UNIVERSITI PUTRA MALAYSIA

PREVALENCE OF EXPOSURE AND RESPIRATORY EFFECTS OF SECOND-HAND SMOKE AND ITS ASSOCIATED FACTORS AMONG HOUSEHOLD MEMBERS IN FELDA RAJA ALIAS, NEGERI SEMBILAN

VINCE CH'NG KHAI SHEN
SITI KATIJAH BINTI ISMAIL
HAZWANY ALYAH BINTI ROSELAN

PREVALENCE OF EXPOSURE AND RESPIRATORY EFFECTS OF SECOND-HAND SMOKE AND ITS ASSOCIATED FACTORS AMONG HOUSEHOLD MEMBERS IN FELDA RAJA ALIAS, NEGERI SEMBILAN

BY

VINCE CH'NG KHAI SHEN

SITI KATIJAH BINTI ISMAIL

HAZWANY ALYAH BINTI ROSELAN

DEGREE OF MEDICAL DOCTOR

UNIVERSITI PUTRA MALAYSIA

2013

Report Submitted to the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, In Fulfillment of the Requirement for the Degree of Medical Doctor

PREVALENCE OF EXPOSURE AND RESPIRATORY EFFECTS OF SECONDHAND SMOKE AND ITS ASSOCIATED FACTORS AMONG HOUSEHOLD MEMBERS IN FELDA RAJA ALIAS, NEGERI SEMBILAN

Vince Ch'ng Khai Shen[1], *Siti Katijah Ismail*[1], *Hazwâny Alyah Roselan*[1], *Suhainizam Mohamad Saliluddin*[2], *Ahmad Azuhairi Ariffin*[2]

[1] *Second Year Medical Student*

[2] *Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*

ABSTRACT

Introduction Second-hand Smoke (SHS) has been proven to have association with adverse health outcome such as chronic cough, phlegm and wheezing. Second-hand smoke is also known as environmental tobacco smoke. SHS consist of side stream smoke that is smoke from lighted cigarette and mainstream smoke that is smoke exhaled by smoker.

Objectives A cross sectional study was conducted in FELDA Raja Alias Negeri Sembilan to determine the prevalence of exposure and respiratory effects of second-hand smoke and its association factors.

Methods Self-administered questionnaire was used in this study to obtain information on socio-demographic factors, place of exposure and presence of respiratory effects related to second-hand smoke. The data were analysed by using SPSS version 21.

Result Based from the results from 320 respondents, the exposure to SHS are 239 (74.7%) at home, 223 (69.7%) at workplace, 302 (94.4%) at public place and 284 (88.8%) at transportation. The results for respiratory effects associated with SHS are 70 (21.9%) reported having cough, 68 (21.3%) reported having phlegm, 24 (7.5%) reported with wheezing and 22 (6.9%) of them reported having other respiratory diseases. There is significant association between gender and exposure to SHS at public place (p=0.041) and workplace (p=0.001), and also between educational level and exposure to SHS at workplace (p=0.041).

Conclusion
The prevalence of exposure to SHS are 74.7% at home, 69.7% at workplace, 94.4% at public place and 88.8% at transportation. There is significant association between gender and exposure to SHS at public place and workplace, and also between educational level and exposure to SHS at workplace. The highest exposure at work place type is farm, while for public place is restaurant and car for transportation.

Keywords prevalence, second hand smoke, respiratory effects, household members

PREVALENS PENDEDAHAN DAN KESAN RESPIRATORI ASAP ROKOK PASIF DAN FAKTOR-FAKTOR YANG BERKAITAN DALAM KALANGAN ISI RUMAH DI FELDA RAJA ALIAS, NEGERI SEMBILAN

Vince Ch'ng Khai Shen[1], *Siti Katijah Ismail*[1], *Hazwany Alyah Roselan*[1], *Suhainizam Mohamad Saliluddin*[2], *Ahmad Azuhairi Ariffin*[2]

[1] *Pelajar Perubatan Tahun Dua*

[2] *Jabatan Kesihatan Komuniti, Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia*

ABSTRAK

Pengenalan Asap rokok pasif telah dibuktikan mempunyai kaitan dengan kesan buruk terhadap kesihatan seperti batuk berpanjangan, kahak berpanjangan dan hembusan nafas berbunyi. Asap rokok pasif juga dikenali sebagai asap rokok persekitaran. Asap rokok pasif terdiri daripada asap rokok aliran sisi iaitu asap daripada rokok yang bernyala dan asap aliran utama iaitu asap yang dihembus oleh perokok.

Objektif Satu kajian telah dijalankan di FELDA Raja Alias, Negeri Sembilan untuk menentukan prevalens pendedahan dan kesan respiratori oleh asap rokok pasif dan faktor-faktor yang berkaitan.

Kaedah Soal selidik yang dijawab sendiri telah digunakan untuk mendapatkan informasi berkenaan faktor sosio demografik, tempat terdedah dan masalah pernafasan yang disebabkan oleh asap rokok pasif. Data telah dianalisis menggunakan SPSS versi 21.

Keputusan Berdasarkan keputusan daripada 320 orang responden, pendedahan kepasa asap rokok pasif ialah 239 (74.7%) di rumah, 223 (69.7%) di tempat kerja, 302 (94.4%) di tempat awam dan 284 (88.8%) dalam pengangkutan. Keputusan untuk kesan respiratori berkaitan dengan asap rokok pasif ialah 70 (21.9%) melaporkan batuk, 68 (21.3%) melaporkan kahak, 24 (7.5%) melaporkan hembusan nafas berbunyi dan 22 (6.9%) melaporkan menghidap kesan respiratori lain. Terdapat kaitan signifikan di antara jantina dan pendedahan kepada asap rokok pasif di tempat awam ($p=0.041$) dan tempat kerja ($p=0.001$), dan juga antara tahap pendidikan dan pendedahan kepada asap rokok di tempat kerja ($p=0.041$). Prevalens tertinggi dalam pelbagai jenis tempat pendedahan kepada asap rokok pasif adalah; di tempat kerja ialah ladang (34.1%), di tempat awam ialah restoran (60.9%), dan dalam pengangkutan ialah kereta (46.9%).

Kesimpulan Prevalens kepada pendedahan asap rokok pasif di rumah ialah 74.7%, di tempat kerja (69.7%), di tempat awam (94.4%), dan dalam pengangkutan (88.8%). Terdapat kaitan signifikan terhadap jantina dan pendedahan kepada asap rokok pasif di tempat awam dan tempat kerja, dan juga di antara tahap pendidikan dan pendedahan di tempat kerja. Prevalens tertinggi di tempat kerja ialah di ladang, manakala untuk tempat awam di restoran dan kereta untuk pengangkutan.

Kata Kunci prevalens, asap rokok pasif, kesan respiratori, isi rumah

ACKNOWLEDGEMENT

First and foremost, we would like to thank God Almighty, an infinite thank for the divine grace, protection and strength You have granted us in making this research project a success, even there were so many obstacles throughout the pathway.

We would like to express our outmost gratitude to our supervisor, Dr. Suhainizam bin Muhamad Saliluddin, for his constant supervision, tired-less help and superb guidance throughout the entire period of study project. We would like to extend our gratitude to our co-supervisor, Dr. Ahmad Azuhairi Ariffin, for his invaluable advices. We would also like to extent our special thanks to the module coordinator, Dr Hayati Kadir@Shahar for guidance and providing us useful information throughout this research period.

Last but not least, we would like to acknowledge the helping hands of colleagues who are involved in making this project work vivid. Special thanks to those who were involved intentionally or unintentionally. Their help are highly appreciated.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURE

LIST OF ABBREVATIONS

SHS	: Second-Hand Smoking
FELDA	: Federal Land Development Authority
US	: United States of America
COPD	: Chronic Obstructive Pulmonary Disease
UK	: United Kingdom
EU	: European Union
GM	: Geometric Mean
WHO	: World Health Organisation
FCTC	: Framework Convention of Tobacco Control
SFL	: Smoke-Free Legislation
NHMS III	: National Health Morbidity Survey III
ETS	: Environmental Tobacco Smoke
EPA	: Environmental Protection Agency
IARC	: International Agency for Research on Cancer
SD	: Standard Deviation
OR	: Crude Odds Ratio
CI	: Confidence Interval
GATS	: Global Adult Tobacco Survey
CDC	: Chronic Disease Prevention

CHAPTER 1
INTRODUCTION

1.1 Background

There is proven evidence linking Second hand Smoke (SHS) exposures to adverse health outcomes (Eisner et al., 2009). Among adults, outcomes such as chronic obstructive pulmonary disease (COPD), deficits in lung functions (Carey et al., 1999), increased risk of adult-onset asthma (Jaakkola et al., 2003), and increased risk of lung cancer (Kurahashi et al., 2008) have been linked to exposures of SHS. SHS exposures among children have been linked with outcomes such as asthma (Carlsen et al., 2008), exacerbations of respiratory ill-health (Pattenden et al., 2006), otitis media (Stenstrom et al., 1993) sudden infant death syndrome (Wisborg et al., 2000) and poor cognitive development (Lambe et al., 2006).

The prevalence of smoking in adults has been estimated at 25% in Malaysia (Rampal et al., 2008). This figure was derived from a cross-sectional study of more than 17,000 Malaysian respondents in 2004 (matching the ethnic distribution of approximately 56% of Malays, 21% Chinese and 11% Indians) and is similar to that obtained for other countries including Scotland (National Statistic Scotland, 2009). However, unlike Scotland and the rest of the United Kingdom (UK), the Malaysian data is highly skewed by gender with a high smoking prevalence among males (47%) with significantly less among females (3%). As in many countries in the Western Pacific Region, Taiwan have a similar skewed distribution of smokers and a national survey in Taiwan reported that half of all women and children were exposed to SHS at home (Wen et al., 2005). The percentage of homes in Malaysia where SHS exposure occurs may be similar to that found in Taiwan.

Most of the studies on tobacco smoke exposure among children identified parental smoking as the main contributor to SHS exposure at home. An estimated 31.7% of children reported living with a smoker in Scotland, and with a similar figure reported in Wales (Akhtar et al., 2007; Holliday et al., 2009). Elsewhere in the European Union (EU), parental smoking prevalence in Greece was found to be the highest, estimated at 44% (Vardavas et al., 2007). In the UK, children's exposure to SHS has been declining in recent years. The Geometric Mean (GM) of salivary cotinine as a biomarker of SHS exposures reduced from 0.6 ng/ml in 1996 to approximately 0.2 ng/ml in 2006 (Sims et al., 2010).

The World Health Organisation's (WHO) Framework Convention of Tobacco Control (FCTC) aims to reduce children's exposure to SHS. Ratification of the FCTC leads to the introduction of Smoke-Free Legislation (SFL) among its member countries with SFL being introduced in many countries in the last decade. The extent of SFL varies from country to country: some countries such as Scotland and Ireland have introduced complete smoke-free environments in all enclosed public spaces with very few exemptions. In Malaysia, signing of the WHO's FCTC was performed in 2003 with ratification in 2005. Legislation partially restricting smoking in public places was introduced in 2004 under the Control of Tobacco Products Regulations under the Food Act 1983(WHO Framework Convention on Tobacco Control, 2003). Smoking restrictions covered five types of locations in 2007 including government offices, health facilities, educational facilities, public transport and air-conditioned venues with further changes in 2008 to include a total of 19 public-space venue types as smoke-free (*Malaysia Food Act 1983*). The designated public areas where smoking restrictions are in place now include air-conditioned restaurants, public transport, internet cafes and shopping complexes. However, smoking is still allowed in some

enclosed public spaces and many outdoor areas such as semi-enclosed eating establishments.

September 16, 2005, Malaysia has become a Party to the WHO Framework Convention on Tobacco Control. Tobacco control in Malaysia is regulated under the Food Act of 1983. The Control of Tobacco Product Regulations 2004 were issued under the Food Act of 1983 and regulate, among other things, smoke free environments, tobacco advertising, promotion and sponsorship, and tobacco packaging and labelling. The 2004 Regulations were amended by the Control of Tobacco Product (Amendment) Regulations 2008, the Control of Tobacco Product (Amendment) (No. 2) Regulations 2009, and the Control of Tobacco Product (Amendment) Regulations 2010 (*Tobacco Control Policy Fact Sheet Malaysia, Article 11*).

This study is aimed to determine the prevalence of exposure and respiratory effects of SHS among households in FELDA Raja Alias, Negeri Sembilan. This study also aimed to determine the socio-demographic factors associated with second hand smokers and to identify the place of exposure associated with second hand smoke (SHS).

1.2 Problem Statement

Second hand smoking is one of the major health issues in Malaysia that has gained concerned of the public in the recent years. A study showed that 52.9% of Malaysian schoolchildren were exposed to SHS at home (Akhtar et al., 2007; Holliday et al., 2009; Vardavas et al., 2007). This is a much higher figure compared to studies in the UK. Previously, a study conducted in Negeri Sembilan, Malaysia indicated that adolescents were exposed to parental smoking in 40% of homes (Lee et al., 2005). In

another study in 2008 on smoking among young women in a private educational institution in Kuala Lumpur, Malaysia smoking among fathers was estimated at 50.9% a value similar to that found in this study (Manaf et al., 2008).

In a multiple regression analysis, one of the strongest predictor of children's Geometric Mean (GM) salivary cotinine concentration was having a father who smoked. This study however reports a lower prevalence of maternal smoking (0.3%) compared to the Malaysian National Health Morbidity Survey III (NHMS III) (1.6%) *(The Third National Health and Morbidity Survey 2006)*.

This present study aims to determine the prevalence of exposure and respiratory effects of second hand smoke and its associated factors.

1.3 Objectives

1.3.1 General Objective

To determine the prevalence of exposure and respiratory effects of second hand smoke and its associated factors.

1.3.2 Specific Objectives

i. To determine the prevalence of exposure of second hand smoke among households in FELDA Raja Alias, Negeri Sembilan.

ii. To determine the prevalence of respiratory effects of second hand smoke among households in FELDA Raja Alias, Negeri Sembilan.

iii. To determine the socio-demographic factors associated with exposure to second hand smoke

a) Age

b) Gender

c) Educational level

d) Households Income

iv. To determine the prevalence of exposure at identified places that associated with second hand smoke

a) Home

b) Workplace

c) Public Setting

d) Transportation

1.4 Research Hypothesis

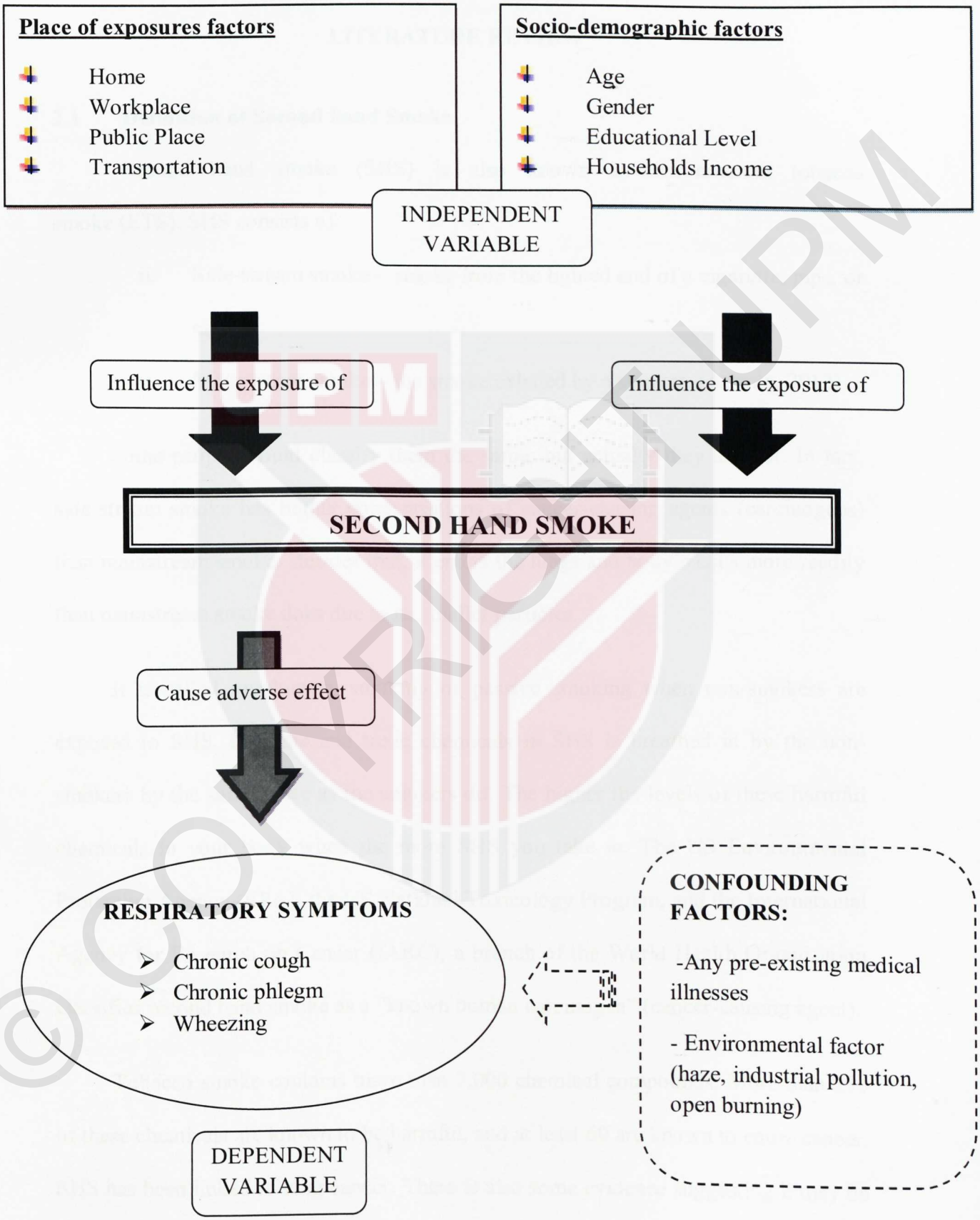
H1 There is a significant association between second hand smoking and socio-demographic factors of the respondents:

- ✓ Age
- ✓ Gender
- ✓ Educational level
- ✓ Households Income

H1 There is a significant association between second hand smoking and place of exposures of the respondents:

- ✓ Home
- ✓ Workplace
- ✓ Public place
- ✓ Transportation

1.5 Conceptual Framework



CHAPTER 2

LITERATURE REVIEW

2.1 Definition of Second hand Smoke

Second hand smoke (SHS) is also known as environmental tobacco smoke (ETS). SHS consists of:

ii. Side-stream smoke – smoke from the lighted end of a cigarette, pipe, or cigar.

iii. Mainstream smoke – the smoke exhaled by a smoker. (Atlanta, 2012)

Some people would classify them the same, but actually they are not. In fact, side-stream smoke has higher concentrations of cancer-causing agents (carcinogens) than mainstream smoke. Besides that, it enters the lungs and body's cells more readily than mainstream smoke does due to its smaller particles.

It is called involuntary smoking or passive smoking when non-smokers are exposed to SHS. Nicotine and toxic chemicals in SHS is breathed in by the non-smokers by the same route as the smokers do. The higher the levels of these harmful chemicals in your body when the more SHS you take in. The US Environmental Protection Agency (EPA), the US National Toxicology Program, and the International Agency for Research on Cancer (IARC), a branch of the World Health Organization classifies second hand smoke as a "known human carcinogen" (cancer-causing agent).

Tobacco smoke contains more than 7,000 chemical compounds. More than 250 of these chemicals are known to be harmful, and at least 69 are known to cause cancer. SHS has been linked to lung cancer. There is also some evidence suggesting it may be

linked with childhood leukaemia and cancers of the larynx (voice box), pharynx (throat), brain, bladder, rectum, stomach, and breast.

According to IARC report in 2009, parents who smoked before and during pregnancy were more likely to have a child with hepatoblastoma. This rare cancer is thought to start while the child is still in the uterus. Compared with non-smoking parents, the risk was about twice as high if only one parent smoked, but nearly 5 times higher when both parents smoked.

2.2 Prevalence of Exposure of Second--hand Smoke

According to an article on exposure of ETS among infants in Thailand published in 2007, 725 infants were reported had household smoking (73.3%) and detectable urinary cotinine (40.7%). Twenty-five infants (3.4%) had urinary cotinine in the range of adult heavy smokers. The prevalence of ETS exposure was significantly higher in infants with a father whose education was ≤grade 6 than in those with father's education >6 years (44.0% vs. 36.0%, $p = 0.039$) (Anuntaseree et al., 2008).

Besides that, in 2006, a study is conducted to assess the prevalence of passive cigarette smoke exposure in primary school children in Liverpool. The results showed that percentage of children living in smoking households was higher than the average reported for England (61.4% vs 53.0%). The average daily number of cigarettes smoked was similar for fathers (15.8) and mothers (16.4). The mean salivary cotinine concentration (+/-SD) was higher in boys than girls (p=0.006). The mean cotinine concentration was higher amongst children less than 7 years of age compared with older children (p=0.01). Children from disadvantaged socio-economic households had

a mean cotinine level of 1.9+/-0.4 ng/ml, and a higher risk of a positive cotinine-validated level (>or=1 ng/ml) [crude odds ratio (OR) 3.5, 95% confidence interval (CI) 1.6-5.2]. Maternal, but not paternal, cigarette smoke exposure was significantly associated with the salivary cotinine-validated level in children (adjusted OR 2.5, 95%CI 1.8-3.4) (Delpisheh et al., 2006).

In 2011, there is also a survey done on schoolchildren's exposure to secondhand smoke in Malaysia. The GM salivary cotinine concentrations for 947 non-smoking schoolchildren stratified by household residents' smoking behavior were: for children living with non-smoking parents, living with a smoker father, living with two smoking parents, children who live with an extended family member who smokes and for children living with two smokers (father and extended family member). Parental-reported SHS exposures showed poor agreement with children's self-reported SHS exposures. Multiple linear regression demonstrated that cotinine levels were positively associated with living with one or more smokers, urban residence, occupation of father (Armed forces), parental-reported exposure to SHS and education of the father (Diploma/Technical certificate) (Abidin et al., 2011).

Another study by Global Adult Tobacco Survey 2001 (GATS, 2001), shows that 39.8% of adult expose to SHS at workplace, 38.4% adult expose to SHS at home, while 71% adult expose to SHS at restaurant.

2.3 The respiratory symptoms associated with second hand smoking

The adverse health effects of exposure to SHS are now well-documented and established in various independent research studies and numerous international reports (Ontario Campaign for Action on Tobacco, 2007).

In 2004, a study was done in the United States to determine the respiratory symptoms associated with second hand smoking. They mailed a health questionnaire to 3,689 members of the International Brotherhood of Teamsters, working or recently retired (within 7 years) from three large U.S. trucking companies. (Laden et al., 2013)

Prevalence of chronic respiratory symptoms was identified based on self-reports using questions from the American Thoracic Society DLD-78 questionnaire that includes questions on timing and severity of the symptoms. "Chronic cough" was defined as cough on most days for 3 consecutive months or more during the year. "Chronic phlegm" was defined as phlegm on most days for 3 consecutive months or more during the year. "Any wheeze" was any report of wheezing with a cold or occasionally apart from colds or on most days or nights. Information on other respiratory illnesses, including hay fever, chronic bronchitis, emphysema, chronic rhinitis, COPD, and asthma was also obtained. (Laden et al., 2013)

2.4 Association between Socio-demographic Factors with Exposure to Second hand Smoke

2.4.1 Age

Globally, World Health Organization study show that 165 000 from 600 000 death per year caused by second hand smoke of worldwide burden disease is among children (Oberg et al., 2012). For children, exposure to second hand smoke defined as having one or both parents who are smoker or being exposed to tobacco smoke (Krieger et al., 2005). While for adults, exposure often defined based on having a spouse who smokes or exposure at work, not only that, the number of cigarettes and duration of exposure also being concerned(Krieger et al., 2005; Babb et al., 2006).

In 2004, the percentage children exposed to second hand smoke worldwide were 40 % (Abidin et al., 2011). About 60% of child death due to second hand exposure occurred in Africa and South East Asia combined. In WHO, over 40% of children have at least one smoking parents (*WHO Tobacco Fact Sheet N 339*). Thus children that live with adults who smoke are commonly associated with respiratory infections (Abidin et al., 2011). Furthermore, almost half of children regularly breathe air polluted by tobacco smoke (Babb et al., 2006). In United States, from 2007 to 2008, 53.6 % of young children (aged 3-11 years) were exposed to second hand smoke. This proven by only 5.4% of adult non-smoker lived with someone who smoked inside their home, while for children (aged 3-11 years) is 18.2% (CDC, Morbidity and Mortality Weekly Report, 2010).

2.4.2 Gender

Worldwide, about 40% of all men and 9% of women smoke (*WHO Gender, Women and Tobacco Epidemic 5*). The largest effects on death of tobacco exposure is higher in women than men, the reason is because the number of female non-smokers (thus susceptible to be exposed to second hand smoke by definition) is about 60% higher than that of male non-smokers(Oberg et al., 2006). In 2004, of the 430 000 adult deaths, about 64% were among women (*WHO Gender, Women and Tobacco Epidemic 5*). One useful surrogate and the only available indicator used in many countries is the rate of smoking prevalence among men and women (*WHO Report on the Global Tobacco Epidemic, 2009*)

Smoking prevalence rates was varying by gender and by country. Smoking prevalence rates in low income countries for men are 28% and for women are 4%. In

middle income countries, men smoke substantially more than women, 45% versus 7%. While in high income countries, smoking prevalence rates for men and women are similar which are 32% and 18% respectively. Thus these prevalence rates indicate women especially in developing countries had constitute a substantial portion of the population at risk of secondhand smoke exposure. For the Asian countries, men have very high smoking rates compared to women that have low smoking rates (*WHO Gender, Women and Tobacco Epidemic 5*).

2.4.3 Education Level

Education is related to most aspects of a person's lifestyle, social performance and psychosocial adjustment, including participation in the family roles, labor force, parenting, and psychological well-being (Kandel et al., 2009).

In Malaysia, media play a big role in educating person which 87.1% of adults noticed anti-cigarette smoking information on the television or radio (GATS, 2011). Adult perception regarding smoking, 85.8% of them believed breathing other peoples' smoke can causes serious illness in non-smokers (WHO, Ten Facts on Second Hand Smoke).

A study in New York done among women shows that rate of current smoking among those who has not graduated from high school is twice higher than those graduated from college. The rates are; among those not graduated from high school (29.3%), graduated from high school (28.5%), those with some college (25.2%), college graduate (13.0%). The persistency of smoking decrease linearly with education, 53.7% of women that has not graduated from high school continue to smoke compare with college graduate (19.5%), high school graduate (43.3%), some college (35.8%) (Kandel et al., 2009).

2.4.4. Households Income

Low and middle income countries indicate heaviest burden of tobacco-related illness and death which are nearly 80% of the more than one billion smokers (*WHO Tobacco Fact Sheet N 339*). Globally, there are countries which their family come from poor households, are frequently employed in tobacco farming to provide their family income. Thus, these children are vulnerable to "green tobacco sickness", which is caused by the absorption of nicotine from the handling of wet tobacco leaves via the skin (*WHO Tobacco Fact Sheet N 339*).

In Malaysia, on average, a current tobacco smoker spent RM 178.80 per month on manufactured cigarettes (GATS, 2011). One of the facts on second hand smoke by WHO, 10% of the economic costs related to tobacco use are attributable to second hand smoke. Direct cause are those associated with treatment tobacco-related illness, while non-direct cause are those associated with reduced activity or lost wages because of death or illness(*WHO, Ten Facts on Second Hand Smoke*).

2.5 Place of Exposure To Second hand Smoke

2.5.1 At Home

A study by GATS in Malaysia for the year 2011, the result shows that 4 in 10 (7.6 million adults) adults are exposed to SHS at home. SHS exposure for adult at home for at least monthly are 43.3% men and 33.3% women with overall percentage of 38.4% (Global Adult Tobacco Survey, 2011). The place where children are most exposed to SHS is home. Comparison made between children who live in house where smoking is allowed and house where smoking is prohibited, shows that children in

house where smoking is allowed has higher level of cotinine compare to children living in house where smoking is prohibited. Cotinine is a biological marker for SHS exposure (*A Report of Surgeon General, U.S*).

Since home is the predominant location for smoking, many children and women are exposed to SHS at home while doing their daily activities (Shafey et al., 2009). Based on Malaysian fact from The Tobacco Atlas, 11.5% of youth (age 13 to 15) are exposed to SHS at home. For children the dominance exposure to second hand smoke (SHS) is at home, where they spend majority of their time. The exposure to SHS in women also is at home, as well as other public places for employed women (Jaakkola et al., 1997). A study in Malaysia in 2010 also shows that some adolescent also expose to SHS via their older siblings as some of them prefer to turn to older siblings for social and scholastic support rather than their parents (Lim et al., 2010).

Another study in Malaysia found that 52.9% of schoolchildren in Malaysia are exposed to SHS at home (Abidin et al., 2011). In Asia, majority of the smokers are men, hence majority of women are exposed to SHS at home (Zhang et al., 1992). A study conducted in Shanghai, China about paternal smoking and birth weight found that 58% of new born babies were exposed to SHS, primarily by the father and less due to mother (Abidin et al., 2011). Besides exposure to SHS at home by parents, SHS also can be contributed by guest who smoke at home. Cotinine level increase when exposed to SHS by guest but not that as high when SHS is contributed by parents (Cook et al., 2004). In a same way, children that spend their times with their smoking carers can have increased cotinine concentration (Jaakkola et al., 1994).

2.5.2 At Workplace

A recent study in 2011 in Malaysia shows that 46.2% men and 30.1% women are exposed to second hand smoke (SHS) at workplace. Overall, 39.8% adults are exposed to SHS at work. About 4 in 10 adults (2.3 million adults) working indoors are exposed to SHS at workplace (GATS, 2011). In Malaysia, smoking has already been banned in school since 1997, but the enforcement is uneven, and there still reports about smoking cases at school (Naing et al., 1997).

A study in US shows that in a workplace where smoking is not restricted, there is 10 times likely the employees will report exposure to SHS compare to workplace where there is 100% smoke-free policies (Skeer et al., 2005). Another study in US shows that SHS exposure at workplace is higher in men than women; men are 15.8% while women are 9.8% (Max et al., 2012). Exposure to SHS at workplace is a major problem. According to recent review in 2006, there is an estimated of 7.5 million workers in EU that are exposed to SHS at work (Jaakkola et al., 2006).

Another data from New Zealand show that the cotinine level in non-smoking hospitality workers in establishment that allow smoking is between 3 and 4 times of those of non-smoking workers in smoke free premises (Bates et al., 2002). There is also another study that suggested that before the introduction of smoke-free legislation in England, Scotland, Wales and Northern Ireland, about 54 hospitality workers died as a result of exposure to SHS every year in United Kingdom (Jamrozik , 2005).

2.5.3 At Public Place

Public places that cause exposure to secondary smoker in Malaysia includes government buildings, restaurants, cafes/coffee shops/bistros, bars/night clubs, indoor shopping complexes and public transportation (Gurpreet et al., 2012). A study by GATS shows that 71% of SHS is exposed to tobacco smoke at restaurant while 39.8% of SHS exposed to tobacco smoke at workplace. These shows high number of exposure to tobacco smoke at public places. In United Kingdom, awareness regarding passive smoking has increased in recent decades. A report in 2002 showed that 54% of the public were in favour of restrictions on smoking in pubs; 88% in restaurants and 87% in other public places (Laden et al., 2002).

In May 2003, a FCTC was adopted at the World Health Assembly. This convention has recognized the dangers of passive smoking in public and implements effective policies in order to protect public from passive smoking in indoor workplace and public places. The first country to sign this convention is United Kingdom (Article 8, WHO Framework Convention on Tobacco Control, 2003). In other regions such as California, United States of America, ban of smoking is done step by step. Several areas in California are ban smoking in early 1990. In 1994 smoking is banned in any enclosed public place. In only came into effect in 1995 but some entertainment area are given duration of three years until 1998 (Wingo et al., 2001).

2.5.4 In Transportation

In US, a study published in paediatrics in 2012 shows that more than one-fifth of students (US middle and high school student) (King et al, 2012). A study in 2008 shows that smoking one cigarette in a car exceeded fine particle exposure limit set by EPA and raised SHS level several times higher than level which can be found in smokes in restaurants and bars (Sendzik et al., 2012).The New Zealand Medical Journal published about a study that found that smoking in car even with window open can produces five times worst air quality than the poorest air quality day in Auckland. It became 10 times worst if the window is closed (Edwards et al., 2006).

There are studies since 2005 that found high support level among public for smoke-free car laws. There are also five studies included since year 2005 that show support levels at 77% or even higher among smoker (Hitchman et al., 2011). For children, they usually expose to SHS when their parents or other adults smoke in cars in their presence. The concentration of smoke in vehicle due to SHS where smoking happen can reach to a very high level, which make vehicle smoke-free would reduce SHS in children *(A Report of the Surgeon General, U.S, 2006).*

CHAPTER 3

METHODOLOGY

3.1 Study Location

This study was conducted at FELDA Raja Alias 1 in Wilayah Raja Alias, Negeri Sembilan

3.2 Study Design

This was a cross sectional study design.

3.3 Study Duration

The study duration was about 6 months. The first phase started from 25th March 2013 until 22nd April 2013 for preparing and presenting the proposal. The second phase continued from 15th July 2013 until 6th September 2013 for data collection and analysis, and report writing and presentation.

3.4 Sampling

3.4.1 Study population

The subjects consist of the residents in FELDA Raja Alias 1, Wilayah Raja Alias, Negeri Sembilan.

3.4.2 Sampling Population

Households of FELDA Raja Alias in Negeri Sembilan

3.4.2.1 Inclusion Criteria

Adolescents and adult household members of FELDA settlement

(Age 10 and above)

3.4.2.2 Exclusion Criteria

Non- Malaysian citizen

3.4.3 Sampling Frame

List of household at selected FELDA Raja Alias. The list is obtained from the village chief.

3.4.4 Sampling Unit

Member of household aged 10 years and above

3.4.5 Sampling Method

This study used simple random sampling method by using random table. Each block FELDA Raja Alias I to IV from Wilayah FELDA Raja Alias was randomly sampled. After 1 block of FELDA Raja Alias is chosen, sampling frame was randomly used to select the household by random table method which becomes our sampling subjects.

3.4.6 Sampling Size Calculation

The calculation for sampling size is based on formula of cross- sectional study design sample size calculation by Lawanga and Lemenshow. The formula is:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

where,

n – Required sample size

P – Estimated prevalence of secondary smoke

(Global Adult Tobacco Survey, 2011)

Z – Confidence level at 95% (standard value of 1.96)

d – Precision (in proportion of 1)

α – Level of significance

i. Using a prevalence of exposure to SHS at workplace **(P=39.8%)**

$$= \frac{1.96^2 x 0.398(1-0.398)}{0.05^2}$$

$$= 368 \approx 370$$

ii. Using a prevalence of exposure to SHS at home at least monthly **(P=38.4%)**

$$= \frac{1.96^2 x 0.384(1-0.384)}{0.05^2}$$

$$= 363 \approx 360$$

iii. Using a prevalence of exposure to SHS inside restaurants **(P=71%)**

$$= \frac{1.96^2 x 0.71(1-0.71)}{0.05^2}$$

$$= 316 \approx 320$$

In this study, we had chosen sample size that has the highest total sample size from the prevalence of 39.8% that is the exposure to SHS is at workplace. Therefore, the sample size chosen is 370. This is because; the largest total sample size 370 should have covered the lower sample size at home at least monthly and sample size when inside the restaurant.

3.5 Instrument and data collection

3.5.1 Instrument

The instrument that used in this study was questionnaire. It was made up of three sections consisting of 7 questions on socio-demographic factor, 14 questions on environmental factor and 8 questions on any history of respiratory illnesses. These questionnaires had been validated before carrying out the study.

The first section consists of residents' personal profile such as age, gender, ethnicity, educational level, and occupation. The second section included questions on the place of exposure and the person that they were exposed to, including their frequency and duration. Finally the last section had asked about any respiratory illnesses that the subjects had which related to exposure of tobacco smoke, duration of symptoms being experienced and the comorbid respiratory condition (asthma, chronic heart failure, etc.).

3.5.2 Data collection technique

Data was collected by using self-administered questionnaires. Questionnaires were distributed and one day was given to the respondents to complete. The next day we came to the house by house to re-collect the questionnaire.

3.5.3 Quality Control

Pre-test was conducted to make sure that the question in questionnaire was valid. We had conducted a Cronbach alpha test in which we will give the questionnaires to FELDA settlers other than FELDA Raja Alias (which is our study population). After they had finished answering the question, we then collected the questionnaire and returned back to the same pre-test subject with the same questionnaire to be answered by them again. Based on the two sets of the answered questionnaires, we had compared the answer and calculated the Cronbach alpha. The value is 0.63. Based on the criteria proposed by Landis and Koch, values between 0.4 and 0.75 are considered as fair to good agreement.

3.6 Data Analysis

In descriptive analysis, socio-demographic factors of the respondents consist of age, gender, educational level and monthly households' income. Besides that, prevalence of secondary smoker among resident of FELDA Raja Alias in Negeri Sembilan and the data was described as frequency, percentage, using central tendency (mean, mode and median) and dispersion. Inferential analysis was analysed by Chi-square test which performed to test for the categorical variables (such as gender,

ethnicity, and educational level). If the expected value for any of the cell was less than 5 and the number of study units was less than twenty, hence Fischer's exact test was used instead of Chi-square test.

3.7 Study Ethics

Prior to commencement of the study, ethical clearance and approval letter was obtained from:

i. Ethical Committee Approval

Ethical approval to conduct the study had been obtained from Ethical Committee for Human Research, Faculty of Medicine and Health Sciences, University Putra Malaysia.

ii. Approval from FELDA Authority

Approval to conduct the study had been obtained from FELDA Authority.

iii. Consent from respondent

Consent had been obtained from the respondents before conducting the interview.

iv. Training of enumerators

To ensure the quality of data collected by enumerators, the enumerators had undergo one day training on the questionnaire used in the study.

3.8 Variables

3.8.1 Dependent variable

i. Respiratory effects

3.8.2 Independent variables

i. . Socio-demographic characteristics:

a) Age

b) Gender

c) Family income

d) Educational level

ii. Place of exposures:

a) At home

b) At workplace

c) At public places

d) Transportation

3.9 Definition of terms

3.9.1 Prevalence - the number of cases of a specific disease present in a given population at a certain time.

(*Dorland'sPocket Medical Dictionary* 28th ed., 2009)

3.9.2 Passive smoke -environmental tobacco smoke (ETS). Consists of:

i. Side-stream smoke – smoke from the lighted end of a cigarette, pipe, or cigar.

ii. Mainstream smoke – the smoke exhaled by a smoker.

3.9.3 Gender - Based on the respondents' identity card (MyKad).

3.9.4 Age -Respondent's age on 1 January 2013 based on respondent's birth date stated on the identity card (MyKad)

3.9.5 Educational level - Based on the questionnaire to determine the level of education whether primary school, secondary school, under graduate, post graduate or no formal education.

3.9.6 Chronic cough – cough on most days for 3 consecutive months or more during the year. One lasting eight weeks or longer — is more than just an annoyance. A chronic cough can ruin sleep and leave feeling of exhausted. Severe cases can result in vomiting, rib fractures and lightheadedness.

3.9.7 Chronic phlegm – phlegm on most days for 3 consecutive months or more during the year. Phlegm is thick, sticky, stringy mucus secreted by the mucous membrane of the respiratory tract, as during a cold or other respiratory infection.

3.9.8 Any wheeze – any report of wheezing with a cold or occasionally apart from colds or on most days or nights. Wheezing is a high-pitched whistling sound during breathing. It occurs when air moves through narrowed breathing tubes.

CHAPTER 4

RESULTS

4.1 Response Rate

Sample size required for this study was 370. Questionnaire had been distributed to 370 respondents. However, only 320 questionnaires were returned completed. Therefore, the response rate was at 86%.

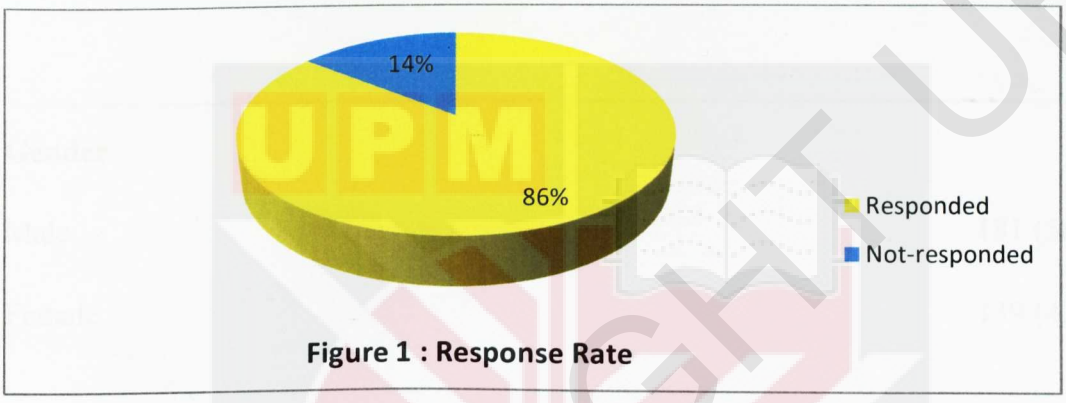


Figure 1 : Response Rate

4.2 Socio-Demographic Characteristics of Respondents

Among all the respondents, the youngest respondents are 19 years old while the oldest are 75 years old. Mean of the age for all the respondents is 42 years old. According to gender, 181 (56.6%) are male while 139 (43.4%) are female. Meanwhile, educational levels of the respondents have also been categorized into several groups, and we found that majority of them are in high school level (57.2%), followed by (25.6%) which is in primary school level, (12.5%) is of university level and (4.7%) with no formal education. The monthly household incomes of the respondents have also been taken into account. The mean of the income is RM1675 while the mode of the income is RM1000. The highest income is RM11000 while the lowest income is RM300. Majority of them (51.9%) earn RM1001-RM5000 monthly. Socio-demographic characteristics of the respondents was summarised in Table I.

Table I: Socio-Demographic Characteristics of Respondents among Households in FELDA Raja Alias Negeri Sembilan.

Socio-Demographic Characteristics	Mean ± SD	n (%)
Age (years old)	42.94 (14.697)	
Less than and equal to 40		123 (38.4)
More than 40		197 (61.6)
Gender		
Male		181 (56.6)
Female		139 (43.4)
Educational Level		
No Formal Education		15 (4.7)
Primary School		82 (25.6)
High School		183(57.2)
University/ College		40 (12.5)
Household income (monthly)	1675.2 (1439.4)	
Lesser than RM1000		142(44.4)
RM1001 – RM5000		166(51.9)
RM5001 and Above		12 (3.8)

4.3 Prevalence of Exposure of Second hand Smoke

Table II and Figure 2below showed the prevalence of exposure of second hand smoke among households in FELDA Raja Alias, Negeri Sembilan. Public place showed the highest prevalence of exposure which indicates 94.4 %. While at workplace the prevalence showed the lowest exposure which indicates only 69.7 %.

Table II: Prevalence of exposure of second hand smoke among households in FELDA Raja Alias, Negeri Sembilan.

Exposure status by place (N for each = 320)	n(%)	Mean	95% CI
Home	239(74.7)	1.25	1.21, 1.30
Workplace	223 (69.7)	1.30	1.25, 1.35
Public place	302 (94.4)	1.06	1.03, 1.08
Transportation	284 (88.8)	1.11	1.08, 1.15

4.4 Prevalence of Respiratory Effects of Second hand Smoke

Table III and Figure 3 below showed the prevalence of respiratory effects of second hand smoke among households in FELDA Raja Alias, Negeri Sembilan. The presence of wheezing and other diseases related to respiratory symptoms shows lowest prevalence which was 8% and 7% respectively. On the other hand, the presence of cough showed the highest prevalence which was 22%.

Table III: Prevalence of respiratory effects of second hand smoke among households in FELDA Raja Alias, Negeri Sembilan.

Respiratory symptoms (N for each= 320)	n(%)	Mean	95% CI
Presence of cough	70 (21.9)	1.78	1.74, 1.83
Presence of Phlegm	68 (21.3)	1.79	1.74, 1.83
Presence of Wheezing	24 (7.5)	1.93	1.90, 1.95
Presence of other Diseases related with Respiratory Symptoms	22 (6.9)	1.93	1.90, 1.96

4.5 Inferential Analysis

4.5.1 Association between Socio-Demographic Factors with Exposure to Second hand Smoke

By referring to Table IV, for age group less than 40, the highest exposure is at public place (96.7%) while the least exposure is at workplace (69.9%). For age group more than 40 years old, the highest exposure is at public place (92.9%) while the lowest exposure is at work place (69.5%). There is no significant association between age group and exposure status at home, workplace, public place, and transportation.

While for gender among male, the highest exposure is at public place (96.7%) while the least exposure is at home (72.9%). For female, the highest exposure is at public place (91.4%) while the lowest exposure is at work place (58.3%). There is a significant association among gender at workplace (0.001) and public place (0.041). However, there is no significant association among gender and exposure status at home and transportation.

Among group with no formal education, the highest exposure is at public place (100%) while the least exposure is at home (86.7%). For group with educational level of primary school, the highest exposure is at public place (92.7%) while the lowest exposure is at home and work place (72.0%). Among secondary school graduate, the highest exposure is at public place (94.5%), while the lowest exposure is at work place

(69.9%). For university graduate, the highest exposure is at public place (95.0%) while the lowest exposure is at work place (55.0%).There is a significant association among educational level at workplace (0.041). However, there is no significant association among educational level and exposure status at home, public place and transportation.

For the group with monthly income less than RM 1000, the highest exposure is at public place (93.0%) while the least exposure is at workplace (73.2%). For group with monthly household income RM 1001 to RM 5000 the highest exposure is at public place (95.2%) while the lowest exposure is at work place (65.1%). For group with income RM 5001 and above, the highest exposure is at public place (100%) while the lowest exposure is at home (83.3%).There is no significant association between economic status and exposure status at home, workplaces, public places and transportations.

Table IV: The Association between Socio-demographic factors (age, gender, educational level and economic status) and Exposure to Second-hand Smoke at Home, Workplace, Public Place and Transportation (* significant value at p < 0.05)

Socio Demographic Factors	Home	Workplace	Public Place	Transportation
			n (%)	
AGE (Years old)				
Less than and equal to 40 (n=123)	96(78.0)	86(69.9)	119(96.7)	113(91.9)
More than 40 (n=197)	143(72.6)	137(69.5)	183(92.9)	171(86.8)
x^2 value	1.194	0.005	2.119	1.948
p value	0.275	0.943	0.145	0.163
GENDER				
Male (n=181)	132(72.9)	142(78.5)	175(96.7)	162(89.5)
Female (n=139)	107(77.0)	81(58.3)	127(91.4)	122(87.8)
x^2 value	0.682	15.156	4.189	0.236
p value	0.409	0.001*	0.041*	0.627
EDUCATIONAL LEVEL				
No Formal Education (n=15)	13(86.7)	14(93.3)	15(100)	14(93.3)
Primary School (n=82)	59(72.0)	59(72.0)	76(92.7)	74(90.2)
Secondary School (n=183)	141(77.0)	128(69.9)	173(94.5)	160(87.4)
University/ College (n=40)	26(65.0)	22(55.0)	38(95.0)	36(90.0)
x^2 value	3.989	8.260	1.375	0.880
p value	0.263	0.041*	0.711	0.830
HOUSEHOLDS INCOME (monthly)				
Less than RM1000 (n=142)	106(74.6)	104(73.2)	132(93.0)	128(90.1)
RM1001- RM5000 (n=166)	123(74.1)	108(65.1)	158(95.2)	145(87.3)
RM5001 and above (n=12)	10(83.3)	11(91.7)	12(100)	11(91.7)
x^2 value	0.505	5.275	1.456	0.704
p value	0.777	0.072	0.483	0.703

4.5.2 Prevalence of Exposure at Identified Places That Associated With Second hand Smoke

Table V showed the rate of exposure to secondary smoke by the respondents at home. Out of 320 respondents, there were 239 people who were exposed to secondary smoke at home which constituents 74.7% of the total respondents. In other words, there were only 81 out of 320 respondents who reported to be unexposed to secondary smoke at home, at rate of 25.3%.

While for workplace, the results showed that the respondents who worked at the farms tend to be exposed greatly to secondary smoke, which were 109 out of total respondents (34.1%). The workplaces which had the second highest exposure rate (20.9%) were unclear because they were not stated in our questionnaires. Then it was followed by working area in terms of services like shops and schools, 17.2% of the respondents were exposed to secondary smoke in that area. Lastly, only 5.3% of total respondents were exposed to secondary smoke at office settings.

In public place, respondents had been given options of different public places like restaurants, cyber cafes, shopping malls, grocery shops and others. The results showed that the public places which had the highest tendency for the respondents to receive secondary smoke, were the restaurants, 60.9% of total respondents reported. The public places which had decreasing rate of exposure are followed by grocery shops (12.2%), shopping malls (9.1%), cyber cafes (2.5%) and others (playground, petrol station, and town hall) (9.7%).

While in transportations, out of the total respondents, 46.9% reported that they were exposed to secondary smoke in the cars. Followed by 28.1% who reported they received secondary smoke in the buses. 4.7% of the respondents were exposed in the taxis while 9.1% of people were exposed in other transportations (motorcycle, lorry and pedestrians).

Table V: Prevalence of Exposure to Secondary Smoke at Home, Workplace, Public Place and Transportations.

Types of Place of Exposure	Frequency (n)	Percentage (%)
Exposure at Home		
Yes	239	74.7
No	81	25.3
Total	320	100
Exposure at Workplace		
Office	17	5.3
Services (Shops/Schools)	55	17.2
Farms	109	34.1
Others	67	20.9
*Not Exposed**	*72*	*22.5*
Total	320	100
Exposure at Public Places		
Restaurants	195	60.9
Cyber Cafes	8	2.5
Shopping Malls	29	9.1
Grocery Shops	39	12.2
Others	31	9.7
*Not Exposed**	*18*	*5.6*
Total	320	100
Exposure at Transportations		
Car	150	46.9
Bus	90	28.1
Taxi	15	4.7
Others	29	9.1
*Not Exposed**	*36*	*11.2*
Total	320	100

**The respondents did not expose to that particular place at all.*

CHAPTER 5

DISCUSSION

5.1 Prevalence of Exposure of Second--hand Smoke

In this study among 320 of respondents from FELDA, Raja Alias, Negeri Sembilan, there were 239 (74.7) of them reported that they were exposed to SHS at home, 223 (69.7%) of them were exposed at workplace, 302 (94.4%) were exposed at public place while 284 (88.8%) were exposed in transportations. The prevalence of exposure to SHS at home in our study is higher compare to GATS is may due to the facts that this two study is done at different location, and our study population consists of a population that is unaware about the danger they give to their family when smoking at home. The highest prevalence of exposure to SHS in our study is at public place which is quite similar to GATS that is at restaurant. This can be due to lack to law enforcement in Malaysia regarding about smoking at public places.

According to Global Adult Tobacco Survey (GATS) Malaysia in 2011, the prevalence of adult expose to SHS at home is 38.4%, at work place is 39.8% and at restaurant is 71.0% (Global Adult Tobacco Survey, 2011).

5.2 The respiratory symptoms associated with second hand smoke

A cross sectional study of second hand smoke exposure in Unites States trucking industry and respiratory symptoms shows that the prevalence of respiratory illness are 9.8% shows chronic cough, 11.7% shows chronic phlegm, 47.8% with any wheeze, and 50.8% with any other symptoms (Laden et al., 2013).

In our study, out of 320 of respondents, 70 (21.9%) of them reported having cough, 68 (21.3%) of them reported having phlegm, 24 (7.5%) of them having wheezing and 22 (6.9%) of them reported having other respiratory diseases. From the results, we can see that a big number from those who were exposed to secondary smoke did not manifest respiratory symptoms of secondary smoking. This may show that secondary smoke has only small effects to respiratory systems. Another possibility regarding the low incidence of respiratory symptoms is due to bias. The respondents may forget if they has encounter any respiratory illness recently, or during the time of answering questionnaire the respiratory illness is gone but temporarily. The respondent might also misunderstood the question, they may think that question is for serious illnesses so they tend to ignore if they have mild illness. Besides that, some of the respondents also unaware of the symptoms they were having that time.

5.3 Association between Socio-Demographic Factors with Exposure to Second-hand Smoke

5.3.1 Association between age with exposure to SHS

Based on Malaysian fact from The Tobacco Atlas, 11.5% of youth (age 13 to 15) are exposed to SHS at home. A study in Malaysia in 2010 also shows that some adolescent also expose to SHS via their older siblings as some of them prefer to turn to older siblings for social and scholastic support rather than their parents (Lim et al., 2010). Global Youth Tobacco Survey of 2003 indicates high exposure to tobacco smoke among school adolescents aged 13 to 15 years, both at home and in public places. Some study also said that several of diseases usually discovered after age 40.

Thus it is the reason for young adult does not concern much on developing respiratory and other diseases. (*Article Health Risk after Age 40*)

However in our study, the results showed that there is no significant association between age and exposure to SHS at home (p= 0.275), workplace (p= 0.943), public place (p= 0.145) and transportation (p= 0.163).This is because age is not really being factor to be exposed to second hand smoke. Most of the house in this study must be at least one smoker. Thus, all range of age whether from neonate until old person will be exposed.

5.3.2 Association between genders with exposure to SHS

In Malaysia, 46.2% men and 30.1% women are exposed to SHS at workplace. Study in US by Max et al. in 2012 shows that SHS exposure at workplace is higher in men than women; men are 15.8% while women are 9.8%. While study done by Zhang et al. in 1992 said that at home, majority of the smokers is men, thus majority of the women will be exposed to second hand smoke. Study by Jaakola et al. in 2003 stated that the exposure to SHS in women also is at home, as well as other public places for employed women.

In this study, there are only significant association between gender with exposure to SHS at workplace (p= 0.001) and public place (p= 0.041). Thus the association support the previous study. Besides that, the number of male being exposed is higher compared to female in each place of exposure which are (M=72.9%, F=77%) for home, (M=78.5%, F= 58.3%) for workplace, (M=96.7%, F=91.4%) for public place, and (M= 89.5%, F=87.8%) for transportation. The higher percentage on

male in exposure at home also supports the previous study. The difference in result with some previous study is because the ratio inequality of gender in the respondents where male is predominant (n=181) than female (n=139).

5.3.3 Association between educational level with exposure to SHS

A study in New York done by Kandel et al. in 2009 shows that rate of current smoking among women who has not graduated from high school is twice higher than those graduated from college. The persistency of smoking decrease linearly with education, 53.7% of women that has not graduated from high school continue to smoke compare with college graduate (19.5%), high school graduate (43.3%), some college (35.8%). While study in US stated that SHS exposure in cars decreased significantly among US middle and high school students from 2000 to 2009. Nevertheless, in 2009, over one-fifth of non-smoking students still reported exposed to SHS in cars. While in study tobacco in Australia in 2008–09, 82% of university-educated smokers reported never smoking when non-smokers were present in their cars–only slightly more than smokers who had not completed high-school education.

In our study, there is significant association between educational level with exposure to SHS at workplace (p= 0.041). As respondents who are exposed at workplace mostly had secondary school background (n=183), they are not really exposed and aware to the dangerous of secondary smoke at their school as this matter is not being concern so much back then. Thus the association support the previous study. However there are no significant association between educational level with exposure to SHS at home (p= 0.263), at public place (p= 0.711) and in transportation (p= 0.830). This is because; most of their time is spent at home which is a usual place

of exposure to SHS. Difference in educational level towards ban of smoking in public place or transportation does not really take in account in order to preserve their good relationship.

5.3.4 Association between households income with exposure to SHS

In study tobacco in Australia, among Australian smokers in 2010–11, those on lower incomes were much more likely to allow smoking anywhere in their house. Women who work in blue-collar jobs are less likely to have smoke free-homes compared to the women who work on in white-collar jobs. Study in Australia in 1990s, blue collar workers were three times more likely to work in environments with no restrictions on smoking. Other than that, second hand smoke exposure tends to be high for persons with low incomes: 60.5% of persons living below the poverty level in the United States were exposed to second hand smoke in 2007–2008. (Morbidity and Mortality Weekly Report, U.S).

In this study, there are no significant association between households income with exposure to SHS either at home (p= 0.777), at workplace (p= 0.072), at public place (p= 0.483) or in transportation (p= 0.703). Through observation, most of respondents average households income monthly is about the same, around RM1001-RM5000. Thus the difference in households income do not contributed well towards exposure to second hand smoke because they had to divide their money wisely for their household's needs and children.

5.4 Prevalence of Exposure at Identified Places That Associated With Second hand Smoke

5.4.1 Exposure at Home

A study by Global Adult Tobacco Survey (GATS) in Malaysia for the year 2011, the result shows that 4 in 10 (7.6 million adults) adults are exposed to SHS at home. Another study in Malaysia found that 52.9% of schoolchildren in Malaysia are exposed to SHS at home, a figure that is much higher compared to study in UK (Abidin et al., 2011). Besides exposure to SHS at home by parents, SHS also can be contributed by guest who smoke at home. (Cook et al., 2004).

In this study, 239 (74.7%) of them reported that they were exposed to SHS at home. This large percentage of exposure at home supports the previous study. This is because most of respondent's time being spent at home. The smoker can smoke anywhere at their home as there is no concept of smoke-free home applied in their home.

5.4.2 Exposure at Workplace

A recent study in 2011 in Malaysia shows that 46.2% men and 30.1% women are exposed to second hand smoke (SHS) at workplace. About 4 in 10 adults (2.3 million adults) working indoors are exposed to SHS at workplace (GATS). In study by Jaakkola et al. in 2006, there is an estimated of 7.5 million workers in European Union (EU) that are exposed to SHS at work. In London, a study showed that cotinine level in a non-smoker bar worker is 4 times the level of non-smoker that live with smoker partner, and 10 times the level of non-smoker living in smoke-free household(Jarvis , 2001).

For workplace, majority of the respondents (34.1%) said that they acquire SHS at farms, and only minority of them received SHS at office (5.3%), in service working places (17.2%), and others (20.9%). Most of the time especially at morning, they spent their time at farm's site. Farms become a majority place because work at farm is the main occupation at this FELDA. The rate of exposure lower at office because office had become prohibited place to smoke, while at services like shops and schools, the respondent only spent a short time when went to that place. While for others the place is unclear because they were not stated in our questionnaires.

5.4.3 Exposure at Public Place

A study by GATS shows that 71% of SHS is exposed to tobacco smoke at restaurant while 39.8% of SHS exposed to tobacco smoke at workplace. These shows high number of exposure to tobacco smoke at public place which is restaurants. (GATS, 2011)

Similarly in this study, we found out that most of the respondents (60.9%) tend to be exposed to SHS at the restaurants. The rest of them reported that they were exposed at cyber cafes (2.5%), shopping malls (9.1%), grocery shops (12.2%) and other places (9.7%), while 5.6% of the respondents are unexposed at any public places. Restaurants become the choices at this area when they hang out with friends whether in the morning, evening or nights.

5.4.4 Exposure at Transportation

A study in Paediatrics 2012 journal, from 2000 to 2009, the prevalence of SHS exposure in cars declined significantly among both non-smokers (39.0%–22.8%; p=0.001) and smokers (82.3%–75.3%; p=0.001). Among non-smokers, this decline occurred across all school level, gender, and race/ethnicity subgroups. (King et al., 2012).

However in this study, car still indicate the highest percentage rate of exposure to SHS which is 46.9% (n= 150). Bus indicates the second highest which 28.1% (n= 90), followed by others such as motorcycle, lorry, and pedestrians which is 9.1% (n= 29), then the lowest percentage is in the taxi which indicates 4.7% (n= 15). Most of respondents had at least one vehicle at home. The exposure to SHS in car is mostly contributed by respondent's siblings, father, and friends. While in the bus mostly the smoke contributed by others passenger. As for taxi, smoking is prohibited if the driver does not allow it.

5.5 Conclusion, Limitation, and Recommendation

5.5.1 Conclusion

From the total 320 respondents taking part in this study, 239 (74.7%) respondents are exposed to SHS at home, 223 (69.7%) at workplace, 302 (94.4%) at public place and 284 (88.8%) at transportation. Among 320 respondents, the respiratory effects due to exposure to SHS are 70 (21.9%) respondents reported having cough, 68 (21.3%) reported having phlegm, 24 (7.5%) reported with wheezing and 22 (6.9%) of them reported having other respiratory diseases.

There is significant association between gender and exposure to SHS at public place and workplace, and also between educational level and exposure to SHS at workplace. However, there are no association between; gender and exposure to SHS at home and transportation, educational level and exposure to SHS at home public place and transportation, and also household income at all four places.

For the exposure at different types of workplace, exposure at farm is the highest (34.1%). At public place, the highest exposure is at restaurant (60.9%). For the exposure at transportation, the highest is in car (46.9%).

5.5.2 Limitation

Since our study is cross sectional design, we cannot explain the temporal sequence of events between secondary smoker and its factors association clearly. Time constraint make the study cannot be done in longer term. There is also non respond bias when respondents refuse to answer the questionnaire and also returning back unanswered questionnaire to the researchers. This is the main reason why we cannot obtain 370 respondents as in our targeted calculated sample size. Besides that, our sample size also is not big enough. Thus it is difficult to find the significant relationship from the data, as statistical test normally require a larger sample size to ensure the representativeness of it in the study.

5.5.3 Recommendation

From our findings result on this study, majority of our respondents that are mostly exposed is male and those with age less than and equal to 40 years old either for male or female. Awareness campaign and reminder about the danger of smoking and exposure smoke to others among male and younger age respondents must be continuously done at least once a month in their workplace and public place. Information and technique to stop smoking and the best way to prevent exposure towards second-hand smoke must be spread and be informed to Felda residence here.

As cross sectional study does not provide temporal sequence to this study, prospective cohort study should be conducted and any intervention must be included such as smoking in work place and few public places.

REFERENCE

1. Abidin EZ, Semple S, Omar A, Rahman HA, Turner SW, Ayres JG(Aug , 2011). A survey of schoolchildren's exposure to secondhand smoke in Malaysia, 11, 634, *BMC Public Health*
2. Akhtar PC, Currie DB, Currie CE, Haw SJ (Sep, 2007), Changes in child exposure to environmental tobacco smoke (CHETS) study after implementation of smoke-free legislation in Scotland: National cross sectional survey, 335,545-549, from *BMJ 2007*
3. Anuntaseree W et al. Exposure to environmental tobacco smoke among infants in southern Thailand: a study of urinary cotinine. *Bulletin of Environmental Contamination and Toxicology*, 2008, 80:34–37.
4. Article 8: WHO Framework Convention on Tobacco Control. (2003)
5. Article Our Health Risks After Age 40- Penn State Extension extension.psu.edu/pubs/uk051
6. Babb S, Bernert J.T, et al. (June ,2006) US Surgeon General. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General.* Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006. Retrieved March 30, 2013
7. Carey IM, Cook DG, Strachan DP (May 1999).The effects of environmental tobacco smoke exposure on lung function in a longitudinal study of British adults, 10,319-326, *Epidemiology*

8. Carlsen K, Carlsen KCL, (2008). Respiratory effects of tobacco smoking on infants and young children, 9, 11-20,*PaediatrRespiratory Reviews*

9. Centre of Disease Control, Morbidity and Mortality Weekly Report, 2010.

10. D.B. Kandel et al. (2009). Drug and Alcohol Dependence. *Educational attainment and smoking among women: Risk Factors and consequences for offspring.* 104, 24-33.

11. Edwards R, et al.(October, 2006). Highly hazardous air quality associated with smoking in cars: New Zealand pilot study.*The New Zealand Medical Journal ,119* (1244), Retrived April 2, 2013 from http://www.nzma.org.nz/journal/119-1244/2294/

12. Eisner MD, Iribarren C, Yelin EH, Sidney S, Katz PP, Sanchez G, Blanc PD (May, 2009). The impact of SHS exposure on health status and exacerbations among patients with COPD, 4,169-176,*Int J COPD*

13. Global Adult Tobacco Survey, Fact Sheet MALAYSIA 2011

14. Institute of Public Health Malaysia: *The Third National Health and Morbidity Survey (NHMS III) 2006: Smoking*. Malaysia; 2008

15. Jaakkola MS, Piipari R, Jaakkola N, Jaakkola JJK (Dec 2003). Environmental Tobacco Smoke and Adult-Onset Asthma: A Population-Based Incident Case-Control Study, 93,12,2055-2060, *American Journal of Public Health* 2003

16. Jaakkola N, Ruotsalainen R, Jaakkola JJ.(1994). What are the determinants of children's exposure to environmental tobacco smoke at home. *Scand J Soc Med,* 22(2),107-12.

17. Jamrozik K. (2005*) Estimate of deaths attributable to passive smoking among UK adults: database analysis*. BMJ; 330: 812–24.

18. Jarvis M. (2001) *Quantitative survey of exposure to other people's smoke in London bar staff.* A report for Smoke Free London 2001. from sflondon@doh.gsi.gov.uk

19. King B A, Dube SR, Tynan MA.(March 2012).Second hand Smoke Exposure in Cars among Middle and High School Students – United States, 2000-2009, 129 (3), 1-6, *Pediatrics*

20. Krieger R et al, (2005), *California Environmental Protection Agency: Air Resources Board. Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant. Sacramento: California Environmental Protection Agency, 2005.* Retrieved March 29,2013

21. Kurahashi N, Inoue M, Liu Y, Iwasaki M, Sasazuki S, Sobue T, Tsugane S (Feb, 2008). Passive smoking and lung cancer in Japanese non-smoking women: A prospective study, 122,653-657, *Int J Cancer*

22. Laden F, Chiu Y-H, Garshick E, Hammond S K, Hart J E. (2013). A cross-sectional study of secondhand smoke exposure and respiratory symptoms in non-current smokers in the U.S. trucking industry: SHS exposure and respiratory symptoms, 13(93), *BMC Public Health.*

23. Lambe M, Hultman C, Torrång A, MacCabe J, Cnattingius S (Sep, 2006).Maternal smoking during pregnancy and school performance at age 15, 17(5), 524-30 Retrieved March 28 2013 from *Epidemiology*

24. Lee LK, Paul CYC, Kam CW, Jagmohni K (2005), Smoking among secondary school students in Negeri Sembilan, Malaysia, 17,130-136, *Asia-Pac J Public Health* 2005

25. Manaf RA, Shamsuddin K (2008), Smoking among young urban Malaysian women and its risk factors, 20,204-213, *Asia-Pac J Public He* 2008

26. Max W., Sung H.Y., Shi Y. (2012). *Exposure to Secondhand Smoke at Home and at Workplace in California*. Public Health Report, Volume 127.

27. Naing NN, Zulkifli A, Wan Maizurin WY, Zani WM. (1997). Smoking and discipline problems among rural secondary school students in Kelantan , 4(1),54-8, *Mal J Med Sc*

28. Öberg M, Jaakkola MS, Woodward A, Peruga A, Prüss-Ustün A.(2006). Worldwide burden of disease from exposure to second hand smoke: a retrospective analysis of data from 192 countries. *Lancet* 2010; published online Nov 26.DOI:10.1016/S0140-6736(10)61388-8.

29. Office for National Statistics: *Scottish household survey 2007/2008*. Scotland; 2009.

30. Pattenden S, Antova T, Neuberger M, Nikiforov B, De Sario M, Grize L, Heinrich J, Hruba F, Janssen N, Luttmann-Gibson H, Privalova L, Rudnai P, Splichalova A, Zlotkowska R, Fletcher T. (Aug 2006). Parental smoking and children's respiratory health: Independent effects of prenatal and postnatal exposure, 15(4), 294-301. Retrieved March 30 2013 from Tob Control.

31. Rampal L, Rampal S, Azhar MZ, Sherina MS, Mohamad T, Ramlee R, Ahmad J. (2008). A national study on the prevalence and factors associated with smoking amongst Malaysians aged 18 years and above ,4,41-53, *Malays J Med Health Science*

32. Sendzik, T, et al. (March,2008). An experimental investigation of tobacco smoke pollution in cars. Toronto, ON: Ontario Tobacco Research Unit . Retrieved April 1,2013 from http://otru.org/an-experimental-investigation-tobacco-smoke-pollution-cars/

33. Stenstrom R, Bernard PAM, Ben-Simhon H (Aug, 1993).Exposure to environmental tobacco smoke as a risk factor for recurrent acute otitis media in children under the age of five years,27(2), 127-36 abstract from Int J PediatrOtorhinolarygol .

34. Wen CP, Levy DT, Yuan CT, Hsu CC, Tsai SP (2005), Smoking behaviour in Taiwan, 2001, 14, 151-155 Retrieved April 1 2013 from *Tob Control* 2005.

35. Wingo C, Kiser D, M.S et al, (2001),*Eliminating smoking in bars, taverns and gaming clubs.* California Department of Health Services from Tobacco Control Section

36. Wisborg K, Kesmodel U, Henriksen TB, Olsen SF, Secher NJ (Sep,2000) A prospective study of smoking during pregnancy and SIDS, 83(3),203-6 Retrieved March 29 2013 fromArch Dis Child.

37. Workplace Secondhand Smoke Exposure in the U.S Trucking Industry. (2010, February). Environmental Health Perspectives, 118, 216-219. Retrieved August 26,2013 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831920/pdf/ehp-118-216.pdf

38. Workplace Secondhand Smoke Exposure in the U.S Trucking Industry. (2010, February). Environmental Health Perspectives, 118, 216-219. Retrieved August 26,2013 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831920/pdf/ehp-118-216.pdf

39. World Health Organisation (2003) *WHO Framework Convention on Tobacco Control.* 2003.

40. World Health Organization. 10 Facts on Second hand Smoke. http://www.who.int/features/factfiles/tobacco/tobacco_facts/en/index.html

41. World Health Organization. *Gender, Women and Tobacco Epidemic 5: Second hand Smoke, Women, and Children.*

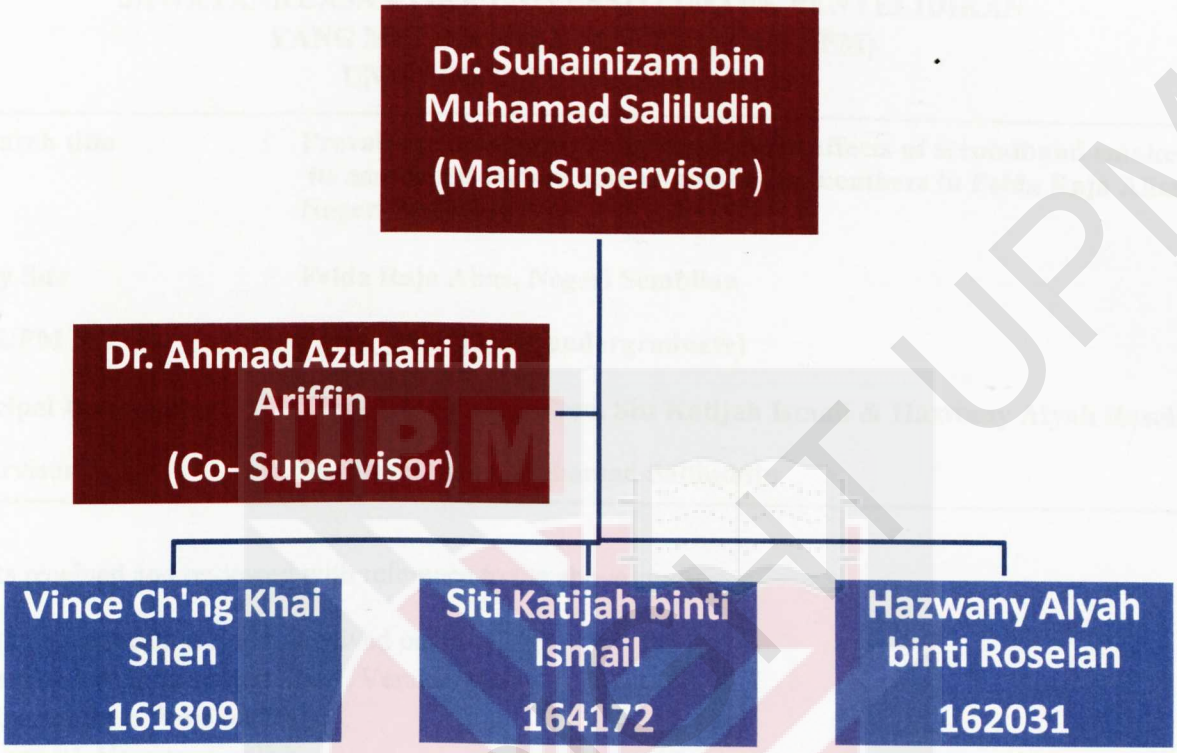
42. World Health Organization. *WHO Report on the Global Tobacco*

43. Zhang J et al (1992). A case-control study of paternal smoking and birth defects *International Journal of Epidemiology*, 21,273–278.

APPENDIX 1: GHANT CHART

No.	Activity	March 2013	April 2013	May 2013	June 2013	July 2013	August 2013	September 2013
1	Preparation of draft proposal							
2	Submission of draft proposal							
3	Preparation, submission and presentation of final proposal							
4	Correction of proposal							
5	Preparation of ethical approval and permission letters to organizations							
6	Data collection and analysis							
7	Submission of data analysis and presentation							
8	Preparation of final report and scientific article							
9	Submission of final report and scientific article							
10	Preparation of final presentation							
11	Final presentation							
12	Correction of project report							
13	Submission of project report, scientific article							

APPENDIX 2: RESEARCH TEAM



APPENDIX 3: BUDGET PLAN

Item	Quantity	Price
Photostatting	400 unit	RM 240
Printing	80 unit	RM 60
Stationary	7 unit	RM 350
Travel	2 days	RM 200
Accommodation and Food	2 weeks	RM 210
Miscellaneous expenses	-	RM 100
Total		**RM 1160**

Attachment 2

JKEUPM Ref No. : FPSK_Mei (13)20 (undergraduate)

Members of the JKEUPM who reviewed the documents:

Prof. Dato' Dr. Lye Munn Sann

Date of approval: 5/6/2013

Endorsed at JKEUPM Meeting on **7/6/2013**, attended by:

NAME	DESIGNATION	GENDER	TICK IF PRESENT
Prof. Dr. Norlijah Othman	Paediatrics& Dean, Faculty of Medicine and Health Sciences	Female	√
Prof. DrZamberiSekawi	Medical Microbiologist & Deputy Dean of Research and Internationalization, Faculty of Medicine and Health Sciences	Male	
Prof. Dato' Dr. Lye Munn Sann	Medical Statistician, Dept of Community Health, Faculty of Medicine and Health Sciences	Male	√
Prof. Dr. TengkuAizanAbd Hamid	Gerontologist & Director, Institute of Gerontology	Female	
Prof. Dr. LekhrajRampal	Medical Statistician, Dept of Community Health, Faculty of Medicine and Health Sciences	Male	√
Prof. Dr. Elizabeth George	Pathologist, Dept of Pathology, Faculty of Medicine and Health Sciences	Female	
Prof. Dr. Lim ThiamAun	Anesthesiologist, Dept of Surgery, Faculty of Medicine and Health Sciences	Male	
Prof. Dr. Wan Omar Abdullah	Medical Parasitologist, Dept of Medical Microbiology and Parasitology, Faculty of Medicine and Health Sciences	Male	√
Prof. Dr. Patimah Ismail	Professor of Biomedicine, Dept of Biomedical Sciences, Faculty of Medicine and Health Sciences	Female	√
Prof. Dr. Azali Mohamed	Professor of Macroeconomics, Dept of Economics, Faculty of Economics and Management	Female	
Assoc. Prof. Dr. Johnson Stanslas	Pharmacologist, Dept of Medicine, Faculty of Medicine and Health Sciences	Male	√
Assoc. Prof Dr. Mansor Abu Talib	Assoc. Professor of Guidance and Counselling, Dept of Human Development and Family Studies, Faculty of Human Ecology	Male	
Assoc. Prof. Dr. Noritah Omar (Lay Person)	Assoc. Professor of English Language, Dept of English Language, Faculty of Communication and Modern Languages	Female	√
Dr. RojanahKahar (Lay Person)	Lecturer of Dept of Human Development and Family Studies, Faculty of Human Ecology	Female	√
Tan Sri Dato' Napsiah Omar (Lay Person)	Chairman, National Population and Family Development Board	Female	√

JAWATANKUASA ETIKA UNIVERSITI UNTUK
PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

BORANG PERSETUJUAN PENYERTAAN (IBUBAPA/ PENJAGA)

TAJUK PENYELIDIKAN : **PREVALENS PENDEDAHAN DAN KESAN RESPIRATORI ASAP ROKOK DAN FAKTOR-FAKTOR YANG BERKAITAN DALAM KALANGAN ISI RUMAH DI FELDA RAJA ALIAS, NEGERI SEMBILAN.**

PENYELIDIK : VINCE CH'NG KHAI SHEN
SITI KATIJAH BINTI ISMAIL
HAZWANY ALYAH BINTI ROSELAN

Saya..... No Kad Pengenalan. .....
beralamat.....
.....dengan ini secara sukarela bersetuju membenarkan *anak / jagaan saya ..... menyertai penyelidikan klinikal *(pengajian klinikal/ pengajian soal selidik/ percubaan ubat-ubatan) seperti yang disebut di atas.

Saya telah diberi penjelasan secara menyeluruh mengenai dasar penyelidikan klinikal dari segi metodologi, risiko dan komplikasi (seperti tertulis pada Helaian Penerangan Responden). Saya memahami bahawa *anak / jagaan saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan.Saya juga memahami bahawa sebarang maklumat yang berkaitan identity *anak / jagaan saya akan dirahsiakan.

Saya* berminat / tidak berminat untuk mengetahui keputusan kajian yang dijalankan ke atas sampel yang diambil *anak / jagaan saya.

*potong yang tidak berkenaan

Tandatangan .....
(*Ibubapa/ Penjaga*)

Tarikh :.....

Tandatangan .....
(*Saksi*)

Nama :.....

No. K/P: .....

Saya mengesahkan bahawa saya telah menerangkan kepada ibubapa/penjaga responden mengenai sifat dan tujuan penyelidikan klinikal tersebut di atas.

Tarikh .....

Tandatangan .....
(*Penyelidik*)

JAWATANKUASA ETIKA UNIVERSITI UNTUK
PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

BORANG PERSETUJUAN RESPONDEN

TAJUK PENYELIDIKAN : PREVALENS PENDEDAHAN DAN KESAN RESPIRATORI ASAP ROKOK DAN FAKTOR-FAKTOR YANG BERKAITAN DALAM KALANGAN ISI RUMAH DI FELDA RAJA ALIAS, NEGERI SEMBILAN

PENYELIDIK : VINCE CH'NG KHAI SHEN
SITI KATIJAH BINTI ISMAIL
HAZWANY ALYAH BINTI ROSELAN

Saya..... No Kad Pengenalan. .....
beralamat.....
.....dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam menyertai penyelidikan klinikal *(pengajian klinikal/ pengajian soal selidik/ percubaan ubat-ubatan) seperti yang disebut di atas.

Saya telah diberi penjelasan secara menyeluruh mengenai dasar penyelidikan klinikal dari segi metodologi, risiko dan komplikasi (seperti tertulis pada Helaian Penerangan Responden). Saya memahami bahawa saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan.Saya juga memahami bahawa sebarang maklumat yang berkaitan identiti saya akan dirahsiakan.

Saya* berminat / tidak berminat untuk mengetahui keputusan kajian yang dijalankan ke atas sampel yang diambil dari saya.

*potong yang tidak berkenaan

Tandatangan .....
(*Responden*)

Tarikh :.....

Tandatangan .....
(*Saksi*)

Nama :.....

No. K/P: .....

Saya mengesahkan bahawa saya telah menerangkan kepada responden sifat dan tujuan penyelidikan klinikal tersebut di atas.

Tarikh .....

Tandatangan .....
(*Penyelidik*)

BORANG SOALSELIDIK

BAHAGIAN A: CIRI-CIRI SOSIO-DEMOGRAFI

No:	Soalan	Kategori	Kod (bulatkan yang berkenaan)
Q1:	Umur :.....tahun, **Tarikh lahir** :.....(hari/bulan/tahun)		
Q2:	Jantina:	Lelaki Perempuan	1 2
Q3:	Bangsa:	Melayu Cina India Lain-lain	1 2 3 4
Q4:	Ugama:	Islam Budha Kristian Hindu Lain-lain	1 2 3 4 5
Q5:	Tahap pendidikan:	Tanpa Pendidikan Formal *(Selain di atas)* Sekolah Rendah*(Tamat darjah enam sekolah rendah/kebangsaan)* Sekolah Menengah*(Tamat Tingkatan 5)* Universiti/Kolej*(Bergraduat dengan ijazah/diploma/sijil)*	1 2 3 4
Q6:	Status pekerjaan	Pelajar Peneroka Berniaga Bekerja dengan kerajaan Bekerja dengan swasta Lain-lain: nyatakan:.....	1 2 3 4 5 6
Q7:	*Pendapatan isi rumah sebulan: 1. Ketua keluarga = RM 2. Isteri = RM 3. Pendapatan isi rumah (anak yang tinggal serumah) = RM 4. Pemberian anak tinggal berasingan = RM *Pendapatan termasuk gaji, pencen, pendapatan dari lading, sumbangan dari badan kebajikan dl		

	KADAR PENDEDAHAN KEPADA ASAP ROKOK		
5	Adakah anda mempunyai ahli keluarga yang merokok dan tinggal serumah dengan anda?	Ya Tidak (*teruskan ke Soalan 7*)	1 2
6	Siapakah ahli keluarga yang merokok dan tinggal serumah dengan anda?	Bapa Ibu Adik-beradik Lain-lain (*nyatakan*)	1 2 3 4
7	Secara kasar dalam sehari, berapa lama anda terdedah kepada asap rokok di rumah?	_____ jam/sehari	
8	Siapa yang mendedahkan anda kepada asap rokok di rumah?	Bapa Ibu Adik-beradik Lain-lain (*nyatakan*)	1 2 3 4
9	Secara kasar dalam sehari, berapa lama anda terdedah kepada asap rokok di tempat kerja/sekolah/institusi pengajian anda? (*Jika tiada, terus ke Soalan 12*)	_____ jam/sehari	
10	Apakah jenis tempat kerja anda?	Pejabat Perkhidmatan (kedai,sekolah) Lading/Kebun Lain-lain (*nyatakan*)	1 2 3 4
11	Andakah anda tahu jika terdapat Polisi mengenai larangan merokok di tempat kerja/institusi anda? Jika 'Ya', adakah anda rasa Polisi itu berkesan dalam mengurangkan tabiat merokok?	Ya Tidak	1 2
12	Secara kasar dalam sehari, berapa lama anda terdedah kepada asap rokok di tempat awam? (*Jika tiada, terus ke Soalan 14*) _____	_____ jam/sehari	

13	Apakah tempat awam di mana anda sering terdedah kepada asap rokok?	Restoran/tempat makan Kafe siber Pusat beli-belah Kedai runcit Lain-lain (*nyatakan*)	1 2 3 4 5
14	Secara kasar dalam sehari, berapa lama anda terdedah kepada asap rokok di dalam kenderaan?	_____jam/sehari	
15	Siapa yang mendedahkan anda kepada asap rokok di dalam kenderaan?	Bapa Ibu Adik-beradik Lain-lain (*nyatakan*)	1 2 3 4
16	Apakah jenis kenderaan di mana anda terdedah kepada asap rokok?	Kereta Bas Teksi/Kereta sewa Lain-lain (*nyatakan*)	1 2 3 4
17	Secara keseluruhan, adakah anda rasa terganggu dengan asap rokok dari perokok lain di sekeliling anda?	Ya Tidak	1 2
18	Adakah anda setuju jika salah satu tempat sama ada rumah/tempat kerja/sekolah/tempat awam/dalam kenderaan dijadikan sebagai tempat yang bebas dari asap rokok?	Ya Tidak	1 2
	SIMPTOM RESPIRATORI		
19	Adakah anda mengalami batuk kebelakangan ini?	Ya Tidak	1 2
20	Sudah berapa lama anda mengalami keadaan batuk berkenaan?	Kurang dari 1 minggu 1 minggu 2 minggu 3 minggu Lebih 3 minggu	1 2 3 4 5
21	Adakah batuk anda menghasilkan kahak?	Ya Tidak	1 2
22	Sekiranya ada kahak, apakah warna kahak yang dikeluarkan?	Tidak berwarna Putih Kuning Hijau Merah Lain-lain (*nyatakan*)	1 2 3 4 5 6
23	Sudah berapa lama anda mengalami batuk dan mengeluarkan kahak berwarna?	Kurang dari 1 minggu 1 minggu 2 minggu 3 minggu Lebih 3 minggu	1 2 3 4 5
24	Semasa menghembus nafas, adakah pernafasan anda berbunyi?	Ya Tidak	1 2
25	Adakah anda mengalami penyakit lain yang berkaitan dengan system pernafasan dan paru-paru anda?	Ya Tidak	1 2

26	Jika anda jawab 'Ya' kepada soalan (25) di atas, sila nyatakan jenis penyakit yang dialami.	Asma/Lelah Paru-paru berair Bronkitis Alahan terhadap asap rokok Lain-lain (*nyatakan*)	1 2 3 4 5

TERIMA KASIH KERANA MENJAWAB SOALAN INI DENGAN JUJUR