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PREVALENCE OF COMORBIDITIES AND ITS ASSOCIATION WITH SMOKING AMONG ADULTS IN FELDA, NEGERI SEMBILAN IN YEAR

2013

KHONG SIAU CHENN
SHAHIDATUL MUNIRAH BINTI MOHAMMAD SALIHHUDDIN

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Khong SC[1], Shahidatul MMS[1], Irmi ZI[2], Anita AR[3]

[1] Second Year Medical Student
[2] Department of Family Medicine
[3] Department of Community Health
Faculty of Medicine and Health Science, Universiti Putra Malaysia

ABSTRACT

Background: Smoking appears to be a common behaviour among Malaysian. Cigarette smoking has consequences which negatively affect the body system.

Objective: To determine comorbidities associated with smoking among respondents in FELDA Raja Alias 1 and FELDA Serting Hilir 1, Negeri Sembilan.

Methods: A cross-sectional study of adults in FELDA was conducted using cluster sampling. A self-reporting questionnaire was used to assess smoking status and medical comorbidities. Piloted COPD-PS questionnaire and DASS 21 were used to assess the risk of chronic obstructive pulmonary disease (COPD) and psychological comorbidities respectively. All the data obtained was categorized and analysed using Chi-square Test or Fisher's Exact Test.

Results: This study involved 498 respondents with a response rate of 96.2%. About 16% of respondents have one or more chronic diseases. The highest prevalent disease among respondents was cardiovascular disease (12.1%) followed by respiratory disease (3.5%).The prevalence of chronic disease among smokers was 24.1%. Among smokers, 6.0% were found to have respiratory disease, 15.1 % have cardiovascular disease (CVD) and 10.3% have risks of COPD. About a third of smokers have depression or anxiety while 17.7% have stress.

Conclusion: The prevalence of chronic disease among FELDA settlers is high. There is a significant association between smoking with chronic disease, respiratory disease, risk of COPD, depression, anxiety and stress.

Keywords: *Comorbidities, smoking, chronic disease, respiratory disease, cardiovascular disease, risk of COPD, depression, anxiety, stress*

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PREVALENS KOMORBIDITI DAN PERKAITANNYA DENGAN MEROKOK DALAM KALANGAN DEWASA DI FELDA, NEGERI SEMBILAN PADA TAHUN 2013

Khong SC[1], Shahidatul MMS[1], Irmi ZI[2], Anita AR[3]

[1] *Pelajar Perubatan Tahun Dua*
[2] *Jabatan Perubatan Keluarga*
[3] *Jabatan Kesihatan Komuniti*
Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia

ABSTRAK

Latar belakang: Merokok merupakan suatu kebiasaan dalam kalangan masyarakat Malaysia. Merokok merupakan tabiat yang mendatangkan keburukan kepada kesihatan sistem tubuh badan.

Objektif: Untuk mengenal pasti komorditi yang berkait dengan merokok dalam kalangan responden di FELDA Raja Alias 1 dan FELDA Serting Hilir 1, Negeri Sembilan.

Kaedah: Kajian keratan rentas dalam kalangan dewasa di FELDA telah dijalankan dengan menggunakan persampelan kelompok. Soal kaji selidik jawab sendiri telah digunakan untuk mencari status merokok dan komorbiditi kesihatan. Soal kaji selidik berpandu COPD-PS dan DASS 21 telah digunakan untuk mencari risiko penyakit pulmonari obstruktif kronik dan komorbiditi psikologi. Semua data telah dikategorikan dan dianalisa dengan menggunakan Chi-square Test atau Fisher's Exact Test.

Keputusan: Kajian ini melibatkan 498 responden dengan kadar respons 96.2%. Lebih kurang 16% responden mempunyai satu atau lebih penyakit kronik. Prevalens penyakit terbanyak dalam kalangan responden ialah penyakit kardiovaskular (12.1%) diikuti oleh penyakit pernafasan (3.5%). Prevalens penyakit kronik dalam kalangan perokok ialah 24.1%. Dalam kalangan perokok, 6.0% mempunyai penyakit pernafasan, 15.1% mempunyai penyakit kardiovaskular, dan 10.3% mempunyai risiko penyakit pulmonari obstruktif kronik. Lebih kurang satu pertiga perokok mengalami kemurungan atau kegelisahan manakala 17.7% mengalami tekanan.

Konklusi: Prevalens penyakit kronik di kalangan penduduk FELDA adalah tinggi. Kajian ini menunjukkan bahawa terdapat perkaitan yang signifikan antara merokok dengan penyakit kronik, penyakit pernafasan, risiko penyakit pulmonari obstruktif kronik, kemurungan, kegelisahan dan tekanan.

Kata kunci: *Komorbiditi, merokok, penyakit kronik, penyakit pernafasan, penyakit kardiovaskular, penyakit pulmonary obstruktif kronik, kemurungan, kegelisahan, tekanan*

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LIST OF ABBREVIATIONS

BMI Body Mass Index
COPD Chronic Obstructive Pulmonary Disease
CVS Cardiovascular disease
SPSS Statistical Package for Social Sciences
UPM Universiti Putra Malaysia
WHO World Health Organization

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Chapter 1: Introduction

1.1 Background

Smoking appears to be a common behaviour among Malaysian. It is labeled as social norms that are overwhelming the society in Malaysia. Smoking behaviour has caused detrimental effects to both smokers and passive smokers. Therefore, smoking-related diseases are the most noted preventable causes of mortality (Naing et al, 2004). According to World Health Organization, 5 million of people per year are killed due to the tobacco use. Smoking principally has its role in causing 1 in 10 adults death. (World Health Organization, 2013)

The contents of tobacco smoke have been found harmful to human health. Four thousand chemical compounds, with 50-60 known carcinogens, several mutagens and many irritating and toxic substances (Agusti et al., 2003). The harm is not limited to primary smokers. It affects the passive smokers also. When the side stream smoke released from the burning end of cigarette and also from partly exhaled mainstream smoke combine, the mixture is known as environmental tobacco smoke. The contents of the side stream smoke, which consequently reach the lungs of the passive smokers, are hazardous to health as it contains more noxious compound than the mainstream smoke (Pietinalho et al., 2009).

Cigarette smoking represents a behaviour that can be seen as a deliberate action of introducing consequences which negatively affect the body system. It does not only bring detrimental effect to the lung, but to the body system as a whole (Yawn and Kaplan, 2008). In Asia Pacific region, the current burden of smoking-related lung cancer is increasing. The number of people dying from lung cancer is expected to double in the next couple of decades if current smoking habits in Asia Pacific Region do not show positive improvement. A strong association can be linked between the risk of coronary heart disease and smoking (White, 2007).

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If emphasis on smoking cessation is not effective, more than 8 million people per year will be killed by tobacco use upon reaching 2030 (World Health Organization, 2013). Reinforcement on anti-smoking campaign must implement a very holistic and comprehensive approach in order to reach and educate every population around the globe that smoking-related morbidities are a big problem indeed to be dealt with. The implementation of key health policies is crucial to be monitored and evaluated (International Tobacco Control South-East Asia Survey, 2005)

1.2 Problem Statement

According to Global Adult Tobacco Survey in Malaysia (Ministry of Health Malaysia, 2011), 43.9% of men, 1.0% of women, and 23.1% overall (4.7 million adults) in Malaysia currently smoked tobacco. 87.1% of adults noticed anti-cigarette smoking information on the television or radio. However, the prevalence of smokers increases over years.

Cigarette smoking is the largest preventable risk factor for morbidity and mortality in developed countries. Smoking predisposes the smoker to a large number of diseases, including many types of cancer (lung, oesophagus, bladder, kidney, stomach, pancreas), chronic obstructive pulmonary disease (COPD), coronary heart disease, stroke, peripheral vascular disease, and peptic ulcer disease. (Fagerström, 2002) Following a study in German, 2006, the cost attributed by smoking increased despite all the efforts of promoting smoking hazards. (Neubaeur et al., 2006)

The establishment of land development scheme under the Federal Land Development Authority (FELDA) is meant to be a part of Malaysia's effort in achieving the industrialized nation status by year 2020. Land development scheme, also known as FELDA settlement, is a social restructured town that was introduced to eradicate poverty and the unbalanced wealth distribution (Hisham, 2010). It is a residence for settlers that come from various regions in

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Malaysia. Therefore, FELDA settlement can be considerably assumed as somewhat a special-planned living place in Malaysia comprises of people that are different in their backgrounds, be it socially or demographically.

Few studies has been established in Malaysia regarding the prevalence of smoking in rural and urban area alone (Ministry of Health 2006; Ministry of Health 2011), but investigation on smoking in land development scheme is very limited (Lim et al., 2006). Therefore, this study is conducted to serve as a delicate approach in creating a pace of introducing more studies in the future regarding FELDA settlers. This study is conducted with the aim to determine comorbidities associated with smoking FELDA settlers, with the basis of relating the essence of FELDA background such as place of origin, ethnicity and occupation to the comorbidities associated with smoking. This study could also reveal the relationship between occupation of FELDA settlers (rubbers workers and palm oil workers) and prevalence of smoking with its comorbidities. This is the first study in Malaysia to investigate the comorbidities associated with smoking though there are few studies have been done in other countries. Moreover, this study is believed to bring an awareness regarding the negative impacts of smoking on health of FELDA settlers.

1.3 Objectives

1.3.1 General Objective

To determine the comorbidities associated with smoking among FELDA settlers.

1.3.2 Specific Objectives

i) To determine socio-demographic characteristics and smoking status among respondents in FELDA.

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ii) To determine the prevalence of medical comorbidities among respondents in FELDA.

iii) To determine the prevalence of psychological comorbidities such as stress, depression and anxiety among respondents in FELDA.

iv) To determine the association between socio-demographic characteristics and medical comorbidities among respondents in FELDA.

v) To determine the association between smoking and medical comorbidities among respondents in FELDA.

vi) To determine the association between socio-demographic characteristics and psychological comorbidities among respondents in FELDA.

vii) To determine the association between smoking and psychological comorbidities among respondents in FELDA.

1.4 Research Hypothesis

1.4.1 Null Hypothesis

i) There is no association between association between socio-demographic characteristics and medical comorbidities among respondents in FELDA.

ii) There is no association between smoking and medical comorbidities among respondents in FELDA.

iii) There is no association between socio-demographic characteristics and psychological comorbidities among respondents in FELDA.

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iv) There is no association between smoking and psychological comorbidities among respondents in FELDA.

1.4.2 Alternative Hypothesis

i) There is association between association between socio-demographic characteristics and medical comorbidities among respondents in FELDA.

ii) There is association between smoking and medical comorbidities among respondents in FELDA.

iii) There is association between socio-demographic characteristics and psychological comorbidities among respondents in FELDA.

iv) There is association between smoking and psychological comorbidities among respondents in FELDA.

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Chapter 2: Literature Review

2.1 Smoking and comorbidities

Over a decade, the prevalence of smoking among most Western countries has been documented to decline steadily. However, the smoking rates are continuously being noted to rise in many developing countries (Hammond et al, 2008). Estimation made by the World Health Organization are saying that two-thirds of the smokers living in developing countries (Thomson, 2004). A big problem that is needed to be highlighted is 70% of the world's 1.1 billion smokers are in developing countries, and from that portion, more than 50% smokers are observed to rise from Asia alone. The smokers are mainly among males (Hammond et al, 2008). The data somewhat demonstrates the fact that is formulated by World Health Organization's Western Pacific Region that being born male is the single greatest reason in smoking.

Smoking initiation is a mixing effect often of complex and various reasons (Morrow and Barraclough, 2003). Even though smoking remains relatively rare among females in Asian countries, it is expected that the smoking prevalence among Asian women will elevate significantly in the upcoming decades as the growth of multinational companies is appearing to become more prominent in Asia (Hammond et al, 2008). All persons that were interviewed in the course of the study that was conducted by Morrow and Barraclough (2003) believed that the prevalence of female smoking was increasing in Malaysia.

Tobacco has a significant cultural role in Malaysia. Of all major ethnic groups, especially among men, the exchange of cigarettes is usually adapted in social interaction, and the provision of cigarettes is common at gatherings such as wedding and Chinese funerals. Although, smoking remains acceptable for men, smoking by women is not socially and

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culturally approved among Malaysian (Morrow and Barraclough, 2003; Lim et al, 2006), yet the disapproval is not universally practised by the society. (Morrow and Barraclough, 2003)

Third National Health and Morbidity Survey 2006 (Ministry of Health Malaysia, 2006) was able to capture the prevalence and smoking patterns of different categories and this enables the tracking of the smoking trends over the past decades (Nur Azian, 2008). According to the Third National Health and Morbidity Survey (Ministry of Health Malaysia, 2006) that was conducted in 2006, there is an increment in the trend of adult ever smokers when compared with the report of NHMS II that was run in 1996. However, a reduction of 2% in national current smoking rate can be seen in NHMS III since the last national survey in 1996. When rural and urban areas are compared, the prevalence of ever smokers was lower in urban areas (24.1%) in contrast to that of rural (32.3%). There was a markedly higher (57.6%) proportion of male ever smokers as compared to females (2.5%). Prevalence of ever smokers among Malays (30.1%) and other Bumiputera (30.8%) were the highest among other ethnic groups. Men and adolescent has the highest prevalence of smoking. (Redhwan et al, 2012)

Based on the Global Adult Tobacco Survey, 43.9% of men, 1% of women and 23.1% overall (4.7% million adult) currently smoked tobacco. 39.9% of men, 0.7% of women, and 20.9% overall (4.3 million adults) currently smoked tobacco on daily basis. Only 9.5% have quit smoking among those who have ever smoked on a daily basis. Exposure to tobacco smoke is experienced by 4 in 10 adults who worked indoor (2.3 million). 4 in 10 adults (7.6 million adults) were exposed to tobacco smoke at home. 7 in 10 adults (8.6 million adults) who have visited restaurants were exposed to tobacco smoke. (Ministry of Health Malaysia, 2011)

The rates of current smoking were showing that the smokers were highest among respondents who were in their twenties and early thirties. The national mean initiation age

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can be reflected by a reduction from 19.9 year in NHMS II to 18.6 year in NHMS II. Simply put, the age of smoking initiation at current is becoming more common at earlier age. 5 million of smokers are in Malaysia and 20% of them are younger than 18 years old (Al-Sadat et al, 2010). Therefore, the smoking behaviour in our country has become one of the major challenges in uprising our nation youth.

The smoking issue among youth – those who start smoking at a younger age – is one of the important national considerations as they tend to develop dependence and face stronger resistance in smoking cessation upon reaching adulthood (Hammond et al, 2008). If the smoking habit among youth population can be effectively curbed, smoking-related diseases that might develop in later years in the population, pertaining in Malaysia with high prevalence of smoking among the adults, can be reduced considerably in the future (Lim et al., 2006). Although, it is a nature of Malaysian to consider smoking habit as normal behaviour among male adults in Malaysia (Lim et al., 2006), the thought of the society must be re-tailored so that smoking is no longer be referred as an okay-habit to be practised in our community.

Morbidity is departure from health which results in or has potential to result in at least some restriction on performing the normal activities of life. (Indrayan, 2008) Disease, injury, burn, handicap, mental depression, insomnia, pain, etc are examples of morbidity. Ways to measure the magnitude of morbidity in a community are the number or percentage of persons affected, the average number of episodes or spells of sickness per unit of time (one can have multiple episodes of sickness at a period of time), the average duration of illness and the number or percentage of patients with different severity. (Indrayan, 2008)

The most common approach to measuring comorbidity is disease counts. According to systemic review by Huntley, 96 studies used disease count method to measure comorbidity

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in outpatient settings. Even so, it is hard to compare findings between studies because different studies included very different number of diseases or no details about the inclusion criteria of diseases. Sometimes, the word morbidity is not well defined. (Huntley et al., 2012)

Cigarette smoking is the largest preventable risk factor for morbidity and mortality in developed countries. (Neubauer et al., 2006) Smoking predisposes the smoker to a large number of diseases, including many types of cancer (lung, oesophagus, bladder, kidney, stomach, pancreas), chronic obstructive pulmonary disease (COPD), coronary heart disease, stroke, peripheral vascular disease, and peptic ulcer disease. (Fagerström, 2002)

2.2 Medical Comorbidities of Smoking

According to Centers for Disease Control and Prevention, an estimated 8.6 million (95% CI = 6.9-10.5 million) persons in the United States had an estimated 12.7 million (95% CI= 10.8-15.0 million) smoking attributable conditions. The most prevalent condition was chronic bronchitis, followed by emphysema, previous heart attack and lung cancer. Generally, smoking attributable morbidity estimates were obtained in two ways. One is each person was considered as the unit of analysis regardless of number of smoking-related condition. On the other hand, the condition was counted as the unit of analysis, therefore persons with multiple conditions were counted more than once. (Hyland et al., 2003)

World Health Organisation claimed that smoking is the single most noted cause of death worldwide (Lim., 2006). Therefore, it is highly assumed that tobacco-related death is preventable (Hammond et al, 2008). The death of 100 million of people, across the globe, during the 20th century is estimated to be principally due to the smoking-related diseases (White, 2007). It is estimated that 10 000 deaths yearly in Malaysia are contributed by smoking-related illnesses (Redhwan et al, 2012). The harmful contents in the cigarette are an evidence-based culprit which may underlie multiple morbidities manifested by the smokers.

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The blend of such chemical and highly toxic substances has created many pathological conditions that adversely affect the health status of the smokers and, no to forget, the second hand smokers.

Lungs serve as a compulsory filtration system to all of the substances in the air which enter the body through the airway passage, including the toxics in the cigarette smoke, preventing their entrance and circulation into the blood stream. The lung is only capable in filtering a portion of tobacco. Therefore, the rest of unfiltered toxic substances are freely circulating in the blood and cause damage to the every system the toxics can reach. (Yawn and Kaplan, 2008)

The link between cigarette smoking and medical status of the smokers is becoming a great concern in public health policies (Lim et al, 2006; Heikkinen et al, 2010; Al-Sadat et al, 2010) as smoking is affecting many organ systems, not the lung solely, and most of them are leading cause of death from many serious illnesses. (Heikkinen et al, 2010)

2.2.1 Smoking and Chronic Pulmonary Airway Disease (COPD)

Celli et al. defined COPD as a preventable and treatable disease state characterised by air flow limitation that is not fully reversible. Inappropriate inflammatory response of the lungs to respiratory pollutants, especially tobacco smoking, can be used to describe the characteristic of COPD (Agusti et al, 2003). A study by Yawn et al in 2008 presents the information to support the connection between smoking and COPD. More than 80% of all cases of COPD are associated with cigarette smoking, and a smoker is 10 times more likely to die of COPD as compared to a non-smoker. Although no test can be run to predict the COPD development in smokers, the risk always exist due to the negative alterations made by the tobacco smoke to the lung function.

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Excessive or inadequate inflammatory response of the lungs to irritants contents in the inhaled gas of cigarette smoke serve as a basis in understanding the pathology of the lungs that leads to COPD development in smoker (Agusti et al, 2003). Although many irritants in the environment may contribute to the pathogenesis of COPD, cigarette smoking remains as the principal risk factor for COPD. The exaggerated inflammations in the lungs of the smokers produce the characteristic pathological lesion of COPD (Celli et al, 2004). If the exposure is prolonged, the alteration possibly cause progressive decline in lung function that serve as a chamber to gases exchange in human.

The symptoms of cough, sputum production, or dyspnoea, or history of exposure to risk factors for COPD should be taken in considering the diagnosis of COPD. Spirometer is needed to diagnose COPD. The presence of airflow limitation that is not fully reversible can be confirmed if a post-bronchodilator forced expiratory volume in one second (FEV1)/ forced vital capacity (FVC) is equal to or less than 0.7 (Celli et a, 2004). According to Celli, spirometry must be obtained in all individual with history of: exposure to cigarettes; and/or environmental or occupational pollutants; and/or presence of cough, sputum production or dyspnoea.

COPD Population Screener Questionnaire (COPD-PS) is a brief, accurate questionnaire that can identify individuals likely to have COPD. It is a 5-item questionnaire, designed to have a high correct classification rate for airflow obstruction diagnosis while retaining a good trade-off between sensitivity and specificity. It is self-scored, brief, and simple to complete and it demonstrated adequate levels of reliability and preliminary evidence for validity. It is appropriate for use with the general population as it is not only targeted to those already seeking treatment for breathing problems. COPD-PS scores accurately classified airflow obstruction status (area under ROC curve = 0.81) and reliable (r

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= 0.91). A cut off of 4 units had the best sensitivity/specificity ratio and correctly classified 78% of participants. (Martinez et. al., 2008; Miravitlles, 2012)

2.2.2 Smoking and Cardiovascular diseases

Around 30% of coronary heart disease (CHD) deaths in the United States each year are associated with cigarette smoking, with the strong risk of dose-related. (US Dept of Health and Human Services, 1989) Smoking doubles the risk of ischemic stroke and also increases the risk for peripheral vascular disease, cancer, chronic lung disease, and many other chronic diseases. (Ockene, Miller, & Reduction, 1997)

A study by Shah (2010) shows a dose-relationship between smoking and stroke. Stroke risk is strongly associated with smoking with current smokers having at least a two to fourfold increased risk of stroke compared with lifelong nonsmokers or individuals who had quit smoking more than 10 years prior. Hence, cessation of smoking is prone to improve health outcomes and reduce risk of stroke. (Shah & Cole, 2010)

Hypertension is a major risk factor for cardiovascular diseases (CVD), and the risk for cardiovascular events doubles with each 20mmHg increase in SBP or 10mmHg DBP. (Lewington, 2002) Importantly, the prevalence of hypertension was higher in former smokers than in never smokers (13.5 versus 8.8%; $P<0.001$). Besides that, the risk of hypertension was higher (odds ratio [OR], 1.31 [1.13 to 1.52]; $P<0.001$) in former smokers than in never smokers, independent of age and alcohol intake. Furthermore, the risk of hypertension found to be associated with the number of cigarettes smoked daily (Orth, 2004). Men who smoked for longer duration or had higher lifetime cigarette consumption were at significantly higher risk of hypertension. Lifetime smoking duration and intensity (pack-years) were each associated with hypertension in a dose–response manner. (Thuy et al., 2010)

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However, strong interrelationships among smoking, alcohol and BMI tend to have potential confounding effects. Therefore, in a study by Primatesta, it examines the relationship between smoking and SBP according to BMI categories. Alcohol intake, which is strongly associated with smoking, appears to affect the smoking-BP relationship. Therefore, the relationship between smoking and SBP is examined separately by alcohol intake, before and after the adjustments for BMI. (Primatesta et al., 2001)

2.2.3 Smoking and Asthma

Nowadays, asthma is one of the commonest chronic disorders in the world. Prevalence of asthma has increased in recent decades. 300 million around the globe is affected by asthma (Anandan, et al, 2010). A study that is conducted by Anandan et al. has proving that the global prevalence of asthma does not decline. Some of the previous do-asthma-is-related-with-smoking studies are saying that the behaviour of active cigarette smoking has been associated with asthma development in the smokers. Hence, asthma is considered as one of the important manifestations of the negative effects seen in smokers. The likelihood of the female smokers, but not among the male smokers, to develop asthma is higher as compared to the never-smokers for the adult-onset asthma. (Thomson, 2004)

Review on study by Pietinalho et al is capturing the fact that environmental tobacco smoke exposure and asthma risk in adults is strongly linked. Findings to be stressed are the strong association of asthma development among nanatopic individuals. When the risk factors associated with asthma are being an interest for further study, the development of asthma before smoking initiation are noted to be associated with atopy (Thomson, 2004). However, the onset of asthma after initiating smoking is associated with the declining in lung system function (Thomson, 2004) due to the irritants in tobacco smoke. Lung function impairment increases with age is noted in adult smokers. (Landau, 2008)

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The linkage between smoking and asthma is not restricted to the primary smokers only. The exposure of cigarette smoke to those who do not smoke, also known as second hand smokers, does elicit harmful effects towards them. Although they do not smoke, they do acquire the detrimental consequences of smoking. Since foetus in the uterus and children in early childhood are in their delicate phase of life (Kanoh, 2011), prolonged exposure to tobacco smoke possibly deteriorates permanently their lungs function and may increases the risk of developing asthma. Same amount of cotinine in the smoking mothers may be built up in the foetus.

Exposure to the environmental tobacco smoke experienced by the infants may cause irreversible lung function damage and increases the risk to contract asthma and asthma exacerbations. Previous studies have documented that prenatal exposure to maternal smoking declines child's lung function as soon as delivery, during infancy, later during childhood and during adult life (Pietinalho, 2009). It causes abnormal lung function that tracks through later childhood and persistent into early adulthood (Landau, 2008). Smoking during pregnancy has been suggested to cause heavier lung function impairment as compared to postnatal exposure. (Pietinalho et al, 2009)

2.2.4 Smoking and Cancers

According to Global Cancer Statistics (2011), smoking is known to be associated with colorectal cancer, lung cancer, stomach cancer, esophageal cancer, bladder cancer, cancers of lip and oral cavity, breast cancer and nasopharyngeal cancer. Global burden of cancer continues to increase partly because of increasing of cancer-causing behaviors, which is smoking. Smoking accounts for 80% of the worldwide lung cancer in males and at least 50% in females. (Jemal et al., 2011)

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Active smoking, especially smoking before the first birth, may be associated with a modest increase in the risk of breast cancer because of carcinogens contained in tobacco smoke.(Xue, 2011) Meanwhile in a cohort study by Freedman, former smokers (119.8 per 100 000 person-years; HR, 2.22; 95% confidence interval [CI], 2.03-2.44; NNH, 1250) and current smokers (177.3 per 100 000 person-years; HR, 4.06; 95% CI, 3.66-4.50; NNH, 727) had higher risks of bladder cancer than never smokers (39.8 per 100 000 person-years) . (Freedman, 2011)

Smoking is reported to be the main cause of 90% of male and 79% of female lung cancers. Ninety percent of deaths from lung cancer are estimated to be due to smoking. Lifelong smokers have 20-40 times higher risk to develop lung cancer compared to non-smokers. (Ozlu & Bulbul, 2005) Besides that, exposure to environmental tobacco smoke also causes lung cancer. Two meta-analyses in 2007 show that exposure to environmental tobacco smoke at the workplace or home is associated with an increased risk of lung cancer. (Stayner et al., 2007; Taylor, Najafi, & Dobson, 2007)

2.3 Psychological Comorbidities of Smoking

Nicotine is the main component in cigarettes. Effects of nicotine include inducing pleasure and reduce stress and anxiety. It is also used to modulate levels of arousal and to control mood. Sometimes smoking improves concentration time, reaction time, and performance of certain tasks (Benowitz, 2010). Emergence of withdrawal symptoms is caused by cessation of smoking. Symptoms of nicotine withdrawal include craving, depression, anxiety, difficulty in concentrating, dysphoria, increased appetite, insomnia, irritability, frustration, anger, restlessness and decreased heart rate. Most of these symptoms peak within 48 hours after the last cigarette and then gradually decline in intensity, but some

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symptoms such as craving for nicotine, increased appetite and impaired concentration may continue for several months or years. (Fagerström, 2002)

Nicotine dependence could be measured by the six question Fagerstrom Test for Nicotine Depence (FTND) which is self-reporting. FTND can assists physicians to determine appropriate cessation treatment. High scores on FTND shows greatest difficulty refraining from smoking and receive the greatest therapeutic benefits from nicotine substitution. FTND is designed to indicate the strength of this dependence. The questionnaire has been widely used in many countries and revised version of FTND is developed. (Fagerstrom, Heatherton, & Kozlowski, 1990)

In a study by Lawrence, smoking is found to be associated with a range of mental disorders including schizophrenia, anxiety disorders and depression. Survey data from the US National Comorbidity Survey-Replication (NCS-R) conducted in 2001–2003, the 2007 Australian Survey of Mental Health and Wellbeing (SMHWB), and the 2007 US National Health Interview Survey were used to investigate the relationship between current smoking, ICD-10 mental disorders and non-specific psychological distress. About one-third of adult smokers had a 12-month mental disorder – 31.7% in the US (95% CI: 29.5%–33.8%) and 32.4% in Australia (95% CI: 29.5%–35.3%). Female smokers had higher rates of mental disorders compared to male smokers while younger smokers had considerably higher rates than older smokers. Mental disorders were assessed in the NCS-R and SMHWB using Version 3 of the WHO Composite International Diagnostic Interview (CIDI). The CIDI is a fully structured interview questionnaire which was administered in both surveys by lay interviewers using computer assisted interviewing software The CIDI includes an initial screener for major symptoms of mental disorders followed by detailed questions on each disorder. (Kessler & Ustün, 2004; Lawrence, Mitrou, & Zubrick, 2009)

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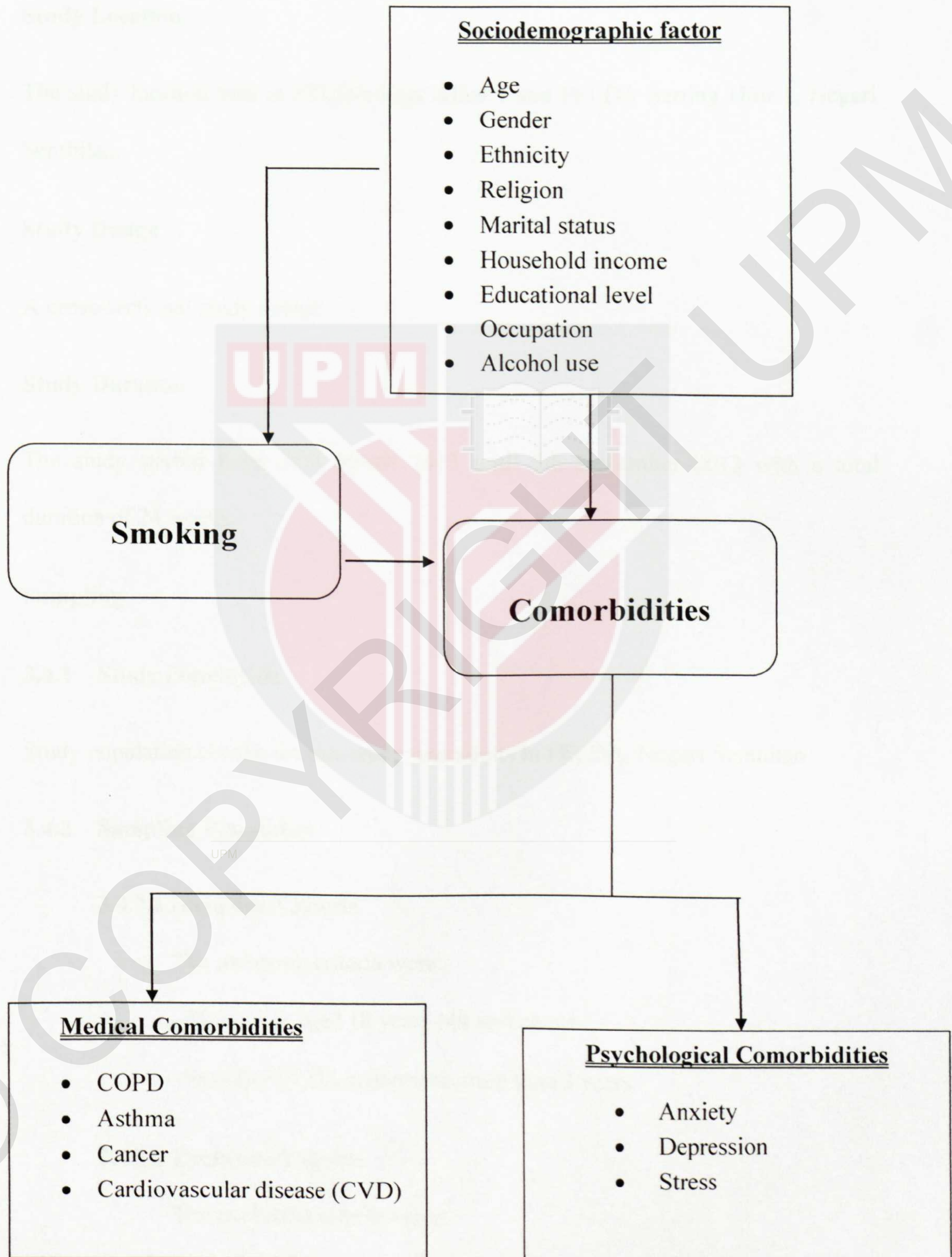
2.4 Conceptual Framework



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Chapter 3: Methodology

3.1 Study Location

The study location was at FELDA Raja Alias 1 and FELDA Serting Hilir 1, Negeri Sembilan.

3.2 Study Design

A cross-sectional study design

3.3 Study Duration

The study started from 25th March 2013 until 5th September 2013 with a total duration of 24 weeks.

3.4 Sampling

3.4.1 Study Population

Study population chosen for this study was adults in FELDA, Negeri Sembilan

3.4.2 Sampling Population

3.4.2.1 Inclusion Criteria

The inclusion criteria were:

- Malaysian aged 18 years old and above
- Stay in FELDA settlement more than 3 years

3.4.2.2 Exclusion Criteria

The exclusion criteria were:

- Non-Malaysian, or aged 17 years old and below
- People with dementia

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3.4.3 Sampling Frame

A list of houses in FELDA

3.4.4 Sampling Unit

An adult FELDA settler

3.4.5 Sampling method

The houses were sampled using cluster sampling. Random houses were chosen and all adults in the house were invited to the study.

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3.4.6 Sample size

Calculation for minimum sample size, n for a cross sectional study derived from formula by Lwanga and Lemeshow, 1991 (Lwanga, 1991)

$$n = \frac{\{z_{1-\alpha/2}\sqrt{2P(1-P)} + z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)}\}^2}{(P_1 - P_2)^2}$$

$$= \frac{\{1.96\sqrt{2(0.19)(0.81)} + 0.842\sqrt{(0.25)(0.75) + (0.13)(0.87)}\}^2}{(0.25 - 0.13)^2}$$

$$= 166.63 \approx \mathbf{167}$$

n = sample size

$\mathbf{z_{1-\alpha/2}}$ = the number of standard error away from the mean = **1.96**

$\mathbf{z_{1-\beta}}$ = **0.842**

P = $(P_1 + P_2) / 2$ = **0.19**

$\mathbf{P_1}$= estimated proportion of smokers who have COPD = **0.25** (Lokke, 2006)

$\mathbf{P_2}$= estimated proportion of non-smokers who have COPD = **0.13** (Lokke ., 2006)

n = 167 x 2 (due to design effect) + 20% estimated non-response rate

= **401**

= 401/3 *we assumed 1 house have 3 adults respondents.

= **134 houses**

With consideration of design effect and estimated 20% of non-respondents, the total number of houses involved in this study was **134**.

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3.5 Instruments and Data Collection

3.5.1 Instrument/Questionnaire

A structured pre-tested questionnaire was used in this study. It was divided into 4 sections. Section A consisted of socio-demographic characteristics questionnaire. Section B consisted of information on smoking status and Section C consisted of information on medical comorbidities. Section D consisted of information on psychological comorbidities.

3.5.1.1 Section A

Questionnaire was used to obtain data for sociodemographic data which includes age, gender, ethnicity, religion, household income, educational level, occupation, marital status and alcohol use. Questions of alcohol use is adapted from Alcohol Use Disorders Identification Test (AUDIT) which is a standardized questionnaire. The AUDIT was developed by the World Health Organization to identify persons whose alcohol consumption has become hazardous or harmful to their health. (Babor et al., 2001; Saunders et al., 1993)

3.5.1.2 Section B

Questionnaire was established with reference to Tobacco Questions for Surveys by Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) in 2011. It is a standardized questionnaire in tobacco survey and is widely used in more than 16 countries currently. The questions adopted provide a foundation to assess key aspects of tobacco use surveillance. (Global Adult Tobacco Survey Collaborative Group, 2011). It is open accessed and translated into Malay language with back translation.

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3.5.1.3 Section C

Questionnaire was used to assess medical comorbidities of the respondents, which include objectives data such as body mass index (BMI), blood pressure, waist circumference and airflow limitation. Other comorbidity status were self reported questions which included asthma, cancer, COPD, and cardiovascular diseases. COPD risk score was assessed using COPD Population Screener which is validated (Martinez, 2008). The questionnaires underwent pilot testing (Cronbach's alpha = 0.68).

3.5.1.4 Section D

Questionnaire contained data on anxiety, depression and stress level of respondents. It is a standardized questionnaire adopted from Depression Anxiety Stress Scale 21-item (DASS 21) developed by Lovibond and Lovibond (1995). Its reliability was assessed using Cronbach's alpha for the depression, anxiety and stress scales which gives 0.91, 0.84 amd 0.90 respectively. (Lovibond and Lovibond, 1995)

3.5.2 Equipment

In measurement of body mass index (BMI), the height(m) and weight(kg) of the respondents were measured by using a measuring tape and weighing scale respectively. Waist circumference was measured by measuring tape. Blood pressure of respondents was measured using a mercury sphygmomanometer. Meanwhile, the airflow limitation data was assessed using a vitalograph. The standard operating procedure (SOP) of the measurements was obtained from

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Scottish Diabetes Research Network. (Scottish Diabetes Research Network, 2013)

3.5.3 Data Collection Technique

Once the household was identified, the adults in the household were invited into the study. They were given information on the study and patient information sheet was given to them to read. Once consent is gotten, the selected respondents will then be interviewed. Data was collected by questionnaire and measurements of airflow limitation, blood pressure and BMI were taken during the interview. Respondent was asked to fill in the questionnaires along with guidance by the trained interviewers.

3.5.4 Quality Control

Questionnaire was translated into Malay language and back translated into English. The questionnaire was pre-tested with pilot study and validated. Meanwhile during data collection, equipment was calibrated according to manufacturer's guidelines. Measurements was taken two to three times and an average of measurements was used as data.

3.6 Data Analysis

The data was analyzed by using IBM SPSS Statistic 21 software. Mean and standard deviation were used to describe the continuos data while percentage was used to descrube the prevalence of smokers among respondents in FELDA settlers, the prevalence of medical comorbidities among respondents in FELDA and the prevalence of psychological comorbidities among respondents in FELDA. The data was categorized and Chi Square Test or Fisher's Exact Test were used to compare the

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categorical variables. In all statistical analyses, a p-value of <0.05 (95% confidence interval) was considered to be statistically significant.

3.7 Study Ethics

Prior to commencement of the study, ethical clearance and approval letter were obtained from Jawatankuasa Etika Universiti Penyelidikan Melibatkan Manusia (JKEUPM), UPM.

3.8 Variables

Dependent variables: Respiratory diseases (COPD, asthma), cardiovascular diseases (hypertension, myocardial infarction), risk of COPD, psychological comorbidities

Independent variables: Socio-demographic characteristics, smoking status

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3.9 Definition of terms

i) Current smoker : Respondent who reported to have smoked 100 or more cigarettes in lifetime and smoked daily or some days in the past one month. (CDC definition) (Ministry of Health, 2006)

ii) Ex-smoker : Respondent who reported to have smoked 100 or more cigarettes in lifetime but not smoking in the past one month preceding the survey. (CDC definition) (Ministry of Health, 2006)

iii) Never-smoker : Respondents who reported never having smoked 100 cigarettes or more in lifetime. (CDC definition)

iv) Hypertension : Persistent elevation of systolc blood pressure of 140mmHg or greater and/or diastolic blood pressure of 90mmHg or greater (Ministry of Health, 2008)

v) COPD : Chronic obstructive pulmonary disease (COPD) is a lung disease characterized by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible.

vi) BMI :

Table 3.1: Classification of BMI (kg/m²) (Ministry of Health, 2004)

Classification	Body Mass Index
Underweight	<18.5
Normal range	18.5-22.9
Overweight	≥ 23
Pre-obese	23-27.4
Obese I	27.5-34.9
Obese II	35.0-39.9
Obese III	≥ 40.0

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vii) Waist circumference :

Table 3.2: Classification of Waist Circumference (Ministry of Health, 2004)

Sex	Waist circumference (cm)	Risk
Male	< 90	Normal
	≥ 90	High risk
Female	< 80	Normal
	≥ 80	High risk

viii) DASS21 score:

Table 3.3: DASS21 severity ratings (Lovibond, 1995)

Severity	Depression	Anxiety	Stress
Normal	0 - 9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely severe	28+	20+	34+

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Chapter 4: Results

4.1 Response rate

A total of 498 respondents answered the questionnaires but 19 were removed due to incomplete answers . The number of valid questionnaires was 479 and the response rate was 96.2%.

4.2 Socio-demographic Profile

Table 4.1 shows the socio-demographic profile of respondents. In this research, all 479 respondents were Malays with Islamic religion. The age of respondents in FELDA was not normally distributed with median of 50 (IQR= 26, Skewness= -0.515, Kurtosis= -1.002). The maximum age of respondent was 85 years old and the minimum age was 19 years old. There were slightly more male respondents (54.3%) and more than half of the respondents had up to secondary level of education (56.5%). Majority of the respondents were plantation workers (45.2%) and married (72.7%). The household income was not normally distributed with median of RM1200 (IQR=1120, Skewness= 3.313, Kurtosis= 14.701). Most respondents (61.7%) had less than 1500 income. Only 1.3% of respondents consumed alcohol.

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Table 4.1: Distribution of Respondents by Socio-demographic Characteristics (N=479)

Variable	n	%	Mean ± SD	Median (IQR)
Age			-	50 (26)
<35	138	28.8		
35-54	187	39.0		
≥55	154	32.2		
Gender				
Male	260	54.3		
Female	219	45.7		
Education level (N=462)				
No formal education	30	6.5		
Primary level	125	27.1		
Secondary level	261	56.5		
Tertiary level	46	10.0		
Occupation (N=462)				
Student	20	4.3		
Plantation workers	209	45.2		
Government servant	20	4.3		
Private sector	68	14.7		
Housewife	115	24.9		
Others	30	6.5		
Marital status				
Single	131	27.3		
Married	348	72.7		
Household income (N=407) [a]			-	1200 (1120)
<RM1000	102	25.1		
RM1000-1499	149	36.6		
RM1500-1999	42	10.3		
RM2000-2499	48	11.8		
≥RM2500	66	16.2		
Alcohol use				
Yes	6	1.3		
No	473	98.7		

[a] Household income was categorized according to Economic Planning Unit (2009), Malaysia.

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4.3 Smoking Status

Table 4.2 shows the smoking status among respondents in FELDA. Out of 479 respondents in FELDA, 34.7% were current-smokers. Current-smoker was classified into smoker while ex-smoker and never-smoker were further classified into non-smokers (Lim et al., 2013). When looking into the current-smokers, the number of smoking pack year was not normally distributed with a median of 15 (IQR: 19, Skewness: 2.039, Kurtosis: 5.854). For the analysis of passive smoking status, there were more than half of non-smokers reported to have someone smoking inside their house. About 45% of non-smokers reported someone smoking at their workplace in the past 30 days. Smoking daily inside the house contributes to 45.8%.

Table 4.2: Distribution of Respondents by Smoking Status

Variable	n	%	Median (IQR)
Smoking status (N=479)			
Current-smoker	166	34.7	
Smoking pack year (N=129)			15(19)
Ex-smoker	37	7.7	
Never-smoker	276	57.6	
Exposure to smoking inside house (N=249) [a]			
Daily	114	45.8	
Weekly	7	2.8	
Monthly	2	0.8	
Less than monthly	7	2.8	
Never	119	47.8	
Exposure to smoking at workplace in the past 30 days (N=249) [a]			
Yes	114	45.8	
No	135	54.2	

[a] Include ex-smoker and never-smoker only.

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4.4 Medical Comorbidities

Table 4.3 shows the self-reported medical comorbidities among the respondents. It was found that 16.3% of respondents reported to have one or more chronic disease. The most recorded disease was cardiovascular disease (12.1%) followed by respiratory disease (3.5%). Cardiovascular disease recorded was mainly of hypertension (93.1%) and it had a mean duration of 4.9 (95% CI: 3.25 - 6.48) years.

Table 4.3: Distribution of Respondents by Medical Comorbidities (N=479)

Variable	n	%
Chronic disease		
Yes	78	16.3
No	401	83.7
Respiratory disease		
Yes	17	3.5
No	462	96.5
Cardiovascular disease		
Yes	58	12.1
No	421	87.9

Table 4.4 shows the assessment of risk for COPD using COPD-PS. Mean score of COPD-PS among the respondents was 2.05 (95% CI: 1.90 – 2.19) which is in normal range. Only 5.3% of respondents were screened to be at risk of COPD.

Table 4.4 : Distribution of Respondents by risk of COPD (N=380)

Variable	n	%	Mean ± SD
COPD-PS score			2.05 ± 1.43
Normal (<5)	360	94.7	
At risk of COPD (≥5)	20	5.3	

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Table 4.5 shows the BMI, waist circumference, blood pressure and airflow rate among the smokers. Looking into the smokers, it is found that the BMI of the smokers was 24kg/m² in mean (95% CI: 22.69 – 25.24), which is categorized in pre-obese group. 19.4% of smokers were obese and 42.9% of smokers had abnormal waist circumference which were at high risk of obesity related disease. Mean of systolic blood pressure (127.4, 95% CI: 122.26 – 132.44) and diastolic blood pressure (84, 95% CI: 79.86 – 88.23) of the smokers were both categorized as pre-hypertensive. More than one third of smokers (39.3%) were found to have abnormal BP. Meanwhile, less than 10% of smokers had an abnormal airflow rate which is suspected of COPD.

Table 4.5: Distribution of Smokers by BMI/Waist Circumference/Blood Pressure/Airflow Rate

Variable	n	%	Mean ± SD
Body Mass Index, kg/m² (N=67)			24.0 ± 5.2
Normal (<27.5 kg/m²)	54	80.6	
Obese (≥27.5 kg/m²)	13	19.4	
Waist Circumference, cm (N=56)			84.8 ± 13.7
Normal	32	57.1	
Abnormal (Men≥90cm ; Women ≥80cm)	24	42.9	
Systolic Blood Pressure, mmHg (N=56)			127.4 ± 19.0
Diastolic Blood Pressure, mmHg (N=56)			84.0 ± 15.6
Hypertensive status (N=56)			
Normal	34	60.7	
Abnormal	22	39.3	
Airflow rate, FEV1/FEV6 (N=52)			0.9 ± 0.1
Normal (≥0.7)	47	90.4	
Abnormal (<0.7)	5	9.6	

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4.5 Psychological Comorbidities

Table 4.6 shows the assessment of psychological status using DASS21. Approximately one third of respondents were found to have depression with almost a quarter being depressed. More than a quarter of respondents were noted to have anxiety and most of them were at moderate level (15.9%). Stress was the least psychological burden among the respondents.

Table 4.6: Distribution of Respondents by Psychological Comorbidities (N=390)

Variable	Frequency	Percentage	Mean ± SD
Depression score			5.1 ± 6.1
Normal	301	77.2	
Mild	42	10.8	
Moderate	39	10.0	
Severe	5	1.3	
Extremely severe	3	0.8	
Anxiety score			5.5 ± 6.5
Normal	266	68.2	
Mild	27	6.9	
Moderate	62	15.9	
Severe	20	5.1	
Extremely severe	15	3.8	
Stress score			6.3 ± 6.9
Normal	343	87.9	
Mild	27	6.9	
Moderate	15	3.8	
Severe	3	0.8	
Extremely severe	2	0.5	

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4.6 Association between Socio-demographic Characteristics and Medical Comorbidities

Table 4.7 shows the association between socio-demographic characteristics and chronic disease. It was observed that higher age group had higher percentage to have chronic disease compared to lower age group, in which age group ≥50 recorded the highest percentage (23.3%). Association between age and chronic disease was statistically significant with p-value of <0.001.

About 22% of male respondents recorded to have chronic disease which was about two-fold higher than female (9.6%). The association between gender and chronic disease was statistically significant (p<0.001). It is found that the higher education level had lower percentage to have chronic disease. About 33% of respondents with no formal education had chronic disease. The association between education level and chronic disease was statistically significant (p=0.001).

The results showed that plantation workers and married respondents had higher percentage of getting chronic disease. The association between occupation and marital status with chronic disease was statistically significant with both p-value of <0.001. 23.5% of respondents with income less than RM1000 had chronic disease. The association between household income and chronic disease was not statistically significant.

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Table 4.7: Association between Socio-demographic Characteristics and Chronic Disease

Variable	Chronic Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Age			19.939	1	<0.001*
<50	18(8.1)	203(91.9)			
≥50	60(23.3)	198(76.7)			
Gender			13.266	1	<0.001*
Male	57(21.9)	203(78.1)			
Female	21(9.6)	198(90.4)			
Education level (N=462)			16.060	3	0.001*
No formal education	10(33.3)	20(66.7)			
Primary level	30(24.0)	95(76.0)			
Secondary level	35(13.4)	226(86.6)			
Tertiary level	3(6.5)	43(93.5)			
Occupation (N=462)			22.457	2	<0.001*
Plantation workers	52(24.9)	157(75.1)			
Housewife	14(12.2)	101(87.8)			
Others[a]	9(6.5)	129(93.5)			
Marital status			13.699	1	<0.001*
Single	8(6.1)	123(93.9)			
Married	70(20.1)	278(79.9)			
Household income (N=407)			3.623	4	0.459
<RM1000	24(23.5)	78(76.5)			
RM1000-1499	22(14.8)	127(85.2)			
RM1500-1999	7(16.7)	35(83.3)			
RM2000-2499	7(14.6)	41(85.4)			
≥RM2500	12(18.2)	54(81.8)			

All tests are using Chi-square test unless stated otherwise.
[a] Includes students, government servant and private servant

Table 4.8 shows the association between socio-demographic characteristics and respiratory disease. The higher age group had higher percentage to have respiratory disease compared to lower age group, in which age group ≥50 recorded the highest percentage (5.0%) but the association was not statistically significant with p-value of 0.057. There were more male respondents (5.8%) recorded to have respiratory disease compared to female (0.9%). The association between gender and respiratory disease was statistically significant (p=0.004).

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Otherwise, the associations between education level, occupation, marital status and household income with respiratory disease were not statistically significant.

Table 4.8: Association between Socio-demographic Characteristics and Respiratory Disease

Variable	Respiratory Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Age			3.625	1	0.057
<50	4(1.8)	217(98.2)			
≥50	13(5.0)	245(95.0)			
Gender			8.189	1	0.004*
Male	15(5.8)	245(94.2)			
Female	2(0.9)	217(99.1)			
Education level (N=462)			5.063	3	0.167
No formal education	2(6.7)	28(93.3)			
Primary level	8(6.4)	117(93.6)			
Secondary level	6(2.3)	255(97.7)			
Tertiary level	1(2.2)	45(97.8)			
Occupation (N=462)			4.612	2	0.100
Plantation workers	12(5.7)	197(94.3)			
Housewife	2(1.7)	113(98.3)			
Others[a]	3(2.2)	135(97.8)			
Marital status			-	-	0.579[b]
Single	3(2.3)	128(97.7)			
Married	14(4.0)	334(96.0)			
Household income (N=407)			2.607	4	0.272
<RM1000	6(5.9)	96(94.1)			
RM1000-1499	3(2.0)	146(98.0)			
≥RM1500	7(4.5)	149(95.5)			

All tests are using Chi-square test unless stated otherwise.
[a] Includes students, government servant and private servant
[b] Fisher's exact test is used

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Table 4.9 shows the association between socio-demographic characteristics and cardiovascular disease. It was observed that among the respondents with cardiovascular disease, majority came from the age of 50 years old or older. They were also seen to be significantly more in male, married plantation workers and from lower education group of respondents with $p<0.05$. Otherwise, the association between household income and cardiovascular disease was not statistically significant.

Table 4.9: Association between Socio-demographic Characteristics and Cardiovascular Disease

Variable	Cardiovascular Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Age			14.946	1	<0.001*
<50	13(5.9)	208(94.1)			
≥50	45(17.4)	213(82.6)			
Gender			4.467	1	0.035*
Male	39(15.0)	221(85.0)			
Female	19(8.7)	200(91.3)			
Education level (N=462)			14.261	3	0.003*
No formal education	8(26.7)	22(73.3)			
Primary level	23(18.4)	102(81.6)			
Secondary level	25(9.6)	236(90.4)			
Tertiary level	2(4.3)	44(95.7)			
Occupation (N=462)			18.053	2	<0.001*
Plantation workers	39(18.7)	170(81.3)			
Housewife	12(10.4)	103(89.6)			
Others[a]	5(3.6)	133(96.4)			
Marital status			13.892	1	<0.001*
Single	4(3.1)	127(96.9)			
Married	54(15.5)	294(84.5)			
Household income (N=407)			7.960	4	0.093
<RM1000	20(19.6)	82(80.4)			
RM1000-1499	14(9.4)	135(90.6)			
RM1500-1999	7(16.7)	35(83.3)			
RM2000-2499	7(14.6)	41(85.4)			
≥RM2500	5(7.6)	61(92.4)			

All tests are using Chi-square test unless stated otherwise.
[a] Includes students, government servant and private servant

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Table 4.10 shows the association between socio-demographic characteristics and risk of COPD. The results showed a statistically significant association ($p<0.05$) between risk of COPD with age, gender, education level, occupation and marital status. It was found that the age group ≥50 years old, male, married, plantation workers, no formal education respondents recorded higher percentage of scores of COPD risk. The association between household income and risk of COPD was otherwise not statistically significant.

Table 4.10: Association between Socio-demographic Characteristics and Risk of COPD

Variable	Risk of COPD		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Age			12.148	1	<0.001*
<50	2(1.1)	180(98.9)			
≥50	18(9.1)	180(90.9)			
Gender					
Male	19(8.8)	198(91.2)	12.376	1	<0.001*
Female	1(0.6)	162(99.4)			
Education level (N=462)					
No formal education	4(20.0)	16(80.0)	17.178	3	0.001*
Primary level	10(9.8)	92(90.2)			
Secondary level	6(2.9)	201(97.1)			
Tertiary level	0	42(100.0)			
Occupation (N=462)					
Plantation workers	17(10.2)	149(89.8)	16.287	2	<0.001*
Housewife	0	81(100.0)			
Others[a]	2(1.6)	120(98.4)			
Marital status					
Single	1(0.9)	109(99.1)	5.886	1	0.015*
Married	19(7.0)	251(93.0)			
Household income (N=407)					
<RM1000	8(9.4)	77(90.6)	3.007	2	0.222
RM1000-1499	6(5.1)	112(94.9)			
≥RM1500	5(3.9)	123(96.1)			

All tests are using Chi-square test unless stated otherwise.

[a] Includes students, government servant and private servant

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4.7 Association between Smoking and Medical Comorbidities

Table 4.11 shows the association between chronic disease and smoking status. It was found that the prevalence of chronic disease among smokers (24.1%) was about twice of the prevalence of chronic disease among non-smokers (12.1%). There were more respondents with chronic disease who smoke. The association between smoking status and chronic disease was statistically significant with p-value of 0.001.

Table 4.11: Association between Chronic Disease and Smoking Status

Smoking Status	Chronic Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Smokers	40(24.1)	126(75.9)	11.374	1	0.001*
Non-smokers	38(12.1)	275(87.9)			

Table 4.12 shows the association between respiratory disease and smoking status. There was higher prevalence of respiratory disease among smokers (6.0%) compared to non-smokers (2.2%). The association between smoking status and respiratory disease was statistically significant.

Table 4.12: Association between Respiratory Disease and Smoking Status

Smoking Status	Respiratory Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Smokers	10(6.0)	156(94.0)	4.546	1	0.033*
Non-smokers	7(2.2)	306(97.8)			

Table 4.13 shows the association between cardiovascular disease and smoking status (CVD). Smokers had higher tendency to have cardiovascular disease (15.1%) compared to

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non-smokers (10.5%). However, the association between smoking status and cardiovascular disease was not statistically significant with p-value of 0.149 (p>0.05).

Table 4.13: Association between Cardiovascular Disease and Smoking Status

Smoking Status	Cardiovascular Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Smokers	25(15.1)	141(84.9)	2.080	1	0.149
Non-smokers	33(10.5)	280(89.5)			

Table 4.14 shows the association between risk of COPD and smoking status. Smokers had higher tendency to be at risk of COPD (10.3%) compared to non-smokers (2.1%). The association between smoking status and risk of COPD was statistically significant with p-value of <0.001.

Table 4.14: Association between Risk of COPD and Smoking Status

Smoking Status	Risk of COPD		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Smokers	15(10.3)	130(89.7)	12.143	1	<0.001*
Non-smokers	5(2.1)	230(97.9)			

Table 4.15 shows the association between chronic disease and smoking pack years among the smokers. Smokers who smoked more than 10 pack years had about 10% higher percentage of getting at least one chronic disease. However, the association between chronic disease and smoking pack years was not significant (p>0.05).

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Table 4.15: Association between Chronic Disease and Smoking Pack Years

Smoking Pack Years	Chronic Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
			1.807	1	0.179
≤10	10(20.4)	39(79.6)			
>10	25(31.3)	55(68.8)			

Table 4.16 shows the association between respiratory disease and smoking pack years among the smokers. About 6% of smokers who smoked more than 10 pack years had respiratory disease. However, the association between respiratory disease and smoking pack years was not significant (p>0.05).

Table 4.16: Association between Respiratory Disease and Smoking Pack Years

Smoking Pack Years	Respiratory Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
			0.664	1	0.415
≤10	5(10.2)	44(89.8)			
>10	5(6.3)	75(93.8)			

Table 4.17 shows the association between cardiovascular disease and smoking pack years among the smokers. It was found that smokers who smoked more than 10 pack years had 11.8% higher percentage of getting cardiovascular disease. There was no significant association between cardiovascular disease and smoking pack years.

Table 4.17: Association between Cardiovascular Disease and Smoking Pack Years

Smoking Pack Years	Cardiovascular Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
			3.250	1	0.071
≤10	4(8.2)	45(91.8)			
>10	16(20.0)	64(80.0)			

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Table 4.18 shows the association between risk of COPD and smoking pack years among the smokers. There were 15.3% of smokers who smoked more than 10 pack years were at risk of COPD, which was about 13% higher compared to those who smoked 10 or less pack years. The association between risk of COPD and smoking pack years was not significant (p>0.05).

Table 4.18: Association between Risk of COPD and Smoking Pack Years

Smoking Pack Years	Risk of COPD		x^2	df	p-value
	Yes, n(%)	No, n(%)			
≤10	1(2.4)	41(97.6)	-	-	0.053
>10	11(15.3)	61(84.7)			

Table 4.19 shows the association between chronic disease and secondary smoking among non-smokers. It was found that exposure and non-exposure to smoking among the non-smokers had almost same percentage to have chronic disease which was about 11%. The association between secondary smoking and chronic disease was not statistically significant (p>0.05).

Table 4.19: Association between Chronic Disease and Secondary Smoking

Exposure to secondary smoking	Chronic Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Yes	20(11.8)	150(88.2)	0.007	1	0.932
No	9(11.4)	70(88.6)			

Include non-smokers only.

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Table 4.20 shows the association between respiratory disease and secondary smoking among non-smokers. The prevalence of respiratory disease was slightly higher among non-smokers who were exposed to secondary smoking (2.9%). However, the association between secondary smoking and respiratory disease was not statistically significant (p>0.05).

Table 4.20: Association between Respiratory Disease and Secondary Smoking

Exposure to secondary smoking	Respiratory Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Yes	5(2.9)	165(97.1)	-	-	0.668[a]
No	1(1.3)	78(98.7)			

Include non-smokers only.
[a] Fisher's exact test is used

Table 4.21 shows the association between cardiovascular disease and secondary smoking among non-smokers. It was found that the prevalence of CVD among non-smokers with no exposure to secondary smoking was slightly higher. The association between secondary smoking and cardiovascular disease was not statistically significant (p>0.05).

Table 4.21: Association between Cardiovascular Disease and Secondary Smoking

Exposure to secondary smoking	Cardiovascular Disease		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Yes	16(9.4)	154(90.6)	0.032	1	0.859
No	8(10.1)	71(89.9)			

Include non-smokers only.

Table 4.22 shows the association between risk of COPD and secondary smoking among non-smokers. Non-smokers who were exposed to secondary smoking had higher percentage being at risk of COPD (3.4%). However, the association between secondary smoking and risk of COPD was not statistically significant (p>0.05).

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Table 4.22: Association between Risk of COPD and Secondary Smoking

Exposure to secondary smoking	Risk of COPD		x^2	df	p-value
	Yes, n(%)	No, n(%)			
			-	-	0.178 [a]
Yes	5(3.4)	144(96.6)			
No	0	71(100.0)			

Include non-smokers only.
[a] Fisher's exact test is used

4.8 Association between Socio-demographic Characteristics and Psychological Comorbidities

Table 4.23 shows the association between socio-demographic characteristics and depression. The association between depression with marital status and household income was statistically significant (p<0.05). It was noted that respondents who were single and with income ≥RM1500 had higher percentage of having depression. However, there were no statistically significant association found between depression with age, gender, education level, occupation (p>0.05).

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Table 4.23: Association between Socio-demographic Characteristics and Depression

Variable	Depression		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Age			4.385	2	0.112
<35	34(28.1)	87(71.9)			
35-54	35(23.4)	111(76.6)			
≥55	21(16.9)	103(83.1)			
Gender			0.754	1	0.385
Male	54(24.4)	167(75.6)			
Female	35(20.7)	134(79.3)			
Education level (N=462)			3.886	3	0.274
No formal education	7(30.4)	16(69.6)			
Primary level	18(17.8)	83(82.2)			
Secondary level	56(26.4)	156(73.6)			
Tertiary level	8(19.0)	34(81.0)			
Occupation (N=462)			10.554	5	0.061
Student	1(5.0)	19(95.0)			
Plantation workers	33(19.8)	134(80.2)			
Government servant	7(38.9)	11(61.1)			
Private servant	18(30.5)	41(69.5)			
Housewife	21(23.9)	67(76.1)			
Others	9(33.3)	18(66.7)			
Marital status			8.139	1	0.004*
Single	36(32.4)	75(67.6)			
Married	53(19.0)	226(81.0)			
Household income (N=407)			6.110	2	0.047*
<RM1000	18(21.4)	66(78.6)			
RM1000-1499	23(18.5)	101(81.5)			
≥RM1500	41(31.3)	90(68.7)			

All tests are using Chi-square test unless stated otherwise.

Table 4.24 shows the association between socio-demographic characteristics and anxiety. However, the association between anxiety with every socio-demographic characteristics was not statistically significant (p>0.05). It was observed that single and male had higher percentage getting anxiety.

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Table 4.24: Association between Socio-demographic Characteristics and Anxiety

Variable	Anxiety		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Age			0.691	2	0.708
<35	42(34.7)	79(65.3)			
35-54	44(30.3)	101(69.7)			
≥55	38(30.6)	86(69.4)			
Gender			0.671	1	0.413
Male	74(33.5)	147(66.5)			
Female	50(29.6)	119(70.4)			
Education level (N=462)			1.735	3	0.629
No formal education	8(34.8)	15(65.2)			
Primary level	28(27.7)	73(72.3)			
Secondary level	73(34.4)	139(65.6)			
Tertiary level	12(28.6)	30(71.4)			
Occupation (N=462)			5.739	5	0.332
Student	3(15.0)	17(85.0)			
Plantation workers	53(31.7)	114(68.3)			
Government servant	9(50.0)	9(50.0)			
Private servant	21(35.6)	38(64.4)			
Housewife	28(31.8)	60(68.2)			
Others	8(29.6)	19(70.4)			
Marital status			1.892	1	0.169
Single	41(36.9)	70(63.1)			
Married	83(29.7)	196(70.3)			
Household income (N=407)			5.970	2	0.051
<RM1000	21(25.0)	63(75.0)			
RM1000-1499	34(27.4)	90(72.6)			
≥RM1500	51(38.9)	80(61.1)			

All tests are using Chi-square test unless stated otherwise.

Table 4.25 shows the association between socio-demographic characteristics and stress. It is noted that higher income group had a higher prevalence of stress whereby prevalence of stress among income group ≥RM1500 recorded the highest with 16.8%. However, there was no significant association between stress with age, gender, education level, occupation, marital status and household income.

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Table 4.25: Association between Socio-demographic Characteristics and Stress

Variable	Stress		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Age			2.375	2	0.305
<35	19(15.7)	102(84.3)			
35-54	14(9.7)	131(90.3)			
≥55	14(11.3)	110(88.7)			
Gender			2.837	1	0.092
Male	32(14.5)	189(85.5)			
Female	15(8.9)	154(91.1)			
Education level (N=462)			0.756	3	0.860
No formal education	2(8.7)	21(91.3)			
Primary level	13(12.9)	88(87.1)			
Secondary level	28(13.2)	184(86.8)			
Tertiary level	4(9.5)	38(90.5)			
Occupation (N=462)			4.862	2	0.088
Plantation workers	16(9.6)	151(90.4)			
Housewife	9(10.2)	79(89.8)			
Others[a]	22(17.7)	102(82.3)			
Marital status			2.539	1	0.111
Single	18(16.2)	93(83.8)			
Married	29(10.4)	250(89.6)			
Household income (N=407)			3.651	2	0.161
<RM1000	7(8.3)	77(91.7)			
RM1000-1499	14(11.3)	110(88.7)			
≥RM1500	22(16.8)	109(83.2)			

All tests are using Chi-square test unless stated otherwise.
[a] Includes students, government servant and private servant

4.9 Association between Smoking and Psychological Comorbidities

Table 4.26 shows the association between depression and smoking status. Smokers had a higher percentage of having depression (30.5%) compared to non-smokers (18.5%). The association between smoking status and depression was statistically significant with p-value of 0.007.

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Table 4.26: Association between Depression and Smoking Status

Smoking Status	Depression		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Smokers	43(30.5)	98(69.5)	7.388	1	0.007*
Non-smokers	46(18.5)	203(81.5)			

Table 4.27 shows the association between anxiety and smoking status. The prevalence of anxiety was higher in smokers (38.3%) compared to non-smokers (28.1%). The association between smoking status and anxiety was statistically significant with p-value of 0.038.

Table 4.27: Association between Anxiety and Smoking Status

Smoking Status	Anxiety		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Smokers	54(38.3)	87(61.7)	4.307	1	0.038*
Non-smokers	70(28.1)	179(71.9)			

Table 4.28 shows the association between smoking status and stress. It is found that the prevalence of stress among smokers was about twice of non-smokers. The association between smoking status and stress was statistically significant with p-value of 0.010.

Table 4.28: Association between Stress and Smoking Status

Smoking Status	Stress		x^2	df	p-value
	Yes, n(%)	No, n(%)			
Smokers	25(17.7)	116(82.3)	6.720	1	0.010*
Non-smokers	22(8.8)	227(91.2)			

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Chapter 5: Discussion and Conclusion

5.1 Discussion

5.1.1 Smoking Status

From the data analysis, the prevalence of current smoker among respondents in FELDA was 34.7%. According to National Health and Morbidity Survey III (NHMS III) that was conducted in 2006 by Ministry of Health Malaysia, the prevalence of current smokers was 21.5%. Therefore, the prevalence of current smokers in FELDA was significantly higher which approximately 13.2% more than national prevalence current smokers.

Global Adult Tobacco Survey (GATS) 2011 reported 23.1% current smokers were found among adult respondents. Thus, in total, the prevalence of current smoker in FELDA was higher as compared to national and global prevalence of current smoker. The prevalence of smoking adults in Australia in 2001 was reported to be 23%, showing a gradual decline from 35% in 1980 (White et al, 2003). In United State, national adult smoking prevalence was 18.6% in 2003; demonstrate a marked reduction from 29.5% in 1985 (Farelly et al, 2008). NHMS II (1996) was providing data of 24.8% on prevalence of adult smoking. Only small decline can be seen when national survey was conducted again (NHMS III).

The prevalence of ex-smoker among respondents was 7.7%. The prevalence of never smoker among respondents in FELDA was 57.6% which exceeds half of the total population in FELDA of interest. It is interesting to prominently picture that the prevalence of current smoker is higher among FELDA settlers as compared to data obtained from NHMS III (2006) and GATS 2011 The higher percentage of smoking adults in FELDA could be influenced by the occupational environment of the FELDA settlers as majority of the respondents works as plantation workers (45.2%). Even though the result of our study may not be generalizable to

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the entire FELDA population in Malaysia, our finding still supports the fact that smoking is a major issue among FELDA settlers.

Regarding second hand smoke analysis, more than half of non-smokers reported to have someone smoking inside their house in which smoking daily inside the house was the most with 45.8% among non-smokers. Based on GATS 2011, 4 in 10 adults were exposed to tobacco smoke at home which was 38.4% among all of the respondents. Almost 50% of non-smokers in this research reported someone was smoking at their workplace in the past 30 days.

5.1.2 Medical Comorbidities

Our research found that the prevalence of chronic disease among the respondents in FELDA was 16.3%, similar to another study by Amal (2011) who found that the estimated overall prevalence of chronic illness in the Malaysian population to be 15.5%.

Study by Amal had also found that the most common chronic illness among the general population in Malaysia was hypertension (7.9%) while heart disease occupied another 1.2%. (Amal, 2011) Compared to our study, we found that the prevalence of CVD among respondents in FELDA was 12.1% in which prevalence of hypertension recorded 11.3%. The prevalence of hypertension in FELDA was about 3% higher compared to the general population. In another study by Rampal et al, 2008, the prevalence of hypertension found was much lower that what was found in this study. Rampal found that the overall prevalence of hypertension for subjects aged ⩾15 years in Malaysia was 27.8% (Rampal, 2008). This may be due to the population in FELDA which consisted mainly of middle adulthood age group. A Framingham study by Vokonas showed that the prevalence and sustained impact of cardiovascular disease become higher as age increases (Vokonas, 1988).

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Besides that, the prevalence of respiratory disease among the FELDA respondents was 3.5% according to our study. Comparing to prevalence of asthma (3.4%) (Amal, 2011) and prevalence of COPD (4.7%) (Regional COPD W.G., 2003) among the general population in Malaysia, the findings in our study among FELDA population were not much different.

The risk of COPD was assessed using COPD-PS questionnaire. 5.3% of respondents were screened to be at risk of COPD. COPD-PS is efficient and convenient to screen COPD in a population. According to study by Martinez, it has a positive predictive value of 56.8% and negative predictive value of 86.4%. (Martinez, 2008)

5.1.3 Psychological Comorbidities

DASS21 questionnaire was used to assess the psychological status of our respondents: depression, anxiety and stress. Based on our findings, 22.9% of our respondents were found to have depression issue with scoring of mild (10.8%), moderate (10.0%), severe (2.1%) and extremely severe (0.8%). More than a quarter of respondents (31.7%) had anxiety and most of them were at moderate level (15.9%). Only 12% of our respondents were found depressed. Majority of the repondents have normal scoring of psychological assessment.

We compared the prevalence of psychological comorbidities with the study by Shamsuddin. Shamsuddin stated that among all students in four public universities, 27.5% had moderate, and 9.7% had severe or extremely severe depression; 34% had moderate, and 29% had severe or extremely severe anxiety; and 18.6% had moderate and 5.1% had severe or extremely severe stress. (Shamsuddin, 2013) It was found that the prevalence of depression, anxiety and stress among students was much higher compared to the respondents in FELDA. This may be due to different occupations which lead to a different lifestyle and obviously harbour a different stress. Majority of respondents in FELDA are mature adults and have more life experience in dealing with stress.

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5.1.4 Association between Medical Comorbidities and associated factors.

Based on our study, we had found that there was a significant association between chronic disease with age, gender, education level, occupation and marital status. It had shown that the higher age group, male, lower education, plantation workers, married status lead to a higher prevalence of chronic disease. Meanwhile, a previous study also proved that increasing age and low education associated with a higher probability of having at least one chronic disease (Hoang, 2008). It is shown that higher age group, male, lower education level, plantation workers and married respondents had a higher prevalence of CVD mainly of hypertension. A previous study proved this by showing that the odds of having hypertension increased with increasing age, in males and with decreasing levels of education. (Rampal, 2008)

Increasing age and male are two established non modifiable risk to develop cardiovascular disease. Increasing age is also a cause of hypertension because of the increasing rigidity of the vessel wall seen in old age. The high prevalence of hypertension in the elderly may be attributed to age-related poor vascular compliance of the large arteries, which subsequently contributes to isolated systolic hypertension and widened pulse pressure. (Dobrin, 1978) Besides that, study by Rampal stated that prevalence of hypertension for respondents aged 50 or above was more than 57% while prevalence of hypertension for aged 30 or above was 40.5%. (Rampal, 2008). In our study the prevalence of CVD for respondents aged 50 or above was 17.4%. This was about 40% lower compared to the national hypertension prevalence in study by Rampal. This was probably due to underreporting by the respondents or the respondents were unaware of their disease because previous study by Rampal proved that only 34.6% subjects with hypertension were aware of their hypertensive status. (Rampal, 2008) Meanwhile the prevalence of CVD among smokers was higher (15.1%) compared to non-smokers (10.5%). However, the result was not significant.

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However, several other studies had shown the health impact of smoking on the cardiovascular system. (Leng et al, 1987; Zieske et al, 2005; Friedlender et al, 2001).

Another previous study showed that lower income associated with chronic disease (Amal, 2011). Amal revealed that those from the lower income groups were the main users of services provided by government health facilities and the private health facilities were mostly visited by those with higher income. However, in our study, the association between chronic disease and income group was not significant. This may be due to a wide interval in each income group. However, the lowest income group <RM1000 had the highest prevalence of chronic disease (23.5%). This was probably due to inadequate government health facilities or insufficient money to visit a private clinic.

The findings from our results also showed a significant association between gender and respiratory disease. We observed that male respondents had higher prevalence of respiratory disease. However, previous studies showed that women are more susceptible to COPD and asthma (Sorheim, 2010; Postma, 2007). Our study had a different finding most probably because majority of the male respondents were smokers. This study also re confirms the risk smoking has on COPD. There were more respondents who have risk to develop COPD smoke. Smoking is the main culprit in the progress of COPD among active and passive smokers. This is also been reaffirmed by this study that noted COPD risk was seen to be more prevalent among secondary smokers compared to non-smokers. (Yawn and Kaplan, 2008)

The respondents in our study were also screened of COPD using COPD-PS questionnaire. It was also found that there was a significant association between risk of COPD with age, gender, education level, occupation and marital status. The prevalence of respondents at risk of COPD were found higher in age group ≥50, male gender, no formal

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education, plantation workers and married respondents. COPD among old age is an increasing problem. The exacerbation of COPD among older age is more severe. It was believed that the risk of COPD among these respondents was due to smoking. In addition exposure to outdoor air pollution is another risk factor (Mannino, 2007) Being a plantation worker, smokers who are mainly men the exposure to other hazardous air pollutants is higher than the female living mostly indoor.

Based on the findings in our study, there was a significant association between smoking status with chronic disease, respiratory disease and risk of COPD. 24.1% of smokers were reported to have one or more chronic disease in which 6.0% of smokers reported to have respiratory disease. According to previous study, smoking adversely affects many systems of human body, not merely the lung (Yawn and Kaplan, 2008). Among most, asthma, hypertension, cardiovascular and respiratory disease were usually related to smoking behaviour. Yawn and Kaplan in 2008 also stated that it was assumable that smoking may deteriorates one or more of human body systems as a consequence of prolonged exposure to tobacco smoking.

Besides that, smokers were found to be more susceptible to be at risk of COPD (10.3%) while only 2.1% of non-smokers were found at risk of COPD. It showed a significant association between smoking status and risk of COPD. According to Yawn and Kaplan in 2008, over 80% of all cases of COPD are associated with cigarette smoking. This had further proven the findings of our study.

According to previous study, increasing secondary smoke exposure was independently associated with increased risk of COPD for 20 or more hours of exposure per week (Jordan, 2011). The risk among never smokers was doubled if exposure exceeded 20h/week. However, in our study, the association between secondary smoking and risk of

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COPD was not significant. Only 3.4% of non-smokers exposed to secondary smoking recorded at risk of COPD. This may be due to short duration of exposure.

5.1.5 Association between Psychological Comorbidities and associated factors

In our study, it was found that there was significant association between depression with marital status and household income. Respondents with single status (32.4%) or income ≥RM1500 (31.3%) had higher prevalence of depression. According to a study by Bromet, depression was estimated to have its highest prevalence in high-income countries, including France (21%) and the United States (19%) (Bromet, 2011). This finding correspond well with our study that prevalence of depression was higher in income group ≥RM1500. Prevalence of depression was high in single status most probably because they were divorced or widowed.

In our study, there was no significant association between anxiety and socio-demographic characteristics. However, it was noted that the prevalence of anxiety increases as the income increases.

According to previous study, smoking had been associated with a range of mental disorders including schizophrenia, anxiety disorders and depression. About one-third of adult smokers had a 12-month mental disorder – 31.7% in the US (95% CI: 29.5%–33.8%) and 32.4% in Australia (95% CI: 29.5%–35.3%) (Kessler & Ustün, 2004) Meanwhile, in our study, the prevalence of depression and anxiety among smokers was about 30%-38%. We obtained an almost similar result whereby the association between smoking status with depression, anxiety and stress was significant.

The relationship between smoking and stress was found to be interrelated. A study in Glasgow reported stressful environment can influence a person to smoke and discourage cessation (Stead et al, 2001). It is important to note a study by Liu in 2003 that was conducted

among Chinese adolescent which revealed smokers experienced more life difficulties than non-smokers. In addition, study by Siqueira et al. in 1999 also obtained similar result by magnifying the fact that stress and negative life events were experienced the most among current smokers as compared to experimenters and never smokers. The feeling of helplessness and loss of capability to cope with anger and stress encourage tobacco use. Based on findings by Siqueiraet al, they again came with a conclusion that higher levels of stress were found in current smokers, less so in experimenters, and lowest in never smokers. A study in Finland by Kouvonen et al in 2005 suggested an association between work stress and smoking. When comparison was made between our findings with those previous studies, we failed to demonstrate stress level is also high among our respondents (17.7%). We were only able to show that the prevalence of anxiety and depression was quite convincingly high among our respondents.

5.2 Limitation

Being cross-sectional in design is limiting the ability of this study to capture the causal relationship between smoking status and medical and psychological comorbidities. The study was done in FELDA Raja Alias 1 and FELDA Serting Hilir only. We couldn't generalize the result because it was only done in small community in FELDA, Negeri Sembilan. The period allocated for data collection was only 3 days which restrict our capability to capture more respondents to increase response rate. Brief period allocated for this study allows only cross-sectional study to be run. Thus, this weakness makes us unable to run cohort study in which causal relationship can be clearly proven. In addition, self-reported medical comorbidities by respondents open up the possibility of bias (recall bias) to occur. We believe these factors have limiting our findings in demonstrating the association between smoking and comorbidities.

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5.3 Recommendation

In future research, study location with balance ethnicity proportion and equal distribution of age group should be selected. Thus, it widens the association that can be revealed from the findings. The period allocated for this study should be extended as it enables cohort study to be run. Therefore, causal relationship can be clearly demonstrated. A larger and bigger sample size should be recruited as large and bigger sample size represents that particular population. Number of places chosen for study location should be increased so that the data is more representative of the whole population.

The FELDA population should be educated on the negative impact of smoking on physical and mental health due to the high prevalence of smoking. An anti-smoking campaign should be launched in FELDA by government which would hopefully reduce the prevalence of smoking and comorbidities among FELDA settlers.

5.4 Conclusion

Tobacco smoke was known as a major contributor to smoking related illnesses. In this study, we have outlined certain comorbidities that were related to smoking and presented the significant association between comorbidities and smoking status. From our findings, prevalence of chronic disease among respondents was high (16.3%) when compared to the national prevalence (15.5%). The prevalence of depression, anxiety and stress among smokers were 30.5%, 38.3% and 17.7% respectively. The study showed that there was a significant association between smoking with chronic disease, respiratory disease, risk of COPD, depression, anxiety and stress. In future, this work is hoped to serve as a delicate approach in creating a pace of introducing more studies in the future regarding FELDA settlers. This study is believed to bring an awareness regarding the negative impacts of smoking on health of FELDA settlers.

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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*		
Q8:	Status perkahwinan	Belumberkahwin Berkahwin Janda/Duda	1 2 3

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Q18:	**Apakah yang anda suka tentang rokok:**		
		Rasa rehat (relaks)	
		Melegakan tekanan	
		Diterima oleh kawan-kawan	
		Merasa hebat	
		Lain-lain: Nyatakan.....................................	
Q19:	**Adakah anda pernah cuba berhenti merokok?** *Jika "Ya" jawabsoalan Q18, jika "Tidak" teruskan kesoalan Q25*	Ya	1
		Tidak	2
Q20:	**Berapa kalikah anda telah cuba berhenti merokok**		
		Sekali sahaja	1
		Dua kali	2
		Tiga kali	3
		Lebih dari tiga kali: Natakan............	4
Q21:	**Siapakah yang mempengaruhi anda untuk berhenti merokok?**	Kesedaransendiri	1
		Isteri/suami	2
		Kawan-kawan	3
		Nasihat doktor, kerana mengidap penyakit:.............	4
		Lain-lain,nyatakan:..............	5
Q22:	**Kenapa anda gagal berhenti merokok?**	Ketagih/gian	1
		Pengaruh kawan	2
		Kurang sokongan/motivasi	3
		Lain-lain, nyatakan:....................	4
Q23:	**Apakah jenama rokok yang anda sering hisap?** Nyatakan jenama:...		
Q24:	**Berapakah harga sekotak rokok jenama di atas (Q23)?** RM..............................sekotak		
Q25:	**Berapa RM kenaikkan harga sekotak rokok akan menyebabkan anda mengurangkan hisap rokok?**	RM 1.00	1
		RM 2.00	2
		RM 3.00	3
		RM 4.00	4
		RM 5.00	5
		Lain-lain, nyatakan:	6
Q26:	**Berapa RM kenaikan harga sekotak rokok menyebabkan anda akan mengambil keputusan terus berhenti merokok?**	RM 1.00	1
		RM 2.00	2
		RM 3.00	3
		RM 4.00	4
		RM 5.00	5
		Lain-lain, nyatakan:	6

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Q27:	Dalam sebulan berapa kotak rokok anda hisap?	
	=..................kotak rokok sebulan	

Q28:	**Adakah anda menghisap rokok tanpa penapis?** **sekiranya "Ya" jawab soalan Q28 dan seterusnya, dan sekiranya "Tidak" teruskan kesoalan Q31*	Ya	1
		Tidak	2

Q29:	**Kenapakah anda menghisap rokok yang tiada penapis?**	Murah	1
		Mudahdidapati	2
		Lain-lain:...............	3

Q30:	**Adakah anda tahu menghisap rokok yang tiada Penapis menyebabkan risiko kesihatan yang lebih tinggi?**	Ya	1
		Tidaktahu	2

Q31:	**Berapakah pendapatan* bulanan anda** = RM....................... sebulan **Termasuk gaji atau lain pendapatan atau bantuan* **Sekiranya anda masih besekolah atau tidak bekerja – nyatakan jumlah wang saku yang anda perolehi dari ibubapa anda.*
Q32:	**Dari jumlah pendapatan di atas (Q31) berapa jumlah yang anda gunakan untuk membeli rokok dalam sebulan?** **= RM.....................sebulan**

BAHAGIAN C: SEJARAH PERUBATAN

Q33:	**Adakah anda mengidap penyakit berikut?** *(Anda boleh jawab lebih dari satu penyakit)* **Sekiranya anda ada mengidap penyakit ini, sila jawab soalan Q33 dan seterusnya, dan sekiranya tiada terus kesoalan Q39*	1. Asma	1
		2. Darah tinggi	2
		3. Kencing manis	3
		4. Kanser	4
		5. PenyakitJantung dan salurdarah (CVD)	5
		6. Penyakit salur pernafasan	6

Q34: **Sudahberapa lama anda mengidap penyakit berikut?**

Penyakit	Tahun
1. Asma	
2. Darah tinggi	
3. Kencing manis	
4. Kanser	
5. Penyakit jantung dan salur darah (CVD)	
6. Penyakit salur pernafasan	

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Q35:	**Sepanjang 3 bulan yang lepas adakah anda mendapat rawatan bagi penyakit berikut? (nyatakan kekerapan dan perbelanjaan yang anda/keluarga tanggung – perbelanjaan termasuk harga rawatan, hospital, ubat dan perjalanan)**

Penyakit	Hopital/Klinik Kerajaan		Hospital/Klinik Swasta	
	Kekerapan	Perbelanjaan setiap kali (RM)	Kekerapan	Perbelanjaan setiap kali (RM)
1.Asma				
2. Darah tinggi				
3. Kencing manis				
4.Kanser				
5.Penyakit jantung dan salur darah (CVD)				
6.Penyakit salur pernafasan				

Q36:	**Sepanjang 3 bulan yang lepas, berapa hari kah anda tidak dapat bekerja/hadir bekerja/sekolah disebabkan penyakit berikut?**

Penyakit	Bilanganharitidakbekerja/ sekolah
1. Asma	
2. Darah tinggi	
3. Kencing manis	
4. Kanser	
5. Penyakit jantung dan salur darah (CVD)	
6. Penyakit salur pernafasan	

Q37:	**Sepanjang 12 bulan lalu, pernahkah anda di masukkan ke hospital kerana penyakit di atas?** Ya pernah, kerana penyakit:.. .... Berapa lama anda tinggal di hospital:................hari Berapa perbelanjaan yang anda tanggung: RM................................
Q38:	**Sekiranya anda bekerja sendiri (seperti peneroka, peniagadll), berapakah anggaran pendapatan anda hilang kerana tidak dapat bekerja sehari disebabkan penyakit di atas?** = RM....................sehari

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Soal Selidik/ *Questionnaire*

Section A: <u>Informasi Sosiodemografi / *Socio-demographic Information*</u>

1. Adakah anda minum minuman alkohol?
   Do you drink alcohol?
   - [ ] Ya (Pergi ke Q10)
     Yes(Go to Q10)
   - [ ] Tidak (Pergi ke Q12)
     No (Go to Q12)

2. Berapa kerap anda mengambil minuman mengandungi alkohol?
   How often do you have a drink containing alcohol?
   - [ ] Tidak pernah / *Never*
   - [ ] Setiap bulan atau kurang / *Monthly or less*
   - [ ] 2-4 kali dalam sebulan / *2-4 times a month*
   - [ ] 2-3 kali dalam seminggu / *2-3 times a week*
   - [ ] 4 kali atau lebih dalam seminggu / *4 or more times a week*

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Section B: Status Merokok / *Smoking Status*

Sila jawab SEMUA soalan di bawah.
Bagi soalan dengan pilihan, sila letak (√) dalam kotak yang berkaitan. Sila pilih hanya SATU jawapan bagi setiap soalan.

No	Soalan	Jawapan
Q12	Adakah anda merokok? *Do you smoke?*	☐ Ya ☐ Tidak
Q13	Adakah anda pernah merokok? Jika ya, sila nyatakan bila kali terakhir anda merokok/ berapa lama anda telah merokok?	Jika Ya, sila nyatakan: a) Bila kali terakhir anda merokok: ________ b) Berapa lama anda telah merokok? [tahun/ bulan] ☐ Tidak (Pergi ke Q22)
Q22	Berapa kerap orang di rumah anda merokok? *How often does anyone smoke inside your home?*	☐ Setiap hari *Daily* ☐ Setiap minggu *Weekly* ☐ Setiap bulan *Monthly* ☐ Kurang dari setiap bulan *Less than monthly* ☐ Tidak pernah *Never*
Q24	Sepanjang 30 hari yang lalu, adakah sesiapa merokok di tempat anda bekerja?	☐ Ya *Yes* ☐ Tidak *No*

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Section C:

Pencarian kes masalah salur pernafasan

1	Adakah anda mengalami sesak nafas sepanjang 4 minggu yang terdahulu?				
	Tidak pernah	A little of the time	Kadang kala	Kebanyakan masa	Sentiasa
	0	0	1	2	2

2	Pernahkah anda batukkan kahak?					
	Tidak pernah	Hanya pada waktu pagi	Hanya semasa selsema atau jangkitan paru paru	Ya. Beberapa hari dalam sebulan	Ya. Kebanyakan hari dalam seminggu	Ya. Setiap hari.
	0	0	0	1	1	2

3	Sepanjang 12 bulan yang lepas, saya kurang buat aktiviti yang biasa saya buat kerana masalah pernafasan. Jawapan di bawah menggambarkan gambaran anda tentang penyataan di atas.				
	Sangat tidak bersetuju	Tidak bersetuju	Tidak pasti	Setuju	Sangat bersetuju.
	0	0	0	1	2

3	Sepanjang 12 bulan yang lepas, saya kurang buat aktiviti yang biasa saya buat kerana masalah pernafasan. Jawapan di bawah menggambarkan gambaran anda tentang penyataan di atas.				
	Sangat tidak bersetuju	Tidak bersetuju	Tidak pasti	Setuju	Sangat bersetuju.
	0	0	0	1	2

4#	Pernahkah pernafasan anda berbunyi?				
	Tidak pernah	Hanya pada waktu pagi	Hanya semasa selsema atau jangkitan paru paru	Ya. Beberapa hari dalam sebulan	Ya. Kebanyakan hari dalam seminggu
	0	1	0	1	2

5#	Adakah anda mengalami masalah alahan?	Ya	Tidak
		1	0

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Scetion D

Data di bawah akan diisi oleh penyelidik.

Data below will be filled in by researcher.

D1. Height: ___________m

Weight: ___________kg

D2. Waist circumference = ___________cm

D3. Blood pressure = _________mmHg (First reading)

_________mmHg (Second reading)

D4. Airflow rate = (First reading) FEV1_________FVC_________

(Second reading)FEV1_________ FVC_________

(Third reading) FEV1_________ FVC_________

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Section D: **<u>Maklumat Komorbiditi Psikologi</u>** / ***<u>Psychological Comorbidities Information</u>***

DASS21

Sila baca setiap kenyataan di bawah dan **BULATKAN** pada nombor 0,1,2 atau 3 bagi menggambarkan keadaan anda sepanjang minggu yang lalu. Tiada jawapan yang betul atau salah.

Jangan mengambil masa yang terlalu lama untuk menjawab mana-mana kenyataan.

Skala pemarkahan adalah seperti berikut:

0 **Tidak langsung** menggambarkan keadaan saya

1 **Sedikit atau jarang-jarang** menggambarkan keadaan saya

2 **Banyak atau kerapkali** menggambarkan keadaan saya

3 **Sangat banyak atau sangat kerap** menggambarkan keadaan saya

1	Saya dapati diri saya sukar ditenteramkan	0	1	2	3
2	Saya sedar mulut saya terasa kering	0	1	2	3
3	Saya tidak mengalami perasaan positif sama sekali	0	1	2	3
4	Saya mengalami kesukaran bernafas (contohnya pernafasan yang laju, tercungap-cungap walaupun tidak melakukan senaman fizikal)	0	1	2	3
5	Saya sukar untuk mendapat semangat bagi melakukan sesuatu perkara	0	1	2	3
6	Saya cenderung untuk bertindak keterlaluan dalam sesuatu keadaan	0	1	2	3
7	Saya rasa menggeletar (contohnya pada tangan)	0	1	2	3
8	Saya rasa saya menggunakan banyak tenaga dalam keadaan cemas	0	1	2	3
9	Saya bimbang keadaan di mana saya mungkin menjadi panik dan melakukan perkara yang memperbodohkan diri sendiri	0	1	2	3
10	Saya merasakan bahawa saya mempunyai apa-apa untuk melihat ke hadapan	0	1	2	3
11	Saya dapati diri saya semakin gelisah	0	1	2	3
12	Saya rasa sukar untuk tenang	0	1	2	3
13	Saya rasa kecewa dan muram	0	1	2	3
14	Saya tidak dapat menahan sabar dengan perkara yang menghalang saya meneruskan apa yang saya sedang lakukan	0	1	2	3

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15	Saya rasa hampir menjadi panik/cemas	0	1	2	3
16	Saya tidak bersemangat dengan apa jua.	0	1	2	3
17	Saya tidak begitu berharga sebagai seorang individu	0	1	2	3
18	Saya rasa yang saya mudah tersentuh	0	1	2	3
19	Saya sedar tindakbalas jantung saya walaupun tidak melakukan aktiviti fizikal (contohnya kadar denyutan jantung bertambah, atau denyutan jantung berhenti satu degup)	0	1	2	3
20	Saya berasa takut tanpa sebab yang munasabah	0	1	2	3
21	Saya rasa hidup ini tidak bermakna	0	1	2	3

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RESPONDENT'S INFORMATION SHEET

Please read the following information carefully and do not hesitate to discuss any questions you may have with the researcher.

STUDY TITLE
Prevalence of comorbidities and its association with smoking among adults in FELDA, Negeri Sembilan in year 2013

INTRODUCTION
Smoking appears as social norms that are overwhelming the society in Malaysia. Many studies regarding smoking have been conducted in rural and urban areas. However, limited data can be obtained regarding smoking issue among those who live in FELDA. Therefore, this study serves as a basis in determining the prevalence of smoking and its comorbidities among land development scheme residents, the FELDA settlers.

WHAT WILL YOU HAVE TO DO?
This study requires a subject to answer a structured pre-tested questionnaires. The questionnaire is divided into 4 parts (Section A-D).

Section A :
To obtain sociodemographic data which includes age, gender, ethnicity, religion, marital status, household incomes, educational level, occupation and alcohol use.
Section B :
To assess key aspects of tobacco use surveillance.
Section C :
To assess the medical comorbidities of subject
(Blood pressure and BMI of a subject will also be measured by researchers)
Section D :
To collect data on anxiety, depression and stress level of subject.

WHO SHOULD NOT ENTER THE STUDY?
FELDA settler who is Non-Malaysian or aged 18 years old and below. FELDA settlers who met the inclusion criterias, but he/she is known to have cognitive problems such as dementia.

WHAT WILL BE THE BENEFITS OF THE STUDY:

(a) TO YOU AS THE SUBJECT?
The result of the questionnaire will be useful to assess whether or not the smoking behaviour is associated with the medical and psychological comorbidities experienced by the subject. The result obtained may re-tailor the subject self-belief regarding smoking.

(b) TO THE INVESTIGATOR?
Subject participation will help in gathering the data in order to determine the prevalence of smoking and its comorbidities among adults in FELDA Gugusan Raja Alias, Negeri Sembilan in year 2013.

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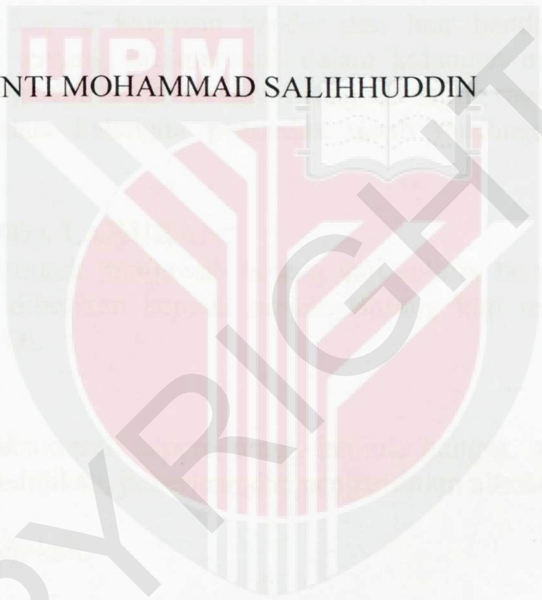
WHAT ARE THE POSSIBLE RISKS?
NONE

WILL THE INFORMATION THAT YOU PROVIDE AND YOUR IDENTITY REMAIN CONFIDENTIAL?
Yes. All the informations provided are strictly confidential. Information will only be presented in a collective manner without the mentioning of any individual identity.

WHO SHOULD YOU CONTACT IF YOU HAVE ADDITIONAL QUESTIONS DURING THE COURSE OF THE RESEARCH?

KHONG SIAU CHENN
016-8357533
chenn1992@hotmail.com

SHAHIDATUL MUNIRAH BINTI MOHAMMAD SALIHHUDDIN
014-5341256
naimsyakirin@yahoo.com



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HELAIAN PENERANGAN RESPONDEN

Sila baca maklumat berikut dengan teliti. Sekiranya anda mempunyai sebarang pertanyaan, sila kemukakan kepada penyelidik.

TAJUK KAJIAN

Prevalens komorbiditi dan perkaitannya dengan merokok dalam kalangan dewasa di felda, negeri sembilan pada tahun 2013

PENGENALAN

Tabiat merokok telah menjadi suatu kebiasaan dalam masyarakat Malaysia. Banyak kajian tentang merokok telah dijalankan di kawasan bandar dan luar bandar. Namun begitu, maklumat dan perolehan data tentang isu merokok dalam kalangan masyarakat FELDA begitu terhad. Oleh itu, kajian ini dijalankan dengan bertujuan untuk menentukan prevalens merokok dan ko-morbiditi dalam kalangan penduduk tanah rancangan iaitu penduduk FELDA.

APAKAH YANG PERLU ANDA LAKUKAN?

Kajian ini memerlukan subjek untuk menjawab borang kaji selidik berstruktur yang telah diuji terlebih dahulu sebelum diberikan kepada subjek. Borang kaji selidik ini terbahagi kepada 4 bahagian (Seksyen A-D).

Seksyen A :
Untuk memperoleh data sosiodemografi seperti umur, jantina, bangsa, status perkahwinan, pendapatan isi rumah, tahap pendidikan, pekerjaan dan pengambilan alkohol.
Seksyen B :
Untuk menilai tentang tabiat merokok.
Seksyen C :
Untuk mendapatkan maklumat tentang ko-morbiditi perubatan
(Tekanan darah dan Indeks Jisim Badan akan diukur oleh penyelidik)
Seksyen D :
Untuk mengumpul data tentang ko-morbiditi mental; kegelisahan, kemurungan dan tahap stress subjek.

SIAPA YANG TIDAK BOLEH MENYERTAI KAJIAN INI?

Penduduk FELDA yang bukan warganegara Malaysia atau berusia 18 tahun dan ke bawah. Penduduk FELDA yang memenuhi semua syarat kemasukan tetapi mempunyai masalah kognitif seperti dementia.

APAKAH FAEDAH MENYERTAI KAJIAN INI?

a) **KEPADA ANDA SEBAGAI SUBJEK?**
Keputusan borang kaji selidik ini berfungsi sebagai akses untuk mengetahui sama ada ya atau tidak tabiat merokok mempunyai perkaitan dengan status kesihatan fizikal dan mental yang dialami oleh subjek. Keputusan yang diperoleh berkemungkinan mampu mengubah persepsi subjek tentang tabiat merokok.

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b) **KEPADA PENYELIDIK?**
Penyertaan subjek akan membantu penyelidik mengumpul data bagi menentukan prevalens merokok dan ko-morbiditi dalam kalangan dewasa di FELDA Gugusan Raja Alias, Negeri Sembilan pada 2013.

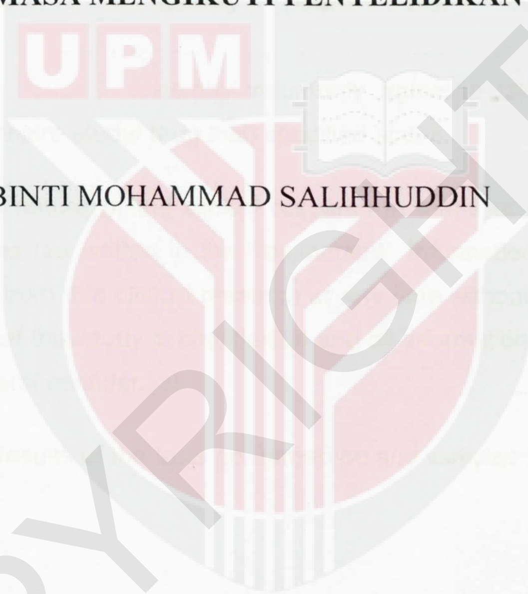
ADAKAH IA BERISIKO?

TIDAK

ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Ya. Segala maklumat yang diperoleh ialah sulit. Maklumat hanya akan digunakan bertujuan untuk pengumpulan data tanpa mendedahkan sebarang identiti individu.

SIAPA YANG SAYA PERLU HUBUNGI SEKIRANYA SAYA MEMPUNYAI SOALAN TAMBAHAN SEMASA MENGIKUTI PENYELIDIKAN INI?



KHONG SIAU CHENN
016-8357533
chenn1992@hotmail.com

SHAHIDATUL MUNIRAH BINTI MOHAMMAD SALIHHUDDIN
014-5341256
naimsyakirin@yahoo.com

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CONSENT FORM (RESPONDENT)

RESEARCH TITLE :
PREVALENCE OF COMORBIDITIES AND ITS ASSOCIATION WITH SMOKING AMONG ADULTS IN FELDA, NEGERI SEMBILAN IN YEAR 2013

RESEARCHER :
KHONG SIAU CHENN
SHAHIDATUL MUNIRAH BINTI MOHAMMAD SALIHHUDDIN
DR IRMI ZARINA BINTI ISMAIL (Main supervisor)
DR ANITA ABD RAHMAN (Co-supervisor)

I ………………………………… Identity Card No. …………………………… address………………………………………………………………………………………………… ………………………………………………hereby voluntarily agree to take part in the clinical research *(clinical study, questionnaire study/ drug trial) specified above.

I have been informed about the nature of the clinical research in terms of methodology, possible adverse effects and complications (as written in the Respondent Information Sheet). I understand that I have the right to withdraw from this clinical research at any time without assigning any reason whatsoever. I also understand that this study is confidential and all information provided with regards to my identity will remain private and confidential.

I* wish / do not wish to know the results of the tests performed on any samples taken from me.

* delete where necessary

Signature ………………………………… (*Respondent*)   Signature ………………………………… (*Witness*)

Date :………………………………………   Name :………………………………………

I/C No. :………………………………………

I confirm that I have explained to the respondent the nature and purpose of the above –mentioned clinical research.

Date ………………………………   Signature ………………………………… (Researcher)

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BORANG PERSETUJUAN RESPONDEN

TAJUK PENYELIDIKAN :
PREVALENS KOMORBIDITI DAN PERKAITANNYA DENGAN MEROKOK DALAM KALANGAN DEWASA DI FELDA, NEGERI SEMBILAN PADA TAHUN 2013

PENYELIDIK :
KHONG SIAU CHENN
SHAHIDATUL MUNIRAH BINTI MOHAMMAD SALIHHUDDIN
DR IRMI ZARINA BINTI ISMAIL (Ketua penyelia)
DR ANITA ABD RAHMAN (Penolong penyelia)

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*)

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Attachment 2

JKEUPM Ref No. : FPSK_Mei (13)53

Members of the JKEUPM who reviewed the documents:

Prof. Dr. Lekhraj Rampal

Date of approval: 25/7/2013

Endorsed at JKEUPM Meeting on **2/8/2013**, attended by:

NAME	DESIGNATION	GENDER	TICK IF PRESENT
Prof. Dr. Norlijah Othman	Paediatrics& Dean, Faculty of Medicine and Health Sciences	Female	√
Prof. Dr Zamberi Sekawi	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. Tengku AizanAbd Hamid	Gerontologist & Director. Institute of Gerontology	Female	√
Prof. Dr. Lekhraj Rampal	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	\
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	

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