKNOLOGI DAN PENDIDIKAN TINGGI
UNIVERSITAS SAM RATULANGI
FAKULTAS KEDOKTERAN
(Faculty Of Medicine Sam Ratulangi University)
Jalan Kampus UNSRAT Kode Pos 95115 Manado,
Email : kedokteran@unsrat.ac.id Laman: www.unsrat.ac.id

Nomor : 1588 /UN12.1.1/LT/2018
Lampiran : Proposal dan CV
Hal : Kesediaan menjadi mitra kerja penelitian Kimiko Inaoka

Yth.
Direktur Pengelolaan Kekayaan Intelektual
Selaku Sekretaris TKPIPA
Kementerian Riset, Teknologi dan Pendidikan Tinggi
Republik Indonesia

Bersama ini dengan hormat kami memberitahukan Fakultas Kedokteran Universitas Sam Ratulangi bersedia menjadi mitra kerja penelitian dengan:

Nama	: Kimiko Inaoka
Fakultas/Jurusan	: Graduate School of Nursing Science, St. Luke's International University, Japan
Judul Penelitian	: Effectiveness of Promoting Smoke-free Homes in Pregnancy Using Educational Comic in Indonesia
Bidang Penelitian	: Kesehatan
Lokasi	: Sulawesi Utara
Waktu Penelitian	: Januari 2019 – Juni 2020

Fakultas Kedokteran Universitas Sam Ratulangi akan bertanggung jawab terhadap segi teknis ilmiah atas pelaksanaan kegiatan penelitian Ms. Inaoka untuk itu kami menunjuk yang disebut di bawah ini sebagai spesifik counterpart.

Nama	: dr. Windy Mariane Virenia Wariki, MSc, PhD
Jabatan	: Lektor
Fakultas/Jurusan	: Kedokteran/Pendidikan Dokter
Email	: wwariki@unsrat.ac.id; wwariki@gmail.com

Atas perhatian dan kerjasama yang diberikan, kami ucapkan terima kasih.

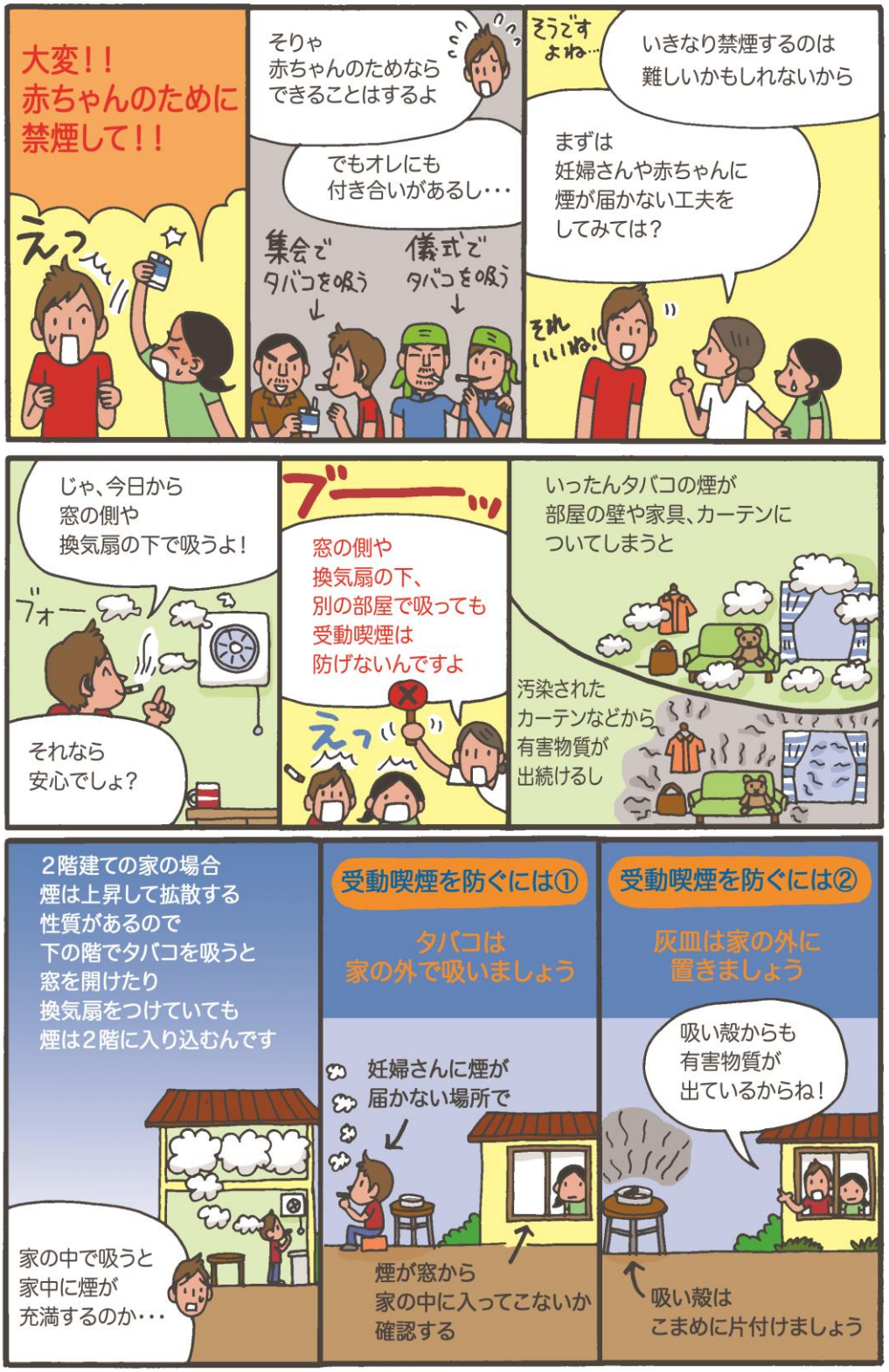
Manado, 17 September 2018
Dekan

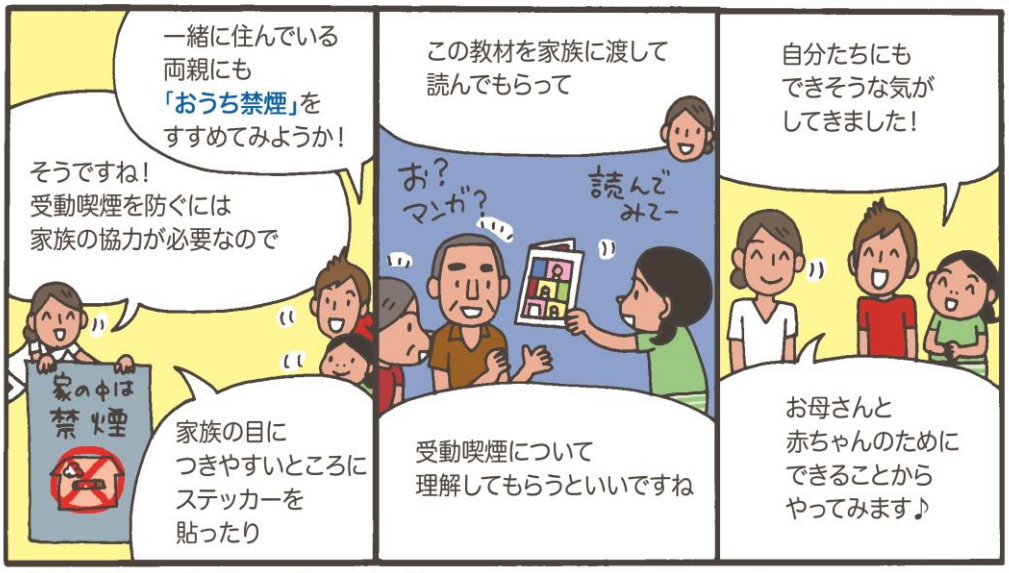
Prof. Dr. dr. Adrian Umboh, SpA(K)
NIP. 195808261987031003

Appendix F: Educational comic booklet (Japanese version)

※低出生体重児・・・生まれた時の体重が2500g未満の赤ちゃん
※早産・・・22週以降37週未満の間の出産

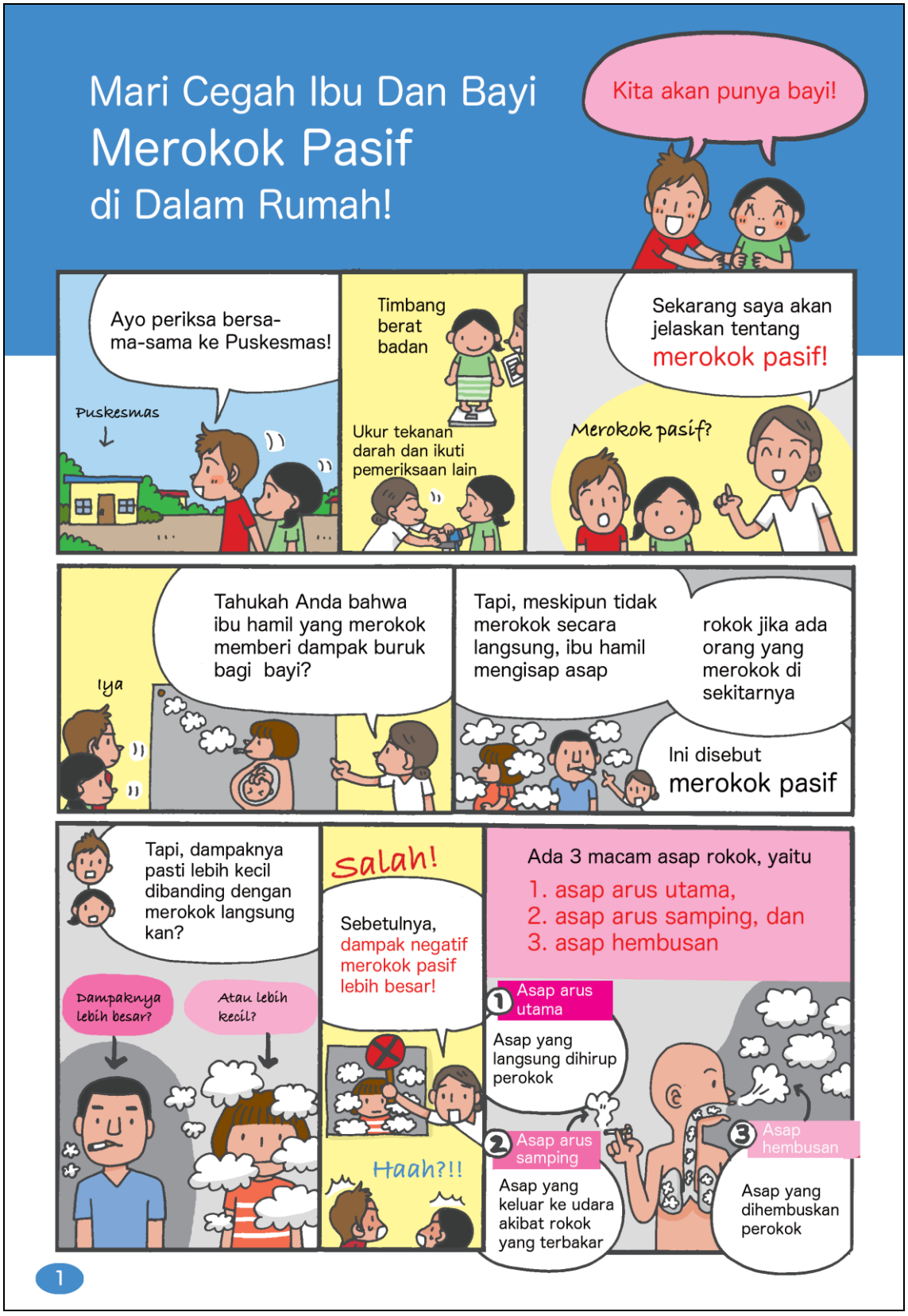
2


大変!!
赤ちゃんのために
禁煙して!!
えっ
そりゃ
赤ちゃんのためなら
できることはするよ
でもオレにも
付き合いがあるし・・・
集会で
タバコを吸う
儀式で
タバコを吸う
そうですよね…
いきなり禁煙するのは
難しいかもしれないから
まずは
妊婦さんや赤ちゃんに
煙が届かない工夫を
してみては?
それいいね!
じゃ、今日から
窓の側や
換気扇の下で吸うよ!
フォー
それなら
安心でしょ?
ブーーッ
窓の側や
換気扇の下、
別の部屋で吸っても
受動喫煙は
防げないんですよ
えっ
いったんタバコの煙が
部屋の壁や家具、カーテンに
ついてしまうと
汚染された
カーテンなどから
有害物質が
出続けるし
2階建ての家の場合
煙は上昇して拡散する
性質があるので
下の階でタバコを吸うと
窓を開けたり
換気扇をつけていても
煙は2階に入り込むんです
家の中で吸うと
家中に煙が
充満するのか・・・
受動喫煙を防ぐには①
タバコは
家の外で吸いましょう
妊婦さんに煙が
届かない場所で
煙が窓から
家の中に入ってこないか
確認する
受動喫煙を防ぐには②
灰皿は家の外に
置きましょう
吸い殻からも
有害物質が
出ているからね!
吸い殻は
こまめに片付けましょう
3

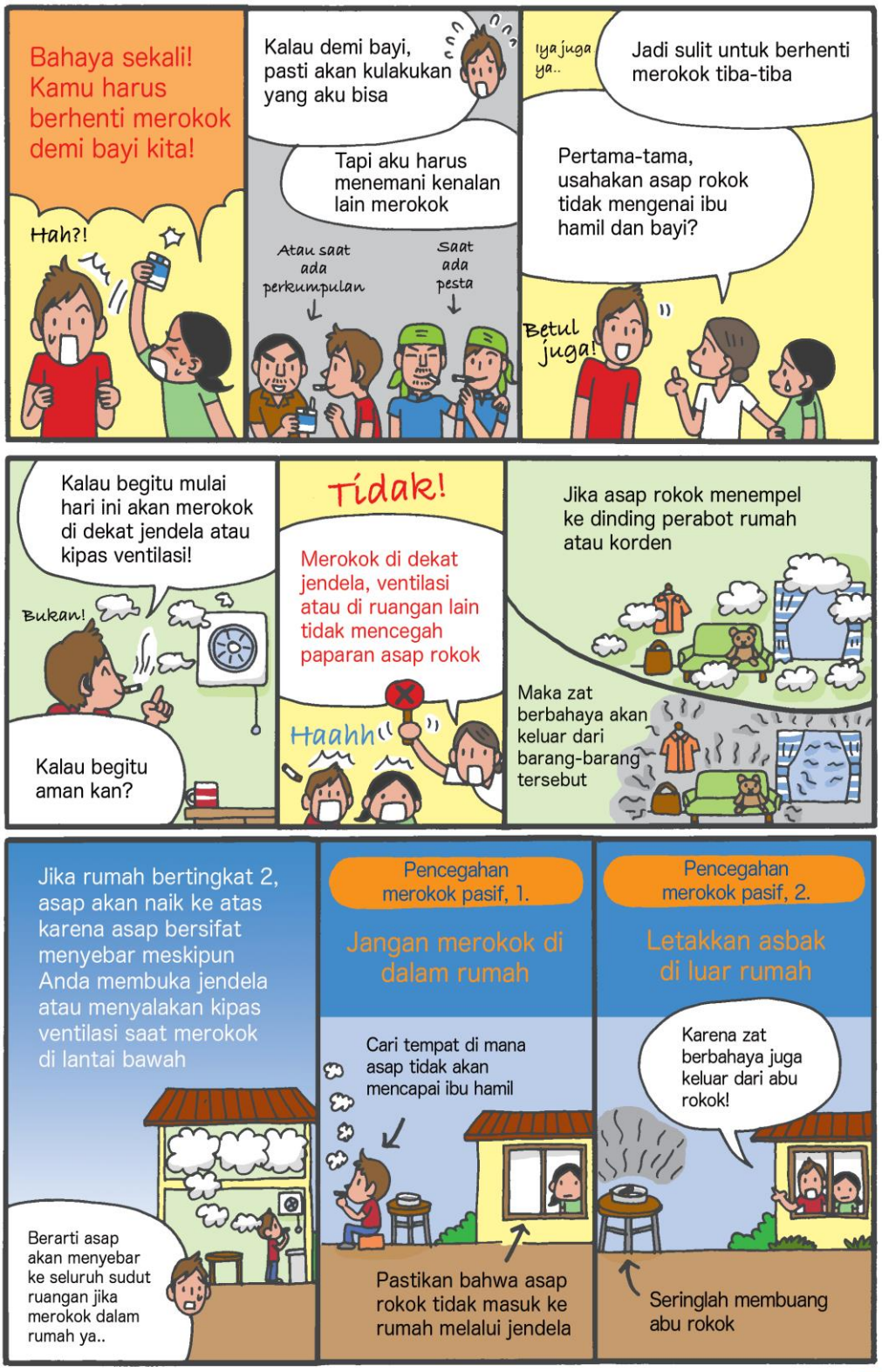


監修：稲岡希美子・大田えりか　漫画：井上きみどり

Appendix F: Educational comic booklet (Indonesian version)




*Nikotin, tar, karbon monoksida: Zat berbahaya bagi tubuh
Asap arus samping mengandung zat berbahaya berkali-kali lipat dibanding asap arus utama
Nikotin
Tar
Karbon monoksida
waah
Jadi asap yang keluar ke udara lebih berbahaya daripada asap yang dihirup langsung ya?
Wah, saya baru pertama kali dengar ini!
Apa yang terjadi pada bayi jika saya menghirup asap dengan zat berbahaya tersebut?
1. Jika ibu hamil menghirup asap rokok
2. Zat berbahaya seperti nikotin, karbon monoksida dll. akan masuk ke tubuh ibu hamil
Karbon monoksida
Nikotin
3. Nikotin akan menyempitkan pembuluh darah tubuh termasuk pembuluh darah ke pusar bayi
4. Karbon monoksida akan menghambat penyaluran oksigen di dalam tubuh
5. Sehingga bayi akan kekurangan oksigen dan gizi
Akibatnya, dibanding ibu dan bayi yang tidak terpapar asap rokok pasif, pada ibu dan bayi yang terpapar akan ada kemungkinan muncul dampak seperti berikut.
Bayi dengan berat lahir rendah
+77%
Risiko akan bertambah
Kelahiran prematur
+18%
Cacat dari lahir
+13%
Bayi lahir mati
+23%
Sebetulnya, lebih dari 70% ibu hamil merokok pasif karena terpapar di dalam rumah!
Wah, berarti saya juga merokok pasif?!
2
*Bayi dengan berat lahir rendah: Bayi dengan berat lahir kurang dari 2.500 gram
*Kelahiran prematur: Kelahiran antara minggu ke-22 hingga 36


Bahaya sekali! Kamu harus berhenti merokok demi bayi kita!
Hah?!
Kalau demi bayi, pasti akan kulakukan yang aku bisa
Tapi aku harus menemani kenalan lain merokok
Atau saat ada perkumpulan
Saat ada pesta
Iya juga ya..
Jadi sulit untuk berhenti merokok tiba-tiba
Pertama-tama, usahakan asap rokok tidak mengenai ibu hamil dan bayi?
Betul juga!
Kalau begitu mulai hari ini akan merokok di dekat jendela atau kipas ventilasi!
Bukan!
Kalau begitu aman kan?
Tidak!
Merokok di dekat jendela, ventilasi atau di ruangan lain tidak mencegah paparan asap rokok
Haahh
Jika asap rokok menempel ke dinding perabot rumah atau korden
Maka zat berbahaya akan keluar dari barang-barang tersebut
Jika rumah bertingkat 2, asap akan naik ke atas karena asap bersifat menyebar meskipun Anda membuka jendela atau menyalakan kipas ventilasi saat merokok di lantai bawah
Berarti asap akan menyebar ke seluruh sudut ruangan jika merokok dalam rumah ya..
Pencegahan merokok pasif, 1.
Jangan merokok di dalam rumah
Cari tempat di mana asap tidak akan mencapai ibu hamil
Pastikan bahwa asap rokok tidak masuk ke rumah melalui jendela
Pencegahan merokok pasif, 2.
Letakkan asbak di luar rumah
Karena zat berbahaya juga keluar dari abu rokok!
Seringlah membuang abu rokok
3

Komik: Kimidori Inoue Materi: Kimiko Inaoka/Prof. Erika Ota
(St. Luke International University)

Appendix G. Request form to participants (English version)

To Participant :

REQUEST FORM

I am a doctoral student at St Luke's International University, Japan. I am going to study the: "Effectiveness of Preventing Second-hand Smoke for Pregnant Women at Home Using an Educational Comic booklet in Indonesia: A Randomized Controlled Trial". I invite you to participate in this questionnaire survey as representative couples. The Purpose of this study is determination of the effectiveness of promoting smoke-free home in pregnancy using educational comic in Indonesia in order to reduce secondhand smoke exposure in pregnancy. The research has been carried out with the permission of the ethical review in St Luke's International University, Japan and Sam Ratulangi University, Inodnesia.

Expected benefits and risks of this research:

1) You can contribute to reduce secondhand smoke exposure for Indonesian pregnant women with your great participation indirectly.
2) There is no adverse event, any unfavorable or unintended injury, and illness to you.
3) If you have any concern, you can contact a person, Dr.Windy in University of Sam Ratulangi who will support you.

Inclusion criteria:

There are following inclusion criteria for pregnant women.

1) 18 years of age or older
2) Non-smoking pregnant women in their first-trimester pregnancy: up to 12 weeks gestation
3) Having second-hand smoke exposure from their husband (19 years of age or older)
4) Living with husband

There are following inclusion criteria for pregnant women's husband

1) 19 years of age or older
2) Smoking at least six cigarettes per week or more within two months before or since pregnancy
3) Living with wife

Exclusion criteria:

There are following exclusion criteria for pregnant women.

1) Pregnant women after the second trimester pregnancy
2) Active smoking pregnant women
3) High risk pregnant women having clinical diseases, gestational diabetes, pregnancy-induced hypertension or suffering from mental disorders

Research terms:

After getting the approval letter from ethical committee in St'Lukes ～30th June, 2022

Request: In pregnancy, please participate following things:

1) At first meeting, please answer the 66 items questionnaire for pregnant women. It will take about 20-30 min. Please answer the 52 items questionnaire for husband. It will take about 20-30 min.
2) A researcher allocate all participants into two groups (Intervention group and control group) randomly using computer random number generator. If you will be allocated into Intervention group, please read educational material and item which you receive. Do not share and give these materials to people other than family. Now we are not sure whether you will be allocated into intervention group or control group. If you will be allocated into control group, there is no activities.
3) Three month later from first meeting, please answer the 66 items questionnaire for pregnant women. It will take about 20-30 min. Please answer the 52 items questionnaire for husband. It will take about 20-30 min.
4) Birth-weight, gestation age, and sex will be gathered via record in health centers and health post where you will give birth by some research assistants.

Ethical issues of concern:

1) **Voluntary participation**: Participation is with your free will and you are free to quit at any time. You will not have any negative influence even if you do not consent to participate.
2) **Protecting privacy**: The questionnaire survey will be answered in a room and submit it back with a sealed envelope to a research assistant. The information you provide will be treated anonymously and only for the purpose of this study. The results of this study may be published, but your anonymity will be protected.
3) **Data security**: The written data will be securely stored in a locked cabinet. All data will be destroyed after five years after the study completes.

4) **Information provision**: You can request and obtain or read the research protocol and documents concerning method of the research, to the extent it does not interfere the protection of personal information of other research participants, and securing of originality of the study.
5) **Publication**: The results of this research will intend to be published as doctoral dissertation and academic papers.
6) **Conflicts of interest**: This research does not meet the certain requirements of the conflicts of interest.

Incentive:
A small Japanese present (candies) will be given to you after questionnaire participation.
If you have any question or concern about this study, please let us know.

Sincerely yours,

KIMIKO INAOKA, MSN, RN
Doctoral Student of Global Health Nursing, St Luke's International University, Japan
Address: 10-1 Akashi-cho Chuo-ku, Tokyo, 104-0044, Japan
Email:17dn002@slcn.ac.jp
Supervisor: Prof. Erica Ota, Ph.D., R.N.M.

Contact Person:
Dr.Windy M.V.Wariki
University of Sam Ratulangi,
Kampus UNSRAT Manado 95115, Sulawesi Utara,Indonesia.
Tel:0431-863886
Fax:0431-822568

Appendix H. Request form to participants in intervention group (Indonesian version)

Kepada partisipan

LEMBAR PERMOHONAN

Saya adalah mahasiswa S3 St Luke's International University, Jepang. Saya mengadakan penelitian berjudul: "Efektivitas Pencegahan Merokok Pasif pada Wanita Hamil dalam Rumah Menggunakan Komik Edukasi di Indonesia: Randomized Controlled Trial". Saya mengundang Anda dan pasangan/suami sebagai perwakilan untuk berpartisipasi dalam survei menggunakan kuesioner.

Tujuan penelitian ini adalah untuk mengukur efektivitas kegiatan promosi rumah bebas asap rokok menggunakan media komik di Indonesia untuk mengurangi paparan rokok pasif selama masa kehamilan. Penelitian ini dilaksanakan dengan izin dari komite etik St. Luke Internasional University, Japan dan Universitas Sam Ratulangi.

Keuntungan dan risiko dari penelitian ini:

1) Secara tidak langsung, Anda dapat berkontribusi dalam mengurangi paparan asap rokok pasif bagi wanita hamil di Indonesia melalui partisipasi dalam penelitian ini.
2) Tidak ada bahaya fisik apa pun yang akan Anda alami karena partisipasi dalam penelitian ini.
3) Jika Anda mempunyai pertanyaan, Anda dapat menghubungi dr. Windy dari Universitas Sam Ratulangi yang akan membantu Anda.

Periode Penelitian:

Setelah mendapat surat izin dari Komite Etik St. Luke International University sampai 30 Juni 2022.

Permohonan: Mohon mengikuti petunjuk berikut selama kehamilan.

1) Saat pertemuan pertama, jawablah 66 nomor dari kuesioner yang akan dibagikan untuk ibu hamil. Pengisian memerlukan 20-30 menit. Jawablah 52 nomor dari kuesioner untuk suami. Pengisian memerlukan 20-30 menit.
2) Bacalah komik edukasi dan gunakan stiker yang Anda terima. Jangan membagikan atau memberikan barang-barang ini ke orang selain keluarga Anda.
3) 3 bulan setelah pertemuan pertama, jawablah 66 nomor dari kuesioner yang akan dibagikan untuk ibu hamil. Pengisian memerlukan 20-30 menit. Jawablah 52 nomor dari kuesioner untuk suami. Pengisian memerlukan 20-30 menit.

4) Informasi berat lahir, umur kehamilan, dan jenis kelamin akan dikumpulkan oleh staf penelitian dari catatan di Puskesmas dan Posyandu di mana Anda melahirkan.

Kode etik dalam penelitian:

1) Partisipasi sukarela: Partisipasi berdasarkan kehendak bebas partisipan dan Anda berhak mengundurkan diri kapan saja. Anda tidak akan mendapat dampak negatif meskipun tidak menyetujui partisipasi.
2) Perlindungan privasi: Kuesioner akan dijawab dalam ruangan dan dikumpulkan ke staf penelitian dalam amplop tertutup. Informasi yang diberikan peserta akan tersimpan anonim dan digunakan hanya untuk keperluan penelitian ini. Hasil penelitian akan dipublikasikan, tetapi data Anda akan terjaga tanpa nama.
3) Keamanan data: Data tertulis akan tersimpan di ruangan terkunci. Semua data akan dimusnahkan 3 tahun setelah penelitian selesai.
4) Penyediaan informasi: Anda dapat meminta informasi atau membaca protokol dan dokumen lainnya berkenaan dengan metode penelitian sejauh hal tersebut tidak melanggar penjagaan informasi pribadi partisipan lain atau orisinalitas penelitian.

Insentif:

Suvenir kecil dari Jepang akan diberikan kepada partisipan setelah menyelesaikan kuesioner. Silakan hubungi kami jika Anda memiliki pertanyaan mengenai penelitian ini.

Hormat saya,

KIMIKO INAOKA, MSN, RN
Doctoral Student of Global Health Nursing, St Luke's International University, Japan
Alamat : 10-1 Akashi-cho Chuo-ku, Tokyo, 104-0044, Japan
Email : 17dn002@slcn.ac.jp
Supervisor: Prof. Erica Ota, Ph.D., R.N.M.

Contact Person:
Dr. Windy M. V. Wariki
Universitas Sam Ratulangi,
Kampus UNSRAT Manado 95115, Sulawesi Utara, Indonesia.
Tel : 0431-863886
Fax : 0431-822568

Appendix I Consent form (English and Indonesian version)

CONSENT FORM

I have been informed about the "REQUEST FORM" of the study on "Effectiveness of Preventing Second-hand Smoke for Pregnant Women at Home Using an Educational Comic booklet in Indonesia: A Randomized Controlled Trial"

Date: _____, ____

Signature of the participant: _____

Signature of the researcher: _____

Research Ethics Committee,
St. Luke's International University: Approval number: _____
Sam Ratulangi University: Approval number: 7383/UN12/LL/2018

LEMBAR PERSETUJUAN

Saya telah mendapat penjelasan menggunakan "LEMBAR PERMOHONAN" mengenai penelitian berjudul "Efektivitas Pencegahan Merokok Pasif pada Wanita Hamil dalam Rumah Menggunakan Komik Edukasi di Indonesia: *Randomized Controlled Trial*"

Tanggal: _____, _____

Tanda tangan partisipan : _____

Tanda tangan peneliti : _____

Komite Etik Penelitian,
St. Luke's International University: Nomor persetujuan : _____
Universitas Sam Ratulangi: Nomor persetujuan : 7383/UN12/LL/2018

Contact Person:
Dr.Windy M.V.Wariki
Universitas Sam Ratulangi,
Kampus UNSRAT Manado 95115, Sulawesi Utara,Indonesia.
Tel :0431-863886
Fax :0431-822568

Appendix J. Withdrawal form (English and Indonesian version)

WITHDRAWAL FORM

Although I consented to participate in the study on "Effectiveness of Preventing Second-hand Smoke for Pregnant Women at Home Using an Educational Comic booklet in Indonesia: A Randomized Controlled Trial", I am informing you that I choose to withdraw from this study.

Date:_____,____

Signature of the participant:_____

LEMBAR PEMBATALAN

Walaupun saya telah menyetujui partisipasi dalam penelitian "Efektivitas Pencegahan Merokok Pasif pada Wanita Hamil dalam Rumah Menggunakan Komik Edukasi di Indonesia: *Randomized Controlled Trial*", dengan ini saya memberitahukan bahwa saya membatalkan partisipasi tersebut.

Tanggal:_____,_____

Tanda tangan partisipan:_____

Contact Person:
Dr.Windy M.V.Wariki
Universitas Sam Ratulangi,
Kampus UNSRAT Manado 95115, Sulawesi Utara,Indonesia.
Tel :0431-863886
Fax :0431-822568

Appendix K. Sticker as reminder (Japanese version)

Appendix K. Sticker as reminder (Indonesian version)

Appendix L. Questionnaires on background characteristics (English version)

Research ID: Date: / / / (DD/MM/YY)

Section A.Background Characteristics for pregnant women/ 20 items

Ⅰ.Please tell me about yourself

A1.Age ( )

A2.Ethnicity
1)Minahasan
2)Sangir
3)Mogondow
4)Gorontalo
5)Tinghoa
6)Other

A3.Religion
1)Protestant
2)Catholic
3)Islam
4)Buddhism
5)Hindu
7)Other _____

A4.Marrital status
1)Married
2)Widowed
3)Sepatrated/divorced
4)Single

A5.Living with partner 1)Yes 2)No

A6.Smoking status
1)Never smoked
2)Quit before pregnancy
3)Quit after pregnancy
4)Current smoker

A7.Gestational week _____ weeks

A8.Number of Gestation
1)1
2)2
3)3
4)4 or more

A9.Number of Birth
1)1
2)2
3)3
4)4 or more

A10.Number of children
1)1
2)2
3)3
4)4 or more

A11.Completed level of education
1)Elementary school
2)Junior high school
3)Senior high school
4)University/College

A12.Your occupation during pregnancy
1)Housewife
2)Private employee
3)Government employee
4)Entrepreneur
5)Farmer
6)Labor
7)Other _____

A13.Household earnings
1)Over Rp.2,600,000per month
2)Rp.2,600,000per month or less

A14.Main work place
1)Indoor
2)Outdoor
3)Both

Appendix L (continue)

A15. Frequency of second-hand exposure	1)Dayly 2)Weekly	3)Monthly 4)Less than monthly
A16.Place of second-hand exposure	1)In your home 2)In workplace 3)In a restaurant	4) In public tansportation 5) In a car 6)Other _____
A17.Type of your house	1)Stilt house	2)Flatland house
A18.Type of your household	1)Nuclear family	2)Joint family
A19.Smoke-free home	1)Yes	2)No
A20. Who smoke in your home?	1) Husband 2)Grandfather 3)Grandmother	4)Brothers(yours or your husband's) 5)Sisters(yours or your husband's) 6)Others( )relationship

Section B.Background Characteristics for husband/ 8 items

II .Please tell me about your partner

B1. Age ( )

B2.Ethnicity	1)Minahasan 2)Sangir 3)Mogondow	4)Gorontalo 5)Tinghoa 6)Other
B3.Religion	1)Protestant 2)Catholic 3)Islam	4)Buddhism 5)Hindu 7)Other _____
B4.Completed level of education	1)Elementary school 2)Junior high school	3)Senior high school 4)University/College
B5.Your (husband) occupation	1)Private employee 2)Government employee 3)Entrepreneur	4)Farmer 5)Labor 6)Other _____
B6.Your(husband) smoking status	1)Smoked as usual 2)Smoked less after pregnancy	3)Smoked more after pregnancy

B7.Number of tobaccos smoked _____ /day

B8. Frequency of Smoking in the Home?

1)Dayly	3)Monthly
2)Weekly	4)Less than monthly

Appendix L. Questionnaires on background characteristics (Indonesian version)

ID Penelitian: Tanggal: / / / (DD/MM/YY)

Bagian A. Karakteristik dasar ibu hamil / 20 nomor

I . Informasikan tentang diri Anda

A1. Umur ( )

A2. Etnis
1) Minahasa
2) Sangir
3) Mogondow
4) Gorontalo
5) Tionghoa
6) Lainnya

A3. Agama
1) Kristen Protestan
2) Katolik
3) Islam
4) Budha
5) Hindu
7) Lainnya _____

A4. Status pernikahan
1) Menikah
2) Cerai mati
3) Cerai hidup
4) Belum menikah

A5. Tinggal bersama suami 1) Ya 2) Tidak

A6. Kebiasaan merokok
1) Tidak pernah merokok
2) Berhenti sebelum hamil
3) Berhenti setelah hamil
4) Sekarang merokok

A7. Minggu kehamilan _____ minggu

A8. Sekarang kehamilan ke berapa?
1) 1
2) 2
3) 3
4) 4 atau lebih

A9. Hingga sekarang, sudah berapa l1) 1
2) 2
3) 3
4) 4 atau lebih

A10. Jumlah anak
1) 1
2) 2
3) 3
4) 4 atau lebih

A11. Pendidikan terakhir yang telah
1) SD
2) SMP
3) SMA
4) Perguruan Tinggi

A12. Pekerjaan selama masa kehamilan
1) Ibu rumah tangga
2) Pegawai swasta
3) Pegawai negeri
4) Wiraswasta
5) Petani
6) Buruh
7) Lainnya _____

A13. Pendapatan rumah tangga
1) Lebih dari Rp. 2.600.000 per bulan
2) Rp. 2.600.000 per bulan atau kurang

A14. Tempat kerja utama
1) Di dalam ruangan
2) Di luar ruangan
3) Keduanya

Appendix L (continue/Indonesian version)

A15. Frekuensi paparan asap rokok	1) Setiap hari 2) Setiap minggu	3) Setiap bulan 4) Kurang dari sekali per bulan
A16. Tempat paparan asap rokok	1) Di rumah 2) Di tempat kerja 3) Di restoran/tempat makan	3) Di transportasi umum 4) Di dalam mobil 5) Lainnya _____
A17. Jenis rumah Anda	1) Rumah panggung	2) Rumah berpondasi
A18. Jenis rumah tangga	1) Keluarga inti	2) Keluarga besar/gabungan
A19. Rumah bebas asap rokok	1) Ya	2) Tidak
A20. Siapa yang merokok di rumah	1) Suami 2) Kakek 3) Nenek	4) Saudara laki-laki (Anda/suami) 5) Saudara perempuan (Anda/suami 6) Lainnya: hubungan (

Bagian B. Karakteristik dasar suami / 8 nomor

II. Informasikan tentang suami Anda

B1. Umur	( )	
B2. Etnis	1) Minahasa 2) Sangir 3) Mogondow	4) Gorontalo 5) Tionghoa 6) Lainnya
B3. Agama	1) Kristen Protestan 2) Katolik 3) Islam	4) Budha 5) Hindu 6) Lainnya _____
B4. Pendidikan terakhir yang telah diselesaikan	1) SD 2) SMP	3) SMA 4) Perguruan Tinggi
B5.Pekerjaan suami	1) Pegawai swasta 2) Pegawai negeri 3) Wiraswasta	4) Petani 5) Buruh 6) Lainnya _____
B6. Kebiasaan merokok suami	1) Merokok seperti biasa 2) Merokok lebih sedikit setelah kehamilan Anda	3) Merokok lebih banyak setelah kehamilan
B7. Jumlah batang rokok	_____ /hari	

B8. Frekuensi merokok dalam rumah

1) Setiap hari	3) Setiap bulan
2) Setiap minggu	4) Kurang dari sekali per bulan

Appendix M. Questionnaires for pregnant women (English version)

Research ID: Date: / / / (DD/MM/YY)

Section A. Your behavior on avoiding secondhand smoke exposure of husband smoking / 19 items (SHS: second-hand smoke)

Please select your answer from (1) to (4).

A1. When I encounter someone who is smoking, I distance myself to unsure that I will not be exposed to smoke.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A2. I allow people to smoke in my home.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A3. If I am with a group of people, and someone beings to smoke, I will remain with the

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A4. If I encounter a friend or relative who is smoking, I will sit and talk with him/her while he/she is smoking.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A5.When I am in public place such as restaurant or offices or clinic, I will leave if unable to sit in the enonsmoking section.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A6. When I trip by bus, or any other public transportation I would request a nonsmoking seat.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A7. When I trip by taxi I will ask the driver not to smoke.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A8. I allow people smoking in the car.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A9. If my friends or relatives are gathering in a designated smoking area to smoke, I will join them rather than be alone.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A10. If I am with people who are smoking and I cannot leave, I will ask them to refrain from smoking.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A11. I will sit in the smoking section of a public place or bus station if there are no seats available elsewhere.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A12. When an outdoor functions where smoking is present, I will move away to avoid it.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A13. When an outdoor functions where waterpipe smoking is present, I will move a way to avoid it.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A14. When exposed to SHS, I wash my clothes solely to remove the smell of smoke from them even if they are otherwise clean

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A15. I find it unpleasant to be around SHS.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A16. I routinely associate with people who smoke.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A17. When eating out, I always sit in the nonsmoking section

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A18. I don't frequently places where smoking is prevalent.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A19. I do not find SHS offensive.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

Section B. Partner's smoking behavior in your home duing the last month / 9 items

Please select your answer from (1) to (4).

B1. Your partner read educational comic on preventing second-hand smoke at home

(1)Never (2) Perceived a educational comic (3) Read partly (4)Read completely

B2. Your partner move a way from wife when he smokes

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

B3. Your partner smokes near an open door or window.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

B4. Your partner smokes near the kitchen fan.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

B6. Your partner smokes outdoors with the door closed.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

B7. Your partner smokes out side of the home.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

B8. Your partner intend to quitting smoking.

(1)Not yet (2)Imform an intention to stop smoking (3) Make the decision to quit (4) Set a quit date within one month

B9. Your partner stop to smoke.

(1)Not yet (2)Reduce number of cigarettes per day (3)Avoid smoking triggers (4)Stop to smoke completely

Section C.Knowledge of SHS/8 items

Please select your answer , (yes) or (no).

C1. Smoke from the cigarettes of my partner is harmful to me and my baby.
(1)Yes (2)No

C2. Smoke from a burning cigarette contains dangerous chemicals to me and my baby.
(1)Yes (2)No

C3. The smoke chemicals is transfered via my partner's mouth.
(1)Yes (2)No

C4. Things (closes, and furnitures etc..) in rooms where my partner smoked are coated.
(1)Yes (2)No

C5. Staying for long time with a person who smokes may increase my health risks.
(1)Yes (2)No

C6. Smoking by my partner in the home can have a harmful effect on me and my unborn baby.
(1)Yes (2)No

C7. Cigarette butts include toxic substances.
(1)Yes (2)No

C8. Smoke including toxic substances go into closed rooms.
(1)Yes (2)No

Section D.Perceived SHS-related disease susceptibility/3 items

Please select your answer from (1) to (4).

D1. Breathing in a room where partner's cigarette can affect fetal development and my health risk

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

D2.Smoke from the cigarette of smokers in a room is harmful to me and my unborn baby

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

D3.You and your unborn baby breathe toxic substances which are released from things (closes, and furnitures) in rooms where your partner smoked

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

Section E. Perceived SHS-related disease severity/ 2 items

Please select your answer from (1) to (4).

E1.The effect of SHS exposure is a very serious condition for pregnant women

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

E2.The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

Section F. Perceived benefits of preventing SHS exposure/ 4 items

Please select your answer from (1) to (4).

F1. It Is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth.

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health .

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation.

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes.

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

Section G. Perceived barriers to preventing SHS exposure/4 items

Please select your answer from (1) to (4).

G1. I disapproved of my partner's smoking outside the home

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

G2. There is no-smoking norm or policy in our home

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

G3. It is difficult to ask my partner not to smoke in the home

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

G4. Smoke-free home is a risk to routine harmonious social relations

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

Section H. Cue to action for preventing SHS exposure/ 7items

Please select your answer from (1) to (4).

H1. I know what is second-hand smoke (SHS).

(1)Do not know (2)Informed what is SHS, but I do not remember (3)Know what is SHS (4)Understand what is SHS

H2. I know risks of second-hand smoke (SHS) for mother.

(1)Do not know (2)Informed risks of SHS , but I do not remember (3)Know risks of SHS for mother (4)Understand risks of SHS for mother

H3. I know risks of second-hand smoke for fetus.

(1)Do not know (2)Informed risks of SHS, but I do not remember (3)Know risks of SHS for fetus (4)Understand risks of SHS for fetus

H4. I know how to prevent second hand smoke expoure in my home.

(1)Do not know (2)Informed how to prevent SHS, but I do not remember (3)Know how to prevent SHS (4)Understand how to prevent SHS

H5. I have conflict with my partner over his smoking in the room.

(1)Never (2)Hardly ever (3)Some of the time (4)All of the time

H6. Brief advice on preventing second-hand smoke from research staff is a cue to action

(1)Have not received brief advice (2)Disagree (3)Agree (4)Strongly agree

H7. Sticker on preventing second hand smoke is a cue to action

(1)Have not received the sticker (2)Disagree (3)Agree (4)Strongly agree

Section I. The General Self-efficacy scale/ 10items

Please select your answer from (1) to (4).

I1. I can always manage to solve difficult problems if I try hard enough.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

Appendix M (continue)

I2. If someone opposes me, I can find the means and ways to get what I want.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I3. It is easy for me to stick to my aims and accomplish my goals.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I4. I am confident that I could deal effeciently with unexected events.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I5.Thanks to my resourcefulness, I know how to handle unforceseen situations.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I6. I can solve most problems if I invest the necessary effort.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I7. I can remain calm when facing difficulties because I can rely on my coping abilities.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I8.When I am confronted with a problem, I can usually find several solutions.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I9. If I am in trouble, I can usually think of a solution.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I10.I can usually handle whatever comes my way.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

Thank you for your great cooperation!

Appendix M. Questionnaires for pregnant women (Indonesian version)

ID Penelitian: Tanggal: / / / (DD/MM/YY)

Bagian A. Kebiasaan Anda menghindari paparan asap rokok dari suami / 19 nomor

Pilih antara nomor (1) hingga (4).

A1. Saat saya bertemu dengan orang merokok, saya menjauhkan diri untuk memastikan diri tidak terpapar asap rokok pasif.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A2. Saya mengizinkan orang merokok di rumah saya.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A3. Jika saya bersama sekelompok orang dan salah satu orang merokok, saya akan tetap bersama mereka.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A4. Jika saya bertemu dengan teman atau kerabat yang sedang merokok, saya akan duduk dan berbincang dengan mereka sembari mereka merokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A5. Saat berada di tempat umum seperti restoran, kantor, atau klinik, saya akan meninggalkan tempat tersebut jika tidak bisa duduk di area bebas rokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A6. Saat naik bus atau transportasi umum lainnya, saya akan meminta kursi di area bebas rokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A7. Saat naik taksi, saya akan meminta pengemudi tidak merokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A8. Saya mengizinkan orang merokok di dalam mobil.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A9. Jika teman atau kerabat berkumpul di area merokok untuk merokok, saya akan bergabung dengan mereka daripada sendirian.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A10. Jika saya bersama orang yang merokok tapi tidak dapat meninggalkan tempat, saya akan meminta mereka berhenti merokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A11. Saya akan duduk di area merokok tempat umum atau terminal bus jika tidak ada tempat lain.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

Appendix M (continue)

A12. Jika ada orang merokok saat kegiatan di luar ruangan, saya akan pergi menghindarinya.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A13. Jika ada orang merokok sisha saat kegiatan di luar ruangan, saya akan pergi menghindarinya.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A14. Saat terpapar asap rokok pasif, saya saya mencuci baju secara terpisah untuk menghilangkan bau rokok meskipun masih terlihat bersih.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A15. Saya merasa tidak nyaman berada di sekitar asap rokok pasif.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A16. Saya bercengkerama secara rutin dengan orang yang merokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A17. Saat makan di luar, saya selalu duduk di area bebas rokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A18. Saya tidak sering berada di tempat-tempat orang biasa merokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A19. Saya tidak merasa asap rokok pasif berbahaya.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

Bagian B. Kebiasaan merokok pasangan/suami di rumah selama sebulan terakhir / 9 nomor
Pilih antara nomor (1) hingga (4).

B1. Suami membaca komik edukasi tentang pencegahan merokok pasif dalam rumah.

(1) Tidak pernah (2) Tahu ada komik edukasi (3) Membaca sebagian (4) Membaca sampai selesai

B2. Suami menjauh dari istri saat merokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

B3. Suami merokok dekat pintu atau jendela terbuka.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

B4. Suami merokok dekat kipas ventilasi dapur.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

Appendix M (continue)

B6. Suami merokok di luar ruangan dengan pintu tertutup.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

B7. Suami merokok di luar rumah.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

B8. Suami berniat berhenti merokok.

(1) Belum (2) Menyatakan niat berhenti merokok (3) Memutuskan untuk berhenti merokok (4) Menentukan tanggal berhenti merokok dalam

B9. Suami berhenti merokok.

(1) Belum (2) Mengurangi jumlah rokok per hari (3) Menghindari pemacu merokok (4) Berhenti total

Bagian C. Pengetahuan tentang merokok pasif / 8 nomor

Pilih jawaban "ya" atau "tidak".

C1. Asap rokok dari suami berbahaya bagi saya dan bayi.
(1) Ya (2) Tidak

C2. Asap dari rokok yang terbakar mengandung zat kimia berbahaya bagi saya dan bayi dalam kandungan.
(1) Ya (2) Tidak

C3. Zat kimia rokok dapat berpindah melalui mulut suami.
(1) Ya (2) Tidak

C4. Benda-benda (lemari, furnitur, dll.) dalam ruangan di mana suami merokok terpapar.
(1) Ya (2) Tidak

C5. Bersama orang yang merokok dalam waktu lama bisa menambah risiko bagi kesehatan saya.
(1) Ya (2) Tidak

C6. Merokok dalam rumah oleh suami dapat memberi dampak berbahaya bagi saya dan bayi dalam kandungan.
(1) Ya (2) Tidak

C7. Puntung rokok mengandung zat beracun.
(1) Ya (2) Tidak

C8. Asap rokok yang mengandung zat beracun masuk ke ruangan tertutup.
(1) Ya (2) Tidak

Bagian D. Kerentanan terhadap penyakit yang berhubungan dengan merokok pasif yang dirasakan / 3 nomor

Pilih antara nomor (1) hingga (4).

D1. Bernapas dalam ruangan di mana suami merokok dapat mempengaruhi perkembangan bayi dan kesehatan saya.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

D2. Asap dari perokok dalam ruangan berbahaya bagi saya dan bayi dalam kandungan.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

D3. Anda dan bayi dalam kandungan menghirup zat-zat beracun dari barang-barang (lemari, furnitur, dll.) di dalam ruangan di mana suami merokok.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Bagian E. Keseriusan penyakit yang berhubungan dengan merokok pasif yang dirasakan / 2 nomor
Pilih antara nomor (1) hingga (4).

E1. Efek paparan asap rokok pasif sangat serius bagi ibu hamil.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

E2. Efek paparan asap rokok pasif sangat serius bagi bayi dalam kandungan ibu.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Bagian F. Keuntungan yang dirasakan dari pencegahan paparan asap rokok pasif / 4 nomor
Pilih antara nomor (1) hingga (4).

F1. Pencegahan paparan asap rokok pasif mendukung perkembangan bayi dalam kandungan lebih baik.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

F2. Pencegahan paparan asap rokok pasif meningkatkan kesehatan mental ibu hamil.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

F3. Pencegahan paparan asap rokok pasif menolong proses kehamilan normal.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

F4. Perlindungan dari paparan asap rokok pasif selama kehamilan mengurangi risiko penyakit jantung dan diabetes pada bayi yang akan lahir.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Bagian G. Hambatan yang dirasakan untuk pencegahan paparan asap rokok pasif / 4 nomor
Pilih antara nomor (1) hingga (4).

G1. Suami tidak setuju untuk merokok di luar rumah.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

G2. Tidak ada peraturan bebas rokok di rumah.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

G3. Kesulitan untuk meminta suami saya tidak merokok dalam rumah.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

G4. Rumah bebas rokok berisiko bagi keharmonisan relasi sosial.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Appendix M (continue)

Bagian H. Alasan untuk mencegah paparan asap rokok pasif / 7 nomor

Pilih antara nomor (1) hingga (4).

H1. Saya tahu mengenai merokok pasif.

(1) Tidak tahu (2) Pernah diberitahu tentang merokok pasif, tapi tidak ingat (3) Tahu tentang merokok pasif (4) Mengerti tentang merokok pasif

H2. Saya tahu risiko merokok pasif bagi ibu.

(1) Tidak tahu (2) Pernah diberitahu tentang risiko merokok pasif, tapi tidak ingat (3) Tahu tentang risiko merokok pasif terhadap (4) Mengerti tentang risiko merokok pasif terhadap ibu

H3. Saya tahu risiko merokok pasif bagi bayi dalam kandungan.

(1) Tidak tahu (2) Pernah diberitahu tentang risiko merokok pasif, tapi tidak ingat (3) Tahu tentang risiko merokok pasif terhadap (4) Mengerti tentang risiko merokok pasif terhadap bayi

H4. Saya tahu cara mencegah paparan asap rokok pasif dalam rumah saya.

(1) Tidak tahu (2) Pernah diberitahu tentang cara pencegahan merokok pasif, tapi tidak (3) Tahu tentang cara pencegahan merokok (4) Mengerti tentang cara pencegahan merokok pasif

H5. Saya mempunyai konflik dengan suami mengenai kebiasaannya merokok dalam ruangan.

(1) Tidak pernah (2) Jarang (3) Kadang-kadang (4) Setiap saat

H6. Nasihat dari staf posyandu adalah awal untuk memulai tindakan.

(1) Sangat tidak setuju (2) Tidak setuju (3) Setuju (4) Sangat setuju

H7. Stiker rumah bebas rokok adalah awal untuk memulai tindakan.

(1) Sangat tidak setuju (2) Tidak setuju (3) Setuju (4) Sangat setuju

Bagian I. Skala *General Self-efficacy* / 10 nomor

Pilih antara nomor (1) hingga (4).

I1. Saya selalu dapat menyelesaikan masalah sulit jika berusaha keras.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I2. Jika seseorang menentang saya, saya bisa menemukan cara untuk mendapatkan yang saya inginkan.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I3. Mudah bagi saya untuk menjaga target dan mencapai tujuan.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I4. Saya percaya diri bahwa saya bisa menangani hal-hal tidak terduga dengan efektif.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I5. Berkat akal saya, saya tahu cara mengatasi situasi yang tidak terprediksi.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I6. Saya bisa mengatasi banyak masalah jika saya melakukan usaha yang diperlukan.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I7. Saya bisa tetap tenang saat menghadapi kesulitan karena kemampuan saya mengatasi kesulitan.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I8. Saat saya menghadapi masalah, biasanya saya bisa menemukan beberapa solusi.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I9. Jika saya dalam masalah, saya biasanya bisa memikirkan suatu solusi.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I10. Biasanya saya bisa mengatasi apapun yang menghalangi saya.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

Terima kasih atas kerjasama Anda!

Appendix N. Questionnaires for husbands (English version)

Research ID: Date: / / / (DD/MM/YY)

Section A. Your smoking behavior in your home duing the last month / 9 items (SHS: second-hand smoke)

Please select your answer from (1) to (4).

A1. I read educational comic on preventing second-hand smoke at home

(1)Never (2) Perceived a educational comic (3) Read partly (4)Read completely

A2. I move a way from my wife when I smoke

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A3. I smokes near an open door or window.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A4.I smokes near the kitchen fan.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A6.I smokes outdoors with the door closed.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A7.I smokes out side of the home.

(1)Almost never true (2)Usually not true (3)Usually true (4)Almost always true

A8.I intend to quitting smoking.

(1)Not yet (2)Imform an intention to stop smoking (3) Make the decision to quit (4) Set a quit date within one month

A9.I stop to smoke.

(1)Not yet (2)Reduce number of cigarettes per day (3)Avoid smoking triggers (4)Stop to smoke completely

Section B. Your wife's behavior for prevention SHS/ 3 items

B1. My wife move a way from me when I smoke

(1)Never not true (2)Usually not true (3)Usually true (4)Almost always true

B2. My wife remind me not to smoke in our home when I smoke near my wife or in home

(1)Never not true (2)Usually not true (3)Usually true (4)Almost always true

B3. My wife move a way from smoker

(1)Never not true (2)Usually not true (3)Usually true (4)Almost always true

Appendix N (continue)

Section C.Knowledge of SHS/8 items

Please select your answer , (yes) or (no).

C1. Smoke from my cigarettes is harmful to my wife and baby.

(1)Yes (2)No

C2. Smoke from a burning cigarette contains dangerous chemicals to my wife and unborn baby.

(1)Yes (2)No

C3. The smoke chemicals is transfered via my mouth.

(1)Yes (2)No

C4. Things (closes, and furnitures etc..) in rooms where I smoked are coated.

(1)Yes (2)No

C5. Staying for long time with a person who smokes may increase health risks of my wife and unborn baby.

(1)Yes (2)No

C6. Smoking by me in the home can have a harmful effect on my wife and unborn baby.

(1)Yes (2)No

C7. Cigarette butts include toxic substances.

(1)Yes (2)No

C8. Smoke including toxic substances go into closed rooms.

(1)Yes (2)No

Section D.Perceived SHS-related disease susceptibility/3 items

Please select your answer from (1) to (4).

D1. Breathing in a room where my cigarette can affect fetal development and wife's health risk

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

D2.Smoke from the cigarette of smokers in a room is harmful to my wife and my unborn baby

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

D3.My wife and unborn baby breathe toxic substances which are released from things (closes, and furnitures) in rooms where I smoked

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

Section E. Perceived SHS-related disease severity/ 2 items

Please select your answer from (1) to (4).

E1.The effect of SHS exposure is a very serious condition for pregnant women

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

E2.The effect of SHS exposure is a very serious condition for the unborn baby in pregnant women

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

Appendix N (continue)

Section F. Perceived benefits of preventing SHS exposure/ 4 items

Please select your answer from (1) to (4).

F1. It is a benefit that preventing SHS exposure during pregnancy can help the fetus for better growth.

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

F2. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for better mental health .

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

F3. It is a benefit that preventing SHS exposure during pregnancy can help the pregnant women for normal gestation.

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

F4. Protection from SHS exposure during pregnancy can reduce newborn baby's risks of heart disease and diabetes.

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

Section G. Perceived barriers to preventing SHS exposure for pregnant women/5 items

Please select your answer from (1) to (4).

G1. Other smokers (visitor) do not accept smoke-free home

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

G2. There is no-smoking norm or policy in our home

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

G3. It is difficult to ask other smokers (visitors) not to smoke in the home

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

G4. Smoke-free home is a risk to routine harmonious social relations

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

G5. I lost social communication with other smoker (visitor) in my house

(1)Strongly disagree (2)Disagree (3)Agree (4)Strongly agree

Section H. Cue to action for preventing SHS exposure/ 8 items

Please select your answer from (1) to (4).

H1. I know what is second-hand smoke.

(1)Do not know (2)Informed what is SHS, but I do not remember (3)Know what is SHS (4)Understand what is SHS

Appendix N (continue)

H2. I know risks of second-hand smoke for mother.

(1)Do not know	(2)Informed risks of SHS, but I do not remember	(3)Know risks of SHS for mother	(4)Understand risks of SHS for mother

H3. I know risks of second-hand smoke for fetus.

(1)Do not know	(2)Informed risks of SHS, but I do not remember	(3)Know risks of SHS for fetus	(4)Understand risks of SHS for fetus

H4. I know how to prevent second hand smoke expoure in my home.

(1)Do not know	(2)Informed how to prevent SHS, but I do not remember	(3)Know how to prevent SHS	(4)Understand how to prevent SHS

H5. I have conflict with other smokers (visitors) over their smoking in the room.

(1)Never	(2)Hardly ever	(3)Some of the time	(4)All of the time

H6. I have already received the educational comic and a sticker on smoke-free home.

(1)Not yet	(2) Received a educational comic and a reminder	(3) Read the comic or use the sticker	(4)Read the comic and use the sticker

H7. Brief advice on preventing second-hand smoke from research staff is a cue to action

(1)Have not received brief advice	(2)Disagree	(3)Agree	(4)Strongly agree

H8. Sticker for smoke-free home is a cue to action

(1)Have not received the sticker	(2)Disagree	(3)Agree	(4)Strongly agree

Section I. The General Self-efficacy scale/ 10items

Please select your answer from (1) to (4).

I1. I can always manage to solve difficult problems if I try hard enough.

(1) Not at all true	(2)Hardly true	(3)Moderately true	(4)Exactly true

I2. If someone opposes me, I can find the means and ways to get what I want.

(1) Not at all true	(2)Hardly true	(3)Moderately true	(4)Exactly true

I3. It is easy for me to stick to my aims and accomplish my goals.

(1) Not at all true	(2)Hardly true	(3)Moderately true	(4)Exactly true

I4. I am confident that I could deal effeciently with unexected events.

Appendix N (continue)

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I5. Thanks to my resourcefulness, I know how to handle unforceseen situations.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I6. I can solve most problems if I invest the necessary effort.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I7. I can remain calm when facing difficulties because I can rely on my coping abilities.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I8. When I am confronted with a problem, I can usually find several solutions.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I9. If I am in trouble, I can usually think of a solution.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

I10. I can usually handle whatever comes my way.

(1) Not at all true (2)Hardly true (3)Moderately true (4)Exactly true

Thank you for your great cooperation!

Appendix N. Questionnaires for husbands (Indonesian version)

ID Penelitian: Tanggal: / / / (DD/MM/YY)

Bagian A. Kebiasaan Anda merokok di rumah selama sebulan terakhir / 9 nomor

Please select your answer from (1) to (4).

A1. Saya membaca komik edukasi tentang pencegahan merokok pasif dalam rumah.

(1) Tidak pernah (2) Tahu ada komik edukasi (3) Membaca sebagian (4) Membaca sampai selesai

A2. Saya menjauh dari istri saat merokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A3. Saya merokok dekat pintu atau jendela terbuka.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A4. Saya merokok dekat kipas ventilasi dapur.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A6. Saya merokok di luar ruangan dengan pintu tertutup.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A7. Saya merokok di luar rumah.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

A8. Saya berniat berhenti merokok.

(1) Belum (2) Saya menyatakan niat berhenti merokok (3) Saya memutuskan untuk berhenti merokok (4) Saya menentukan tanggal berhenti merokok dalam sebulan

A9. Saya berhenti merokok.

(1) Belum (2) Mengurangi jumlah rokok per hari (3) Menghindari pemacu merokok (4) Berhenti total

Bagian B. Kebiasaan istri Anda menghindari paparan asap rokok / 3 nomor

B1. Istri menjauh dari saya saat saya merokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

B2. Istri mengingatkan saya untuk tidak meokok di dalam rumah saat saya merokok di dekat istri atau di dalam rumah.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

B3. Istri saya menjauh dari perokok.

(1) Hampir selalu tidak benar (2) Biasanya tidak benar (3) Biasanya benar (4) Hampir selalu benar

Appendix N (continue)

Bagian C. Pengetahuan tentang merokok pasif / 8 nomor

Pilih jawaban "ya" atau "tidak".

C1. Asap rokok saya berbahaya bagi istri dan bayi saya.

(1) Ya (2) Tidak

C2. Asap dari rokok yang terbakar mengandung zat kimia berbahaya bagi istri saya dan bayi dalam kandun

(1) Ya (2) Tidak

C3. Zat kimia rokok dapat berpindah melalui mulut saya.

(1) Ya (2) Tidak

C4. Benda-benda (lemari, furnitur, dll.) dalam ruangan di mana saya merokok terpapar.

(1) Ya (2) Tidak

C5. Bersama orang yang merokok dalam waktu lama bisa menambah risiko bagi kesehatan istri dan saya dan bayi dalam kandungan.

(1) Ya (2) Tidak

C6. Merokok dalam rumah (oleh saya) dapat memberi dampak berbahaya bagi istri saya dan bayi dalam

(1) Ya (2) Tidak

C7. Puntung rokok mengandung zat beracun.

(1) Ya (2) Tidak

C8. Asap rokok yang mengandung zat beracun masuk ke ruangan tertutup.

(1) Ya (2) Tidak

Bagian D. Kerentanan terhadap penyakit yang berhubungan dengan merokok pasif yang dirasakan / 3 nomor

Pilih antara nomor (1) hingga (4).

D1. Bernapas dalam ruangan di mana saya merokok dapat mempengaruhi perkembangan bayi dan kesehatan istri saya.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

D2. Asap dari perokok dalam ruangan berbahaya bagi istri saya dan bayi dalam kandungan.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

D3. Istri saya dan bayi dalam kandungan menghirup zat-zat beracun dari barang-barang (lemari, furnitur, dll.) di dalam ruangan di mana saya merokok.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Bagian E. Keseriusan penyakit yang berhubungan dengan merokok pasif yang dirasakan / 2 nomor

Pilih antara nomor (1) hingga (4).

E1. Efek paparan asap rokok pasif sangat serius bagi ibu hamil.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

E2. Efek paparan asap rokok pasif sangat serius bagi bayi dalam kandungan ibu.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Bagian F. Keuntungan yang dirasakan dari pencegahan paparan asap rokok pasif / 4 nomor

Pilih antara nomor (1) hingga (4).

F1. Pencegahan paparan asap rokok pasif mendukung perkembangan bayi dalam kandungan lebih baik.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Appendix N (continue)

F2. Pencegahan paparan asap rokok pasif meningkatkan kesehatan mental ibu

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

F3. Pencegahan paparan asap rokok pasif menolong proses kehamilan normal.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

F4. Perlindungan dari paparan asap rokok pasif selama kehamilan mengurangi risiko penyakit jantung dan diabetes pada bayi yang akan lahir.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Bagian G. Hambatan yang dirasakan untuk pencegahan paparan asap rokok pasif / 5 nomor

Pilih antara nomor (1) hingga (4).

G1. Perokok lain (tamu) tidak setuju untuk merokok di luar rumah.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

G2. Tidak ada peraturan bebas rokok di rumah.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

G3. Kesulitan untuk meminta perokok lain (tamu) tidak merokok dalam rumah.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

G4. Rumah bebas rokok berisiko bagi keharmonisan relasi sosial.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

G5. Saya kehilangan komunikasi sosial dengan perokok lain (tamu) di rumah saya.

(1) sangat tidak setuju (2) tidak setuju (3) setuju (4) sangat setuju

Bagian H. Alasan untuk mencegah paparan asap rokok pasif / 8 nomor

Pilih antara nomor (1) hingga (4).

H1. Saya tahu mengenai merokok pasif.

(1) Tidak tahu (2) Pernah diberitahu tentang merokok pasif, (3) Tahu tentang merokok pasif (4) Mengerti tentang merokok pasif

H2. Saya tahu risiko merokok pasif bagi ibu.

(1) Tidak tahu (2) Pernah diberitahu tentang risiko merokok (3) Tahu tentang risiko merokok pasif terhadap (4) Mengerti tentang risiko merokok pasif terhadap ibu

H3. Saya tahu risiko merokok pasif bagi bayi dalam kandungan.

(1) Tidak tahu (2) Pernah diberitahu tentang risiko merokok (3) Tahu tentang risiko merokok pasif terhadap (4) Mengerti tentang risiko merokok pasif terhadap bayi

H4. Saya tahu cara mencegah paparan asap rokok pasif dalam rumah saya.

(1) Tidak tahu | (2) Pernah diberitahu tentang cara pencegahan | (3) Tahu tentang cara pencegahan merokok pasif | (4) Mengerti tentang cara pencegahan merokok pasif

H5. Saya mempunyai konflik dengan perokok lain (tamu) mengenai kebiasaannya merokok dalam ruangan

(1) Tidak pernah | (2) Jarang | (3) Kadang-kadang | (4) Setiap saat

H6. Saya sudah menerima komik edukatif dan stiker pengingat rumah bebas rokok.

(1) Belum menerima | (2) Sudah menerima komik dan stiker | (3) Sudah membaca komik atau menggunakan | (4) Sudah membaca komik dan menggunakan stiker

H7. Nasihat dari staf posyandu adalah awal untuk memulai tindakan.

(1) Sangat tidak setuju | (2) Tidak setuju | (3) Setuju | (4) Sangat setuju

H8. Stiker rumah bebas rokok adalah awal untuk memulai tindakan.

(1) Sangat tidak setuju | (2) Tidak setuju | (3) Setuju | (4) Sangat setuju

Bagian I. Skala General Self-efficacy / 10 nomor

Pilih antara nomor (1) hingga (4).

I1. Saya selalu dapat menyelesaikan masalah sulit jika berusaha keras.

(1) Tidak benar sama sekali | (2) Tidak benar | (3) Cukup benar | (4) Sangat benar

I2. Jika seseorang menentang saya, saya bisa menemukan cara untuk mendapatkan yang saya inginkan.

(1) Tidak benar sama sekali | (2) Tidak benar | (3) Cukup benar | (4) Sangat benar

I3. Mudah bagi saya untuk menjaga target dan mencapai tujuan.

(1) Tidak benar sama sekali | (2) Tidak benar | (3) Cukup benar | (4) Sangat benar

I4. Saya percaya diri bahwa saya bisa menangani hal-hal tidak terduga dengan efektif.

(1) Tidak benar sama sekali | (2) Tidak benar | (3) Cukup benar | (4) Sangat benar

I5. Berkat akal saya, saya tahu cara mengatasi situasi yang tidak terprediksi.

(1) Tidak benar sama sekali | (2) Tidak benar | (3) Cukup benar | (4) Sangat benar

I6. Saya bisa mengatasi banyak masalah jika saya melakukan usaha yang diperlukan.

(1) Tidak benar sama sekali | (2) Tidak benar | (3) Cukup benar | (4) Sangat benar

I7. Saya bisa tetap tenang saat menghadapi kesulitan karena kemampuan saya mengatasi kesulitan.

(1) Tidak benar sama sekali | (2) Tidak benar | (3) Cukup benar | (4) Sangat benar

I8. Saat saya menghadapi masalah, biasanya saya bisa menemukan beberapa solusi.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I9. Jika saya dalam masalah, saya biasanya bisa memikirkan suatu solusi.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

I10. Biasanya saya bisa mengatasi apapun yang menghalangi saya.

(1) Tidak benar sama sekali (2) Tidak benar (3) Cukup benar (4) Sangat benar

Terima kasih atas kerjasama Anda!

Appendix O. Business request to research assistants

Business request to research assistants

Thank you for joining our research "Effectiveness of Preventing Second-hand Smoke for Pregnant Women at Home Using an Educational Comic Booklet in Indonesia: A Randomized Controlled Trial". The guide form which was made by researchers: Ms.Inaoka, Dr.Windy, and Prof. Ota was lead you to the right on activities as research assistants. Please read the request form before pursuing research activities.

Client	Kimiko Inaoka: A doctora student of global health nursing, St Luke's International University, Japan Address: Akashi-cho 10-1, Chuo-ku,Tokyo,104-0044,Japan Email:17dn002@slcn.ac.jp
Duration	After ethical review approval to the end of October, 2019 (see the data collection's schedule)
Place	*Posyandues* or *puskesmas* in Tomohon and Manado
Language	English and Indonesian
Research objective	The purpose of this study is to determine the effectiveness of preventing second-hand smoke for pregnant women at home in order to reduce SHS exposure in pregnancy.
Type	1) Identification of eligible participants 2) Preparation and intervention 3) Data collection and data input
Task	1) Identification of eligible participants (1) To identify potentially eligible pregnant women in their first-trimester (up to 12 weeks) of pregnancy who visit to the posyandu or puskesmas for first antenatal care (ANC) based on records of the posyandu or puskesmas. (2) To determine eligibility for the study based on inclusion criteria, and inform about objective, methods, terms, common requests and expected benefit and risks of the study eligible couples. (3) To hand a request form and informed consent form to eligible pregnant women and their partners. (4) To inform that they have the right of withdrawal from the study (5) To collect baseline demographic data (20 items for pregnant women, 8items for husband), including age, education, marital status, employment status of pregnant women and their partners, monthly family income, gestational week, the smoking status of the participant's partner, as well as

	whether the participant's home and work environment allowed smoking. (6) To make a participants list of eligible couples who will agree with participating to the research. One Indonesian researcher will receive each name lists of eligible couples and finalize the lists. 2) Preparation and support of intervention (1) To submit a participants list to Dr.Windy, at Sam Ratulangi University, Indonesia. (2) To make invitation letters including date, time, place, and research name to all participants based on the result of random assignment into the intervention group or the usual-care group. (3) To send invitation letters to all participants. Implementation will be provided in different places for both groups. 3) Data collection and data input **<u>At intervention</u>** (1) To hand one envelop to eligible pregnant women from 16 weeks to 20 weeks of pregnancy and their partners in intervention group. They will receive educational comic booklet and a sticker as reminder. Participants in control group will receive nothing as intervention. (2) To collect all self-report from participants including pregnant women and their husband in both groups. (3) To input the data (demographic data and questionnaire) into a specified excel file of St. Luke's google drive. (4) To keep paper based questionnaires of self-report and demographic data into Dr.Windy's room. **<u>Three months later from intervention (third antenatal care visit)</u>** (5) To collect follow-up slip as self-report from participants including pregnant women and their husband in both groups (6) To provide brief advice to participants in intervention. Please follow " Guide for giving advice for Preventing Second-hand Smoke for Pregnant Women and husband" (7) To input the data (questionnaire) into a specified excel file of St. Luke's google drive.. **<u>After delivery</u>** (8) To collect newborn baby's data: Birthweight, height, gestation age at delivery and baby's gender via record in each posyandu or puskesmas. (9) To input the data (baby's data) into a specified excel file.

	(10) To submit a specified excel file to Ms.Inaoka
Orientation reminders	1) To participate an orientation, and report meeting for research assistants. 2) To read and understand study proposal, questionnaires, a schedule and ethical considerations. 3) To support all participants when they have difficulties in self-reporting. But, do not change questions by your-self 4) To store these questionnaires in a locked safe place and confidentially managed by Dr.Windy at Sam Ratulangi University, Indonesia.
Assistant fee	2,000 yen worth of assistant fee per month will be payed to research assistant.

Data Collection's schedule

Duration	Schedule
After getting the approval letter from ethical committee in St'Lukes ～February 24, 2019	1） To identify eligible couples, pregnant women in their first-trimester (up to 12 weeks), 2） To make name lists of participants. 3） To submit the participants lists to Dr.Windy 4） To input demographic data and conduct double-check
February 25-March 10, 2019	Dr. Windy will conduct simple random assignment using a computer random number generator at Sam Ratulangi University, Indonesia
March 11-15, 2019	All eligible participants will receive an invitation letter
March 21 – 21 April , 2019	1) To conduct Intervention 2) To input questionnaire data and conduct double-check
June 21- 20 July, 2019	1）To conduct Follow-up 1(three months later from intervention) 2）To provide brief advice 1) To input questionnaire data and conduct double-check
August 18 – September 30	1) Follow-up 2 (after delivery) at posyandu or puskesmas 2) To input questionnaire data and conduct double-check

Appendix P. Letter of request for research cooperation

28 January, 2019

Your excellency

_____

Head of Health facility

cc.

1. Head of Health Office of _____ City

A LETTER OF REQUEST ON RESEARCH COOPERATION

Dear_____,

I am an Associate Professor of Faculty of Medicine at the Sam Ratulangi University, and currently co-supervising a Japanese doctoral student in Global Health Nursing at the St Luke's International University. Her name is Kimiko INAOKA.

We are intending to conduct a randomized control trial titled "**Effectiveness of Preventing Second-hand Smoke for Pregnant Women at Home Using an Educational Comic in Indonesia: A Randomized Controlled Trial**" in a collaborative research of St Luke's International University and Sam Ratulangi University. The aim of the trial is to determine the effectiveness of preventing second-hand smoke using educational comic in Indonesia in order to reduce secondhand smoke exposure in pregnancy. The research has been carried out with the permission of the ethical review in St Luke's International University, Japan and Sam Ratulangi University, Inodnesia.

In the process of preparing the trial, we need help from health facilities (posyandu and puskesmas). Attached please find the research proposal describing the methods and research permission. We believe that this research will bring Indonesian pregnant women and baby to be healthier. I hereby request your permission and cooperation on our proposed collaborative research including ethical clearance. In advance, thank you very much for your kind consideration. I am looking forward to hearing from you at your earliest convenience.

Research terms:

After getting the approval letter from ethical committee in St'Lukes ～30th June, 2020

Request

Please cooperate following activities:

1) In your health facility, research assistant identify potentially eligible pregnant women in their

first-trimester (up to 12 weeks) of pregnancy who visit to the posyandu or puskesmas for first antenatal care (ANC) based on records of the posyandu or puskesmas.

(Inclusion criteria)

There are following inclusion criteria for pregnant women.

1) 18 years of age or older

2) Non-smoking pregnant women in their first-trimester pregnancy: up to 12 weeks gestation

3) Having second-hand smoke exposure from their husband (19 years of age or older)

4) Living with husband

There are following inclusion criteria for pregnant women's husband

1) 19 years of age or older

2) Smoking at least six cigarettes per week or more within two months before or since pregnancy

3) Living with wife

(Exclusion criteria)

There are following exclusion criteria for pregnant women.

1) Pregnant women after the second trimester pregnancy

2) Active smoking pregnant women

3) High risk pregnant women having clinical diseases, gestational diabetes, pregnancy-induced hypertension or suffering from mental disorders

2) It will take about 10-15 min for each couple to recruit and identify potentially eligible participants using baseline demographic data form (20 items for pregnant women [Section A], 8items for husband [Section B], see Appendix 12), including age, education, marital status, employment status of pregnant women and their partners, monthly family income, gestational week, the smoking status of the participant's partner, as well as whether the participant's home and work environment allowed smoking will be collected.

3) Research assistant will make participants lists for this research.

4) In detail of request to participants, please see "REQUEST FORM" for participants including contents of request, ethical issues of concern, incentive, and information of contact persons.

5) Research assistant collect newborn baby's data: Birthweight, height, gestation age at delivery and baby's gender via record in each posyandu or puskesmas.

6）Voluntary cooperation: cooperation is with your free will and you are free to quit at any time. You will not have any negative influence even if you do not consent to cooperation.

7) Please fax CONFIRMATION FORM OF RESEARCH COOPERATION to this fax number (0431-822568).

We are grateful for your agreement with research cooperation. If you have inquiry and comments, please contact Dr. Windy M.V.Wariki. In advance, thank you very much for your kind consideration.

Faithfully yours,

KIMIKO INAOKA, MSN, RN
Doctoral Student of Global Health Nursing, St Luke's International University, Japan
Address: 10-1 Akashi-cho Chuo-ku, Tokyo, 104-0044, Japan
Email:17dn002@slcn.ac.jp
Supervisor: Prof. Erica Ota, Ph.D., R.N.M.

Contact Person:
Dr.Windy M.V.Wariki
University of Sam Ratulangi,
Kampus UNSRAT Manado 95115, Sulawesi Utara,Indonesia.
Tel:0431-863886
Fax:0431-822568

CONFIRMATION FORM OF RESEARCH COOPERATION

Destination: Dr.Windy M.V.Wariki, University of Sam Ratulangi,
Kampus UNSRAT Manado 95115, Sulawesi Utara,Indonesia.
Tel:0431-863886 Fax: 0431-822568

Date:_____,2019

Name of City:_____

Name of facility:_____

Phone number: _____

Fax number:_____

- Research cooperation (please describe ✔on ☐)

  ☐Agree with research cooperation

  ☐Disagree with research cooperation

  ☐Need more explanation on this research

- Information of contact person and number for this research cooperation
  Name of in-charge:_____

  Phone number: _____

  Fax number:_____

Acknowledgements

Firstly, I would like to express my sincere gratitude to my advisor Prof. Erica Ota for the continuous support of my Ph.D. study and related research, for her patience, motivation, and her immense knowledge. Her guidance helped me throughout the research and writing of this dissertation. I could not have imagined having a better advisor and mentor for my Ph.D. study.

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Last but not the least, I would like to thank my family, in particular, I am grateful to husband for supporting me spiritually throughout writing this thesis and my life in general.

2021. March

Kinaka