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Tobacco use, knowledge and attitude among Malaysians age 18 and above

Lim, K.H.[1], Sumarni, M.G.[1], Amal, N.M.[1], Hanjeet, K.[1], Wan Rozita, W.M.[1] and Norhamimah, A.[2]
[1] Institute for Medical Research, Jalan Pahang, Kuala Lumpur
[2] District Health Office, Kota Tinggi, Johor
Email: limkhl@imr.gov.my
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Abstract. This study aims to determine the level of knowledge and to understand their attitude towards smoking and secondly to determine how sociodemographic background, smoking status and knowledge on the health risks of smoking contribute toward the development of such attitude. A total of 10,545 respondents age 18 years and above across Malaysia were interviewed. Results indicated that level of knowledge and attitude varied by gender, education level, smoking status, age, ethnicity and smoker category. Smokers' low education, poor knowledge on the dangers of smoking and being males had more positive or greater impact on their attitudes towards smoking. Formulation and implementation of a holistic programme aimed at increasing knowledge and attitude change that accounts for sociodemographic background of the population is recommended in order to bring down smoking rates and thus reduce smoking related health problems in this country.

INTRODUCTION

Mortality and morbidity due to smoking-related illnesses are public health problems that pose a burden on many countries. It is estimated that 10,000 deaths due to these illnesses are reported in Malaysia every year making it the primary cause of death in this country since the 1980s (Disease Control Division, 2003). In 2006, diseases related to smoking account for at least 15% of hospitalized cases and approximately 35% of hospital deaths (Information and Documentation System, 2006). Cardio-vascular diseases also account for one third of years of life lost (YLL) and a fifth of the Disability Adjusted Life Years (DALY) among the Malaysian population (Division of Burden of Disease, 2004). In all three National Health and Morbidity surveys which have been conducted since 1986 the prevalence of smoking among adults age 18 and above in Malaysia were more than 20%; i.e. 21.5% in 1986, 24.8% in 1996 and 22.8% in 2006 (Public Health Institute,1986;1996; 2006) Almost half (46.4%) adult Malaysian adult males smoke, which is among the highest in the region. Should the current trend continue it is estimated that there will be 30,000 deaths due to smoking-related diseases by the year 2020 (Disease Control Division, 2003). Considering that the prevalence of smoking is highest among the socio economically disadvantaged (Public Health Institute, 2006), this section of the population will be the most affected.

Various factors that influence smoking have been identified. Among them are social norms, social influence and social and economic status. Psychological models of health behavior such as the Health Belief Model (Glanz *et al*., 1997), the Theory of Planned Behavior (Fishbein & Ajzen, 1975) and the Stages of Change Model (Velicer *et al*., 1983) stress on the roles of cognitive factors such as attitudes and risk awareness in smoking. Previous studies have identified knowledge on the hazards of smoking as a

protective factor (Charlton & Blair, 1989) and positive attitude toward smoking as a risk factor for smoking especially among girls (Spear & Akers, 1988). Ignorance of the risks associated with smoking has been reported in many surveys among smokers (Shiffman, 1986).

Several previous studies revealed that smokers tend to downplay the adverse effects of smoking on health. (Mcmaster & Lee, 1991; Parerri-Wattel, 2006) This may be due to genuine ignorance of the dangers of smoking or cognitive dissonance at work, wherein the smoker realises that smoking is harmful to health but to minimise psychological dissonance, downplays the risks through cognitive processes so that it is compatible with his smoking habit.

Previous studies also revealed that those who smoke especially heavy smokers have positive attitudes towards smoking compared to former smokers and non-smokers (Taylor *et al.*,1998). Besides smoking status, attitude towards smoking is also associated with socioeconomic background. People with higher education have more negative attitudes towards smoking and those with higher income believe that cardiovascular diseases and cancer are strongly associated with smoking compared to those with low income (Manfredi *et al.*, 2002) .

Several studies on smoking among the adult population in Malaysia have been conducted in the past. The most extensive being the National Health and Morbidity Survey (NHMS) that is conducted every ten years. Findings from the latest NHMS study which was conducted in 2006 inform policymakers towards mitigating health problems in the population due to smoking. However, the NHMS survey's focus on smoking was confined to prevalence of smoking and its associations with gender, ethnicity and socioeconomic background. To our knowledge, few studies in this country have examined the cognitive aspects that influence smoking. To enable the formulation of more effective anti-smoking policies and programmes, more information on the contributing factors need to be elucidated and taken into account in policy-making. This study aims to fill the gap that currently exists in the understanding of the relationship between smoking and demographic background on the level of knowledge and attitude and how these factors can contributed to the development of such attitudes. The data for this paper was obtained from the Malaysian National Healthy Lifestyle Study conducted in the year 2002.

MATERIALS & METHODS

The Malaysian National Healthy Lifestyle Study was conducted from January to March 2002 and has been described in details elsewhere (Lim *et al.*, 2006). In brief, the healthy lifestyle study themed "Promotion of healthy environment" consisted of three components, i.e. clean environment, food hygiene and clean air and involved data collection among respondents aged 18 years and above throughout the country. Sample selection was done by a two-stage proportionate-to-size sampling strategy. The first stage consisted of random selection of enumeration blocks by the Statistics Department followed by the second stage which was selection of households. Respondents age 18 and above from the selected households were interviewed. A total of 11,000 respondents required for the study were calculated based on the year 1996 prevalence and an additional 5% for non-response. The sampling frame was from the year 2000 census data.

The study instrument was a questionnaire developed by a panel of experts consisting of public health specialists and health education officers who had worked on the campaign for a long time. The questionnaire was pilot-tested on 50 selected households in the state of Selangor to assess its validity and reliability as well as to identify weaknesses in the study procedure and the language used in the questionnaire. The final version of the questionnaire was produced after addressing the shortcomings identified during the pilot test.

The interviews were conducted face-to-face at the respondents' home. Respondents were given assurance of data confidentiality and verbal consent was obtained prior to commencing interviews. Interviewers comprised of health inspectors and public health nurses from the District Health Offices. To ensure quality of data, interviewers attended three days of central training, which included interviewing technique and non-response control measures. The state health education officers acted as coordinators streamlining activities at state level. In addition, state-level facilitators and central-level public health specialists made field visits to oversee data collection.

For the purpose of this paper, only the healthy air component will be discussed. This component was divided into three main parts. The first part contained, information relating to social demographic characteristics of the respondents, including age, gender, ethnicity, education and income. The second part contained questions related to smoking., i.e. smoking status, age started smoking, number of cigarettes smoked per day and the final part consisted of elements of knowledge and attitude related to smoking.

The respondents' knowledge on the dangers of smoking was assessed using multiple choice questions. A correct answer was given one mark, while a wrong answer was not given any mark. Answers to questions relating to attitude (13 questions) were in the form of a scale of 1 to 3. Some of the questions on attitude were phrased in the negative and were re-coded before further analyses were carried out. Respondents with attitudes favourable towards smoking (positive attitude) were given one mark, while those unfavourable towards smoking (negative attitude) were given 3 marks. The sum of the marks in attitude and behavior were divided by the total number of questions.

The independent t-test and analysis of variance (ANOVA) were performed to determine the difference in knowledge and attitude scores between ethnic groups, age groups, smoking status and category of smoker. Multivariate Ordinary Least Square (OLS) test was used to examine the influence of socio demographic variables such as ethnicity, gender, education, age, smoking status and category of smoker and knowledge of smoking hazard simultaneously on attitude. Six dummy variables (ethnicity, gender, education, age group, smoking status and category of smoker) included in the model. The lowest mean of variable was used as the comparison groups. Overall model fitness, variable functions forms and outliers were checked by standardised residual plots to ensure the model fulfill the requirements for OLS analysis. All statistical tests were done using SPSS software version 11.5 at the 95% confidence level.

Definitions:
Smoker – Smoked for at least one day in the last 30 days
Former smoker – Stopped smoking for at least 6 months
Non-smoker – Never smoked

RESULTS

Table 1 shows knowledge scores were higher among ethnic Indians and other minority ethnic groups ($p<0.001$) and the scores of males were higher compared to females ($p<0.001$). The scores for knowledge on dangers of smoking increased with education ($p<0.001$).

Females were found to have more negative attitudes towards smoking in comparison to males (2.19 against 2.12, $p<0.001$). A similar trend was observed among different levels (Table 1).

After controlling for other variables in the model, the significance of ethnic group for predicting attitude scores was partially diminished. There was no significant difference in attitude scores between "other" ethnic group and Malays or Indians, however a significant difference was found between "other" ethnic group and Chinese ($p=0.01$). Smoking status, education, category of smoker were significant in univariate and multivariate analysis, however the variable

Table 1. Univariate analysis of knowledge and attitude scores, by sociodemographic characteristics

Variables	Knowledge			Attitude		
	N	Score	p value	N	Score	p value
Ethnicity						
Malay	5535	4.88	p<0.001	5535	2.14	p<0.01
Chinese	2403	4.32	(F=52.72)	2403	2.15	(F= 0.34)
Indian	759	4.91		759	2.17	
Others	1396	4.21		1396	2.18	
Gender						
Male	5234	4.78	p<0.001	5016	2.12	p<0.001
Female	5311	4.53	(t= 5.34)	5083	2.19	(t= 14.61)
Education level						
Never attended school	817	3.36	p<0.001	776	2.09	p<0.001
Attended primary school	3014	4.33	(F= 143.03)	2860	2.14	(F=72.41)
Attended secondary school	5492	4.94		5282	2.18	
Attended public/private institutions of higher learning	1045	5.22		1011	2.21	
Age group (years)						
18	318	4.95	p<0.001	305	2.17	p<0.001
19-29	1953	4.69	(F=20.31)	1885	2.17	(F=13.08)
30-39	2834	4.84		2715	2.18	
40-49	2606	4.8		2485	2.16	
50-59	1476	4.51		1409	2.15	
>60	1324	4.03		1258	2.12	
Smoking status						
Smoker	2580	4.66	p=0.06	2462	2.06	
Former smoker	532	4.9	(F=2.78)	515	2.17	
Never smoked	7290	4.64		6998	2.19	
Category of smoker						
Light smoker	791	4.76	p= 0.245	598	2.09	p<0.001
Moderate smoker	1039	4.63	(F=1.41)	1001	2.06	(F=11.37)
Heavy smoker	630	4.54		751	2.03	

age group which was significant in univariate analysis was not significant in multivariate analysis. Knowledge was also a significant predictor of respondents attitude, as it was positively correlated with attitude (the higher the knowledge, the more negative the attitude towards smoking) (Table 2).

DISCUSSION

To our knowledge, this is the first paper on knowledge and attitude amongst Malaysian adults age 18 and above that has ever been published. The findings indicated that knowledge and attitude differ according to smoking status, smokers had less knowledge and more positive attitudes compared to non-smokers. This finding is consistent with findings from previous studies (Nabile *et al.*, 2000; Ma *et al.*, 2003).

Education level was also strongly associated with knowledge and attitude scores, which is consistent with previous studies as well. Knowledge on the health effects of tobacco products on the smoker's

Table 2. Coefficients from OLS regression of attitude scores

Variable	Reference group	Coefficient	Standard error	p value
Knowledge		0.19	0.013	<0.001
Ethnic group				
Malay	(others)	0.065	0.093	0.487
Chinese	(others)	-0.271	0.105	0.01
Indian	(others)	0.024	0.138	0.863
Education				
Attended primary school	(Never attended school)	0.581	0.117	<0.001
Attended secondary school	(Never attended school)	0.982	0.12	<0.001
Attended public/private institutions of higher learning	(Never attended school)	1.44	0.15	<0.001
Gender				
Male	(Female)	0.302	0.072	<0.001
Age				
18	(>60 years)	0.059	0.198	0.765
19-29	(>60 years)	-0.085	0.125	0.495
30-39	(>60 years)	0.078	0.116	0.5
40-49	(>60 years)	0.085	0.11	0.442
50-59	(>60 years)	0.178	0.118	0.133
Smoking status				
Former smoker	(Smoker)	1.44	0.17	<0.001
Non smoker	(Smoker)	1.78	0.12	<0.001
Category of smoker				
Light smoker	(Heavy smoker)	0.41	0.15	0.007
Moderate smoker	(Heavy smoker)	-0.095	0.14	0.53

and on other people may have contributed to this phenomenon. The findings also revealed that there was a significant difference in scores between ethnic groups. However, the same was not observed for the scores on attitude. Surprisingly, female respondents whose level of knowledge on smoking hazard is low show more negative attitude towards smoking compared to males. Their negative attitude towards smoking might be due to observance of local customs in which smoking is not considered as an acceptable behavior among women.

Multivariate analysis performed to analyse the effects of socio demographic variables on attitude showed that smoking status, education level, category of smoker and knowledge were associated with negative attitude towards smoking. As shown b the high standard beta coefficient, the strongest predictor was smoking status. This may be explained using Festinger's cognitive dissonance theory. The theory postulates that dissonance or psychological turmoil occurs when a person has two or more conflicting cognitions (behavior and attitude) at the same time. From the cognitive dissonance perspective, smoking produces dissonance in a smoker. To reduce it smokers are compelled to either stop smoking or change their attitude towards it. In general, attitudes are much easier to change compared to behaviour (Cooper, 2007), therefore, instead of quit smoking,

smokers tend to adopt a positive attitude towards smoking. Similar results have been reported by several other researchers (Parerri-Wattel, 2006; Mcmaster & Lee, 1991).

Education was also found to be associated with a negative attitude as shown in the multivariate analysis. The statistical significance of this variable in the univariate analysis did not diminish in the multivariate analysis. Knowledge of hazards of smoking was also associated with attitude even if to a lesser magnitude. This finding suggests that an approach that increases knowledge is needed with particular emphasis on knowledge on the short and long-term effects of smoking. The approach must underline the short-term effects such as the discomfort or health-problems caused by smoking given that any attitude change can only happen if an individual is able to foresee the harmful consequences compared to long-term effects that take a much longer time to manifest (more than 10 years) (Oncken *et al.*, 2005). The messages should also be in a simple and easy to understand language.

The negative attitude shown by the women in this study provides an opportunity for behaviour change through the involvement of family members in anti-smoking programmes. From the Asian cultural perspective, the family is an important institution. (Lafferty *et al.*, 1999). Advice and encouragement by the spouse, mother or sister on smoking cessation and hazard of smoking may influence male family members to stop smoking or deter those who do not smoke from initiating. (Ma *et al.*, 2003).

There were differences between ethnicities with respect to knowledge and attitude. More Chinese displayed a positive attitude towards smoking. This requires further detailed studies. However, the observed difference needs to be factored in when planning smoking cessation programmes. Clearly, we believe that no one approach is suitable for all. Hence, a "one size fits all" approach may not achieve the desired results.

This study has several limitations. Among them, smoking status was self-reported and was not validated objectively. Current evidence however, shows that self-reported is nonetheless reasonably accurate for smoker/non smoker classification. A validation study (US Department of Health and Human Services, 1990) found that no self-reported study obtained more than 5% false negative results. A similar result was reported from the Scottish Health Survey which utilized a biological marker (serum cotinine) to validate the smoking status of respondents (Henderson *et al.*, 1981). Secondly, as this study was cross-sectional, we were unable to draw conclusions about the causal relationship between attitude and practice. Nevertheless, another study did find associations between change of smoking status and cognitive factors such as attitude and knowledge after a period of one year (Steptoe *et al.*,1995).

Despite these limitations, the findings do add to our understanding of smoking among Malaysians in particular adults, their knowledge and attitude level toward smoking and how sociodemographics and knowledge of smoking hazards influence their attitude toward smoking. The results from this study present some important inputs for the development of culturally-appropriate smoking prevention and cessation programmes for Malaysians.

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