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PREVALENCE OF SMOKING AND ITS ASSOCIATED FACTORS AMONG ADULTS IN GUGUSAN FELDA RAJA ALIAS, NEGERI SEMBILAN

By
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PREVALENCE OF SMOKING AND ITS ASSOCIATED FACTORS AMONG ADULTS IN GUGUSAN FELDA RAJA ALIAS, NEGERI SEMBILAN

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ABSTRACT

Background: Tobacco smoking epidemic has become an immense public health threat especially in developing countries such as Malaysia. Residential locality, especially the FELDA settlements in Malaysia, has not been extensively studied with regard to their relationship to smoking prevalence.

Objective: To determine the prevalence of smoking and its associated factors among adult residents in Gugusan FELDA Raja Alias, Negeri Sembilan.

Method: A cross-sectional study design was done among 494 adult FELDA settlers by using a questionnaire. The response rate was 89.49%. The associative factors for smoking investigated in this study, besides socio-demographic characteristics, were peer influence, family influence, level of stress and level of knowledge.

Results: The prevalence of smoking status was classified into three groups which were non-smokers (57.5%, 95% CI 53, 61.8), ever smokers (8.8%, 95% CI 6.6, 11.7) and current smokers (33.7%, 95% CI 29.6, 38). Of the socio demographic characteristics, gender (p=0.000), occupation (p=0.000) and level of education (p=0.008) had a significant association with smoking status. Age (p=0.215) and family income (p=0.464) were not statistically significant. Other associated factors such as peer influence (p=0.000), family influence (p=0.000), level of stress (p=0.001) and level of knowledge (p=0.029) were significantly associated with smoking status.

Conclusion: This study reveals a high prevalence of smoking in the FELDA settlement. The significant associated factors with smoking status are gender, occupation, level of education, peer influence, family influence, level of knowledge and level of stress. Preventive measures should be taken to reduce the effect of these associated factors.

Keywords: *Prevalence, Smoking, Associated Factors, Adults, Gugusan Felda Raja Alias*

PREVALENS MEROKOK DAN FAKTOR BERKAITAN DALAM KALANGAN DEWASA DI GUGUSAN FELDA RAJA ALIAS, NEGERI SEMBILAN

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ABSTRAK

Latar belakang: Epidemik menghisap rokok telah menjadi satu ancaman kesihatan awam yang besar terutamanya di negara-negara sedang membangun seperti Malaysia. Kajian tentang hubungan antara lokasi setempat terutamanya gugusan FELDA di Malaysia dengan prevalens merokok tidak dilaksanakan secara meluas di Malaysia.

Objektif: Untuk mengenal pasti prevalens merokok dan faktor yang berkaitan dalam kalangan penduduk dewasa di Gugusan FELDA Raja Alias, Negeri Sembilan.

Kaedah: Kajian keratan rentas telah dijalankan dalam kalangan 494 responden menggunakan borang soal selidik (kadar respons 89.49%). Faktor berkaitan yang dikaji, selain ciri sosio-demografi, ialah pengaruh rakan, pengaruh keluarga, tahap tekanan dan tahap pengetahuan.

Keputusan: Prevalens status merokok telah dibahagikan kepada tiga kumpulan iaitu tidak merokok (57.5%, 95% CI 53, 61.8), pernah merokok (8.8%, 95% CI 6.6, 11.7) dan masih merokok (33.7%, 95% CI 29.6, 38). Ciri sosio-demografi seperti jantina (p=0.000), pekerjaan (p=0.000) dan tahap pendidikan (p=0.008) mempunyai hubungan yang penting dengan status merokok. Umur (p=0.215) dan pendapatan keluarga (p=0.464) tidak mempunyai hubungan yang penting. Faktor berkaitan yang lain seperti pengaruh rakan (p=0.000), pengaruh keluarga (p=0.000), tahap tekanan (p=0.001) dan tahap pengetahuan (p=0.029) mepunyai hubungan yang penting dengan status merokok.

Konklusi: Kajian ini menunjukkan kadar merokok yang tinggi dalam kalangan orang dewasa di gugusan FELDA tersebut. Faktor berkaitan yang mempunyai hubungan yang penting dengan status merokok termasuklah jantina, pekerjaan, tahap pendidikan, pengaruh rakan, pengaruh keluarga, tekanan tekanan dan tahap pengetahuna. Langkah-langkah pencegahan patut diambil untuk mengurangkan kesan faktor-faktor tersebut.

Kata kunci: *Prevalens, Merokok, Faktor Berkaitan, Dewasa, Gugusan Felda Raja Alias*

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LIST OF ABBREVIATION

WHO – World Health Organization

CDC – Centers for Disease Control and Prevention

GATS – Global Adult Tobacco Survey

DALYs – disability adjusted life years

YLL – years of life lost

FELDA – Federal Land Development Authority

MI – Myocardial Infarction

MOH – Ministry of Health

CHAPTER 1

INTRODUCTION

1.1 Background

Smoking is the most common method of consuming tobacco, where it is often mixed with additives and then combusted (Wigand et al., 2006). The smoke that ensues is then inhaled and the active substances are absorbed through the alveoli in the lungs (Gilman et al., 2004). The active substances trigger chemical reactions in nerve endings setting in motion a variety of sensations such as increased heart rate, alertness and reaction time. In addition, smoking feels pleasurable due to the pleasure inducing hormones being released, dopamine and endorphins (Gilman et al., 2004). Though there might be many kinds of tobacco products, such as cigarettes, cigars, kreteks, bidis and pipes, the most common form is the manufactured cigarette. This cigarette is a cylindrical roll of tobacco material mass wrapped in a non-tobacco or paper wrapper (Wigand et al., 2006). The invention of machine manufactured cigarettes has enabled it to be more economical resulting in widespread demand for the harmful product. What started out in history as a means of pleasure limited for the wealthy, has now become a global trend affecting rich and poor alike.

Today the tobacco smoking epidemic has evolved into one of the biggest global public health threats with more than 5 million people per year being killed due to tobacco user (WHO, 2011). This agricultural product is responsible for 1 in 10 adult deaths making it one of the five greatest risk factors for mortality and occupying the top spot as the world's number one avoidable cause of death and misery (WHO, 2011). According to current estimation, tobacco plays an immense role in 8.8% of all deaths and 4.1% of the global burden of all disease, which is measured as number of years spent living with a disease (disability adjusted life years – DALYs) (Norsiah Ali, 2011). Globally, the current estimate of smokers of 1.3 billion is widely expected to rise to 1.6 billion by 2025, and the number of deaths as a result

of tobacco smoking is also expected to steadily climb to 8.3 million by 2030, from 4.8 million in 2006 (Mathers et al., 2006).

What is it that makes cigarette smoking so dangerous? Besides the obvious harmful effects of tobacco, cigarette smoke contains about 4,000 different chemicals capable of damaging the cells and systems of the body (Macnair, 2011). These include approximately 80 known carcinogens (including tar, arsenic, benzene, cadmium and formaldehyde), nicotine (the addictive chemical that leads to the addiction) and many other poisons like cyanide, carbon monoxide and ammonia (Macnair, 2011). As a result, these findings clearly justify why smoking is a known cause of approximately 25 diseases and according to World Health Organization (WHO) figures responsible for five million deaths worldwide every year (Macnair, 2011).

The World Health Organization (WHO) states that, "Much of the disease burden and premature mortality attributable to tobacco use disproportionately affect the poor" (CDC, 2009). Many studies have shown that tobacco use and poverty related inextricably and that in the poorest households in some low and middle –income countries, more than 10% of total household expenditure is on tobacco (WHO, 2011). In fact, the consumption of cigarettes in developed countries is reducing while in the developing world, tobacco consumption is rising by 3.4% per year as of 2002 (WHO, 2002). As further proof, of the total smokers in the world, 1 billion of them live in developing or transitional economies (CDC, 2009).

As one of the developing countries in the world, smoking- related diseases have been the main cause of death for the past three years in Malaysia (MOH, 2003). A study on the burden of disease in 2003 estimates that one-fifth of disability adjusted life years (DALYs) and one-third of years of life lost (YLL) for Malaysians were due to smoking-associated diseases (Yusoff et al., 2005). The National Health Morbidity Survey 2006 has identified that

diseases related to smoking in Malaysia account for at least 15% of hospitalized cases and approximately 35% of hospital deaths (Norsiah Ali, 2011). The recent prevalence of smoking in Malaysia had also been highlighted in the Global Adult Tobacco Survey 2011 where 43.9% of men, 1.0% of women, and 23.1% overall (4.7 million adults) currently smoked tobacco. Around 4.3 million adults currently smoked on a daily basis and of that number only 9.5% have quit smoking (GATS, 2012).

There have been many studies on the social demographic factors contributing to prevalence of smoking in Malaysia whereby age, gender, level of education, occupation, household income and residential locality are said to be major risk factors (Lim et al., 2013). A recent Malaysian study has shown that the prevalence of smoking differs among different age groups (Lim et al., 2013). This study indicated that the prevalence of smoking showed a declining trend with age and also indicated a clear relationship between smoking prevalence with level of education, monthly household income and occupation (Lim et al., 2013).

The associated factors perceived to be of importance however, include stress, peer influence, history of smoking in the family as well as awareness on the dangers of smoking. Stress especially is reported to play a substantial role in the prevalence of smoking with several studies. For instance a study regarding reasons to start smoking among school teachers in Malaysia showed that majority of the respondents cited relaxation (33.3%) followed by stress relief (28.2%) (Al Naggar et al., 2012). The Global Adult Tobacco Survey (GATS) 2011 shows that a vast majority of Malaysian adults were fully aware of the health detriments of smoking (GATS, 2012).

The residential locality is a factor of particular interest as indication of a strong relationship with smoking prevalence has been suggested in a study by Lim et al. (2010). The study investigated the association between smoking prevalence and three locations which

were Federal Land Development Authority (FELDA) settlements, rural and urban schools. FELDA settlements were initially founded by the Malaysian Government Agency to handle the resettlement of the rural poor into newly developed areas and to organize smallholder farms growing cash crops. All settlers are required to reside in the settlement itself and are allotted land in a planned village where their homes, which are already built by FELDA, are located. Those living in these settlements differ from other Malaysian citizens with regard to their residential location, occupation, as well as income. The findings of the study by Lim et al., (2010) described prevalence of smoking to be higher among students in FELDA settlements (44%), compared to other areas, urban and rural (21.2%), $p<0.001$, which have generated a major interest in studies based in FELDA settlements (Lim et al., 2010). This study has sparked major interest in studying on the smoking prevalence and its associated factors in FELDA populations, especially among adults age of adults aged 20 and above.

1.2 Problem Statement

Smoking remains a public health problem and it has always been the cause of various preventable diseases, disability as well as death around the world. In Malaysia, the prevalence of smoking is increasing where there were 46.4% smokers in 2013 (Lim et al., 2013) as compared to 43.9% smokers in 2011 (GATS, 2012). FELDA is a rural area with increasing social problems. Hence, it is crucial to conduct a study among rural Malaysians in FELDA as they contribute the most to the prevalence of smoking in Malaysia. The previous studies revealed that 28.6% smokers are amongst rural Malaysians as compared to only 21.7% of smokers in urban areas (NHMS, 1996), while study by Lim et al. in 2013 also found that male respondents in rural areas tend to be smokers (Lim et al., 2013). The purpose of these studies were to investigate the reasons behind smoking prevalence and at the same time, smoking

problems among rural Malaysians can be solved in order to avoid future consequences to their health. Quitting smoking is not easy, but it is greatly beneficial to health as it aids in the prevention various smoking-related diseases such as myocardial infarction(MI) and lung cancer. This is because current smoking can increase 6-fold the odds of having a MI (95% CI 1.01 to 37) (Panagiotakos et al., 2007) and prolonged exposure to genotoxic carcinogens from smoking will increase the chances of DNA damage and mutations which then leads to lung cancer (Stephen, 2012).

This study on prevalence of smoking and its risk factors are important to help to overcome the issue of a major modifiable cause of death in Malaysia. The prevalence of smokers help us to identify the magnitude of the problem in our nation, while discovering the risk factors can prove to be helpful to take the necessary steps to rectify it. This study is important as it focuses on the FELDA settlers and there has been scarce research in this particular sample group. One study conducted in Kota Tinggi, Johor by Lim et al. has also shown that among school students in that district the prevalence of smoking was highest among the FELDA settlers compared to those from urban and rural areas (Lim et al., 2010). The study by Lim et al. claims that FELDA settlers are among the heaviest smoking population in Malaysia, so this current study aims to investigate this claim through research on smoking prevalence in the designated area. The study conducted by Lim et al. however was designed specifically for school children. On top of that, most of the previous studies had shown that one of the risk factors that contribute to the high prevalence of smoking among adolescents in FELDA Negeri Sembilan is family history. Therefore, we decided to base this study on the adult sample in FELDA Raja Alias 1 and FELDA Serting Hilir 1, Negeri Sembilan as they would be the influencing figures on the younger population especially adolescents.

By participating in this study, the respondent will be more aware of dangerous of smoking to their health. In addition, the study will help the government to plan anti-smoking campaign as well as to introduce new strategies such as implementing new policies and restricting licenses to premises of cigarettes. With the findings at hand, standard safety measures could be publicised and implemented in FELDA settlements, hopefully to help one day contribute to a possible smoke-free nation.

1.3 Objectives

1.3.1 General Objective:

To determine the prevalence of smoking and its associated factors among adult residents in Gugusan FELDA Raja Alias, Negeri Sembilan.

1.3.2 Specific Objectives:

I. To determine the prevalence of smoking (current smokers, ever smokers, non-smokers) among respondents.

II. To determine the socio-demographic characteristics (age, gender, level of education, occupation, family income) of respondents.

III. To determine the associated factors characteristics (peer influence, history of smoking in family, level of stress, level of knowledge) of respondents.

IV. To determine the association between smoking with socio-demographic characteristics among respondents.

V. To determine the association between smoking with its associated factors characteristics among respondents.

1.4 Null Hypothesis

I. There is no significant association between smoking and socio-demographic characteristics of respondents.

a. Age

b. Gender

c. Level of Education

d. Occupation

e. Family income

II. There is no significant association between smoking and its associated factors characteristics.

a. Peer influence

b. History of smoking in family

c. Level of stress

d. Level of knowledge

1.5 Conceptual Framework

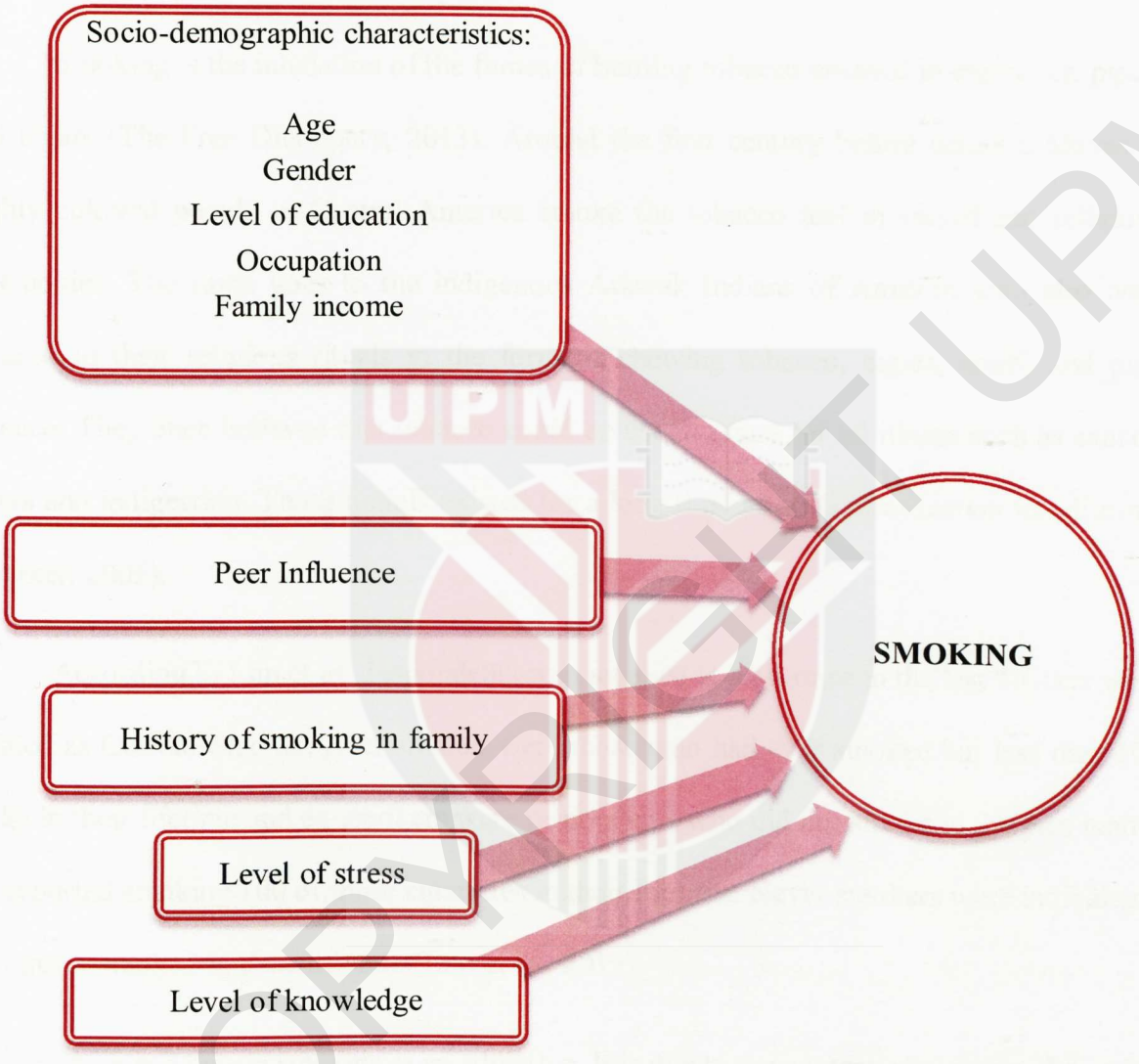

Figure 1 : Conceptual Framework of Smoking

CHAPTER 2

LITERATURE REVIEW

2.1 Definition of Smoking

Smoking is the inhalation of the fumes of burning tobacco encased in cigarettes, pipes, and cigars (The Free Dictionary, 2013). Around the first century before century, Mayas, a highly cultured people in Central America smoke the tobacco leaf in sacred and religious ceremonies. The same goes to the indigenous Arawak Indians of Amazon who also used tobacco in their religious rituals in the form of chewing tobacco, cigars, snuff, and pipe tobacco. They once believed that tobacco could be used to cure for all illness such as cancer, ulcers and indigestion. Those beliefs existed for a long time after its introduction into Europe (Sharker, 2005).

According to Lim et al., respondents who smoked at least once in the last 30 days were defined as Current Smoker. Ever smoker were those who had ever smoked but less than 100 sticks in their lifetime and ex-smokers were respondents who did not smoke in the past month but reported smoking 100 or more cigarettes in their lifetime. Never smokers were individuals who never smoked in their lifetime (Lim et al., 2013).

There is a reason smoking is so addictive. It is due to the content of nicotine, the active ingredient in tobacco. This leads to physical as well as psychological addiction once smoking becomes a habit as most of nicotine will remain in the lungs upon inhalation while the rest passes into the bloodstream and up to the smoker's brain within 10 seconds (The Free Dictionary, 2013). Once there, nicotine triggers a number of chemical reactions that create temporary feelings of pleasure for the smoker, but these sensations subside within minutes as it is taken up by peripheral tissues, followed by elimination from the body. As the nicotine level drops in the blood, smokers will have the symptoms of nicotine withdrawal (Martin,

2012). In order to avoid the symptoms, the smokers tend to increase the dose so that they will obtain the desired effect (Benowitz et al., 1988). That is the fundamental reason that individuals persist in smoking which contributes to the high prevalence of smoking worldwide. The persistent smoking then will contribute to various diseases and greater risk of death.

2.2 Prevalence of smoking among adults worldwide.

Globally, 1.3 billion of smokers is said to be increased to 1.6 billion by 2025 and number of deaths also expected to increase and reach 8.3 million in 2030 (Lim et al., 2013).

The prevalence of current cigarette smoking among US adults aged 18 years old and above slightly decreased from the period of 2005 to 2010, and it is estimated that 19.3% of US adults were current cigarette smokers. In addition to this, 78.2% adult smoked every day and 21.8% smoked on certain days. More man and female adults were included which were 21.5% and 17.3% respectively (CDC, 2011).

In China (2010) it is estimated that 28.1% of adults, which include 52.9% of men and 2.4% of women were current smokers. The prevalence for men aged 24 – 64 years was highest (63.0%) and lowest among men age 15 – 24 years (33.6%). Besides, it is said that about 85.6% of all current smokers smoked daily. Those who smoked manufactured cigarettes smoked an average of 14.2 cigarettes per day which is 14.3 for men and 10.6 for women. However, 16.9% smokers who smoked sometimes had quit smoking and were not smoking currently. On the other hand, 33.1% had quit smoking but still smoking currently based on GATS China (Li et al., 2011).

On the other hand, in Singapore, National Health Surveillance Survey (2010) reported that the prevalence of daily smoking among adults Singaporean aged 18 to 69 years was 14.3% which had slightly increased compared to the survey in 2007, which was 13.6%. Besides, based on the survey on 2007, it is found that the daily smoking among males was greater than females which is 23.7% and 3.7% respectively and both are from adults aged 18 to 69 years. It is also found that the most prevalent daily smoking was in young adults aged 18 to 29 years which is 17.2% (Picco et al., 2012). These results indicate an increasing prevalence of daily smoking among adults in Singapore.

2.3 Prevalence of smoking among adults in Malaysia.

In Malaysia, there were 49% of adult males in Malaysia as well as 5% of adult females smokers based on data provided by Ministry of Health (2003) whereas 24.8% contribute to overall current smokers. With regards to the mortality part, smoking contributed for one in every five deaths in Malaysia. Smoking related health hazard was the most modifiable cause of premature death and responsible annually for an estimated 120 000 years of potential life lost (Sharker, 2005).

Malaysian National Health and Morbidity Survey also found that smoking prevalence among adults 18 years old and above has decreased from 24.8% in 1996 to 21.5% in 2006. However, the prevalence of smoking among adults is still high, especially among men which consist about 46.4% while women only consist 1.6% (ITC Malaysia National Report, 2012).

From other studies, the prevalence of smoking among adults age 18 years and above in Malaysia were also said to be more than 20% based on all the three National Health and Morbidity Surveys since 1986, 21.5% in 1986, 24.8% in 1996 and 22.8% in 2006, these

results being obtained from Public Health Institute. It is also estimated that by the year 2020, there will be 30 000 deaths due to diseases caused by smoking (Lim et al., 2010).

World Bank also reported that the prevalence of smoking in the population is still considerably high, with 50.9% of the adult male population ages 15 and above are smoking in 2009 (World Bank, 2010).

In 2011, the prevalence of current smokers was 5.3% and ever smokers 9.3%. Among the ever smokers, 42.6% have quitted smoking. There were also more male compared to female current and ever smokers ($p<0.001$) (Rashid et al., 2011).

Another study done by Lim et al. in 2013 revealed that the prevalence of smoking among Malaysian males remained high where by there were 46.5% smokers (95% CI: 45.5–47.4%) in spite of several population interventions over the past decade. This causes tobacco to be likely remain as a primary cause of premature mortality and morbidity in Malaysia (Lim et al., 2013).

2.4 Associated factors

Numerous studies have been conducted to identify the associative factors of smoking. Further studies on age, gender, level of education, family income, and occupation were often being described as associated smoking. A study by Lim et al. (2010) showed that gender, percentage of friends who smoke, smokers in the family and academic achievement, where being a male, having more than 40% friends who smoke, having a brother who smokes and having a poor academic achievement were all significantly associated with smoking. In fact, the study also claimed that the higher the number of associated factors the higher is the

prevalence of smoking. The following section describing further the literature or the factors associated with smoking.

2.4.1 Age

In a study by Rampal & Narasimman (2003), the prevalence of smoking among current smokers in Kampong Jenderam Hilir, Sepang, Selangor, increased with age ($p<0.01$). The study by Rampal & Narasimman (2003) showed that the highest prevalence of smoking was among those in the 50-59 age group the lowest prevalence among those with the 20 age group. This finding however contradicted with another study conducted more recently by Lim et al. in 2013 whereby the prevalence of smoking shows a declined with increasing age with a majority of 59.3% of the smokers (95% CI 57.4–61.2) being among the 21-30 year olds, 56.8% (95% CI 55.0–58.6) among the 31-40 year olds, 48.5% (95% CI 46.7–50.3) among the 41-50 year olds and a reduced 35% (95% CI 32.9–37.1) among those aged 61 and above (Lim et al., 2013). The initiation age for smoking among the two studies, were approximately the same. The study by Rampal et al. stated a mean and median initiation age of 18.4 and 18.0 years respectively among males and 23.8 and 22.0 years respectively in females ($p<0.01$). Similarly a study done by Lim et al. (2010) stated that most smokers started smoking in their teens with 90.1% of them begin before the age of 25.

2.4.2 Gender

Gender is a risk factor that has been strongly associated in a majority of studies on smoking prevalence. Males are usually linked with a higher smoking prevalence compared to females. The 2011 GATS in Malaysia has highlighted that 43.9% of men and 1.0% of women currently smoked tobacco (GATS, 2012). This description is echoed not only locally but also abroad in countries such as in China where in the year

2010 an estimated 28.1% of adults in China (52.9% men and 2.4% of women were current smokers) (Li et al., 2011) as well as Singapore where daily smoking was 6 folds greater in males with approximately one in 4 (23.7%) males aged 18 to 69 years being daily smokers compared with one in 27 (3.7%) females (Picco et al., 2012).

2.4.3 Level of Education

Lim et al. (2013) in their study showed that education level was significant role in smoking prevalence as the results where respondents without a formal education were more likely to smoke than those with tertiary education (Lim et al., 2013). Other studies such as Lim et al (2010) in the Petaling district, compared academic achievement in school to smoking prevalence among school students, Top achievers with mostly "A" were described to have the lowest prevalence of smoking while those with mostly "D" had the highest prevalence (Lim et al., 2010). The findings on the significant role of a high level of education on decreased smoking prevalence were consistent with studies conducted abroad in China, Singapore and Japan (Li et al., 2011; Picco et al., 2012; Fukuda et al., 2005). Western populations also showed the same pattern as where by people with a lower educational level was prone to smoke (van Oort et al., 2006).

2.4.4 Occupation

A study done by van Oort et al. in 2006 founded that smoking was more prevalent for adults who experienced unemployment (van Oort et al., 2006). Another study by Ali Khan Khuwaja revealed that one of the factors associated with smoking was being a student as compared to being an office or business worker (OR=3.2, 95% CI 1.8-5.4). They were three times likely to be smokers than the respondents who had office or business occupations (Ali Khan Khuwaja et al., 2004). Differ the studies that have

been mentioned, employment in Vietnam was positively correlated with smoking on 2010. People who are working in Vietnam tend to smoke by around 10 percentage points than non-working people as they have a habit to invite others to smoke together (Cuong, 2010). Study by Sajid Ali et al. also found the significance of occupational categories such as business and labour that were positively associated with smoking and it showed the same result to the findings reported from rural China (Sajid Ali et al., 2006; Hu and Tsa, 2000).

2.4.5 Family Income

A study conducted by Rampal et al. in 2003 has shown that 164 (38.7%) respondents out of 650 respondents with an income less than RM2000 were current smokers as compared to 23.7% of the 244 respondents with household income of RM2000 or more. This study claimed that there was an increase in smoking prevalence with a decreasing level of income. However, the difference was not statistically significant ($p>0.05$) (Rampal et al., 2003). Lim et al. in their study in 2013 greatly differs in the sense that household income indicates a significant role in smoking prevalence. This is confirmed by the results where respondents with monthly household income less than RM2000 had higher prevalence than those with income of RM3000 and above (Lim et al., 2013). Univariate analysis from another study by Redhwan A Al-Naggar et al. also showed that monthly income were significantly associated with smoking among school teachers ($p=0.031$) (Al-Naggar et al., 2012).

2.4.6 Peer Influence

One study by Naing et al. (2004) in Kelantan highlights that peer influence is the major reason for initiation of smoking. The study was conducted among secondary school boys in Kelantan and a majority of 24% of total respondents said they started

smoking when mixing with their smoker friends (Naing et al., 2004). In the study by Lim et al. (2010) in Petaling district, peer influence is again more significant as most of the current smokers started smoking in the company of friends (62% of boys and 63% of girls). The same study also stated that youths with more smoking friends were more likely to become a smoker themselves and 80% of current smokers started with their peers (Lim et al., 2010).

2.4.7 History of smoking in family

In a study by Rampal et al. (2003), there were 163 (73.4%) smokers whose parents were smokers as compared to 459 (68.3%) non-smokers whose parents were smokers (Rampal et al., 2003). However, there was no significant difference between them ($p=0.15$). These findings of another study Lim et al. in Kota Tinggi indicated that a majority of respondents were non-smokers if their parents were smokers (Lim et al., 2010). However, the same study also showed that most of the respondents (51.9%) were smokers as compared to non-smokers (48.1%) when they had an elder brother who smoked. These findings are echoed in Lim et al. (2010) which stated that the influence of parents while statistically significant in a univariate analysis was not statistically significant when controlling for other factors. Contrastingly, having a brother who smokes was significant even after controlling other factors.

2.4.8 Level of stress

Stress is assumed to play a substantial role in the prevalence of smoking according a study by a local study in Management and Science University on *Stress and Coping Strategies among Students in a Medical Faculty in Malaysia*. This study showed that smokers used active coping strategies less than non-smokers, meaning that smoking might affect student's ability to cope positively with stress. Students who were

smokers were also proven to perceive greater stress than non-smokers (Sami Abdo Rahman Al-Dubai et al., 2011). Studies abroad however focused more on the relationship of job stress with smoking prevalence such as the one by Radi et al. regarding *Job Stress and Other Working Conditions: Relationships with Smoking Behaviours in a Representative Sample of Working Australians*. This study claimed that in men, prevalence of high psychological demand and low job control was higher among current smokers compared to non and former smokers. In addition, prevalence of high job strain and extreme job pressure was also increased in current smokers. In women however, prevalence of occupational stress had little significance on current smokers but in contrast to prevalence of physical work demand which was high among current smokers (Radi et al., 2007). A similar study was conducted in Finland where job strain or any of its components had no statistical significance on smoking prevalence. Instead another form of work stress model studied, effort-reward imbalance, proved to have an impact on smoking prevalence with a higher effort-reward imbalance leading to increased prevalence (Kouvonen et al., 2005).

2.4.9 Level of knowledge

The figures from the GATS 2011 has shown that 92.2% of adults believed smoking causes serious illness, 85.8% of adults believed breathing other people's smoke causes serious illness in non-smokers, and 83.5% of adults believed that smoking should be prohibited indoors (GATS, 2012). These figures clearly demonstrate that most of the Malaysian adults are fully aware of the harms of smoking. This is especially so after the introduction of graphic images on cigarette packs in our country since Jan 1 2009 as proven by a study by Ahmed et al. in 2010 on *Impact of the New Malaysian Cigarette Pack Warnings on Smoker's Awareness and Interest in Quitting Smoking*. This study showed that exposure to the pictorial health warnings was associated with a

significant increase in awareness of the health risks of smoking (Ahmed et al., 2010). In addition, interest in quitting also increased significantly in those exposed to the pictorial warnings. The correlation between knowledge of the danger of smoking was made with attitude towards smoking in a 2009 study by Lim K.H. et al. titled *Tobacco use, knowledge and attitude among Malaysians age 18 and above*. The results of the study showed that males had higher knowledge score than females and that the scores for knowledge on the dangers of smoking increased with education. On top of that, females were found to have a more negative attitude towards smoking than males. Knowledge was claimed to be a significant predictor of respondent's attitude, as it was positively correlated with attitude (the higher the knowledge, the more negative the attitude towards smoking) (Lim K.H. et al., 2009).

CHAPTER 3

METHODOLOGY

3.1 Study Location

The study was conducted in FELDA Raja Alias 1 and FELDA Serting Hilir 1, Negeri Sembilan.

3.2 Study Design

A cross-sectional study design was used in this study.

3.3 Study Duration

The study duration was divided into 2 sessions. First session started from March 2013 until April 2013 for proposal preparation and presentation. Second session continued from June until 6 September 2013 for data collection, analysis of data as well as for final report with a total duration of 6 months.

3.4 Sampling

3.4.1 Study Population

Population in FELDA Raja Alias 1 and FELDA Serting Hilir 1, Negeri Sembilan.

3.4.2 Sampling Population

Adult population of Gugusan FELDA Raja Alias, Negeri Sembilan.

3.4.2.1 Inclusion criteria:

All adult residents aged 20 years old and above.

3.4.2.2 Exclusion criteria:

Non Malaysian citizen, non FELDA settler, and mentally retarded.

3.4.3 Sampling Frame

List of FELDA's in Gugusan FELDA Raja Alias, Negeri Sembilan.

3.4.4 Sampling Unit

An adult resident in FELDA Raja Alias 1 and FELDA Serting Hilir 1.

3.4.5 Sampling method

Simple random sampling was chosen. After the list of FELDA's in Gugusan FELDA Raja Alias, Negeri Sembilan was obtained from FELDA Authority, FELDA Raja Alias 1 and FELDA Serting Hilir 1 were randomly selected.

3.4.6 Sampling size calculation

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

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

$$= \frac{\{1.96\sqrt{2(0.86)(0.14)} + 0.842\sqrt{(0.796)(0.204)+(0.924)(0.076)}\}^2}{(0.796-0.924)^2}$$

$$= \frac{1.8711}{0.016384}$$

$$= 114.2 \approx 115$$

$$= 115 \times 2 \times 2 = 460$$

n = sample size

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

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

P = $(P_1 + P_2) / 2$

P_1= estimated proportion (smokers) from risk factor of knowledge on newborn babies' health due to smoking (Sharker, 2005)

P_2= estimated proportion (non-smokers) from risk factor of knowledge on newborn babies' health due to smoking (Sharker, 2005)

With consideration of estimated 20% of the respondents would not respond, an additional 92 respondents was added. Thus, number of respondents will be involved is 552. We assume that an average of 2 adults per house, so estimated houses to be sampled is 276 houses.

3.5 Variables

3.5.1 Dependent variable

Smoking among adult aged 20 years old and above in FELDA Raja Alias 1 and FELDA Serting Hilir 1, Negeri Sembilan.

Smoking status then was classified into three categories of smokers which are Current Smoker, Ever Smoker, and Non-Smoker (Lim et al., 2013).

3.5.2 Independent variables

I. Socio-demographic characteristics:-

a. Age

b. Gender

c. Level of education

d. Occupation

e. Family income

II. Associated factors characteristics:-

a. Peer influence

b. History of smoking in family

c. Level of stress

d. Level of knowledge

3.6 Instruments and Data collection

3.6.1 Questionnaire

A self-administered questionnaire was provided to respondents in this study. Brief explanations on the questions and instructions on how to complete the questionnaire were attached with the forms. The questionnaire was divided to four sections.

First, we asked about the socio-demographic and general information from the respondents. This section inquires about age, gender, level of education, family income and occupation.

The other three sections of questionnaire consist of other risk factors such as family history of smoking, peer influences, level of knowledge and level of stress. For the risk factors of family history and peer influences which were in the second section of the questionnaire, the questions were adopted from the study of *Prevalence and Factors Associated with Smoking among the Students and Staff in University Putra Malaysia* by Dr. Sharker Md. Numan.

Knowledge of smoking which is in the third section was adopted from the study of *Prevalence of Smoking among Secondary School Students and its Associated Factors in the District of Kuantan, Malaysia* by Azlan B Hj. Osman.

In the fourth section, we adopted the Depression Anxiety and Stress Scale (DASS) questionnaire. We also make some changes to the questionnaires that we adopted so that it is relevant to our study of risk factors. All questionnaires were checked to ensure that they were answered and in the correct manner.

To complete this questionnaire, the respondents have to tick (✓) and to circle (O) at the relevant answers.

3.6.2 Data Collection Technique

The self-administered questionnaires were given by the researchers using the modified questionnaire (bilingual). Before each interview started, the researcher read out the consent form in order to obtain written consent.

3.6.3 Quality Control

Forward backward translation was done as we are using bilingual questionnaire (Bahasa Malaysia and English). On top of that, validity of the questionnaire was obtained from the expert opinion of supervisors in charged before it is used to prevent any grammar mistake, sentences and language. Hence, we were using face validity in this study. Pre-test was conducted in order to test for the reliability of the questionnaire. It was done for 30 respondents from Seri Kembangan (Cronbach's Alpha = 0.963). Besides, in order to prevent any data miscalculation, one member keyed the data first then the other members checked the data so that the result obtained was valid.

3.7 Ethics and Approval

Before conducting this survey, we sent our proposal and application form to Ethical Committee of Faculty of Medicine and Health Science in University Putra Malaysia in order to get approval. Permission was also sought from FELDA Authority. Other than that, the questionnaires answered will remain anonymous to ensure privacy and confidentiality.

3.8 Data Analysis

Descriptive statistics were used to estimate the prevalence of smoking. In our analysis, smoking status was classified into three categories of smokers which were Current Smoker, Ever Smoker, and Non-Smoker. In statistical analysis part, Ever Smoker and Non-Smoker then were combined and constituted as Non-Smoker category.

Data was analysed by using Statistical Package of Social Sciences (SPSS) version 21. Statistical analysis done such as Chi square test was used to study the relationship between categorical variables (gender, level of education, occupation). The independent samples t test is also used to analyse differences in mean scores for the variables.

3.9 Definition of terms

3.9.1 Current smoker	Respondents who smoke at least once in the last 30 days.
3.9.2 Never smoker	Respondents who reported never having smoked in their lifetime.
3.9.3 Ever smoker	Respondents who smoked but quit smoking in the past month.
3.9.4 Prevalence	The number of cases of a specific disease present in a given population at a certain time. (Dorland's Medical Dictionary) (28th edition)
3.9.5 Adult	Person aged 20 years and above in FELDA Raja Alias 1 and FELDA Serting Hilir 1, Negeri Sembilan.
3.9.6 Risk factors of smoking	Something that increases a person's chances to smoke.
3.9.7 Age	Based on respondents' birth date from the identity card (MyKad).
3.9.8 Gender	Based on respondents' identity card (MyKad).
3.9.9 Level of education	Respondents' highest level of education.
3.9.10 Occupation	Current occupation of respondents.
3.9.11 Family income	Total income of family members who were living together with respondents.
3.9.12 Peer influence	Respondents' status of smoking based on their friends' status of smoking.
3.9.13 Family History of smoking	Respondents' status of smoking based on their family members' status of smoking.
3.9.14 Level of Stress	Based on the DASS 21 scores.
3.9.15 Level of Knowledge	Respondent's knowledge towards the consequences on smoking in questionnaires.

CHAPTER 4

RESULTS

4.1 Descriptive analysis

4.1.1 Response Rate

Out of 552 eligible respondents, 494 respondents responded in our study. Therefore, the response rate was 89.49 %. It was above the minimum sample size required which is 460.

4.1.2 Normality Test

Distribution of test of normality on continuous variables such as age, family income and knowledge score were determined Kolmogrov-Smirnov Test (K-S test). Variables are considered to be normally distributed if the p-value is more than 0.05. Symmetry of data was tested using the skewness statistics whereby the data is assumed to be symmetrical if the value is within ±1. Besides symmetry, the measure of peakness of data distribution is determined through kurtosis. In this study, none of the continuous variables were normally distributed.

Table 1 : Skewness, Kurtosis and Kolmogorov-Smirnov Test of Continuous Data

Variables	Skewness		Kurtosis		Kolmogorov-Smirnov	
	Statistic	Std. Error	Statistic	Std. Error	Statistic	Sig.
Age	-.532	.110	-.998	.220	.188	.000
Family income	3.258	.112	14.645	.224	.218	.000
Knowledge score	-.697	.115	-.330	.229	.130	.000

4.1.3 Prevalence of status of smoking among respondents

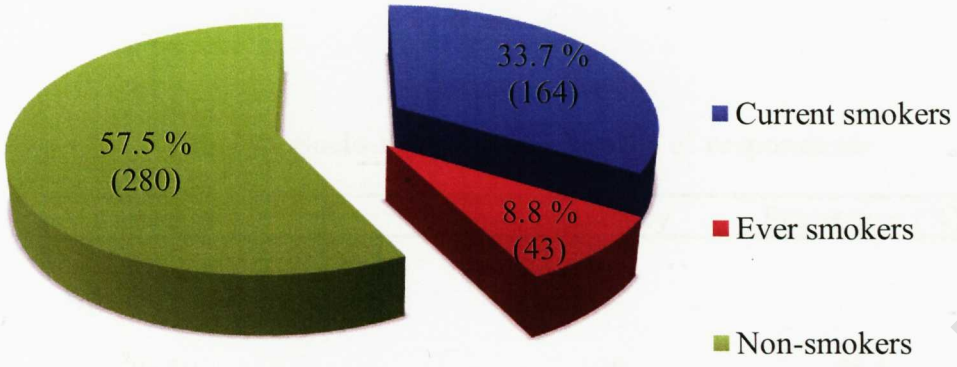

Figure 2 : Distribution of respondents by status of smoking (n= 487)

Figure 2 shows the prevalence of status of smoking among the respondents. The status of smoking was divided into Non-smokers, Ever smokers and Current smokers. Current smokers are defined in our study as respondents who had smoked at least once in the last 30 days while Ever smokers are defined as respondents who smoked but quit smoking in the past month. On the other hand, Non-smokers are defined as respondents who reported never having smoked in their lifetime. The study showed 280 (57.5%, 95% CI 53, 61.8) non-smokers, 43 (8.8%, 95% CI 6.6, 11.7) ever smokers and 164 (33.7%, 95% CI 29.6, 38) current smokers.

4.1.4 Socio-demographic characteristics

Table 2 shows the demographic profile of the respondents. Demographic characteristics such as race and religion were omitted from the analysis due to the non-existent data from the other races and religions as the FELDA settlements house mainly Malays who are Muslims. On table 2, it shows most of the respondents are between the age group 51-60 (39.3%) and males

(54.5%). The majority of them have secondary level of education (56.2%) and work as 'Peneroka' (38.5%). Most of them also earn a family income of RM1000-RM1999 (45.2%).

Table 2 : Socio-demographic profile of respondents

Variables	Frequency	Percentage (%)
Age (n = 491)		
20-30	130	26.5
31-40	23	4.7
41-50	93	18.9
51-60	193	39.3
>60	52	10.6
Gender (n = 494)		
Male	269	54.5
Female	225	45.5
Education level (n = 473)		
No formal education	30	6.3
Primary level	129	27.3
Secondary level	266	56.2
Tertiary level	48	10.1
Occupation (n = 483)		
Student	22	4.6
'Peneroka'	186	38.5
Business	26	5.4
Government servant	21	4.3
Private sector	43	8.9
Housewife	185	38.3
Family income (n = 473)		
RM999 and below	120	25.4
RM1000-RM1999	214	45.2
RM2000-RM2999	95	20.1
RM3000 and above	44	9.3

4.1.5 Influence of friends and family

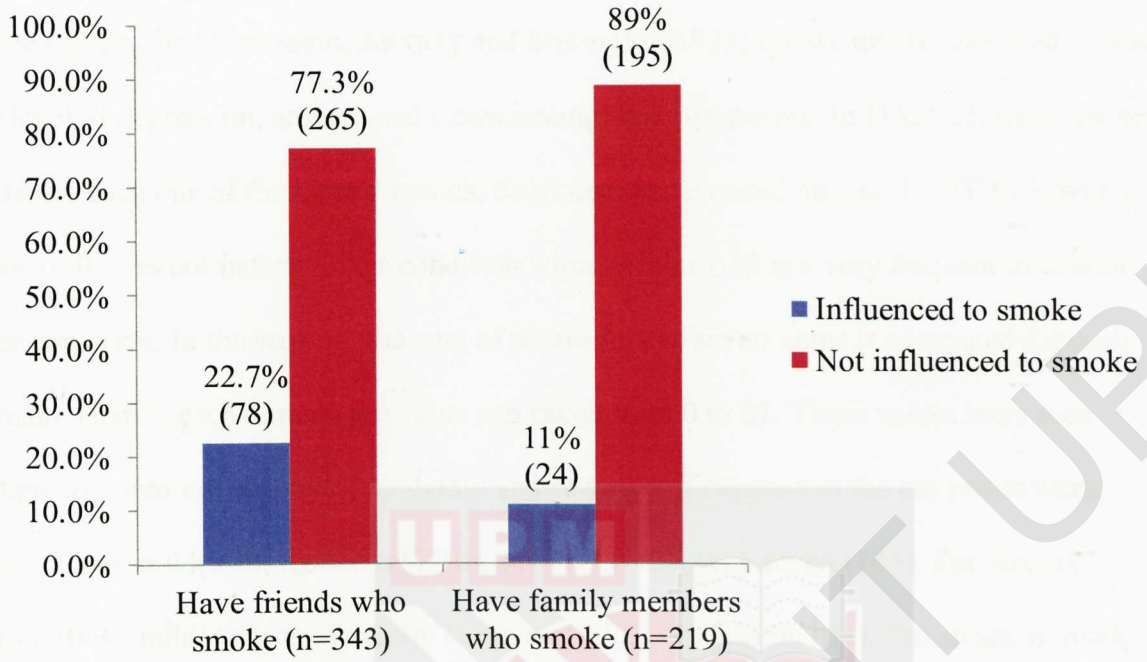

Figure 3 : Influence of friends and family

The influence of friends and family of the respondents to smoke are investigated as associated factors for status of smoking. The findings showed that 344(78.2%) respondents had friends who smoked while 96(21.8%) respondents did not have friends who smoked. From the respondents who had friends who smoked, 78(22.7%) of them were influenced by their friends to smoke while 265(77.3%) were not influenced. Besides that, it was also determined that 229(54.3%) respondents had family members in the same house who smoke. This study determined that 24(11%) out of those with family members in the same house who smoked were influenced to smoke themselves. The results of influence of friends and family to smoke are depicted in Figure 3.

4.1.6 Depression, anxiety and stress (DASS21) results

In the survey, the Depression, Anxiety and Stress (DASS21) questionnaire was used to assess the level of depression, anxiety and stress among the respondents. In DASS21, there are seven items for each one of the three domains. Each item is measured on a scale of 0 to 3, where a value of 0 does not indicate their condition while a value of 3 is a very frequent indication of their condition. In the scoring, the sum of scores for the seven items is computed for each domain. Hence, each domain the value can range from 0 to 21. These values were then categorized into normal, mild, moderate and severe. For depression the cut points were: normal(0-4), mild(5-6), moderate(7-10), severe(11-13), very severe(14+). For anxiety: normal(0-3), mild(4-5), moderate(6-7), severe(8-9), very severe(10+). For stress: normal(0-7), mild(8-9), moderate(10-12), severe(13-16), very severe(17+). The summary is provided in table 3. The percentages for extremely severe conditions were very low for all three domains, hence the categories severe and extremely severe were collapsed into one which is severe.

Table 3 : Summary statistics for depression, anxiety and stress

Severity	Depression(n=393)		Anxiety(n=394)		Stress(n=394)	
	Freq	%	Freq	%	Freq	%
Normal	303	77.1	267	67.8	347	88.1
Mild	42	10.7	61	15.5	27	6.9
Moderate	40	10.2	31	7.9	15	3.8
Severe	8	1.6	35	8.9	5	1.3

4.1.7 Level of knowledge on smoking

There are 12 questions measuring the knowledge of the respondents on smoking for this analysis. A score of 1 was given for the correct response, a score of -1 for incorrect response and a score of 0 for "don't know" response. The scores were then added for each respondent. The minimum and maximum scores possible are -12 and 12, respectively. The descriptive statistics for knowledge scores are provided in table 4. The median value is 8, which means at least 50% of the respondents knowledge is below 8.

Table 4 : Descriptive summary for Knowledge score (n = 454)

Statistic	Value	SE
Median	8.0	
Minimum	-12	
Maximum	12	
Range	18	
Interquartile Range	6	
Skewness	-.697	.115
Kurtosis	-.330	.229
p-value for test of normality	<0.001	

4.2 Statistical Analysis

4.2.1 Association between status of smoking and socio-demographic characteristics

This section studies the association between the socio-demographic characteristics in Table 2 with the status of smoking of the respondents. In this section, status of smoking has been categorised as 'Smokers' and 'Non-smokers'. The Ever smokers and Non-smokers tabulated earlier in the prevalence is grouped together as 'Non-smokers' while the Current smokers are classified as 'Smokers'. The table for this new grouping is presented below in Table 5.

Table 5 : Prevalence of smokers and non-smokers (n=487)

Smoking status	Frequency	Percentage (%)
Smokers	164	33.7
Non-smokers	323	66.3

The results of the test of association between socio-demographic characteristic and status of smoking are presented in Table 6. The test of association was done using Chi square test where a p-value of less than 0.05 is deemed to have a significant association between the variables. Based on Table 6, there were significant association between gender(p=0.000), education level (p=0.008) and occupation(p=0.000) with status of smoking. Therefore, the null hypothesis for gender, education level, and occupation were rejected. As for the other variable in socio-demographic characteristics such age (p=0.215) and family income (p=0.464), there were no significant association between these variables with status of smoking. Therefore, the null hypothesis for age and family income were not rejected.

Table 6 : Association between socio-demographic characteristics and status of smoking

Variable	Smoker	Non-Smoker	Total	Chi square	p-value
Age (n=484)					
20-30	46(35.7%)	83(64.3%)	129	5.797	0.215
31-40	10(43.5%)	13(56.5%)	23		
41-50	22(23.9%)	70(76.1%)	92		
51-60	69(36.5%)	120(63.5%)	189		
>60	17(33.3%)	34(66.7%)	51		
Gender (n=487)					
Male	164(61.9%)	101(38.1%)	265		0.000*
Female	0(0.0%)	222(100.0%)	222		
Education level (n=469)					
No formal edu.	9(30.0%)	21(70.0%)	30	11.791	0.008
Primary level	40(31.7%)	86(68.3%)	126		
Secondary level	104(39.2%)	161(60.8%)	265		
Tertiary level	7(14.6%)	41(85.4%)	48		
Occupation (n=478)					
Student	2(9.1%)	20(90.9%)	22	72.999	0.000
'Peneroka'	98(53.0%)	87(47.0%)	185		
Businessman	12(46.2%)	14(53.8%)	26		
Gov. servant	5(23.8%)	16(76.2%)	21		
Private sector	18(41.9%)	25(58.1%)	43		
Housewife	25(13.8%)	156(86.2%)	181		
Family income (n=467)					
≤RM999	36(30.3%)	83(69.7%)	119	2.561	0.464
RM1000-RM1999	74(35.2%)	136(64.8%)	210		
RM2000-RM2999	31(33.0%)	63(67.0%)	94		
≥RM3000	19(43.2%)	25(56.8%)	44		

*based on Fisher's exact test

4.2.2 Association between status of smoking and its associated factors

This section studies the association between status of smoking and its associated factors. The associated factors investigated were influence of friends, influence of family, level of knowledge and level of stress.

4.2.2.1 Friends influence

Based on Table 7, 78 respondents have friends who influence to smoke. Out of these 78 respondents, 59(75.6%) of them ended up becoming smokers while 19(24.4%) did not become smokers. On the other hand, out of the 360 respondents who do not have friends who influence to smoke, 259(71.9%) did not become smokers while 101(28.1%) became smokers (p=0.000). Therefore there was an association between having friends who influence to smoke and status of smoking. As such, the null hypothesis for friends influence was rejected.

Table 7 : Association between status of smoking and having friends who influence to smoke (n= 438)

Have friends who influence to smoke	Smoking status		Total	p-value*
	Smokers	Non-smokers		
Yes	59(75.6%)	19(24.4%)	78	0.000
No	101(28.1%)	259(71.9%)	360	

* based on Fisher's exact test

4.2.2.2 Family influence

Based on Table 8, 24 respondents have family members who influence to smoke. Out of these 24 respondents, 18(75.0%) of them ended up becoming smokers while 6(25.0%) did not become smokers. On the other hand, out of the 278 respondents who do not have family members who influence to smoke, 193(69.4%) did not become smokers while 85(30.6%) became smokers (p=0.000). Therefore there was an association between having family members who influence to smoke and status of smoking. As such, the null hypothesis for family influence was rejected.

Table 8 : Association between status of smoking and having family members who influence to smoke (n = 302)

Have family members who influence to smoke	Smoking status		Total	p-value*
	Smokers	Non-smokers		
Yes	18(75.0%)	6(25.0%)	24	0.000
No	85(30.6%)	193(69.4%)	278	

* based on Fisher's exact test

4.2.2.3 Level of stress

Table 3 described the descriptive summary for depression, anxiety and stress (DASS21). The associative risk factor with smoking used in this study was stress levels. Hence, the values of stress levels were extracted from the DASS21 results in Table 3. These values are then studied in relation with status of smoking in Table 9 (p=0.001). Therefore, there was an association between stress levels and status of smoking. As a result, the null hypothesis for level of stress was rejected.

Table 9 : Association between status of smoking and stress levels (n=394)

Stress level	Smoking status		Chi square	p-value
	Smoker (n = 139)	Non smoker (n = 255)		
Normal	113(32.6%)	234(67.4%)	17.117	0.001
Mild	11(40.7%)	16(59.3%)		
Moderate	10(66.7%)	5(33.3%)		
Severe	5(100.0%)	0(0.0%)		

4.2.2.4 Level of knowledge

Group statistics for knowledge scores by status of smoking is provided in table 10. Levene's test of homogeneity gave a p-value of 0.378. Since the p-value is more than 0.05, the assumption of equality of variance was met. The mean difference was -0.841 and the standardised difference, t = -2.186. The 95% confidence interval for mean difference (-1.597, -0.085) does not contain the tested value of 0 and the p-value of the test is less than 0.05. Thus, there was a difference in mean knowledge score between smokers and non smokers. The mean knowledge score was higher among non smokers than smokers. We were 95% confident that the difference is between -1.597 and -0.085.

Table 10 : Group statistics for knowledge scores by smoking status (n=453)

Smoking status	n	Mean	Std.deviation	Std.Error Mean	p-value*
Smokers	158	6.196	3.741	0.298	0.029
Non-smokers	295	7.037	3.985	0.232	

*based on Independent Samples T-Test for Equality of Means

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Discussion

5.1.1 Response Rate

The overall response rate of 89.49 % was satisfactory as the ideal response rate in a social and health sciences discipline would be above 80%.

5.1.2 Prevalence of smoking among respondents

This study's prevalence of current smokers was 33.7%, 8.8% of ever smokers and 57.5% of non-smokers (Figure 2). The prevalence of current smokers of this study was much higher while the prevalence of ever smokers was lower than a nationwide study conducted by Rampal et al. where only 21.7% of current smokers and 28.8% of ever smokers (Rampal et al., 2004). This study's current smoking prevalence was also higher than findings from GATS (2012) where current cigarette smokers was 22.9% (GATS, 2012).

5.1.3 Distribution of respondents by socio-demographic characteristics

There were total of 494 respondents involved in this research. Socio-demographic characteristics such as age, gender, education level, occupation and family income have been taken into account in our study. Race and religion were omitted from the analysis due to the non-existent data from the other races and religions as the FELDA settlements house mainly Malays who are Muslims. As for age, we divided the age into 5 groups which were 20-30, 31-40, 41-50, 51-60 and above 60 years old. In our study, it showed that most of the respondents were between the age group 51-60 (39.3%) and followed by age group of 20-30 (26.5%). Only 4.7% respondents were between the age group 31-40. Males also dominated the number of respondents with 54.5% as compared to female (45.5%). As for the education level, we

asked the respondents for the highest education they ever had before such as no formal education, primary level, secondary level or tertiary level. Majority (56.2%) of them had secondary level of education while the least was 6.3% of them who had no formal education. For the occupation part, we considered on the common type of work that they were working on. Then we classified the type of occupation into 6 groups (students, 'Peneroka', business, government servant, private sector and housewife). Most of them (38.5%) were working as 'Peneroka' since our study was conducted in the FELDA area. The least number of respondents (4.3%) was working as a government servant. As for the family income, we divided the income into RM999 and below, RM1000-RM1999, RM2000-RM2999 and RM3000 and above after taken into consideration of the income of FELDA settler. Most of them (45.2%) earn a family income within RM1000-RM1999 and only a few of them (9.3%) earn RM3000 and above (Table 2).

5.1.4 Distribution of respondents by associated factors of smoking

The question "Do you have friends who smoke?" and "Do your friends give influence to you to smoke?" were being asked to investigate one of factors that lead to smoking which was friends influence. Majority (78.2%) of the respondents had friends who smoked while 96(21.8%) respondents did not have friends who smoked. From the respondents who had friends who smoked, 22.7% of them were influenced by their friends to smoke (Figure 3).

"Is there anybody in your family who smokes?" and "Do they influence you to smoke?" also being asked to investigate factor of family influence to smoking. Based on the first question, 54.3% respondents had family members in the same house that smoke and 89% out of them were influenced to smoke themselves (Figure 3).

Level of stress among respondents was measured using the Depression, Anxiety and Stress (DASS21) questionnaire. The levels of stress are divided into normal, mild, moderate

and severe. Out of 394 respondents, 347(88.1%) respondents had normal level of stress, 27(6.9%) mild level of stress, 15(3.8%) moderate level of stress and 5(1.3%) severe level of stress.

As for the knowledge part, FELDA settlers in this study were required to answer 12 questions which measured the knowledge of respondents on smoking. On a scale of -12 to 12, it was found that at least 50% of the respondent's knowledge to be below 8.

5.1.5 Association between status of smoking and socio-demographic characteristics

In this section, status of smoking has been categorised as 'Smokers' and 'Non-smokers'. The Ever smokers and Non-smokers tabulated earlier in Figure 2 were grouped together as 'Non-smokers' while the Current smokers was classified as 'Smokers' (Table 5). This study's prevalence of Smokers was 33.7% and Non-smokers was 66.3%.

In our study, respondents within the age group 31-40 years old have made a higher prevalence of smokers (43.5%) whereas respondents with age group 41-50 years old have lower in prevalence of smokers (23.9%). However, Rampal et al. (2003) reported the different findings where that study showed that the prevalence of smoking was higher among respondents with increasing age since respondents from the 50-59 age group contributed the highest prevalence of smokers. On the other hand, respondents below 20 age group showed the lowest prevalence of smokers. That study also showed significant association between age and smoking ($p < 0.01$) (Rampal et al., 2003). However, in our study there was no significant association between age and smoking ($p=0.215$). It might be because middle aged respondents has high tendency to smoke as compared to those with younger and elder age group.

Consistent with other studies, males made up higher smoking prevalence with 164 respondents were smokers (61.9%) as compared to female. Besides, among females, they had made up high prevalence of non smokers with 222 respondents (100%). The same view was

expressed in GATS (2012) which showed that men had a highest prevalence of smokers (43.9%). For women, the prevalence of smokers showed the lowest (1.0%) (GATS, 2012). This situation might be due to the persistence of local customs in which smoking is not acceptable behaviour in women. Our study revealed there was significant association between gender and status of smoking (p=0.000). Similarly with other study by Picco et al which found that there was significant association between gender and smoking (p<0.001) with males made up (27%) of smokers as compared to females (5.6%) (Picco et al., 2012).

The level of education has been associated with smoking in large number of studies. In our study, for the level of education, we found that respondents with the highest education level of secondary level education showed the highest prevalence of smokers (39.2%). In contrast with tertiary level respondents who showed the lowest smoking prevalence (14.6%), it could be due to increase awareness among them since they have better education than secondary level respondents. However, study conducted by Ali Khan Khuwaja (2004) showed that there were high prevalence of smokers among the more highly educated people. In our study, there was a significant association between education level and status of smoking in our study (p=0.008). Ali Khan Khuwaja also showed showed a significant association (p=0.002) (Ali Khan Khuwaja et al., 2004).

In our research, we found that working respondents ('Peneroka' 53.0%, business 46.2%, government servant 23.8% or private sector 41.9%) had a high prevalence of smokers. Non-working respondents (students or housewives) however showed low prevalence of smokers compared to non-smokers. Consistent with study done by Lim et al., 'Peneroka' showed the highest prevalence of smokers (53.0%) as compared to other occupation in our study. Study by Lim et al. themselves showed that elementary workers and agricultural workers had a higher tendency to smoke than those in management and other professional occupations where it has been postulated that lower level occupational groups face more

physical and psychosocial stressors compared to the managerial and professional classes (Lim et al., 2013). Therefore, they were more likely to engage in high risk health behaviours such as smoking. This was also supported by Nguyen Viet Cuong which showed working for an enterprise or organization (private or public) increases the smoking probability by around 10 percentage points compared to the non-working people (Cuong, 2010). There was significant association between type of occupation with status of smoking in our study (p=0.000) similarly with study done by Lim et al (2013).

Economic condition was an influencing factor in smoking. Our study showed that respondents with income more than RM3000 showed highest prevalence of smokers (43.2%) as compared to those with income below RM999 who showed lowest prevalence of smokers (30.3%). The findings was different with findings by Rampal et al (2003) that showed that respondents with household income less than RM2000 showed the high prevalence of smokers (38.7%) as compared to those with household income RM2000 or more who showed low prevalence of smokers (23.7%). However, this difference was not statistically significant (p >0.05). The study also showed that there was also no significant difference in the prevalence of current smokers between the different family income (Rampal et al., 2003). Similarly in this study, there is no significant association between family income and status of smoking among respondents (p=0.464).

5.1.6 Association between status of smoking and its associated factors

From this study, a significant association was observed between peer influence with status of smoking among respondents. From our study, 75.6% of respondents who have friends that influence to smoke ended up becoming smokers while 71.9% of respondents who do not have friends that influence them to smoke did not become smokers. It showed that influence of friends play an important role in determining whether they smoke or not.

Consistent with the study conducted by Rampal et al (2003) that also revealed that there were 95% smokers whose friends were smokers as compared to 56.3% non-smokers whose friends were smokers (Rampal et al., 2003). There was also significant association seen in friends' smoking habit and respondents' smoking status ($p<0.01$) similarly seen in our study that there was significant association between peer influence with smoking ($p=0.000$).

There was a significant association between having family members who influence to smoke and status of smoking among respondents ($p=0.000$). Our study found that 75.0% of respondents who have family members that influence to smoke ended up becoming smokers while 69.4% of respondents who do not have family members that influence them to smoke did not become smokers. This showed that family members also play an important role towards the smoking habit among respondents. This was consistent with findings reported by Rashid et al. as they also found there were more current and ever smokers among those whose family members smoked (Rashid et al., 2011). They also stated that there was a significant association between smoking and family influence.

This study showed a significant association between stress levels and smoking status ($p=0.001$) whereby a higher level of stress led to increased prevalence of smoking status. Those with normal stress levels had the lowest smoking prevalence (32.6%) while the highest prevalence was among those with severe stress levels where all of them were smokers (100%). This finding is similar to that of Sami AbdoRahman Al-Dubai et al. (2011). Their study indicated that stress plays a substantial role in the prevalence of smoking among medical students in Management and Science University. Another study, by Radi et al. (2007), conducted in Australia, also showed a high level of association between job strain and job pressure with status of smoking (Radi et al., 2007).

Based on the findings, there was also significant difference in mean knowledge score between smokers and non-smokers. The mean knowledge score was higher among non-smokers compared to the smokers. This showed that knowledge is an important factor that influences people to smoke. This finding echoes that of a study by Lim et al. (2009), which claims that the higher the knowledge, the more negative the attitude towards smoking (Lim, K.H. et al., 2009). The findings of this study are so similar to another among male physicians in China conducted by Ceraso et al. (2009). Their study recorded that those who smoked had a more limited knowledge of smoking-related diseases (Ceraso et al., 2009). There was also significant association between level of knowledge with smoking seen in our study (p=0.029).

5.2 Conclusion

Our study showed that there were 280 (57.5%) non-smokers, 43 (8.8%) ever smokers and 164 (33.7%) current smokers which revealed a high prevalence of smoking in the FELDA population.

The study found that here were significant association between gender (p=0.000), education level (p=0.008) and occupation (p=0.000) with status of smoking. Other associated factors such as peer influence (p=0.000), family influence (p=0.000), level of stress (p=0.001) and level of knowledge (p=0.029) were also significantly associated with status of smoking. However, there were no significant association between age (p=0.215) and family income (p=0.464) with status of smoking.

5.3 Limitation

Causal-effect relationship between smoking and its associated factors could not be determined due to the study design effect. Cross sectional study cannot explain the temporal relationship between smoking and its associated factors clearly. This is one of the limitations that should be considered when conducting this type of study.

Other than that, our study also does not represent the whole intended population since our study location was in FELDA which not really generalised at entire FELDA and the whole Malaysia.

5.4 Recommendation

We recommended for further study like prospective cohort to be conducted for a longer duration in a larger population so that it will be able to represent the whole intended population. Thus, this type of study will cater the causal-effect relationship and also will give a more representative result at the end of the result. A better population which has a balance ethnicity proportion should be selected also in order to be more representative to the whole population in FELDA settlement.

Smoking is rampant and issue to be tackled in the society. Hence, we hope that the information obtained from this study will act as a guide to FELDA Authority so that preventive measures could be taken in order to tackle this problem such as by planning for health promotion and anti-smoking programs among FELDA settlers.

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Attachment 2

JKEUPM Ref No. : FPSK_Mei (13)36(undergraduate)

Members of the JKEUPM who reviewed the documents:

Prof. Dato' Dr. Lye Munn Sann

Date of approval: 4/6/2013

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

NAME	DESIGNATION	GENDER	TICK IF PRESENT
Prof. Dr. Norlijah Othman	Paediatrics& Dean, Faculty of Medicine and Health Sciences	Female	√
Prof. Dr ZamberiSekawi	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	√
Prof. Dr. Azali Mohamed	Professor of Macroeconomics, Dept of Economics, Faculty of Economics and Management	Female	
Assoc. Prof. Dr. Johnson Stanslas	Pharmacologist, Dept of Medicine, Faculty of Medicine and Health Sciences	Male	√
Assoc. Prof Dr. Mansor Abu Talib	Assoc. Professor of Guidance and Counselling, Dept of Human Development and Family Studies, Faculty of Human Ecology	Male	
Assoc. Prof. Dr. Noritah Omar (Lay Person)	Assoc. Professor of English Language, Dept of English Language, Faculty of Communication and Modern Languages	Female	√
Dr. Rojanah Kahar (Lay Person)	Lecturer of Dept of Human Development and Family Studies, Faculty of Human Ecology	Female	√
Tan Sri Dato' Napsiah Omar (Lay Person)	Chairman, National Population and Family Development Board	Female	√

JAWATANKUASA ETIKA UNIVERSITI UNTUK
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UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

CONSENT FORM (RESPONDENT)

RESEARCH TITTLE:
PREVALENCE OF SMOKING AND ITS RISK FACTORS AMONG ADULTS IN GUGUSAN FELDA RAJA ALIAS, NEGERI SEMBILAN

RESEARCHER :

1. FATIN ADLENA BT MOHD SHUHAIMI	**161191**
2. MAHENDRA A/L KARUTHAN	**163711**
3. NUR ATIQAH BINTI ROSLAN	**161587**

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)

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 smoking and its risk factors among adults in Gugusan Felda Raja Alias, Negeri Sembilan.

INTRODUCTION

Smoking is the most common method of consuming tobacco through inhalation of the fumes of burning tobacco encased in cigarettes, pipes, and cigars. Cigarette smoke contains about 4,000 different chemicals include carcinogens, nicotine and other poisons capable of damaging the cells and systems of the body.

WHAT WILL YOU HAVE TO DO?

You will be given a set of questionnaire. You should answer all the questions given honestly. If you find any difficulties, please refer to the researchers.

WHO SHOULD NOT ENTER THE STUDY?

Those who are non-Malaysian residents, non-FELDA settler and mentally retarded individuals are excluded from this study.

WHAT WILL BE THE BENEFITS OF THE STUDY:

a) TO YOU AS THE SUBJECT?

Respondents are not going to be charged throughout the research. Information given by respondents will contribute in the study of understanding prevalence of smoking and its risk factors among adults aged 19 years and above. Besides that, this study also helps to increase the awareness among respondents about the dangerous of smoking to their health.

b) TO THE INVESTIGATOR?

Your participation will help in the gathering of data for the prevalence of smoking and its risk factors. Therefore, it can help researchers to form a better understanding of the risk factors of smoking among adults. Besides, intervention to reduce prevalence of smoking among adults in Felda Raja Alias 2 in the future can be formed.

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?

FATIN ADLENA BT MOHD SHUHAIMI	013-3444297
MAHENDRA A/L KARUTHAN	012-6929731
NUR ATIQAH BINTI ROSLAN	017-3829187

QUESTIONNAIRE

Respondent Serial No.				

PREVALENCE OF SMOKING AND ITS ASSOCIATED FACTORS AMONG ADULTS IN GUGUSAN FELDA RAJA ALIAS, NEGERI SEMBILAN

QUESTIONNAIRE

Supervisor committee

Associate Prof. Dr. Muhamad Hanafiah Bin Juni (Main Supervisor)

Dr Ahmad Shahrul Nizam Bin Isha (Co-Supervisor)

Department of Community Health

Faculty of Medicine and Health Sciences

Universiti Putra Malaysia

Researcher

Fatin Adlena Binti Mohd Shuhaimi	**161191**
Mahendra A/L Karuthan	**161587**
Nur Atiqah Binti Roslan	**163711**

Section 1: Socio-demographic and General Information

You are requested to circle O mark at **ONE** of the appropriate number whenever you choose for all questions, where there is no other instruction.

No	Question and Filters	Categories	Code
Q1	Sex	Male Female	1 2
Q2	Age	20 – 30 31 – 40 41 – 50 51 – 60 >60	1 2 3 4 5
Q3	To which ethnic group do you belong?	Malay Chinese Indian Others	1 2 3 4
Q5	What is your level of education?	Primary Secondary Tertiary No formal education	1 2 3 4
Q6	How much is your family income?	RM999 and below RM1000-RM1999 RM2000-RM2999 RM3000 and above	1 2 3 4
Q7	What is your occupation?	Student 'Peneroka' Business Government servant Private sector Others	1 2 3 4 5 6

Section 2: History of Smoking and Peer influences

You are requested to **circle O mark** at **ONE** of the appropriate number whenever you choose for all questions, where there is no other instruction.

No	Questions and Filters	Categories	Code
Q8	Are you currently smoking? **(*current smoker refers to those who smoke at least once in the last 30 days)*	Yes No *If yes, please go to **Q9** and continue* *If No, please go to **Q13** and continue*	1 2
Q9	How old were you when you first started smoking?	Age *Please state your actual starting age*	___
Q10	On average, how many cigarettes do you smoke per day?	10 or less 11 to 20 21 to 30 31 or more	0 1 2 3
Q11	What were the reasons that make you difficult to stop smoking? **(*you are allowed to select more than one response)*	Influence from friends Addiction to smoke Lack of support/motivation Smoking again after stressful Others, *please specify* _____	1 2 3 4 5
Q12	Do you have any intention to quit smoking in future?	Yes No	1 2
Q13	Are you former smoker? **(*former smoker refers to those who smoked but quit smoking in the past month)*	Yes No *If yes, please go to **Q14** and continue* *If No, please go to **Q15** and continue*	1 2

Q14	Why did you quit smoking, if you are former smoker? **(*you are allowed to select more than one response)*	Friend's advise Family told me to stop I feel better for not smoking Anti-smoking campaigns Others, *please specify* _____	1 2 3 4 5
Q15	Do you have friends who smoke?	Yes No Don't know	1 2 3
Q16	Do your friends give influence to you to smoke?	Yes No	1 2
Q17	Is there anybody in your family who smokes?	Yes No Don't know	1 2 3
Q18	If yes, please state your relationship with those family members. **(*you are allowed to select more than one response)*	Father Mother Elder brother Elder sister Younger sibling Others, *please specify* _____	1 2 3 4 5 6
Q19	Do they (Q18) live together with you?	Yes No	1 2
Q20	Do they (Q18) influence you to smoke?	Yes No	1 2

Section 3: Knowledge

You are requested to tick ✓ **mark** at **ONE** correct answer on each of the following questions.

No	Questions and Filters	**True**	**False**	**Don't know**
Q21	How would grade your knowledge on smoking give effects on health.			
Q22	Breathing smoky air harms babies and young children.			
Q23	Nicotine in cigarette can cause smoking addiction.			
Q24	Smoking in certain places is against the law.			
Q25	Smoking is bad for you only if you smoke a lot every day.			
Q26	Smokers usually die younger than non-smokers.			
Q27	Almost everyone who gets lung cancer has been a regular smoker.			
Q28	A woman who is going to have a baby could harm the baby if she smokes.			
Q29	Smoking is bad for you only if you smoke for many years.			
Q30	If you smoke you more likely to cough.			

Section 4: Stress

DASS21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3

16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

GANTT CHART

TABLE 1.0 GANTT CHART FOR RESEARCH ACTIVITIES

TITLE: PREVALENCE OF SMOKING AND ITS ASSOCIATED FACTORS AMONG ADULTS IN GUGUSAN FELDA RAJA ALIAS, NEGERI SEMBILAN

No	Activites	2013						
		March	April	May	June	July	August	September
1	Preparation of draft proposal							
2	Submission of draft proposal							
3	Preparation, submission and presentation of final proposal							
4	Preparation of ethical approval and permission letters to organizations							
5	Data collection and analysis							
6	Submission of data analysis and presentation							
7	Preparation of final report and scientific article							

8	Submission of final report and scientific article																												
9	Preparation for final presentation																												
10	Final Presentation																												
11	Correction of project report																												
12	Submission of project report, scientific article																												

ORGANIZATION CHART

Supervisor	Associate Prof. Dr. Muhamad Hanafiah Bin Juni Department of Community Health Faculty of Medicine and Health Sciences University Putra Malaysia hanafiah@medic.upm.edu.my 013 - 6215276	
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