RESEARCH COMMUNICATION

Prevalence and Associated Factors of Smoking among Malaysian University Students

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Abstract

  <u>Objective</u>: The objectives were to determine the prevalence and associated factors for smoking among university students in Malaysia. <u>Methodology</u>: A cross-sectional study was conducted among 199 students in the period from December of academic year 2009 until April of academic year 2010 in Management and Science University (MSU), Shah Alam, Selangor, Malaysia. The questionnaire was distributed randomly to all faculties of MSU by choosing one of every 3 lecture rooms, as well as the library and cafeterias of the campus randomly by choosing one from every 3 tables. Questions concerned socio-demographic variables, knowledge, attitudes and practice toward smoking. Participant's consent was obtained and ethical approval was provided by the ethics committee of the University. Data entry and analysis were performed using descriptive statistics, chi square test, Student t- test and logistic multiple regression with the SPSS version 13.0, statistical significance being concluded at $p<0.05$. <u>Results</u>: About one third of students were smokers (29%). The most important reason of smoking was stress (20%) followed by 'influenced by friends' (16 %). Prevalence of smoking was significantly higher among male and those in advanced semesters ($p= >0.001$, $p=0.047$). Smokers had low level of knowledge ($p<0.05$), had wrong beliefs on smoking ($p<0.05$), and negative attitude toward tobacco control policies compared to non smokers ($p<0.05$). On multiple logistic regression, significant predictors of smoking in the model were gender ($p=0.025$), age ($p=0.037$), semester of study ($p= 0.025$) and attitude toward smoking ($p<0.001$). <u>Conclusion</u>: This study found that 29% of university students were smokers. Males and students in advanced semesters were more likely to smoke. The results provide baseline data to develop an anti-smoking program to limit smoking in the university by implementing policies against smoking.

Keywords: Prevalence - knowledge - attitude - practice smoking - university students - Malaysia

Introduction

There are around 1.1 thousand million smokers in the world, which is approximately one third of the global population who are aged 15 years and over (47% of men and 12% of women). Most smokers live in developing countries; there has been a corresponding 50% increase in smoking rates in developing countries. While smoking rates have decreased in developed countries over the last 13 years (Richmond,1999). Despite Tobacco is the main avoidable cause of death worldwide, each year approximately five million people die from tobacco-related diseases in developing countries (WHO, 2008). It is estimated that tobacco-related deaths will be the most important cause of deaths in developing countries by 2020 (Lopez et al., 2006). Cigarette smoking is the major cause of many chronic diseases, such as stroke, heart disease, chronic obstructive pulmonary disease (COPD), periodontal disease, peripheral vascular disease,

pneumonia, lung and oral cancer (McGinnis and Foege, 1993; Wald and Hackshaw, 1996; Ockene and Miller, 1997; Lung et al., 2006).

In Malaysia, the prevalence of smoking among adolescents was 30.7% (Abdulah, 1999), about half of all men smoke every day; about 50 teenagers below the age of 18 start smoking; studies show about 30% of adolescent boys (aged 12 to 18) smoke. Smoking among female teens is rose from 4.8% to 8% and previous study found nearly one in five teens smokes in 1999. The Malaysian Global Youth Tobacco Survey conducted in 2003 found that one in three students have ever smoked cigarettes, while a significantly higher rate was found in males (53.6%) than females (Manimaran, 2003). It is estimated that 10,000 deaths annually due to smoking (MOH, 2004). Some studies have shown that lung cancer is rising at a rate of 17% per year. Smoking is estimated to have caused more than half a million coronary events. A study in 2005 on tobacco use among female college and university students

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found that 21.3% of these students have ever smoked and 4.3% were currently smoking. Most of these smokers were light smokers, smoking less than 10 cigarettes daily. Most smoked in the company of friends and outside the home (Khor, 2005). The national prevalence of smoking among adults 18 years and above obtained from the third National Health and Morbidity Survey conducted in 2006 was 21.5%, male smoking rate was many fold higher (46.4%) than that of female (1.6%) (Zarihah et al., 2007). The aim of this study is to determine the prevalence and associated factors towards smoking among university students and to determine the knowledge attitude and practice towards smoking among university students in Malaysia.

Materials and Methods

This cross sectional study was conducted in the period from December of academic year 2009 until April of academic year 2010 in Management and Science University (MSU), Shah Alam, Selangor, Malaysia. A total number of 199 university students were participated in this study recruited from the following faculties: International Medical School (IMS), Faculty of Health and Life Sciences (FHLS), Faculty of Business management and professional studies (FBMP), and Faculty of Information Sciences and Engineering (FISE). The survey was conducted by random distributing self-administered questionnaires to all faculties of MSU by choosing one lecture room from every 3 lecture rooms. At the same time, questionnaires were distributed to library and cafeterias of the campus randomly by choosing one table from every 3 tables. Malaysian students older than or equal to 18 years old and can speak Malay language and English were included in this study. Foreign students, students less than18 years old and unable to communicate in Malay language and/or English were excluded from this study.

Instrument

A self-administrated questionnaire was developed by the researchers based on the literature review. The questionnaire consists of three parts; first part contains socio-demographic characteristics. The second part asked about factors associated to smoking. The third part consists

Table 1. Socio-demographic Characteristics of the Respondents (n=199)

Variables		Frequency (n)	Percentage (%)
Sex	Male	102	51.3
	Female	97	48.7
Age	< 20	25	12.6
	≥ 20	174	87.4
Race	Malay	139	69.8
	Chinese	7	3.5
	Indian	22	11.1
	Others	31	15.6
Marital status	Single	189	95
	Engage	6	3
	Married	4	2
Faculty	Health & Medical Faculties	126	63.3
	Non-Health & Medical Faculties	73	36.7
Semester	1-3	119	59.8
	4-6	80	40.2

of knowledge, attitude and beliefs. Socio-demographic details like gender, race, marital status, type of faculty and semester were noted. The knowledge towards harmful effects of smoking, beliefs about smoking and attitude towards tobacco control policies was measured by using four items.

Ethics

The protocol of this study was approved by the research and ethics committee of Management and Science University. Consent form was obtained from student before they answered the questionnaire.

Data analysis

Data entered into SPSS version 13 and analysis was performed. Statistical significance was considered if $p < 0.05$. Descriptive statistics, Chi square test, student t- test and logistic multiple regression were used to analyze data in this study.

Results

Total number of 199 university students from

Table 2. The Relationships between Socio-demographic Characteristics and Smoking in the University Students

Variable		Smoking status		X^2	OR	95%CI	p-value
		Smokers N (%)	Non-smokers N (%)				
Sex	Male	42 (41.2)	60 (58.8)	13.3	3.3	1.7- 6.3	>0.001
	Female	17 (17.5)	80 (82.5)				
Age	< 20	8 (32.0)	17 (68.0)				
	≥20	51 (29.3)	123 (70.7)	0.07	1.14	0.46-2.80	0.78
Race	Malay	42 (30.2)	97 (69.8)				
	Chinese	0 (0.0)	7 (100)	4.70			0.20
	Indian	5 (22.7)	17 (77.3)				
	Others	12 (38.7)	19 (61.3)				
Marital status	Single	51 (27.0)	51 (27.0)				
	Engaged or Married	8 (80.0)	2 (20.0)	12.8	0.09	0.02-0.45	0.001
Type of Faculty	Health & Medical Faculties	36 (28.6)	90 (71.4)	0.19	0.87	0.46	0.66
	Non-Health & Medical Faculties	23 (31.5)	50 (68.5)				
Semester	1-3	29 (24.4)	90 (75.6)	3.95	0.54	0.29	0.05
	4-6	20 (37.5)	50 (62.5)				

Table 3. Characteristics of Smokers among University Students (n=59)

Variable		Frequency (n)	Percentage (%)
Reason of Smoking	Curios	7	3.5
	Show off	10	5.0
	Stress	20	10.1
	Influenced by Friends	16	8.0
	For fun	2	1.0
	Other reason	4	2.0
Frequency of Smoking			6.0
	One Cigarette/week	12	3.5
	One Cigarette/day	7	20.1
	More than one/day	40	29.6
Place of Smoking	Public Places	32	16.1
	My home or My car	20	10.1
	Others	7	3.5
Preferable Smoking Time	Before Meals	6	3.0
	After Meals	41	20.6
	Anytime	12	6.0
Type of Cigarettes	Dunhill	13	6.5
	Pallmall	11	5.5
	Suria	3	1.5
	White horse	5	2.5
	SKL	3	1.5
	Malboro	5	2.5
	Samprona	7	3.5
	Winstone	8	4.0
	Others	4	2.0

all faculties of MSU participated in this study. Male participants (51.3%) were slightly higher than female participants (48.7%). Mean (SD) of age was 21.8 (±2.3) years old; minimum and maximum age was 18 and 30 years old respectively. The majority of the participants (87.4%) were ≥ 20 years old. Malays were the majority of respondent with 69.8% and Chinese were the smallest respondents with 3.5% from all respondents. Almost 95% of the respondents were single. The majority of the participants were from Health & Medicine faculties

(63.3%) and junior students (semester 1-3) (59.8%) (Table 1). The overall prevalence of smoking among university students is 29%.

Prevalence of smoking was higher among male (41.2%) than in female (17.5%), OR=3.3, 95% CI 1.7-6.3, P < 0.001 but was lower among singles (27%) compared to married or engaged (80%) (P=0.001). Smoking was also higher among students in advanced semesters (37.5%) than among students in semester 1-3 (24.4%) (p=0.047). No significant association was found between other socio-demographic variables and smoking (Table 2).

The majority of smokers reported that the reason for smoking was stress (10.1%), smoke more than one cigarette per day (29.6%). Regarding the place of smoking, the majority of the smokers reported that they smoke in the public places such as restaurant (16.1%). The majority of the participants reported that the preferable time is after taking a meal (20.6%). Regarding the type of cigarettes, the majority of the participants were smoked Dunhill (6.5%) (Table 3).

The knowledge towards harmful effects of smoking among university students, respondents were given a list of eight statements regarding the harmful effects of smoking such as: smoke contains more than 40 cancer agents; smokers spend 27% more in hospital compare to no-smokers. Smokers have a twice risk of dying before the age of 65 years old, each cigarette cost 5-25 minutes of smokers' life, smoking cause lung cancer, hypertension, pregnant women exposure to second hand smoke can cause miscarriage and lung problem to the baby and smokers. Smokers were less knowledgeable than non smokers on sex out of eight issues (p<0.05). Mean of total knowledge score was lower among smokers compared to non smokers (Table 4). Beliefs about smoking among university students were determined by asking respondents to report their opinion (agree or disagree) on nine statements on smoking. These statements were: smoking

Table 4. Knowledge Towards Harmful Effects of Smoking among Smoker and Nonsmoker University Students

Variable		Knowledge		X	OR	95% CI	P value
		Knowledgeable (Correct response)	Not knowledgeable (Non- correct response)				
Smoke contains > 40 cancer agents	Smoker	29 (49.2)	30 (50.8)	5.22	0.49	0.26- 0.91	0.02
	Nonsmoker	93 (66.4)	47 (33.6)				
Smokers spend 27% more in hospital compare to no-smokers	Smoker	16 (27.10)	43 (72.9)	6.41	0.43	0.22-0.83	0.01
	Nonsmoker	56 (46.4)	75 (53.6)				
Smokers have a twice risk of dying before the age of 65 years old	Smoker	22 (37.3)	37 (62.7)	24.5	0.20	0.11-0.39	<0.01
	Nonsmoker	104 (74.3)	36 (25.7)				
Each cigarette cost 5-25 minutes of smokers' life	Smoker	26 (44.1)	33 (55.9)	3.88	0.54	0.29-1000	0.05
	Nonsmoker	83 (59.3)	57 (40.7)				
Smoking cause lung cancer	Smoker	42 (71.2)	17 (28.8)	20.2	0.15	0.06-0.37	<0.01
	Nonsmoker	132 (94.3)	8 (5.7)				
Smoking cause and increase hypertension	Smoker	33 (55.9)	26 (44.1)	17.1	0.25	0.13-0.49	<0.01
	Nonsmoker	117 (83.6)	23 (16.4)				
Pregnant women exposure to second hand smoke can cause miscarriage and lung problem to the baby	Smoker	45 (76.5)	14 (23.7)	6.47	0.36	0.81-0.81	0.01
	Nonsmoker	126 (90.0)	14 (10.0)				
Secondhand smokers have higher risk to get diseases as smoker	Smoker	34 (57.6)	25 (42.4)	24.3	0.18	0.08-0.37	<0.01
	Nonsmoker	124 (88.6)	16 (11.4)				
Total knowledge score maen *		4.19	6.03				<0.01

Chi squre test, *Student t- test was used to compare Mean of total knowledge score among smokers and non smokers.

Table 5. Beliefs about Smoking among University Students

		Agree N (%)	Disagree N (%)	X	OR	95% CI	P value
Smoking increase concentration	Smoker	41 (69.5)	18 (30.5)	94.3	43.3	16.9-110.9	<0.01
	Nonsmoker	7 (5.0)	133 (95)				
Smoking help to calming down	Smoker	47 (79.7)	12 (20.3)	113.5	64.6	24.9-167.9	<0.01
	Nonsmoker	8 (5.7)	132 (94.3)				
Smoking induce sleep	Smoker	34 (57.6)	25 (42.4)	80.6	46.2	15.1-141.7	<0.01
	Nonsmoker	4 (29.0)	136 (97.1)				
Smoking give more energy	Smoker	29 (49.2)	30 (50.2)	54.6	18.4	7.35-45.9	<0.01
	Nonsmoker	7 (5.0)	133 (95.0)				
Smoking give confident	Smoker	37 (62.7)	22 (37.3)	87.2	45.4	16.1-128.2	<0.01
	Nonsmoker	5 (3.6)	135 (96.4)				
Smoking make people more active	Smoker	17 (28.8)	42 (71.2)	22.2	7.69	2.99-19.8	<0.01
	Nonsmoker	7 (5.0)	133 (95.0)				
Smoking help to reduce weight	Smoker	34 (57.6)	25 (42.4)	24.9	4.99	2.59-9.60	<0.01
	Nonsmoker	30 (2.4)	110 (78.6)				
Smoking help to be more socials	Smoker	34 (57.6)	25 (42.4)	64.2	19.8	8.46-46.3	<0.01
	Nonsmoker	9 (6.4)	131 (93.6)				
Smoking is more attractive	Smoker	27 (45.8)	32 (54.2)	30.6	7.03	3.35-14.8	<0.01
	Nonsmoker	15 (10.7)	125 (89.9)				

Table 6. Attitudes Towards Tobacco Control Policies among University Students

Variable		Disagree N (%)	Agree N (%)	X	OR	95% CI	P value
Increase the cigarette price to reduce the rate of smokers	Smoker	37 (62.7)	22 (37.3)	58.1	14.0	6.60-29.7	<0.01
	Nonsmoker	15 (10.7)	125 (89.3)				
Frequent Change the pictures of the diseases on the cigarette box	Smoker	32 (54.2)	27 (45.8)	43.6	9.88	4.71-20.7	<0.01
	Nonsmoker	15 (10.7)	125 (89.3)				
Smoking should ban in public places	Smoker	31 (52.5)	28 (47.5)	57.8	18.3	7.59-43.9	<0.01
	Nonsmoker	8 (5.7)	132 (94.3)				
Penalty should be given to smokers in public places	Smoker	33 (55.9)	26 (44.1)	55.7	14.9	6.68-33.2	<0.01
	Nonsmoker	11 (7.9)	129 (92.1)				

Table 7. Multiple Logistic Regression, Predictors of Smoking among University Students

Variable		B	OR	95.0% C.I. for OR		P value
				Lower	Upper	
Gender	Male	1.02	2.8	1.1	6.7	0.03
	Female	Reference	Reference	Reference	Reference	Reference
	Age	1.41	0.24	0.07	0.9	0.04
Marital Status	Married or engaged	1.77	5.9	0.7	50.2	0.10
	Single	Reference	Reference	Reference	Reference	Reference
Semester	4-6	1.12	3.1	1.2	8.2	0.03
	1-3	Reference	Reference	Reference	Reference	Reference
	Knowledge	-0.19	0.8	0.7	1.0	0.09
	Attitude	-3.38	0.03	0.01	0.1	p<0.001

OR= odds ratio, 95% CI= 95% confidence interval

increase concentration, calming down, induce sleep, give more energy, give more confident, make people more active, reduce weight, more socials and smoking is more attractive. Smokers had wrong beliefs on smoking more than nonsmokers and the differences were statistically significant (p<0.01) (Table 5).

The attitudes towards Tobacco Control Policies among university students were determined by four attitudinal questions. The percentage of smokers was (62.7%) who disagree on 'Increase the cigarette price to reduce the rate of smokers' was higher than that of non smokers (10.7%), p<0.01. Among smokers, 54.2% disagree on 'Frequent change the pictures of the diseases on the cigarette box', while only 10.7% of nonsmokers disagree on that action p<0.01. Thirty one of smokers (52.5%) was disagree on 'Smoking should ban in public places', while eight of non smokers disagree on that action (5.7%), p<0.01. Among

smokers, 55.9% disagree on 'Penalty should be given to smokers in public places' in comparison to 7.9% of non smokers (Table 6).

On multiple logistic regression, significant predictors of smoking in the model were gender (p=0.025), age (p=0.037), semester of study (p=0.025) and attitude toward smoking (p<0.001). The total model was significant (p<0.001) and accounted for 57% of the variance (Table 7).

Discussion

The prevalence of smoking among university students in this study was (29%) comparable to that found in Jordan (28.6%) (Linda et al., 2002), but higher than that in Finland (15%) (Adetunji et al., 2008).

Smoking in the current study was higher among male

than in female which is similar to previous studies (Linda et al., 2002; Adetunji et al., 2008). Low prevalence of smoking reported by female compared to male may be attributed to cultural and social reasons or may be due to under-reporting because of shame. However, the prevalence of smokers among female in the current study (17.5%) was higher than those reported by WHO (1999) indicated that the prevalence of smoking was 48% among male and 7% among female in developing countries. Female smoking rate in the current study was also higher in comparison to that reported in a recent report in Malaysia where (7.4%) (Foong and Tan, 2008). In the previous report, the smoking rate was significantly higher among upper secondary (9.1%) and college/university (7.9%) students compared to 5.4% of lower secondary students. In this study, the prevalence of smoking was higher among students in advanced semester than among those in early semesters. A previous study among US college students found that the prevalence of smoking increased significantly according to year of studies from 9.6% in the first year to 56.7% in the fourth year (Everette, 1999).

A recent study in Malaysia found that the rate of smoking is higher among college and university female students (REFERENCE??). A Turkish study found that the first three years of medical education had the highest risk for initiation of smoking because up to 30% of those who were non-smokers at the time of registration became smokers within the first 3 years of starting medical school (Senol et al., 2006). This finding could be explained by the fact that stress of study in university could be a contributing factor. This explanation could be supported by the finding of previous studies that found a relationship between initiation of smoking and high anxiety scores suggesting that medical education may possibly have an indirect negative effect on smoking (Senol et al., 2006).

In addition, Stress was reported by the majority of smokers in the current study as the most important reason for smoking (20%). This finding is consistent with a previous study that showed that the majority of the smokers (31%) did so in order to cope with stress and the stress was the second common reason for smoking after pleasure (Adetunji et al., 2008).

A longitudinal study should be conducted over the study years to track changes in the knowledge, attitude and behavior of the students in order to determine the risk factors of smoking and of initiating smoking among medical students in Malaysia. There was no difference in the prevalence of smoking between students in health and medical faculties and those who were in non health and medical faculties. This finding is against that found in a previous study (Linda et al., 2002).

This finding may indicate that type of education has no effect on smoking status. At the present time, there are no separate preventive strategies taught at the medical faculty of the university. This defect in the focus of medical education is not only in Malaysia. In a worldwide survey of medical schools, only 11% of the schools teach tobacco issues as a specific module (Richmond, 1999). Present medical education should be changed to include more proactive, planned and preventive care of students.

Smokers in general were less knowledgeable of harmful effects of smoking compared to non-smokers in this study. Previous studies showed similar findings (Foong and Tan, 2008). This indicates the necessity of raising the level of knowledge among students by expanding the Anti-smoking media campaigns through all possible means, such as TV, radio and newspapers. Non-smokers were supportive of a ban on tobacco advertising inside shops and stores and a ban on display of cigarettes compared to smokers. This study found that age, semester, gender and attitudes toward smoking were significant predictors of smoking among university students. More tension and support should be given to these groups of high risk. This study also found that most college and university students have high knowledge about smoking effects. Smokers were more likely to have a positive image of smoking such as smoking can cause weight loss, and that it is acceptable for women to smoke (Khor, 2005).

In conclusion and Recommendations, this study found that 29% of faculty students were smokers. Males and students in advanced semesters were more likely to smoke. Smokers had lower level of knowledge, wrong beliefs on smoking, and negative attitude toward tobacco control policies compared to non smokers. Comprehensive tobacco policies are important in preventing and decreasing tobacco use among population and students. Strategies like price controls and taxation of tobacco products, limiting depictions of, smoking in mass media, packaging regulations advertising bans, smoking location restrictions, and sales legislation, have been found to be effective at the population level. To protect population from the harmful exposure to secondhand smoke, the government should legislate and implement smoke-free environments. Stress was reported by the majority of smokers in this study as the most important reason for smoking, which indicated the necessity to initiate a stress management programming in the university.

Acknowledgments

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