

ASSESSMENT OF SMOKING BEHAVIOR AMONG MALAY MALE SMOKERS IN KELANTAN, MALAYSIASITI KHARIEM SOPHIA M^{1*}, NURIWANI AR¹, IMRAN AHMAD², RUZILAWATI AB¹¹Department of Pharmacology, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia. ²Department of Family Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia. E-mail: tieimran@yahoo.com

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ABSTRACT**Objective:** The aim of this study was to assess smoking behavior among Malay male smokers in Kelantan, Malaysia.**Methods:** Volunteers (n=496) were recruited in the study by randomly selected manner. The participants were categorized as smokers (n=248) and non-smoking controls (n=248). All participants were given data collection sheets to record their information. The participants who were selected in smokers group (n=248) were given a form containing questionnaires regarding their smoking behavior. The participants were asked about their smoking history such as smoking initiation age, factors that influence smoking behavior, number of cigarettes daily, number of quitting attempts, and methods of quitting attempts. The validated Malay version of Fagerstrom test for nicotine dependence (FTND-M) was used to measure physical dependence on nicotine among smokers.**Results:** The study revealed that smokers in this study group were mainly light smokers. More than half of the participants, i.e., 51.6% (n=128), in this study had an FTND-M score lower than 2 (very low nicotine dependence). The minimum smoking initiation age of the participants in this study was 10 years whereas the maximum age was 40 years. Most of the participants start smoking at the age of <20 years with the higher frequency being 18 years. More than half of the participants (58.5%) claimed that peer influence is the main factor initiating their smoking behavior. From the study, about 50.4% (n=125) of participants used <10 sticks of cigarettes per day, 39.1% (n=97) used 11-20 sticks, 9.39% (n=23) used 21-30 sticks, while 1.2% of the participants used more than 31 sticks of cigarettes per day. Our data indicate that only 10.9% (n=27) of participants had tried more than 5 times to quit smoking. Even though new effective treatments are now available, almost half of the participants, i.e., 51.6% (n=128), had tried to quit smoking without any intervention.**Conclusion:** Data obtained from this study later may help the public health policy makers and practitioners, especially in Kelantan, Malaysia, to make smoking prevention strategies more effective.**Keywords:** Smoking behavior, Male smoker, Malay male and smoking assessment.© 2017 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>) DOI: <http://dx.doi.org/10.22159/ajpcr.2017.v10i2.15335>**INTRODUCTION**

Tobacco consumption is well known as a leading cause of preventable morbidity and mortality worldwide. Over a decade, cigarettes smoking cause many public health problems and becoming more important to focus. It is a major contributor to many diseases such as stroke [1], heart disease [2,3], chronic obstructive pulmonary disease [4], periodontal disease [5], peripheral vascular disease [6], pneumonia [7], lung cancer [8], and oral cancer [9].

In Malaysia, smoking-related diseases have been the primary cause of mortality for the past three decades. It is estimated that one-fifth of disability adjusted life years and one-third of years of life lost for Malaysians were due to smoking-related diseases [10,11]. According to the Ministry of Health Malaysia (MOH), tobacco use in Malaysia accounts for 35% of in-hospital deaths, principally from cancer, heart disease, and stroke. More than 10,000 Malaysians die from smoking-related illnesses each year [12]. Statistics from the MOH in 2006 revealed that diseases related to smoking remained the top causes of death in MOH hospitals, accounting for more than 15% of hospitalizations and 35% of in-hospital deaths. Heart diseases and diseases of pulmonary circulation ranked first, accounting for 15.7% of these deaths, followed by malignant neoplasms (10.6%) and cerebrovascular diseases (8.5%) [12].

The objective of this study was to assess smoking behavior among Malay male smokers in Kelantan, Malaysia. Data obtained from this study later may help the public health policy makers and practitioners,

especially in Kelantan, Malaysia, to make smoking prevention strategies more effective.

METHODS**Subjects**

Overall, 496 volunteers were recruited. The participants were categorized as smokers (n=248) and non-smoking controls (n=248). To be included in the study, smokers were defined as having smoked more than 100 cigarettes in a lifetime and being a current smoker at the time of the study [13]. Non-smokers were defined as volunteers who never smoked cigarettes. Ex-smokers or those who had stopped smoking before the study were excluded from the study. Other exclusion criteria included history of cancer, coronary heart disease, liver disease, and undergoing treatment for drug addiction. The participants were informed about the experimental procedures and aim of the study before giving written informed consent. All participants were given data collection sheets to record their information. The data collection sheets were given based on smoking status group. Smoking history and family background of the participants were obtained. All participants who aged 18-50 years were included in the study. The study protocol was approved by our Local Research and Ethics Committee, School of Medical Sciences, Universiti Sains Malaysia.

Smoking behavior assessment

Smoking behavior was assessed with a questionnaire concerning tobacco use. Participants who were selected in smokers group (n=248) were given a form containing questionnaires regarding their smoking

behavior. Participants were asked about their smoking history such as smoking initiation age, factors that influence smoking behavior, number of cigarettes daily, number of quitting attempts, and methods of quitting attempts.

Fagerstrom test

The Fagerstrom test for nicotine dependence (FTND) is a widely used six-item questionnaire, which was used as a measure of physical dependence on nicotine [14]. The higher the Fagerstrom score, the more intense is the individual's physical dependence on nicotine. In this study, we used the validated Malay version of FTND-M [15]. The form was given to each participant who has been identified as smoker. The three yes/no items are scored 0 (no) and 1 (yes). The three multiple-choice items are scored from 0 to 3. The items are summed to yield a total score of 0-10. The score of the participants was calculated, and they were classified into five-level categorizations: Very low nicotine dependence (0-2), low nicotine dependence (3-4), moderate nicotine dependence (5), high nicotine dependence (6-7), and very high nicotine dependence (8-10) according to the score.

Statistical analysis

Demographic data of participants were analyzed using Independent sample t-test and Mann-Whitney test. $p < 0.05$ was considered statistically significant. All statistical analyses were performed using the SPSS package version 20 (IBM, Armonk, NY).

RESULTS AND DISCUSSION

A total of 496 Malay male individuals were selected based on the study's exclusion and inclusion criteria. The participants were divided into two groups comprising 248 smokers and 248 nonsmokers.

In our study, we focus on Malay male population aged between 18 and 50 years. According to the Global Adult Tobacco Survey Malaysia (GATS Malaysia) in 2011, Malay ethnic has the highest number of daily smokers compared to other ethnics. Among the three main ethnic groups in Malaysia, 22.3% of Malays, 17.2% of Indians, and 14.2% of Chinese were daily smokers. The proportions of non-smokers were 84.6% of Chinese, 80.4% of Indians, and 75.4% of Malays. Thus, this study was focusing only on the pure Malay individuals. To fulfill these criteria, we have selected Malay male individuals from three generations of Malay ethnic group (his father and mother, grandfather, and grandmother must be Malay). This is to avoid ethnic bias since Malaysia has multi-ethnic population, which can contribute to the trait of the individual.

Only male individuals were recruited in this study. One of the reason was smokers are more prominent in male. The GATS Malaysia reported 23.1% or 4.75 million Malaysian adults aged 15 years or older were current smokers of tobacco with 43.9% (4.64 million) of men and 1.0% (0.10 million) of women. According to Kahende *et al.* [16], in general, smoking may be up to five times more prevalent among men than women in some communities although the gender gap usually declines with younger age. In Egypt, for example, the prevalence of smokers among men was 97% compared to women and was higher among adults under the age of 45 years [17]. In the United States, smokers were more prevalent among men (20.5%) than women (15.3%) [18]. The first study on smoking habits in Sweden was performed in 1946

when 50% of men and 9% of women were smokers; in 1977, 32% of women and 41% of men were smokers. In Algeria, the smoking rate for men was 29.9 ± 2.5 whereas for women was 0.3 ± 0.2 [17].

Demographic data for the two groups such as age, weight, height, blood pressure (BP), and body mass index (BMI) were recorded and are shown in Table 1. There were no significant differences between the two groups for all the parameters except for age and brachial systolic blood pressure. Results were expressed as mean (standard deviation) for weight, height, BMI, and brachial systolic and diastolic blood pressure. The result was expressed as median (interquartile range) for age. The median age for nonsmokers group was 24.0 (16.0) years and for smokers group was 33.5 (19.0) years.

Based on the demographic data of the participants in this study, age and systolic BP showed significant difference between smokers group and nonsmokers group. The age of the participants in our study was selected between 18 and 50 years. The average age for non-smoker group was in the 20s while in smokers group was in the 30s. One reason could be that most of the males of nonsmoker group were recruited from institute of higher education which is Maktab Perguruan Pengkalan Chepa, Kelantan, Malaysia (College for teacher education) and Universiti Sains Malaysia. While compared to smoker group, participants were recruited in various locations in Kota Bharu, Kelantan, Malaysia. This supports the interpretation that the community and school level variables are predictive of adolescent smoking [19]. School achievement has been shown to be a strong predictor of smoking behavior [20].

Numerous cross-sectional studies indicate that body weight or BMI is lower in cigarette smokers than in nonsmokers [21,22]. Smoking's effect on body weight could lead to weight loss by increasing the metabolic rate, decreasing metabolic efficiency, or decreasing caloric absorption (reduction in appetite), all of which are associated with tobacco use. The metabolic effect of smoking could explain the lower body weight found in smokers [23]. Nicotine reduces body weight by raising the resting metabolic rate while blunting the expected increase in food intake in response to the increase in metabolic rate [24]. However, there is no significant difference observed between smokers and nonsmokers in terms of age and BMI in this study. The result is consistent with Schindler-Ruwisch *et al.* [25] that reported smokers have BMIs similar to the general population, for instance nonsmoker population. One possible reason could be the difference between the averages age of the nonsmoker group and smoker group. Studies show that increasing age will change body's composition and fat storage. This is due to the metabolism changes, less muscle mass, and increase body fat mass that impact the speed and degree of fat accumulation [26,27].

The significantly lower systolic BP between smokers compared to nonsmokers in this study might be because of various reasons. The study done by Mikkelsen *et al.* [28] demonstrated that the smokers presented lower mean daytime systolic BP readings. They suggested that this outcome was caused by an adaptive effect in the sympathetic nervous system after numerous years of exposure to nicotine. The authors emphasized that smoking also helps reduce stress, which could be associated with the lowering of BP [28]. A vasodilator effect of cotinine which is the major metabolite of nicotine also may contribute

Table 1: Demographic data of participants involved in the study

Variables	Mean±SD		p
	Non-smokers (n=248)	Smokers (n=248)	
Age (years) ^a	24.00±16.00 ^c	33.50±19.00 ^c	<0.001***
Height (m) ^b	168.60±0.06	168.00±0.06	0.307
Weight (kg) ^b	69.58±12.32	69.24±12.45	0.760
BMI (kg/m ²) ^b	24.47±4.16	24.50±4.05	0.945
Brachial systolic BP (mm/Hg) ^b	130.27±13.69	126.89±11.81	0.003**
Brachial diastolic BP (mm/Hg) ^b	75.91±9.45	75.42±9.91	0.578

^aMann-Whitney test, ^bIndependent samples t-test, ^cMedian. ** $p < 0.01$, *** $p < 0.001$. SD: Standard deviation, BMI: Body mass index, BP: Blood pressure

to the lower blood pressure. Cotinine relaxes vascular smooth muscle and dilates blood vessels *in vitro* [29].

Smoking initiation was defined as the age at which an individual first smoked a whole cigarette [30]. The minimum smoking initiation age of the participants in this study was 10 years whereas the maximum age was 40 years. Most of the participants start smoking at the age of <20 years with the higher frequency being 18 years. The GATS Malaysia reported that more than half (51.8%) of those aged 20-34 years and who had ever smoked on a daily basis had started smoking daily before the age of 18 years. This is consistent with the studies done by Bawazeer *et al.* [31], Felimban and Jarallah [32], and Haddad and Malak [33], which found that the most common age of smoking initiation was between 15 and 19 years among all smokers. According to Young *et al.* [34], the great majority of smokers start the habit before 20 years of age. In the United Kingdom, over 80% of adult populations started smoking before the age of 20 years [35].

There are many reasons for smoking, such as alleviation of stress, life problems, peer pressure, social acceptance issues, family history (parental modeling of smoking behavior), lower educational attainment, and lower economic status [33]. Young smokers desire to appear mature, self-confident, and independent and to attain a high personality profile [36]. Smith and Stutts [37] reported that the most important factors associated with smoking are family smoking behavior and peer pressure [37]. These statements support our result on the factors that influence smoking behavior. More than half of the participants (58.5%) in this study claimed that peer influence is the main factor initiating their smoking behavior (Table 2) while 23.8% (n=59) participants chose stress and 16.5% (n=41) participants being a smoker by their own desire in initiating their smoking behavior. However, only 1.2% of participants choose influence by family member. The strength of the influence from family and friends may depend on the quality of their social bond with the individual. As mentioned before, the average age of smoking initiation for smoker in this study is <20 years of age. Thus, taking into account that adolescence is a period of increasing bonds with peers and possibly of weakening bonds with parents, smoking among friends might have more influence on adolescent smoking behaviors. According to Khuder *et al.* [38], adolescents are more likely to smoke if they associate with others who are smokers. Being away from family, experiencing stress from studies and new adulthood are also factors associated with student smoking taking into account that most of our participants are university and college students.

All participants were asked whether there has been any family member in their family that has been a smoker. The question "Is there anyone in your family who smoke?" was given to both group nonsmoker and smoker. A significant association was observed between the smoking status and the family members who smoke (Table 3). There was highly significant difference observed between smoking status and participants who have family members who smoke ($p < 0.001$). For smoker groups, the frequency of individual who has smoker in their family member was 93.5% (n=232) while individual who does not have smoker among their family member was 6.5% (n=16). Compared to nonsmoker group, the frequency of individual with smoker family member was 63.3% (n=157), and 36.7% (n=91) for individual who has no smoker among family members. This result showed that genetic and environment factors may influence people to become a smoker. The development of nicotine dependence in individuals requires nicotine exposures. The initiation to smoke has been associated with family risk factors, such as parental smoking, family protective factors including a strong parent-child relationship, and also the influence by family members. According to So and Yeo [39], having a family that approves of smoking in the home was significantly associated with early smoking initiation. Several studies have shown that parental smoking has an impact resulting in a higher risk of smoking initiation, escalation, and the persistence of adolescent smoking [40-42]. Previous studies that focus on the effects of smoking siblings on adolescent also reported that smoking sibling increases the likelihood of smoking among adolescents [38,43]. The

association observed between smoking status and the existence of smoker in family member in this study might also suggest that genetic factor might be the reason of this positive result. People who have family member who smoked may have higher tendency to be a smoker as they have the same genetic made up. Parental and sibling smoking is a strong and significant determinant of the risk of smoking uptake by young people [44].

From the result (Table 2), about 50.4% (n=125) of participants used <10 sticks of cigarettes per day, 39.1% (n=97) used 11-20 sticks, 9.39% (n=23) used 21-30 sticks, while 1.2% of the participants used more than 31 sticks of cigarettes per day. In 2011, the GATS Malaysia reported that on average, a daily Malaysian adult smoker smoked 14 cigarettes per day.

All smokers were asked if they had ever tried to quit. Smokers were asked how many attempts they had made to quit smoking. Our data indicate that only 10.9% (n=27) had tried more than 5 times (Table 2). About 49.6% (n=123) of the smokers in this study had tried to quit smoking 2-5 times in their life. It is clear that most smokers made repeated attempts to quit smoking. While 26.2% (n=65) had tried once in their lifetime, it is interesting to note that 13.3% (n=33) were never made a serious quit attempt. According to Ary and Biglan [45], smokers who attempt to quit smoking need effective skills to overcome high exposure to smoke.

Another important indicator of whether smokers are seriously thinking about quitting is the methods that the participants used to quit smoking. Even though new effective treatments are now available, almost half of the participants, i.e., 51.6% (n=128), had tried to quit smoking without any intervention. About 28.6% (n=71) participants used candy and 4.8% (n=12) tried with nicotine replacement method while 0.8% (n=2) used traditional method and other method such as exercise (Table 2).

Table 2: Summary of the participants' smoking history

Characteristics	n (%)
Factor influencing smoking behavior among smokers	
Peer influence	145 (58.5)
Stress	59 (23.8)
Self-desire	41 (16.5)
Family	3 (1.2)
Number of quitting attempts among smokers	
Never	33 (13.3)
Once	65 (26.2)
2-5 times	123 (49.6)
>5 times	27 (10.9)
Methods of quitting attempts among smoking	
Never	33 (13.3)
Use of candy	71 (28.6)
Without intervention	128 (51.6)
Use of traditional medicine	2 (0.8)
Nicotine replacement	12 (4.8)
Others (e.g., exercise)	2 (0.8)
Number of cigarettes daily among smokers	
<10	125 (50.4)
11-20	97 (39.1)
21-30	23 (9.3)
≥31	3 (1.2)

Table 3: Association of smoking status and having family members who smoke

Variable	Family member who smoke, n (%)		χ^2	p
	Yes	No		
Nonsmoker	157 (63.3)	91 (36.7)	67.03	0.000
Smoker	232 (93.5)	16 (6.5)		

Table 4: The distribution of FTND-M score of the smokers

FTND-M score	Classification of nicotine dependence	n=248 (%)
0-2	Very low nicotine dependence	128 (51.6)
3-4	Low nicotine dependence	48 (19.4)
5	Moderate nicotine dependence	31 (12.5)
6-7	High nicotine dependence	28 (11.3)
8-10	Very high nicotine dependence	13 (5.2)

FTND-M: Malay version of Fagerstrom test for nicotine dependence

Smokers in this study group were mainly light smokers. Table 4 shows the distribution of FTND-M score in the smoker group. More than half of the participants, i.e., 51.6% (n=128), in this study had the FTND-M score lower than 2. Overall, the smokers in this study were not heavy smokers with only 5.2% (n=13) being considered as very high nicotine dependence.

CONCLUSION

Data obtained from this study later may also help the public health policy makers and health-care practitioners, especially in Kelantan, Malaysia, to make smoking prevention strategies more effective.

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