Factors associated with tobacco use among the adult population in sarawak, malaysia: a cross sectional study

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ABSTRACT

BACKGROUND: Consumption of tobacco in any form is one of the leading causes of preventable mortality. The World Health Organization recommends that it should be monitored regularly. A study was conducted to estimate the prevalence of tobacco use and factors associated with it among rural adult population in Sarawak.

METHODS: This was a cross-sectional study conducted among the adult population. Data were collected from ten *Kampungs* (villages) in Kota Samarahan and Kuching Division by face-to-face interview using modified Global Adult Tobacco Survey (GATS) questionnaire. Non-probability sampling method was adopted to select the villages. All the households of the selected villages were visited and an adult member, irrespective of sex, was selected randomly from each household. The study was conducted for a period of one year from July 2012 to June 2013. After missing value imputation, 1000 data were analysed using statistical software SPSS 19.0 version.

RESULTS: Analysis showed that 30.9% of the respondents were current tobacco users and 11% were past tobacco users. The mean age (SD) of starting tobacco use was 18.1 (6.48) years. The mean frequency of tobacco use was 14 times per day. Hierarchical Logistic regression analysis revealed that age with male sex (OR=1.064, 95% CI: 1.052, 1.076), secondary education (OR=-2.712; 95% CI: 1.122, 6.555), higher secondary and above (OR=3. 571; 95% CI: 1.641,7.774), business as occupation (OR=3.152; 95% CI: 1.732, 5.735) environmental exposure such as smoking at working place (OR=2.754;95% CI: 1.895,4.002), coffee house (OR=2. 274;95% CI: 1.32,3.919) and at home (OR=1. 827;95% CI: 1.242,2.687) appeared to be important predictors of tobacco use (p<0.05).

CONCLUSIONS: A large proportion of males used tobacco products. Though tobacco use was negligible among females, nonetheless they would be potential users. Environmental exposure to tobacco appeared to be important predictors. Tobacco control campaigns should target banning of tobacco use in more closed and open areas and also to intensify the monitoring of all forms of tobacco use by the population.

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INTRODUCTION

Smoking is a major public health problem in the developing world. It is the most important modifiable risk factor for premature death in the world, causing 5.4 million deaths every year and it is expected that by 2030 an estimated 7.4 to 9.7 million deaths will be attributable to tobacco smoking [1]. For the past three decades, smoking-related diseases accounted for approximately 10,000 deaths annually and this figure is expected to increase to 30,000 given the current trend [2]. Many previous scientific studies conducted in the preceding decades have found smoking as a cause of various preventable diseases [3]. Besides, the adverse effects of smoking on smokers' health, the economic costs incurred are also substantial. It is estimated that 2.9 billion Malaysian Ringgit is spent on treating three major diseases related to smoking, namely cancer of the lungs, Ischemic Heart Disease (IHD) and Chronic Obstructive Pulmonary Disease (COPD) [4].

Despite thousands of scientific studies that have established the carcinogenic and other health effects of tobacco, the number of smokers are increasing [5]. Tobacco consumption peak in developed countries has passed, but it is increasing in many developing countries [6]. There are about 1.1 thousand million smokers in the world, which is approximately one third of the global population. They are aged 15 years and over [7]. There are 1.2 billion smokers globally, of which the Southeast Asian countries have about 600 million tobacco smokers. Malaysia alone has about 5 million smokers [8]. The smoking prevalence in Malaysia is high especially among men and adolescents [9] and is among the highest in the region [3]. Approximately 10,000 Malaysians die every year from smoking-related ailments, making it one of the top killers in the country [10]. Smoking habit is often considered a normal behaviour among male adults in Malaysia despite the efforts by national authorities, information campaigns and advices on the deleterious effects of smoking [11].

There are so many reasons why people smoke. Several factors frequently associated with smoking among adolescents are socioeconomic factors, peer pressure and mass media exposure [11]. Identification of socio-demographic factors associated with smoking may help to underpin strategies to its prevention. Previous researches reported tobacco consumption habit to be associated with socio-demographic variables such as age, education level, income and marital status [12]. Age, gender and household assets are identified as predictors for tobacco use [13]. Ghani et al.[6] concluded that gender, ethnicity, history of quid chewing and alcohol consumption have been found to be important factors in smoking commencement.

Most of the current data are more on tobacco smoking. However, there are smokeless tobacco product for example chewing tobacco which is less researched on. In this article, we report the prevalence of current tobacco use and examine the association between several factors among the adults in Sarawak.

MATERIALS AND METHODS

Study setting and design

This was a community-based cross-sectional study. A total of ten villages *(Kampungs)*; five from Kuching Division and another five from Kota Samarahan Division were selected purposively. The detail methodology was also described elsewhere [14]. The selected households from each village *(Kampungs)* were screened out and an adult respondent aged 18 years and above irrespective of age was selected randomly from each household. Respondents who did not consent or unwilling to participate; aged below 18 years, persons incapable of answering the questionnaires and persons visiting the state were excluded from the study. The tobacco prevalence survey was designed to produce estimates that meet the following precision requirements where estimates had a 95% CI with margin of error of 5 point [15]. The required sample size was 382. Assuming a design effect of 2, the minimum sample size was 764. The sample size was further inflated into 840 household using 10% non-response rates. The research was conducted one year from July 2012 to June 2013 with definitive breakdown of different activities.

Instrument development and data collection procedure

A modified data collection instrument was developed based on Global Adult Tobacco

Survey and other relevant additional instruments [16-19]. The Global Adult Tobacco Survey (GATS) is a nationally representative household survey that was launched in February 2007 as a new component of the ongoing Global Tobacco Surveillance System (GTSS) by WHO/CDC [16, 17]. The GATS has been established in the low and middle income countries where more than half of the world's smokers live and that bear the highest burden of tobacco use. The developed instruments were pretested in a non-sample area, utilizing the translated Bahasa Malaysia questionnaire. There was no skip or branching pattern of any question. Data collection was done by personal interview of Doctor of Public Health (DrPH) first year students. The questionnaire consisted of several parts such as socio-demographic characteristics, tobacco use behaviour and its patterns, cessation attempts and second hand smoking. The questionnaire also elicited the knowledge, attitude and practice of tobacco use, perception on pictorial health warning on cigarette packet and effects on smoking behaviour and dependence on nicotine. In the present study, current tobacco use was considered as dependent variable.

Respondents who reported smoking at least one cigarette in the last month, at the time of the survey, smoked either every day or some days were defined as current smoker. Respondents who reported giving up smoking for the last six months were defined as former smokers. Respondents who reported never having smoked in a lifetime were defined as "never smoker". The study proposal was approved by the Technical Review Committee of the Faculty of Medicine and Health Science (FMHS) and Research and Innovation Management Centre (RIMC), Universiti Malaysia Sarawak (UNIMAS). Ethical clearance was also taken from the Faculty of Medicine and Health Sciences, UNIMAS.

Data processing and analysis

The data entry was started simultaneously with the data collection. A total of 1150 adults were selected and invited to participate in the survey. Out of these, 1064 respondents completed the interview giving a response rate of 93%. The survey data were checked, verified and then entered into the computer. Incomplete and inconsistent data were not included for final analysis. After missing value imputation, finally 1000 data were used for the data analysis. Data analyses were done using SPSS version 19 software [20]. Simple frequencies, bi-variate, multivariate analyses were done as appropriate. For multivariate analysis, hierarchical binary logistic regression was fitted. Regression coefficients, odds ratios, and 95% confidence intervals for odds ratios for each of the predictors were reported in the table [21]. A 'p value' less than 0.05 was considered as statistically significant.

RESULTS

Socio-demographic characteristics of the respondents

Details of socio-demographic characteristics of the respondents are presented in Table 1. The mean age of the respondents was 40.09 years with standard deviation 17.2 years. More than half (52%) of the respondents were male and the rest were female. About two-fifths (41.1%) of the respondents had higher secondary education and above followed by primary level education (27%). The majority of the respondents were ethnic Malays (91.5%) and Muslims (92.2%). The mean family size was 5.37 with standard deviation 2.1. Three-fourths (74.8%) respondents were married. One third of the respondents were engaged in any gainful job such as in service sector (24%) and 10.2% were in business. However, 65.8% were engaged in different types of job such as homemakers, students, self-employed and others. To determine the socioeconomic status, the number of living room in the house was used as proxy variables. The mean number of living rooms was 2.99 and one-third of the respondents had 1-2 living rooms (32.9%) and less than one-thirds had more than 4 living rooms (28.7%).

Prevalence and behavioural characteristics of tobacco users

Table 2 shows the smoking status of the respondents. Out of 1000 respondents interviewed, 28.8% were current smokers (95% CI: 25.9, 31.7), 10.9% were past or former smokers (95% CI: 8.9, 12.9) and 58.2% have never smoke (95% CI: 55.2, 61.2). The mean

TABLE 1

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS (N=1000)				
CHARACTERISTICS	FREQUENCY	%	95% CI	
			LOWER BOUND	UPPER BOUND
AGE IN YEARS				
<20	124	12.4	10.4	14.4
20-29	206	20.6	18.1	23.1
30-39	206	20.6	18.1	23.1
40-49	187	18.7	16.4	21.1
50-59	123	12.3	10.3	14.4
≥60	154	15.4	13.1	17.7
Mean (SD) years	40.1(17.2)		39.05	41.19
GENDER				
Male	520	52.0	48.9	55.1
Female	480	48.0	44.9	51.1
Level of Education				
No formal education	169	16.9	14.6	19.2
Primary	270	27.0	24.3	29.8
Secondary	150	15.0	12.9	17.2
Higher secondary & above	411	41.1	38.1	44.2
RELIGION				
Muslim	922	92.2	90.5	93.8
Non-Muslim	78	7.8	6.2	9.5
Ethnicity				
Malay	915	91.5	89.7	93.2
Chinese	85	8.5	6.8	10.3
Family size				
<5	366	36.6	33.6	39.6
≥5	634	63.4	60.4	66.4
Mean (SD)	5.37(2.1)		5.23	5.51
MARITAL STATUS				
Unmarried	252	25.2	22.5	27.9
Married	748	74.8	72.1	77.5
Nature of work				
Service	240	24.0	21.4	26.7
Business	102	10.2	8.4	12.1
Others	658	65.8	62.9	68.6
NO. OF ROOMS				
1-2	329	32.9	30.1	35.8
3	384	38.4	35.4	41.4
≥4	287	28.7	25.9	31.4
Mean (SD)	2.99(1.1)		2.90	3.06

age at initiation of tobacco use was 18.06 years with standard deviation 6.48 years. Three-fifths (59.3%) of the respondents started at the age of 15-19 years (95% CI: 54.5, 64.1). However,

TABLE 2

CHARACTERISTICS	FREQUENCY	%	95% CI	
			LOWER BOUND	UPPER BOUND
PATTERN OF TOBACCO USE (N=1000)				
Smoking	288	28.8	25.9	31.7
Past uses	109	10.9	8.9	12.9
Chewing tobacco	21	2.1	1.3	3.1
Never use	582	58.2	55.2	61.2
AGE AT INITIATION OF TOBACCO USE (YRS) (N=418)				
<15	61	14.6	11.2	17.9
15-19	248	59.3	54.5	64.1
≥20	109	26.1	22.0	30.4
Mean (SD)	18.06 (6.48)		17.4	18.7
DURATION OF TOBACCO USE (YRS) (N=309)				
1-9	84	27.2	22.2	32.3
10-19	126	40.8	35.2	46.4
20-29	49	15.9	11.9	19.9
≥30	50	16.2	12.1	20.5
Mean (SD)	17.40(12.4)		16.10	18.85
FREQUENCY OF TOBACCO USE PER DAY (N=418)				
1-10	179	42.8	38.3	47.8
11-20	216	51.7	46.9	56.5
21-30	23	5.5	3.4	7.7
Mean (SD)	13.57 (8.01)		12.8	14.3

Table title: **PREVALENCE AND CHARACTERISTICS OF THE TOBACCO USERS**

more than one-tenth (14.6%, 95% CI: 11.2, 17.9) initiated before the age of 15 years. The mean duration of tobacco use was 17.40 (95% CI: 16.10, 18.85) years. On an average, they smoke 13.57 (95% CI: 12.8, 14.3) times per day.

Factors affecting tobacco use:
Hierarchical Logistic regression analysis

A hierarchical binary logistic regression was undertaken to examine the current tobacco use and selected demographic and environmental factors in which non-use of tobacco was used as the reference category. Table 3 above shows the results of this analysis. All the variables were entered into a logistic regression model one by one to determine the significant individual contribution. Although some variables were statistically significant in bi-variate chi-square analysis, but had no potential impact in logistic regression analysis and were thus excluded from the final model. In the hierarchical logistic model, age and gender entered first in which female was used as reference category followed by other demographic variables such as level of education and occupation, and finally environmental tobacco use factors were entered in the model. Thus, seven variables were entered into the final model. The model containing the seven independent variables explained 34.1% (Cox and Snell R square) and 47.4% (Nagelkerke R squared) of the variance of tobacco use. It was also able to classify 81.3% of the cases. No variables had standard error more than 2.0 indicating multivariate normality [21]. Analysis revealed that age with male sex (OR=1.064, 95% CI: 1.052, 1.076), secondary education (OR=-2.712; 95% CI: 1.122, 6.555), higher secondary and above (OR=3.571; 95% CI: 1.641,7.774), occupation as business (OR=3.152; 95% CI: 1.732, 5.735) and environmental exposure of tobacco use such as smoking at working place (OR=2.754; 95% CI: 1.895,4.002), coffee house (OR=2.274; 95% CI: 1.32,3.919) and at home (OR=1.827;

TABLE 3

FACTORS INFLUENCING TOBACCO USE: HIERARCHICAL BINARY LOGISTIC REGRESSION ANALYSIS (TOBACCO USER VS NEVER USER)			
CHARACTERISTICS	**β**	**ODDS RATIO**	**95% CI**
			LOWER LIMIT
Age & Sex	0.062***	1.064	1.052
LEVEL OF EDUCATION			
No formal education (Ref)	-	-	-
Primary	-0.232	0.793	0.384
Secondary	0.998*	2.712	1.122
Higher secondary and above	1.273***	3.571	1.641
OCCUPATION			
Service	-0.128	0.88	0.569
Business	1.148***	3.152	1.732
Others (Ref)	-	-	-
SMOKING AT WORKING PLACE			
Yes	1.013***	2.754	1.895
No (Ref)	-	-	-
Smoking at coffee houses			
Yes	0.822**	2.274	1.32
No (Ref)	-	-	-
SMOKING AT HOME			
Yes	0.603**	1.827	1.242
No (Ref)	-	-	-
Constant	-4.401	0.012	
Model chi square (df)	358.069(9)***		
Nagelkerke R Square	0.474		
n	859		
Ref	Reference category		
p-value	*p<0.05, **p<0.01, ***p<0.001		

95% CI: 1.242,2.687) appeared to be important determinants of tobacco use (p<0.05).

DISCUSSION

In this study, it was found that the prevalence of smoking was 28.8% and the prevalence of smokeless tobacco usage was 2.1%. The prevalence in this study is was lower than the report by the Global Adult Tobacco Survey in Malaysia (GATS), 2012 [22]. The survey reported that the prevalence is was 43.9% of men, 1.0% of women, and 23.1% overall (4.7 million adults) currently smoked tobacco. The observed decrease is very modest compared to other countries that have reduced smoking prevalence by 9% to 25% over 10–20 years after implementing anti-tobacco measures [23]. The mean age of smoking onset (18.06 years) was lower than reported by the Malaysian National Health Morbidity Survey II in 1996 which was (19.5 year old) [24]. This was consistent with the mean age of smoking onset in Kuwait (18 years) [25] and Thailand (18.3 years) [18] yet was higher than India (17.8 years) [19]. Young adults (age 15 to 34) in this study were found to be the largest group and significant smoking group. Malaysia alone has about 5 million smokers, 20% of whom are younger than 18 years old [8]. This would represent the successful influence and advertisement by tobacco companies to the youngsters. The other possible explanations would be the lack of perception of harmful effects of tobacco amongst Malaysians [26], higher affordability and easy availability and

accessibility to tobacco products in Malaysia.

It was found that there was gender significance associated with smoking which were being male (27%) and the remainder 17% was female. The prevalence of smoking among Malaysian males remained high in spite of several population interventions over the past decade [27]. The prevalence of smoking among adult males in Malaysia was 46.5% (95% CI: 45.5–47.4%), which was 3% lower than a decade ago [27]. A recent study in Syria had found that smoking prevalence among males was 26.1%, significantly higher than among females (9.5%) [28]. However, a lower prevalence of cigarette smoking among female may not be reflective of their prevalence on tobacco-related deaths. Tobacco chewing is one of the most common forms of smokeless tobacco use in certain South East Asian countries, especially, India, Pakistan, Bangladesh and Nepal [29]. Little study had been done in Malaysia about smokeless tobacco. However, consumption of smokeless tobacco use among the Malaysian is very low compared to India and Bangladesh as the smokeless tobacco is not so popular in Malaysia. An earlier study in 2004 by WHO, reported about 17% of total population in Southeast Asia uses oral tobacco; of which 95% belong to India (82%) and Bangladesh (13%) [30].

The average number of cigarettes smoked by the study respondents was 13.6 cigarettes per day, slightly more than 13.3 cigarettes per day in 1996 [23]. In the Philippines, it was reported that the average number of cigarettes smoked was lower, 11.3 cigarettes per day [31], and yet Vietnam [32] and China [33] reported a higher average number of cigarette smoked, 13.5 and 14.3 respectively. An intensified effort should be directed at encouraging smokers to quit smoking.

The significant factors associated with smoking were that age with male sex, secondary education, higher secondary and above, occupation as business and environmental exposure tobacco use such as smoking at working place, coffee house and at home appeared to be important determinants of tobacco use (p<0.05). Ali et al. [5] reported that smoking prevalence increased with age and income and was highest among subjects aged 44 years and above. Laaksonen et al. [34] showed that all socioeconomic indicators namely education, occupational status, household income per consumption unit, housing, economic difficulties and economic satisfaction were strongly associated with smoking among both men and women. Lim et al. [35] indicated that the 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. Education level has been well known to be associated with smoking. Studies had been done and it was found that those with lower educational level tend to smoke [27]; [36]; [34]. The probability of tobacco use was 3.57 times higher among the respondents having secondary and above level of education compared to no formal education. This might be a challenge for the national tobacco control.

Limitations

The limitation in this cross-sectional survey was that smoking and smoking status were obtained through self-reporting. Therefore, some respondents might have underreported their tobacco use. Moreover, the existing taboo against tobacco use, might be under reported by female respondents. The study was carried out in rural areas among the Malay communities. Therefore, the results cannot be extrapolated to the rest of Sarawak.

CONCLUSION

The prevalence of tobacco use among adult population in Sarawak was still high (31.8%) especially among the males. Environmental tobacco exposure such as smoking at home, work place and coffee house were significantly associated with tobacco use (p<0.05). More efforts and preventive strategies should be discussed and implemented in reducing the prevalence of smoking. The knowledge and attitude towards smoking among the population of Sarawak, and stricter law enforcement on smoking may help to reduce the prevalence of smoking.

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