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Perception Towards Cigarette Smoking And Awareness Of Risk Of Cigarette Smoking Among Sibu Population In Sibu District From April To July 2020

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A B S T R A C T

Background: Cigarette smoking is a crucial public health problem with 1.3 billion smokers around the world, causing 5 million death annually. In Malaysia, the prevalence of cigarette smoking among both male and female Malaysian adults aged 15 years and above is 23.1%, and is highest in those aged 21-30 years old. Although majority of people in Malaysia have knowledge on harmfulness of smoking and second-hand smoke, their perception towards smoking is not clearly determined. Thus, we conducted a study to determine the perception and awareness of risk of cigarette smoking in Sibu community. **Methods:** A cross sectional study was conducted in Sibu districtdistrict from April to May 2018, involving 356 respondents. A questionnaire was used to collect data, which consists of four sections. These covered the sociodemographic data, smoking status of respondents, their perception towards cigarette smoking and knowledge regarding the risk of cigarette smoking and second-hand smoke. The data were then analyzed using SPSS version 22. **Results:** The respondents' overall perception towards cigarette smoking is strongly positive with 50.6% out of 356 respondents. Awareness on risk of cigarette smoking is high with 81.7% having good awareness level in contrast to only 3.1% having poor awareness level. There is a significant difference on perception level between smoking status, genders, different education level and different occupation. There is also a significant difference between awareness of risk of cigarette smoking and education level and occupation.
Conclusion: Generally, the perception level towards cigarette smoking among sibu community is strongly positive and thus, against smoking .As well as their awareness level towards risk of smoking is relatively high with majority having good awareness level. This shows that most of Sibu community have good knowledge of cigarette smoking and are against smoking.

1.0 Inroduction

Cigarette smoking is the act of smoking and breathing in tobacco smoke, comprising of molecule and vaporous stages. It is believed to have started as early as 5000– 3000 BC in Mesoamerica and South America (Gately *et al*., 2004). Studies have demonstrated that German researchers discovered a connection between smoking and lung cancer in the late 1920s, bringing about the first anti-smoking campaign in modern history (Doll *et al*., 2004). Evidence continued to develop in the 1980s, which triggered political action against the practice (WHO/WPRO-Smoking Statistics *et al*., 2002).

Cigarette smoking is a crucial public health problem around the world, particularly in developing countries. Despite the

decrease in prevalence of smoking in several countries through increased awareness of its risks and tobacco control policies, smoking remains to spread widely (Shafey *et al*., 2003). There are 1.3 billion smokers around the world and 5 million people die worldwide from smoking annually. Smoking still continues to rise, significantly within the low and middle-income countries as well as the high-income countries (World Health Organization; 2008). A local study reports that the prevalence of current smoking among adult males in 2006 in Malaysia is 46.5% (95% CI: 45.5–47.4%), that was 3.0% lower than a decade ago (Lim *et al*., 2013). The prevalence of current smoking among both male and female Malaysian adults aged 15 years and above is 23.1% (Tee *et al*., 2003), (Ministry Of Health Malaysia, 2008) and is highest in those aged 21-30 years old (Institute For Public Health, 2011).

There has been many studies and nationwide surveys in Malaysia, beginning with the National Health and Morbidity Survey in 1986 (NHMS I), NHMS II in 1996 and NHMS III in 2006 due to variations in operating definitions used in these surveys. Trends of tobacco use was not developed but between NHMS II (1996) and NHMS III (2006), the prevalence of current adult smokers aged 18 years and above declined from 24.8% to 22.8%.

The prevalence of smoking remained at around 25% from 2011 to 2015 with one in two males were smokers

Statement of problem

Tobacco use behaviors have modified considerably over the past century. After a steep rise in cigarette use rates over the first half the twentieth century, adult smoking prevalence rates started declining from their peak in 1964. This was contributed by the improved understanding of the health risks of smoking, assisted by the United States Surgeon General's Reports issued annually starting from 1964.

Other driving forces of the decline in smoking prevalence included the recognition of tobacco use as an addiction and reason behind cancer and problems related to the ill-effects of breathing second-hand smoke. These contributed to the decreasing social acceptance of smoking, significantly with the introduction of legal restrictions on smoking in public areas, mass media counter-marketing campaigns, and higher taxes on cigarettes (Brandt *et al*., 2007).

Research question

1. What is the perception of the public towards cigarette smoking among Sibu community?
2. What percentage of the population is aware of risk of cigarette smoking?
3. What are the factors that influence the awareness of risk of cigarette smoking?
4. Are there any differences in perception on smoking between ex-smokers and non-smokers?
5. Are there any differences in awareness of risk of cigarette smoking between exsmokers and non-smokers

Research hypothesis

1. There is a significant difference in perception towards cigarette smoking between ex- smokers and non-smokers.
2. There is a significant influence of sociodemographic factors on perception towards cigarette smoking.
3. Awareness of the risk of cigarette smoking is influenced by sociodemographic factors (age, gender and educational level).

Research objectives

General Objective: To explore the awareness of risk and perception of cigarette smoking among Sibu community.

Specific Objectives:

1. To determine the perception level towards cigarette smoking among the Sibu community.
2. To determine the awareness level of risk of cigarette smoking among the Sibu community.
3. To compare the different perception level between ex-smokers and non-smokers.
4. To compare the level of awareness of risk of cigarette smoking between ex-smokers and non-smokers.
5. To determine the factors associated with perception level towards cigarette smoking and awareness level of risk of cigarette smoking.

Justification of study

This study is to identify the perception of cigarette smoking and awareness of risk of cigarette smoking such as lung cancer among Sibu community based on smoking status and associated sociodemographic factors and to educate and inform the community about risks of smoking.

Operational definition

1. Awareness: Having the knowledge about something, in this case, knowledge about cigarette smoking being harmful to one's and the surrounding people's health.
2. Perception: Positive or negative view towards the act of cigarette smoking.
3. Smoker: A person who currently smokes cigarettes.
4. Ex-Smoker: A person who regularly smoked in the past and had stopped smoking.
5. Non-smoker: A person who never smoked cigarette.
6. Sociodemographic factors: Independent variables included in this research, such as age, gender educational level and occupation.
7. Positive perception: Any views that are against the act of smoking.
8. Negative perception: Any views that are supporting the act of smoking

Literature Review

History and definition of smoking

Smoking cigarette is the commonest technique of consuming tobacco, and tobacco is the commonest substance smoked. The additional products are usually mixed with additives (World Health Organization, 2002). Then combusted. The resulting smoke is then inhaled and therefore the active substances took up through the alveoli within the lungs or the oral mucosa. Combustion was traditionally increased by addition of potassium or different nitrates. Multiple substances in cigarette smoke trigger chemical reactions in nerve endings, that increase pulse

rate, and alertness (Al-Sadat *et al*., 1998). Biochemicals like dopamine and endorphins are released, given off the pleasure in inhaling cigarettes. Tobacco is used by about 49% of men and 11 % of women aged 15 or older in low-income and middle-income countries between 2008-2010 with about 80 % of it being in the form of smoking.

Epidemiology

There has are several nationwide surveys done in Malaysia, The first National Health and Morbidity Survey was conducted in 1986 (NHMS I), NHMS II in 1996 and NHMS III was conducted in 2006.and many other research were done.

Smoking Prevalence

In Children and Adolescents

Previous research conducted in 2010 in Malaysia showed that there were 5 million smokers classified as children or adolescents younger than 18 years old. (Al-Sadat *et al*., 1998). Another research conducted in 2015 showed that 1 in 10 Malaysians aged between 13 to 17 year old were smokers (National Health and Morbidity Survey, 2015). A study conducted in The Kota Bharu, Kelantan showed that the prevalence of cigarette smoker among male secondary school children was 33.2% (Shamsuddin *et al*., 2000). While in Johor, the prevalence range was within 29.7 to 43.0%.(16) From a study conducted in Sarawak in 2011, 32.8% of secondary school children were smoking although the majority (96.9%) were not smokingdaily (Lim *et al*., 2006).

In Adults

In Malaysia, 46.5% of adult Malaysian males were smoking based on National health and morbidity survey III conducted in 2006, which is 3.0% lower than NHMS I done in 1986 (Lim *et al*., 2006). A study conducted in 2013 showed that 23.1% of Malaysian males and females aged 15 years old and above were smokers (Cite *et al*., 2013; Cheah *et al*., 2012), highest in those aged 21-30 years old (Cite *et al*., 2013). However between the three National health and morbidity surveys (I, II , III) the prevalence of current adult smokers aged 18 years and above reduced from 24.8% to 22.8% although the prevalence of smoking remained at around 25% from 2011 to 2015.

In the Elderly

In a study done in 2005, 39.2% of elderly who was 60 years old and above are smokers (Lim *et al*., 2005).

Smoking and Gender

Research showed that male was significantly associated with smoking (Cite *et al*., 2013; Cheah *et al*., 2012; Al-Naggar *et al*., 2012; Masran *et al*., 2006; Osman A, 2007). The prevalence of female smoking was lower than males, with males smoking at younger age than female (Cheah *et al.*, 2012).

Sociodemographic Factors and Smoking Prevalence

A study conducted in 2010 showed that smoking was highest among those with lower income, younger age, unmarried status (Al-Sadat *et al*., 1998; Lim *et al*., 2006), only primary level education, rural residence and sedentary lifestyle. However, the prevalence of smoking is different depending on the types of occupation (Cheah *et al*., 2012; Lim *et al*., 2006).

Laws and regulations

Malaysia has introduced smoking restrictions under the Food Act 2008 as a signatory to the treaty under WHO (Abidin *et al*., 2013). However, unlike restrictions implemented in the UK, Ireland, many EU countries, Malaysia smoke-free laws are partial and smoking is allowed to continue in certain types of enclosed public venues. Since 2010, 21 types of public space venues are declared smoke-free. This includes entertainment centre, health centres, public lift, toilet, air-conditioned eateries or shop, public vehicle or public transport terminal, government premise, educational institution, area of assembly activity, nursery, school bus, petrol station, floor with service counter, shopping complex, sports and fitness centre, stadium, gymnasium, religious places, library, and internet café.

Ministry of Health is responsible to enforce smoking restrictions under the authorization of Assistant Environmental Health Officers (AEHO) who can penalise anyone violating the smoke-free regulations (Zulkifli *et al*., 2014). However, the enforcement is rather questionable due to overlapping duties of the officers.

Even with the implementation of laws and regulations around smoking, a research found that almost two-thirds of Malaysian adolescents were vulnerable to second-hand smoke within a period of one month from the study (Lim *et al*., 2018). Although Malaysia has introduced smoke-free policies and regulations, poor enforcement has been observed around the restricted areas where smoking is off-limits.

Complications of smoking

According to National Health and Morbidity Survey, smoking accounts for 15.0% of hospitalisations and 35.0% of inpatient hospital deaths in Malaysia. In Malaysia, smoking kills 20,000 people anually (National Health and Morbidity Survey; 2015). In a study, it was reported that smoking was associated with an increasing trend of cancer cases. In a study of female breast cancer patients in Kelantan, 4.6% were smokers. In most Southeast Asian countries, oral cancer is caused by smoking, betel chewing, and alcohol consumption (Wei Lei Hum *et al*., 2016). Based on Abdullah M, most patients with squamous cell carcinoma of the oesophagus had a positive history of smoking (Abdullah *et al*., 2013). Based on Pillay KVK, *et al*., 2007, in evaluating the effect of smoking in peptic ulcer disease patients, there was a significant association between Helicobacter Pylori infection and smoking status. Smokers had a higher risk of developing rheumatoid arthritis when compared to non-smokers (Wei Lei Hum *et al*., 2016). In a study it was found that 92% of Malaysian lung cancer male patients have a significant smoking history (Liam *et al*., 2016). Moreover, studies had also found that smokers were more likely to be involved in high-risk health behaviours such as using illicit drugs, pre-marital sex and consuming alcohol (Kuang Hock Lim, 2017). In another study by Mahdi Fallahi, it has been discussed that life expectancy is

negatively affected by smoking; the impact of smoking-related diseases results in death, which lowers the overall level of life expectancy. Individuals who have never smoked have higher life expectancy than ex-smokers and current smokers (Mahdi *et al*., 2015).

Second hand smoke

Second hand smoke (SHS) is tobacco smoke that is inhaled passively by someone who is not smoking. According to Global adult tobacco survey (GATS) Malaysia, non-smokers exposed to second hand smoke have a 25%-30% higher risk of coronary heart disease than do non-smokers who are not exposed to second hand smoke. This study showed that 39.8% (2.3 million) of adults in Malaysia had been exposed to second hand smoke in their workplace whereas for non-smokers 33.9% (1.4 million) had been exposed. In addition, 38.4% of adults in Malaysia (7.6million) were exposed to secondhand smoke at home and among non-smokers 27.9% (4.2million) were exposed. Furthermore, Malaysians are exposed to passive smoking at public places such as cafes, bars, restaurants, public transportation, and healthcare facilities (Institute For Public Health, 2011). In one study, it has been shown that exposure to passive smoking during pregnancy increased the maternal risk of delivering infants with cleft lip and palate. School children who are exposed to this type of smoke have greater risk of developing cough, nasal and throat problems at night, as well as wheezing and asthma. The risk is increased with increasing number of smokers at home (Wei Lei Hum *et al*., 2016).

Influence of sociodemographic factors and smoking status on attitude towards smoking

In this section, attitude means the perception towards the act of smoking, whether it is positive (against smoking) or negative (support smoking). A study in Malaysia found that the attitude towards smoking was found to be moderate. In this study, those with higher attitude scores indicated that they were against the act of cigarette smoking.

Non-smokers have slightly positive attitude towards cigarette smoking than ex-smokers. The median attitude scores of non-smokers versus ex-smokers were 90.50 and 87.50 with a p-value of <0.001 signifying a statistically significant difference. (Nurul *et al*., 2016).

On the other hand, there was no significant difference between age and attitude towards smoking with a p-value of 0.573. (33) In contrast, a different study described that age plays an important role in influencing attitude regarding smoking. People of more advanced age were indirectly more likely to encounter smoking-related health problems, thus causing them to develop an opposing attitude against smoking (Lim *et al*., 2013).

There was a significant difference regarding the influence of gender and educational level on the attitude towards smoking. The mean attitude scores of females were 90.91±8.755 which was statistically significantly higher than males which were 81.26±15.967 (p-value of <0.001. Nurul *et al*., 2016, Females are more likely than males to oppose smoking and to support smoking control program. Males tend to have a supportive view towards smoking where they perceive smoking as a stress-reliever, work performance enhancer and as a symbol of attraction to women and being modern.

In terms of educational level, the median scores of those studying till secondary school, diploma and bachelor's degree were 79.50, 91.00 and 88.00 respectively. These differences are significant with a p-value of 0.016. People with higher level of education had a negative attitude towards smoking compared to those with lower level of education. However, this relationship may be cofounded by early exposure and home education about smoking behaviour that were experienced differently by certain people more than others (Nurul *et al*., 2016).

Regarding occupation as a factor influencing people's perception, there was a lack of literatures studying the association between the attitude towards smoking and different types of occupation.

Influence of sociodemographic factors and smoking status on knowledge about cigarette smoking

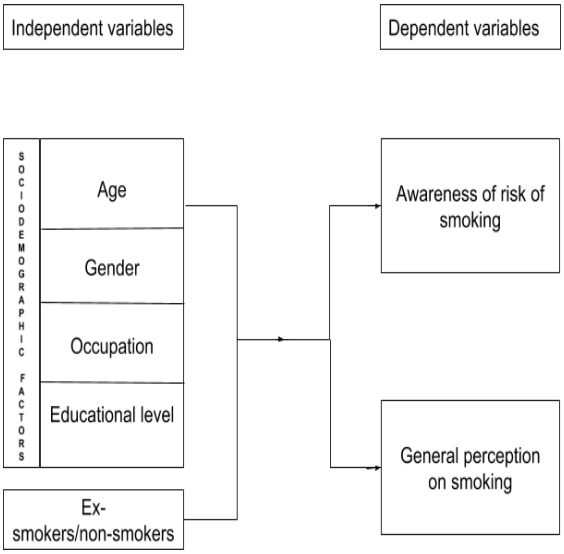
According to a study done in Malaysia, 63.5% of respondents had good knowledge score about smoking with most of them knowing about second-hand smoking. However, there was no significant difference between sociodemographic factors and knowledge regarding smoking; irrespective of age, gender, smoking status and educational level. Comparing smokers and non-smokers, no significant difference were found concerning the knowledge level about the harmful consequences of smoking. Both non-smokers and smokers scored a mean score of 23.00 with a p-value of 0.124. It was also found that there was no statistically significant association between age and knowledge about smoking risks with a p-value of 0.162.Other than that, females were found to have relatively higher level of knowledge compared to males. In a local study, the scores of knowledge for females (n=58, mean=22.34±3.923) were higher than males (n=57, mean=21.42±3.923) with p-value of 0.152, indicating that the difference was not statistically significant (Nurul *et al*., 2016). However, an earlier study revealed that young females had relatively poorer knowledge around smoking but without any significant difference between genders (Manaf *et al*., 2016).

Each education level, namely secondary school, diploma, bachelor holders were alike in terms of the mean score values of knowledge regarding smoking. The median scores for those in secondary school, diploma and bachelor's degree were 22.50, 23.00 and 23.00 respectively with a p-value of 0.940 which signified no statistical significance (Nurul *et al*., 2016). However, a previous study revealed that people with lower education level had poorer knowledge about smoking (Manaf *et al*., 2016).

In a study conducted by Minhat *et al*., 2016 on knowledge on smoking behaviour among Felda settlers in Malaysia, a significant difference was discovered between knowledge about risk of smoking and occupation status. Out of 230 participant, 59.3% of employed people have good knowledge about the risk of smoking while 50.7% of unemployed people have poor knowledge about the risk of smoking (p-value = 0.002). However, there is limited evidence available on the impact of different types of

occupation on the knowledge regarding smoking risks.

Conceptual Framework



Materials and Methods:

Study design; Cross- sectional descriptive study design.

Study area/population

Study area

The study will be conducted in Sibu District of Sarawak. The estimated population of Sibu is 247,995.

Study population

The study population would be both male and female adults aged between 18 to 60 in Sibu districtdistrict.

Sampling method/size

Sampling method

Convenience

Sample size

Sample Size for Frequency in a Population

Population size(for finite population correction factor or fpc)(*N*):	247995
Hypothesized % frequency of outcome factor in the population (*p*):	63.5%+/-5
Confidence limits as % of 100(absolute +/- %)(*d*):	5%
Design effect (for cluster surveys-*DEFF*):	1

Sample Size(*n*) for Various Confidence Levels

ConfidenceLevel(%)	Sample Size
95%	356
80%	153
90%	251
97%	436
99%	614
99.9%	1000
99.99%	1396

Equation

Sample size $n = [DEFF*Np(1-p)]/ [(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]$

Results from OpenEpi, Version 3, open source calculator--SSPropor
Print from the browser with ctrl-P
or select text to copy and paste to other programs.

Study period

Study period is from April 2020 july 2020

Inclusion/ exclusion criteria

Inclusion criteria

- Adult male and female aged between 18 to 60 years old.
- Currently residing in Sibu district

Exclusion criteria

- Unable to comprehend English or Malay
- Current smokers

Research instruments

The questionnaire for this research is prepared in two languages (English and Malay) so that it would be easier for both the interviewers and respondents to comprehend it. Informed consent form is also prepared and distributed to the respondents before they can begin answering the questionnaires to ensure the confidentiality the information. Part A described on sociodemographic status of the participants. The participants' age may range from 18 – 60 years old and includes both genders. Ethnicity includes Malay, Chinese, Iban, Melanau, Bidayuh and others. Marital status of participants includes single, married, and divorced/widowed. Highest educational level of the participants includes no formal education, primary school, secondary school and university. Current occupation includes working outdoor/field worker, indoor/ office-worker, or unemployed.

Part B described about the smoking status of the participants ie. non-smoker or ex-smoker.

Part C depicted the perception towards cigarette smoking among the participants. This part is divided into 4 sections. The first three sections consisted of 5 statements each while the last section consisted of 6 statements. The first section detailed statements about the participants personal perception towards cigarette smoking. The second section described the aesthetic perception while the third section elucidated social perception towards cigarette smoking. The last section talked about cigarette smoking in public places. The options of responses range from strongly disagree, disagree, neutral, agree to strongly agree.

Part D consisted of 9 questions detailing the awareness of risks of cigarette smoking among participants. The participants may respond yes, no or don't know to these statements.

Data Collection Procedure

The permission to conduct this research was obtained and granted by the Associate Dean and the senior lecturers of the Faculty of Medicine of SEGi University. Each researcher will introduce themselves and provide a short explanation regarding this research. Informed consent was obtained from the respondents before we begin the questionnaires. The respondents may ask questions in case of any difficulty.

Data entry and data analysis

The data collected was edited, coded and entered accurately in the Microsoft Excel Spreadsheet. It was then analyzed using SPSS for Windows Version 22.

Frequency tables were used to demonstrate the

sociodemographic characteristics, smoking status of the respondents, perception level towards cigarette smoking and the awareness level of risks of cigarette smoking among the Sibu population. Cross tabulation and Chi-square test were used to illustrate the association between the risk factors and the outcomes. A P-value of ≤ 0.05 is considered statistically significant whereas a P-value of ≤0.001 is very statistically significant.

Age	Frequency	Percent
< 20 yr	16	4.5
20 - 29 yr	223	62.6
30 - 39 yr	64	18.0
40 - 49 yr	36	10.1
50+ yr	17	4.8
Total	356	100.0

For this questionnaire, scores are only given for Part C and Part D. For Part C, there are positive statements which are statements against cigarette smoking and negative statements which are statements supporting the act of cigarette smoking. For positive statements, scores are given according to this system: 1 for 'Strongly Disagree', 2 for 'Disagree', 3 for 'Neutral', 4 for 'Agree' and 5 for 'Strongly Agree'. However, this scoring is reversed for negative statements: 1 for 'Strongly Agree', 2 for 'Agree', 3 for 'Neutral', 4 for 'Disagree' and 5 for 'Strongly Disagree'. Respondents may obtain a total score ranging from 0 to 105 for these 21 statements in Part C.

Then, we categorized the overall perception towards cigarette smoking into 3 categories: negative, moderately positive and strongly positive; using the Bloom's cut-off (60%-80%). Any scores that are <60% which translates into scores that are <63 indicate a negative perception while any scores within 60% to 80% which translates into scores between 63 and 84 indicates a moderately positive perception towards cigarette smoking. A score of >80% which translates into scores of >84 implies a strongly positive perception towards cigarette smoking.

For Part D, there are 9 questions which consist of statements about the risks of smoking. A score of 1 is given for the answer 'Yes' while a score of 0 is given for the answers 'No' and 'Don't Know'. Respondents may obtain a total score ranging from 0 to 9. A total score within 0-3 is considered a poor awareness of risk of cigarette smoking. Any scores within 4-6 indicates a moderate awareness while scores within 7-9 implies a good awareness about risk of cigarette smoking.

Ethical Considerations

Participation of the respondents in this research was 100% voluntary. They may withdraw from this research at any point of time or skip the question that they refuse or feel uncomfortable to answer. A serial number is assigned to each respondent to identify the right data collection forms in case of any errors in the middle of the data entry process. This is also to ensure that the participants' personal information remain confidential throughout data collection and data storage. As part of informed consent, all participants were informed how and to whom the information will be shared, utilized, published, or stored.

The objectives of this study were also explained before obtaining the respondents' informed consent and before giving out the questionnaires. To avoid any favor when receiving answers, no incentives were provided. Participants were encouraged to ask questions when in doubt. These questionnaires were revised and edited with guidance from our supervisor.

Results:

Sociodemographic characteristics and smoking status of participants

Table 1: Age distribution of the participants

The total number of participants in this study is 356 people, ranging from age 18 to 60 years old. We categorized the age into 5 groups which are less than 20 years, 20-29 years, 30-39 years, 40-49 years, and more than 50 years. Out of this, majority of the participants are among the group age of 20-29 years old with 62.6%, which falls under the younger age group.

Table 2: Gender distribution, ethnicity, marital status, education level, and occupation of the participants

		Frequency	Percent
Gender	Male	147	41.3
	Female	209	58.7
	Total	356	100.0
Ethnicity	Malay	95	26.7
	Chinese	81	22.8
	Iban	100	28.1
	Melanau	39	11.0
	Bidayuh	9	2.5
	Others:	32	9.0
	Total	356	100.0
Marital status	Single	215	60.4
	Married	123	34.6
	Divorced / Widowed	18	5.1
	Total	356	100.0
Education	No formal education	12	3.4
	Primary school	10	2.8
	Secondary school	147	41.3
	University	187	52.5
	Total	356	100.0
Occupation	Outdoor/ Fieldworker	62	17.4
	Indoor/Office-worker	187	52.5
	Unemployed	107	30.1
	Total	356	100.0

		Perception Level			
		Negative	Moderately positive	Strongly Positive	Total
Have you ever smoked cigarettes in your life?	Non-smoker	9	89	154	252
	Ex-smoker	12	66	26	104
Total		21	155	180	356

For gender distribution among the participants, the total number of male participants are 147 (41.3%) and the total number of female participants are 209 (58.7%), thus majority being female. A large number of the participants are Iban (28.1%), followed by Malay (26.7%) and Chinese (22.8%). The rest are Melanau (11%), others (9%) and Bidayuh (2.5%). Out of the total 356 participants, 60.4% are single, followed by married (34.6%), and divorced/widowed (5.1%). In terms of education level, 52.5% of the participants studied until university, followed by secondary school (41.3%), no formal education (3.4%) and primary school (2.8%). As for the occupational aspect, 52.5% of the participants are indoor/office worker, followed by unemployed (30.1%), and outdoor/field worker (17.4%).

Table 3: Distribution of smoking status of participants.

	Frequency	Percent
Non-smoker	252	70.8
Ex-smoker	104	29.2
Total	356	100.0

Among the 356 participants, majority of the participants are non-smoker (70.8%) followed by ex-smoker (29.2%).

Factors influencing perception level towards cigarette smoking

Table 4: Perception level towards cigarette smoking among Sibu community.

	Frequency	Percent
Negative	21	5.9
Moderately positive	155	43.5
Strongly positive	180	50.6
Total	356	100.0

The results show that out of the total 356 participants, the majority of participants have strongly positive perception (50.6%), followed by moderately positive (43.5%) and negative perception (5.9%). Based on this result, we can conclude that most of our participants have strongly positive perception and are against cigarette smoking.

Association between smoking status and perception level

Table 5: Perception level based on smoking status
Pearson Chi-Square40.301, P-value <0.001

		Perception Level			
		Negative	Moderately Positive	Strongly Positive	Total
sex:	M	11	81	55	147
	F	10	74	125	209
Total		21	155	180	356

Among the 252 non-smokers, majority of them have strongly positive perception (61.1%) followed by moderately positive (35.3%) and negative (3.6%). But among 104 ex-smokers, majority of them have moderately positive perception (63.5%), followed by strongly positive (25%) and negative (11.5%). Comparing non-smokers and ex-smokers, non-smokers have the highest number of strongly positive perception towards cigarette smoking. Based on chi square test, p-value is <0.001, indicating a highly significant difference in the perception level towards cigarette smoking between different smoking status.

Association between age group and perception level

Table 6: Perception level based on age group
Pearson Chi-Square 10.296, P-value 0.245

		Perception Level			
		Negative	Moderately positive	Strongly Positive	Total
Age Group	< 20 yr	3	6	7	16
	20 - 29 yr	8	96	119	223
	30 - 39 yr	6	28	30	64
	40 - 49 yr	2	18	16	36
	50+ yr	2	7	8	17
Total		21	155	180	356

Among the total 356 participants, majority of the respondents are 20-29 years old with 223 (62.6%) participants, followed by 30-39 years old with 64 (18%) participants, 40-49 years old with 36 (10.1%) participants, more than 50 years old with 17 (4.8%) participants and less than 20 years old with 16 (4.5%) participants respectively. Even though the age group 20-29 years old have highest number of participants, they also have the highest respondents with strongly positive perception (53.4%), followed by moderately positive (43%) and negative perception (3.6%). Those aged 20 and below have (43.8%)

strongly positive, (37.5%) moderately positive and (18.8%) negative while those aged 30 -39 years old have (46.9%) strongly positive, (43.8%) moderately positive and (9.4%) negative. Participants within the age 40-49 years old have (44.4%) strongly positive, (50%) moderately positive and (5.5%) negative. Last but not least, those aged more than 50 years old have (47%) strongly positive, (41.2%) moderately positive and (11.8%) negative. Based on chi-square test with p-value being more than 0.05, the difference in perception between different age group is not significant.

Association between gender and perception level towards cigarette smoking

Table 7: Perception level based on gender

Pearson Chi-Square17.313, P-value <0.001

From our research, there are total of 209 females (58.7%) and 147 males (41.3%) respectively. And among the female respondents, majority of them have strongly positive perception level (59.8%) followed by moderately positive (35.4%) whereas in male, highest respondents are in moderately positive perception level (55.1%) followed by strongly positive (37.4%). Furthermore, only a small proportion of 4.8% of female respondents have negative perception whereas about 7.4% of male respondents have negative perception. Based on chi-square test with p value <0.001, there is a highly significant difference between gender and perception level on cigarette smoking.

Association between education level and perception level towards cigarette smoking

Table 8: Perception level based on education level

Pearson Chi-Square

23.154, P-value <0.001

		Perception Level			
		Negative	Moderately Positive	Strongly Positive	Total
Education level	No formal education	4	5		12
	Primary school	2	4	4	10
	Secondary school	9	65	73	147
	University	6	81	100	187
Total		21	155	180	356

Based on the table above, about 100 respondents (53.4%) out of those who studied up till university level have strongly positive perception level whereas 81 respondents (43.3%) have moderately positive perception followed by 6 respondents (3.2%) having negative perception. As for secondary school leavers, 49.6% have strongly positive perception followed by moderately positive (44.2%) and (3.2%) negative. Primary school leavers have 40% on both strongly and moderately positive perception and 20% negative perception. For those with no formal education 25% are strongly positive, 41.6% moderately positive and 33.3% are negative about cigarette smoking.Thus, we can conclude that there is a highly significant difference between perception level on cigarette smoking and education level as the p-value is <0.001.

Association between occupation and perception level towards cigarette smoking

Table 9: Perception level based on occupation

Pearson Chi-Square 20.162, P-value <0.001

		Perception Level			
		Negative	Moderately Positive	Strongly Positive	Total
Current Occupation	Outdoor/ Fieldworker	10	29	23	62
	Indoor/Office-worker	8	72	107	187
	Unemployed		54	50	107
Total		21	155	180	356

In our research, more than half of the respondents are indoor/office-workers with 187 participants (52.5%) followed by unemployed with 107 participants (30%) and 62 outdoor/field workers (17.4%). Indoor/office worker have highest respondent towards strongly positive perception (57.2%) followed by moderately positive (38.5%) and negative perception (4.2%) Most of the outdoor/fieldworkers 46.8% have moderately positive perception, followed by 37.1% strongly positive and 16.1% negative. Among those unemployed, majority of them (50.5%) are moderately positive, followed by 46.7% strongly positive and only 2.8% are negative. The difference between in perception level between different occupation is highly significant as p-value is less than 0.001.

Factors influencing the awareness level of risk of cigarette smoking

Table 10: Awareness level of risk of cigarette smoking among the Sibu community.

		Frequency	Percent
	Poor	11	3.1
	Moderate	54	15.2
	Good	291	81.7
	Total	356	100.0

From our research we found that our of 356 participants 81.7% (291 participants) are having good awareness of risk of cigarette smoking. While 15% (54 participants) are having moderate knowledge about the risk of smoking, and 3.1% (11 participants) are having poor knowledge about the risk of smoking. In general the majority of the participants are having good awareness of risk of cigarette smoking.

4.3.1 Association between smoking status and awareness level of risk of cigarette smoking

Table 11: Awareness level of risk of cigarette smoking based on smoking status.

		Awareness Level			
		Poor	Moderate	Good	Total
Have you ever smoked cigarettes in your life?	No	6(2.9 %)	39(18.8%)	207(82.1 %)	252
	Yes	5(4.8 %)	15(14.4%)	84(80.8%)	104
Total		11	54	291	356

Pearson Chi-Square1.474, P-value 0.479

Comparing non-smokers and ex-smokers, non-smokers have the highest level of awareness of risk of cigarette smoking among the general population (58.1%). However, based on chi square test, p-value is >0.05, thus there is no significant difference between smoking status and awareness level of risk of cigarette smoking.

Association between age group and awareness level of risk of cigarette smoking

Table 11: Awareness level of risk of cigarette smoking based on age group

Pearson Chi-Square4.768, P-value 0.782

		Awareness Level			
		Poor	Moderate	Good	Total
Age Group	< 20 yr	1(6.3 %)	4(25 %)	11(68.8 %)	16
	20 - 29 yr	6(2.7 %)	30(13.5%)	187(83.9 %)	223
	30 - 39 yr	3(4.7 %)	11(17.2%)	50(7.8%)	64
	40 - 49 yr	1(2.8 %)	5(13.9 %)	30(83.3 %)	36
	50+ yr	0(0%)	4(23.5 %)	13(76.5 %)	17
Total		11	54	291	356

Out of 16 participants who are under 20 years old 68% are having good knowledge of risk of cigarette smoking, while 25% have moderate knowledge, and 6.2% are having poor knowledge of risk of cigarette smoking. The majority of the participants are falling in the age group between 20 and 29 years old. Out 223 participants 83.85% have good knowledge about risk of cigarette smoking . While 13.4% are having moderate knowledge, and 2.6 % are having poor knowledge of risk of cigarette smoking. 64 participants are falling in the age group between 30 and 39 years old 78.1% of the participants are having good knowledge about the risk of cigarette smoking while 17.1% are having moderate knowledge, and 4.6 % are having poor knowledge of risk of cigarette smoking. Out of 36 participants falling in the age group between 40 and 49 years old 83.3% are having good knowledge about the risk of cigarette smoking while 13.8 % are having moderate knowledge, and 2.7% are having poor knowledge of risk of cigarette smoking. And out of 17 participants who are above 50 years old 76.4% are having good knowledge about the risk of cigarette smoking, and 23.6% are having moderate knowledge, while no one are having poor knowledge of risk of cigarette smoking.

From that we can conclude that there are no significant difference in knowledge between different age groups (P-value >0.05).

4.3.3 Association between gender and awareness level of risk of cigarette smoking

Table 11: Awareness level of risk of cigarette smoking based on gender

		Awareness Level			
		Poor	Moderate	Good	Total
Gender:	Male	4(2.7%)	17(11.6%)	126(85.7 %)	147
	Female	7(3.3%)	37(17.7%)	165(78.9 %)	209
Total		11	54	291	356

Pearson Chi-Square2.738, P-value 0.254

The are 147 male participants, 85.7 % are having good knowledge about risk of cigarette smoking, 11.56% are have moderate knowledge, while 2.72% are having poor knowledge about risk of cigarette smoking. And out of 209

female participants 78.9% are having good knowledge about the risk of cigarette smoking, while 17.7 % are having moderate knowledge, and 3.3% are having poor knowledge about the risk of cigarette smoking.

		Awareness Level			Total
		Poor	Moderate	Good	
Current Occupation	Outdoor/Fieldworker	2(3.2%)	15(24.2%)	45(72.6%)	62
	Indoor/Office-worker	5(2.7%)	32(17.1%)	150(80.2%)	187
	Unemployed	4(3.7%)	7(6.5%)	96(89.7%)	107
Total		11	54	291	356

In general there is no significant difference between the gender about the awareness of risk of cigarette smoking (P-value >0.05).

Association between education level and awareness level of risk of cigarette smoking

Table 11: Awareness level of risk of cigarette smoking based on education level

Pearson Chi-Square43.268, P-value <0.001

		Awareness Level			Total
		Poor	Moderate	Good	
Education level	No formal education	2(16.7%)	7(58.3%)	3)(25%)	12
	Primary school	0(0%)	4(40%)	6(60%)	10
	Secondary school	6(4.1%)	28(19%)	113(76.9%)	147
	University	3(1.6%)	15(8%)	169(90.4%)	187
Total		11	54	291	356

Out of the total participants, there are 12 participants who received no formal education, 25% only are having good knowledge about the risk of cigarette smoking, while 58.3 % are having moderate knowledge, and 16.6% have poor knowledge about the risk of cigarette smoking. Out of 10 participants who have studied till primary school, 60% are having good knowledge about the risk of cigarette smoking, and 40% are having moderate knowledge, while no one have poor knowledge of risk of cigarette smoking. Out of 147 participants whose education level is secondary school, 76.8% are having good knowledge about the risk of cigarette smoking. And 19% are having moderate Knowledge, while 4% are having poor knowledge about the risk of cigarette smoking. And out of 187 participants whose education level is university, 90.37% are having good knowledge about the risk of cigarette smoking, and 17.7% have moderate knowledge, while 1.6% are having poor knowledge about the risk of cigarette smoking. There is strongly significant difference between the awareness of risk of cigarette smoking and educational level, as those with higher education have better awareness about the risk of cigarette smoking (P-value <0.001).

Association between occupation and awareness level of risk of cigarette smoking

Table 11: Awareness level of risk of cigarette smoking based on occupation

Pearson Chi-Square10.822, P-value 0.029

Out of the total number of participant, there are 62 who are outdoor workers, 72.5% of them are having good knowledge about the risk of cigarette smoking, and 24.1% are having moderate knowledge about the risk of cigarette smoking, while 3.2% are having poor knowledge about the risk of cigarette smoking. And out of total participants, 187 are indoor worker, 80.2% of them are having good knowledge about the risk of cigarette smoking, and 17.1% are having moderate knowledge about the risk of cigarette smoking, while 2.67% are having poor knowledge of risk of cigarette smoking. There are 107 participants who are unemployed, 89.7% of them have good knowledge about the risk of cigarette smoking and 6.5% are having moderate knowledge about the risk of cigarette smoking, while 3.7% are having poor knowledge about the risk of cigarette smoking.

There is significant difference between occupation and awareness of risk of cigarette smoking, as unemployed has better knowledge than the indoor and outdoor worker (P-value 0.029)

Discussion

Perception level of the general public towards cigarette smoking

Our study revealed a huge majority of the participants having positive perception towards cigarette smoking, with 50.6% having strongly positive perception and 43.5% with moderately positive perception. Only a minor proportion of 5.9% have negative perception towards cigarette smoking. Comparing the result from a study in Kuantan, Malaysia in 2016 which discovered that the general public's perception was moderate (Nurul *et al*., 2016), there is now a higher proportion of participants who are against the act of cigarette smoking compared to the past. This may be explained by the improved level of knowledge regarding the harmful effects of primary and secondary smoking through mass media counter-marketing strategies and public health promotion; contributing to the more positive perception towards cigarette smoking among today's generation.

Association between sociodemographic factors and smoking status and perception towards smoking cigarette

Among the factors influencing the people's perception investigated in our research include smoking status: whether a person is a non-smoker or ex-smoker; and sociodemographic factors such as age, gender, education level and occupation. We found that perception level towards cigarette smoking were associated with smoking status and sociodemographic factors as mentioned earlier, except for age group. Our findings were similar to a past

study by Nurul Izzati *et al*., 2016 where there were significant association for smoking status, gender, education level with perception level. However, information regarding the impact of different types of occupation on the perception level was unavailable due to lack of past literatures investigating this factor.

Non-smokers were more likely to have more positive perception compared to ex-smokers in our study. The difference between smoking status may be due to the participants' educational background where non-smokers probably have better education level compared to ex-smokers. They have chosen not to smoke in the first place as they are better at making informed choices because they have better knowledge and perception about the risks of smoking. A similar result was found in a previous research where smoking status was an important predictor of people's perception towards cigarette smoking.

In contrast, the perception level towards cigarette smoking was not associated with age groups, meaning the perception were similar regardless of the age of participants. Everyone in this study was probably exposed to the same media and public health promotion in their environment. However, a different study found that perception was influenced by age. People of more advanced age were indirectly more likely to encounter smoking-related health problems, thus causing them to develop an opposing attitude against smoking (Lim *et al*., 2013).

From our study, females were found to have significantly more strongly positive perception compared to males with majority of them having moderately positive perception towards cigarette smoking. The findings from our research may be explained by the nature of smoking prevalence in males. A similar result was found by Nurul Izzati *et al*., 2016, where men had less positive perception than women because they tend to believe that smoking is a symbol of attraction to women and that smoking may help release stress and increase work performance. They may also have underestimated the power of addiction and the risks of smoking, thinking that smoking would not impact them as much others (Nurul *et al*., 2016). Other than that, people of higher education level were revealed to have better perception than those with lower education level from our research. This was similar to findings from a previous study where people of better education were more likely to be receptive towards anti-smoking campaigns and initiatives. This may be due to the positive influence from their study environment where smoking is usually not permitted and health education about the risks of smoking was widely available. This consequently altered their perception towards cigarette smoking. The ones with little or no education only received early exposure and education limited to home.

Limited evidence were found regarding the effect of different types of occupation on perception towards smoking. Nonetheless, our study discovered a significant association between occupation and perception. People who work in office or indoor have strongly positive perception compared to those working outdoors or as fieldworkers and those who are unemployed. This may be partly due to the environment they are working in where "No Smoking" rule applies, therefore shaping their perception into thinking that smoking is rather unacceptable. In comparison, those who work outdoor think it is acceptable to smoke at their workplace. Furthermore, this may be related to their educational level too, where people with higher educational level are more likely to be working indoor compared to those working outdoor or unemployed.

Awareness level of the general public about the risk of cigarette smoking

In general, majority of our respondents (81.7%) had good awareness, (15.2%) had moderate awareness and only (3.1%) respondents had poor awareness level of risk of cigarette smoking. This could be because majority of our respondents had higher educational level which contribute to their good level of knowledge on harmful effects of smoking and this lead to good awareness level of our participants regarding the risk of cigarette smoking. In a previous study by Dao Thi Minh, general knowledge on the health risks of active smoking (AS) and exposure to second-hand smoke (SHS) was good (A Dao Thi Minh An *et al*., 2016).

Association between sociodemographic factors and smoking status and awareness level of risk of cigarette smoking

Based on our study, there was no significant association between all demographic factors with awareness level except for education level and occupation. This means the level of awareness were similar regardless of their age, gender and smoking status.

In our study, there was no significant difference between different age group and awareness level. All age group had good level of awareness. For younger age group, this could be because of early exposure and education that starts from home. For advanced age, the increasing age will indirectly expose them to encounter smoking related health problems, and tends to make these people more receptive to public health messages. In a previous study by Dao Thi Minh, increasing age was positively associated with knowledge of health consequences of second hand smoke (A Dao Thi Minh An *et al*., 2016). However, in our study, there was no significant difference between age group and awareness level of risk of cigarette smoking.

A study by Nurul Izzati AH, found that gender was not associated with knowledge towards smoking. Our study also found that there is no significant difference between gender and awareness level of risk of smoking. Even though the scores of awareness for female are higher as compared to males the p-value of 0.254 meant that the difference was not statistically significant. This result may be due to participants were more alert and conscious about health. Therefore, they might have interest to learn health-related knowledge regardless of their gender.

Based on Nurul Izzati AH, comparison of knowledge scores towards smoking between different education levels, yield the p-values of more than 0.05. This means that there were no statistical significant differences in term of knowledge towards smoking in different levels of education owever, in our study we found very statistical significant difference between different education levels and awareness. In general, people with university education (47.4%) had the highest level of awareness than those with

no formal education (0.8%). This could be because those from university have higher health knowledge while those with no formal education have low health knowledge. Dao Thi Minh also found adults with secondary education, college education or above had significantly higher levels of knowledge of active smoking and second hand smoke health risks than those with primary education.

In our study we found that occupation was significantly related to awareness level. People who work indoor/office workers (42.1%) had the highest level of awareness than those who are outdoor/field workers (12.6%). This could be because indoor/office workers have more exposure and knowledge regarding the harmful effect of cigarette smoking compared to outdoor/fieldworker. Previous study on the relationship between occupation and awareness level of risk of cigarette smoking was limited.

Based on Pin Zheng 2013, non-smokers exhibited greater knowledge of awareness of harms of smoking than smokers. Another study also demonstrated that non-smokers had a significantly higher likelihood of demonstrating better knowledge on health risks related to active smoking and second-hand smoke than smokers (A Dao Thi Minh An *et al.*, 2016). Based on our study, non-smokers had higher awareness level than ex-smokers. However, there was no significant difference between smoking status and awareness level. This could be because they might have received the same smoking-related knowledge from mass media such as internet and television.

Limitations

Throughout this study, there were limitations such as participants provided self-reported data which possibly included biased report and recalling history. Nevertheless, all the participants were kindly instructed to think thoroughly and answer the questionnaires with full honesty, and were assured of confidentiality anonymity to their answers. Due to our sample size of this research study which may seem to be smaller, as well as our convenient sampling method which may limit the ability to represent the whole Sibu district population accurately. Furthermore, Sibu has various ethnicities and based on the small sample size that had been done in this research, the number of respondents may not be equally distributed amongst all ethnics. Other than that, due to multiracial background with various educational levels, some participants required to be explained by details of each question within the questionnaires. A few participants necessitate translations to their respective language in order to fully understand of questions asked. Finally, this cross sectional study design may not accurately determine the respondent's perception and awareness of risk of cigarette smoking at a later time. Because we use non-probability convenience sampling as our sampling method, our participants may not be representative of Sibu population.

Conclusion

In conclusion, the perception and awareness of risk of cigarette smoking among Sibu community is high with more than half of our respondents having good awareness level and strongly positive perception towards smoking. Based on this research, we can conclude that sociodemographic factors such as gender, education and occupation play a role in different perception level towards cigarette smoking. As for the awareness of risk of cigarette smoking, education and occupation play a major role in determining the awareness level.

The findings from this study might be useful for the relevant authorities in predicting perception regarding this research topic in the area of study. As well as more awareness and knowledge can be spread through bigger scale campaigns regarding health risks of smoking and second-hand smoke. By doing this, the rate of smoking-related diseases such as lung cancer might be reduced in the future, all due to public education. There are a few recommendations that can be made if there is at all any future study of the same topic as this research. We would suggest investigating perception and knowledge on cigarette smoking and second-hand smoke between urban and rural by increasing the coverage of study area to other parts of Sarawak.

Refernaces

Abdullah M, Karim AA, Goh KL (2010) Late presentation of esophageal cancer: Observations in a multiracial South-East Asian population. J Dig Dis. 11, pp. 28-33.

Abidin E, Hashim Z, Semple S. (2013) Second-Hand Smoke in Public Spaces: How Effective has Partial Smoke-Free Legislation Been in Malaysia? Asian Pacific Journal of Cancer Prevention. 14 (11), pp. 6845-6850.

A Dao Thi Minh An, Hoang Van Minh. (2013) Knowledge of the health consequences of tobacco smoking: a cross-sectional survey of Vietnamese adults. Global health action.

Al-Naggar A, Redhwan AJ, Ammar A, Bobryshev YV. (2012) Prevalence of cigarette smoking and associated factors among secondary school teachers in Malaysia. Asian Pac J Cancer Prev. 13, pp. 5539-43.

Al-Sadat N, Misau AY, Zarihah Z, Su TT. (2010) Adolescent tobacco use and health in Southeast Asia. Asia-Pacific J Public Heal. 22(3), pp. 1755- 805.

Brandt A. The Cigarette Century: The Rise, (2007) Fall, and Deadly Persistence of the Product That Defined America. New York: Basic books.

Cheah YK, Naidu BM. (2012) Exploring factors influencing smoking behaviour in Malaysia. Asian Pac J Cancer Prev. 13, pp. 1125-30.

Cite as - Chua P, Shean Y, Lim E, et al. (2013) Tobacco Use & Nicotine Dependence in a Selected Village of Northern Borneo. Borneo J Med Sciences. 7, pp. 28-36.

Doll, R.; Hill, B. (2004). "The mortality of doctors in relation to their smoking habits: a preliminary report: (Reprinted from Br Med J 1954:ii;1451-5)". BMJ (Clinical research ed.). 328 (7455), pp. 1529–1533.

(2013) Epidemiology of smoking among Malaysian adult males: prevalence and associated factors. BMC Public Health. 13, pp. 8.

Gately, Iain. (2004) Tobacco: A Cultural History of How an Exotic Plant Seduced Civilization. Diane.

Institute For Public Health. (2011) Report of the Global Adult Tobacco Survey (GATS) Malaysia. Kuala Lumpur.
Institute For Public Health, National Health and Morbidity Survey. (2015) Report on Smoking Status Among Malaysian Adults. Kuala Lumpur.

Juslina O, Leelavathi M, Khairani O, Iryani T. (2011) Prevalence of smoking among secondary school students in Sarawak. Malaysian Fam Physician. 6(2), pp. 66.

Kuang Hock Lim. (2017) Smoking among school-going adolescents in selected secondary schools in Peninsular Malaysia- findings from the Malaysian Adolescent Health Risk Behaviour (MyaHRB) study.

Liam CK, Pang YK, Leow CH, Shymala P, Menon AA. (2006) Changes in the distribution of lung cancer cell types and patient demography in a developing multiracial Asian country. Lung Cancer. 53, pp. 23-30.

Lim KH, Amal NM, Hanjeet K, Wan Rozita WM, Sumarni. (2005) Prevalence, knowledge and attitude towards Risk of smoking among elderly males aged 60 years and above in Malaysia. Mal J Public Health Med. 5(2), pp. 32–8.

Lim KH, Amal NM, Hanjeet K, et al. (2006) Prevalence and factors related to smoking among secondary school students in Kota Tinggi District, Johor, Malaysia. Trop Biomed. 23(1), pp. 75-84.

Lim K, Teh C, Nik Mohamed M, Pan S, Ling M, Mohd Yusoff M et al. (2018) Exposure to tobacco second hand smoke and its associated factors among non-smoking adults in smoking-restricted and non-restricted areas: findings from a nationwide study in Malaysia. BMJ Open. 8(1), e017203.

Mahdi Fallahi, Norashidah MN. (2015) The impact of Human Development on Cigarettes Consumption in Malaysia. International Journal of Economics and Management.

Manaf RA, Shamsuddin K. (2018) Smoking among Young Urban Malaysian Women and its Risk Factors. Asia Pac J Public Health. 20, pp. 204-13.

Masran M, Syed Mohamed A. (2006) The study of smoking effect on work performance among staff of Health Department of Malacca. J KesihatMasy. 12 (1).

Minhat HS, Huda BZ, Anita AR, Muhammad Hanafiah Juni. (2015) Knowledge on Smoking Behaviour among Felda Settler in Malaysia. International Journal of Public Health and Clinical Sciences. 2(1), pp. 128-134

Ministry Of Health Malaysia. Institute for Public Health. The Third National Health and Morbidity Survey (NMHS III) 2006: executive summary. Kuala Lumpur, Malaysia: Ministry of Health Malaysia, Kuala Lumpur.

Nurul Izzati AH, Nor Azlina AR, Nor Iza AR, Mainul H. (2016) Knowledge, Attitude and Practice towards Smoking among International Islamic University Malaysia Kuantan Communities. International Medica Journal Malaysia. 15(2), pp. 19-26.

Osman A. (2007) Prevalence of Smoking Among Secondary School Students and Its Associated Factors in the District of Kuantan, Malaysia, Master Of Science Thesis. Universiti Putra Malaysia.

Parkin C, Fairweather DB, Shamsi Z, Stanley N, Hindmarch I. (1998) "The effects of cigarette smoking on overnight performance". Psychopharmacology. 136 (2)
Pillay KVK, Htun M, Naing NN, Norsa'adah B. (2007) Helicobacter Pylori Infection in Peptic Ulcer Disease: the Importance of Smoking and Ethnicity. Southeast Asian J Trop Med Public Heal. 38(6), pp. 1102-10.

PinPin Zheng Haihong Qian Fan Wang Shaojing Sun Eric J. Nehl Frank Y. Wong (2013) Health Education Research, Volume 28, Issue 5, pp. 879–887.

Shafey O, Dolwick S, Guindon GE, editors. (2003) Tobacco Control Country Profiles. Atlanta, GA: American Cancer Society.

Shamsuddin K, Abdul Haris M. (2000) Family influence on current smoking habits among secondary school children in Kota Bharu, Kelantan. Singapore Med J. 41(4), pp. 167-71.

Tee GH, Gurpreet K, Hairi NN, Zarihah Z, Fadzilah K. (2013) Smoking behaviours and attitudes toward tobacco control among assistant environmental health officer trainees. Int J Tuberc Lung Dis. 17, pp. 1652-5.

Wei Lei Hum. (2016) A Review of Smoking Research in Malaysia Med J Malaysia Vol 71.

WHO/WPRO (2002) Smoking Statistics. World Health Organization Regional Office for the Western Pacific.

World Health Organization. (2008) World Health Organization. WHO Report on the Global Tobacco Epidemic.

Zulkifli A, Abidin N, Abidin E, Hashim Z, Rahman A, Rasdi I et al. (2014) Implementation of Smoke-free Legislation in Malaysia: Are Adolescents Protected from Respiratory Health Effects. Asian Pacific Journal of Cancer Prevention. 15(12), pp. 4815-4