

**Original article:**

**Knowledge, Attitude, Pictorial Health Warnings And Quitting Attempt To Smoking In Sarawak, Malaysia**

Rahman MM<sup>1</sup>, Arif MT<sup>2</sup>, Suhaili MR<sup>3</sup>, Razak MFA<sup>4</sup>, Tambi Z<sup>5</sup>, Akoi C<sup>6</sup>, Azihan NZ<sup>7</sup>, Nanthakumar<sup>8</sup>

**Abstract**

**Background:** Every year, millions of preventable deaths and disabilities were directly and indirectly caused by smoking. Various methods have been employed and millions of dollars have been spent in order to tackle this issue. **Objectives:** This study was designed to identify the factors associated with knowledge, attitude and quitting attempts to smoking among adult population in Sarawak. **Materials and Methods:** This was a cross-sectional study conducted among the adult population in Sarawak. Data were collected from ten 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 villages were visited, and an adult member was selected randomly from each house irrespective of the sex. After missing value imputation, a total of 1000 data were analysed using statistical software SPSS 19.0 version. **Results:** Analysis showed that 28.8% of the respondents were current smokers. Multiple Linear Regression Analysis (MLR) revealed that younger age, family size, marital status, scariness and informativeness of Pictorial Health Warnings (PHWs) significantly contributed to perceived knowledge of health effects of smoking ( $p < 0.05$ ). Similarly level of education, perceived knowledge of health effects and information on cigarette packages have significant positive contribution to preventive attitude towards smoking, whereas non smoking status has no influence on the attitude towards smoking ( $p < 0.05$ ). On the contrary, marital status, clarity and nature of information on the cigarette packages about PHWs have significantly influence for quitting attempts ( $p < 0.05$ ), whereas the nature of jobs such as business and service had no influence in quitting attempt of smoking ( $p < 0.05$ ). **Conclusion:** Despite numerous interventions programme for tobacco control being implemented such as PHWs, the study findings revealed that better plans and strategies for more effective preventive measures against smoking should be instituted by policy makers.

**Keywords:** Attitude, Cigarettes, Perceived Knowledge, Quitting, Smoking, Sarawak, Pictorial Health Warning

Bangladesh Journal of Medical Science Vol. 16 No. 02 April'17. Page : 266-273

**Introduction**

Mortality and morbidity due to smoking related illnesses are considered as public health problems that pose great burden on many countries. Every year, millions of preventable deaths and disabilities

were directly and indirectly caused by smoking<sup>1</sup>. It is estimated that every year tobacco kills over 3.5 million people worldwide and by the year 2020 to 2030, tobacco will kill 10 million people a year<sup>2</sup>. In Malaysia, smoking related diseases account for

1. Md Mizanur Rahman
2. Mohd Taha Arif
3. Mohd Raili bin Suhaili
4. Mohd Fadzillah Abd Razak
5. Zainab Tambi
6. Clifton Akoi
7. Nor Zam Azihan
8. Nanthakumar

Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak

**Correspondence to:** Md Mizanur Rahman, Professor, Department of Community Medicine and Public Health Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak. Email: [rmizanur1958@gmail.com](mailto:rmizanur1958@gmail.com), [email:rmmizanur@unimas.my](mailto:email:rmmizanur@unimas.my)

at least 15% of hospitalization and approximately 35% of hospital deaths in 2006<sup>3</sup>. However, cessation of tobacco consumption, will improve a person's quality of life and reduce tobacco-related health risks<sup>4,5</sup>. Therefore, efforts should be made to actively encourage smokers to stop smoking.

Malaysian government has done a lot of effort to tackle the issue of tobacco consumption. The government is committed to implement tobacco control policies as part of its support for the WHO Framework Convention on Tobacco Control in 2005. One of the efforts made includes the introduction of Pictorial Health Warnings (PHWs) with the enactment of the Control of Tobacco Product (Amendment) Regulations (CTPR) 2008. This enactment requires the cigarette packs sold in Malaysia to have six rotating PHWs occupying 40% of the front and 60% of the back of the principal areas of each pack effective from 1 January 2009. This effort was further extended by the comprehensive ban on tobacco advertising, promotions and sponsorships in 2004. All these national smoking prevention policies as shown in previous empirical studies have positive effects on anti-smoking efforts<sup>6,7</sup>.

Previous studies identified that knowledge on the smoking hazard as a protective factor<sup>8</sup>, whereas positive attitude toward smoking as a risk factor<sup>9</sup>. These were further supported by Taylor et al (1998), who shows that heavy smokers have positive attitudes towards smoking compared to former smokers and non-smokers<sup>10</sup>. One of the important aspects of smoking is that smokers also tend to be careless about the smoking adverse effects on health<sup>11,12</sup>. This can be due to the ignorance of the smokers towards the danger and harmful effects of smoking or can be due to the cognitive dissonance. In this case, even though they realize that smoking is harmful and dangerous, they try to find reasoning through their cognitive process to make it compatible with their smoking habit.

Despite that, the study on Knowledge, Attitude and Practice (KAP) of smoking is still important especially for policy making and developing preventive measures. Therefore, this study was designed to identify the factors associated with knowledge, attitude and quitting attempts to smoking among adult population in Sarawak.

## **Materials And Methods**

### ***Study design and sampling procedure***

This was a cross-sectional study conducted in ten (10) different *Kampungs* (villages), in two of the eleven divisions in Sarawak. Five *Kampungs* from

Kota Samarahan and five *Kampungs* from Kuching division were selected. A non-probability sampling technique was adopted to select the villages. In each village, has 150 to 200 households. All the households within the villages were visited. One respondent aged 18 years and above was selected randomly irrespective of sex from each household. The respondent who did not consent or unwilling to participate; age below 15 years and incapable of answering the questionnaires and those visiting the state were excluded from the study. Detailed procedure has been described elsewhere<sup>13</sup>.

### ***Instrument development and data collection procedure***

A modified data collection instrument was developed based on Global Adult Tobacco Survey<sup>14</sup> and other relevant additional instruments. Data collection was done by Doctor of Public Health (DrPH) first-year students using structured questionnaire. The questionnaire consists of several parts, which include socio-demographic characteristics, tobacco use behavior and its patterns, cessation attempts and second-hand smoking. The questionnaire also consisted of knowledge, attitude and practice of tobacco smoking, perception on pictorial health warning on cigarette packet and effects of smoking on behavior and dependence on nicotine. A pre-test of the questionnaire was done in a non-sample area, utilizing the translated Malay language questionnaire. The reliability of the questionnaire was tested. The Cronbach's alpha coefficient for knowledge, attitude and pictorial health warning questionnaire were 0.791, 0.601 and 0.928 respectively. A minor change of the questionnaire was made after the pre-test. The 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 a "current smoker". Those who reported giving up smoking for the last six months were defined as a "former or past smoker". The respondents who did not smoke in a lifetime were defined as a "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 Ethical Review Committee (ERC) of 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%. Data was entered manually and cross-checking was done using SPSS Software 19.0 version. After validation, descriptive statistics were presented to summarize participants' socio-demographic characteristics. A major hypothesis was that quitting attempts of smoking has to be linked with knowledge, attitude and pictorial health warnings on the cigarette packages. Missing data were carefully examined and was imputed. However, failure to collect an important variable such as smoking history, rendered the data not usable in the final data analysis. Multiple Regression Analysis (MLR) was done to test the hypothesis. A *p*-value of less than 0.05 was considered as statistically significant. After missing value imputation, a total of 1000 data were finally analysed.

## Results

### *Socio-demographic characteristics of the respondents*

Details of the socio-demographic characteristics of the respondents by smoking status are presented in Table 1. Out of 1000 respondents, 28.8% were smokers and the rest were non-smokers (Table not shown). The mean age of the smokers was 36.64 years with standard deviation 14.6 years and the mean (SD) age of the non-smokers was 41.49 (18.0) and the mean difference was statistically significant ( $p < 0.001$ ) indicating that smokers were significantly younger than the non-smokers. The analysis revealed a statistically significant difference between smokers and non-smokers in terms of gender, level of education, marital status and nature of the job ( $p < 0.05$ ). The proportion of smokers was found to be high among the males, higher education, unmarried and having job in business and service. However, no statistically significant association was found between smoking status and religion, ethnicity, family size and number of rooms (as proxy economic status) in the house ( $p > 0.05$ ).

**Table 1 Socio-demographic characteristics of the respondents (n=1000)**

Characteristics	Total		Non-smoker 712 (71.2%)		Smoker 288 (28.8%)		p-value
	n	%	n	%	n	%	
<b>Age in years (SD)</b>	1000	40.09 (17.2)	41.49 (18.0)		36.64 (14.6)		<0.001
<b>Gender</b>							
Female	480	48.0	463	65.0	17	5.9	<0.001
Male	520	52.0	249	35.0	271	94.1	
<b>Level of Education</b>							
No formal education	169	16.9	140	19.7	29	10.1	<0.001
Primary	270	27.0	192	27.0	78	27.1	
Secondary	150	15.0	107	15.0	43	14.9	
Higher secondary & above	411	41.1	273	38.3	138	47.9	
<b>Religion</b>							
Others	78	7.8	53	7.4	25	8.7	0.509
Muslim	922	92.2	659	92.6	263	91.3	
<b>Ethnicity</b>							
Others	85	8.5	58	8.1	27	9.4	0.528
Malay	915	91.5	654	91.9	261	90.6	
<b>Marital status</b>							
Unmarried	252	25.2	158	22.2	94	32.6	<0.010
Married	748	74.8	554	77.8	194	67.4	
<b>Nature of work</b>							
Service	240	24.0	138	19.4	102	35.4	<0.001
Business	102	10.2	53	7.4	49	17.0	
Others	658	65.8	521	73.2	137	47.6	
<b>Family size (SD)</b>	1000	5.37(2.1)	5.42(2.17)		5.22(2.07)		0.180
<b>No. of rooms (SD)</b>	1000	3.00(1.1)	2.96(1.11)		3.09(1.09)		0.103

*p*-value obtained from chi square test

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

**Perceived Knowledge on Health effects and Attitude towards Smoking**

To assess the perceived knowledge of health effects and attitude towards smoking a series of questions were asked to the respondent with *yes* and *no* responses. A total of five questions for knowledge assessment and four questions for assessment of attitudes towards smoking were asked. Table 2 shows the item-wise percentage distribution of the

responses of smokers and non-smokers. Finally, a median index was calculated based on individual responses. Non-parametric independent sample test revealed that perceived knowledge of health effects was found to be higher among the non-smokers than the smokers ( $p < 0.001$ ). Similarly, preventive attitude towards smoking was also higher among the non-smokers compared to smokers and the difference was statistically significant ( $p < 0.001$ ).

**Table 2 Percentage distribution of perceived knowledge on health effects and attitude towards smoking (n=1000)**

<i>Propositions</i>	<i>Total</i>	<i>Non-smoker</i>		<i>Smoker</i>		<i>p-value</i>
	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	
<b>Knowledge on Health effects</b>						
Smoking causes serious diseases	96.8	695	71.8	273	28.2	<b>&lt;0.022</b>
Smoking causes heart attack	87.9	648	73.7	231	26.3	0.635
Smoking causes lung cancer	93.5	673	72.0	262	28.0	<b>&lt;0.001</b>
Smoking causes stroke	83.5	592	70.9	243	29.1	<b>&lt;0.039</b>
Smoking causes shortness of breath	87.8	632	72.0	246	28.0	0.143
<i>Knowledge index (Median, IQ)</i>		5.0 (5.0,5.0)		5.0 (4.0,5.0)		<b>&lt;0.001</b>
<b>Attitude towards smoking</b>						
Cigarette cause addiction	96.9	692	71.4	277	28.6	0.404
Support or against the tobacco tax	62.2	528	84.9	94	15.1	<b>&lt;0.001</b>
Exposure to cigarette smoke bring harm to smokers	93.8	671	71.5	267	28.5	0.363
Exposure to cigarette smoke bring harm to non-smoker	96.6	681	70.4	286	29.6	<b>&lt;0.003</b>
<i>Attitude index (Median, IQ)</i>		4.0 (3.0,4.0)		3.0 (3.0,4.0)		<b>&lt;0.001</b>

*p-value reached from Mann Whitney U test*

*\*p<0.05; \*\*p<0.01; \*\*\*p<0.001*

**Pictorial Health Warning on Cigarette Packages**

All the six pictorial health warnings were evaluated in terms of clarity, fearfulness (scariness) and the nature of information on health warnings. Each health warning was evaluated in three dimensions using five points Likert’s scale starting from ‘0’ to ‘5’. Finally, a composite score was developed from six messages of

pictorial health warnings in cigarette packets. Table 3 depicts the perceived effectiveness of the health warnings. The median score with interquartile ranges are shown in the tables. Analysis indicated that non-smokers had a better perception of the pictorial health warnings compared to smokers and the difference was statistically significant ( $p < 0.001$ ).

**Table 3 Percentage distribution of respondents by perceived effectiveness of health warning on cigarette packages (n=1000)**

<i>Propositions</i>	<i>Non-smoker</i> 712(71.2%)		<i>Smoker</i> 288(28.8%)		<i>p-value</i>
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	
<b><i>Clarity of Health Warning</i></b>					
Not clear at all	33	78.6	9	21.4	
Less clear	6	100.0	0	0.0	
Moderately clear	20	43.5	26	56.5	
Clear	44	45.4	53	54.6	
Very clear	609	75.3	200	24.7	
<i>Median (IQ)</i>	5.0 (4.7,5.0)		4.6 (4.0,5.0)		<0.001
<b><i>Scariness of Health Warning</i></b>					
Not scared at all	9	19.6	37	80.4	
Less scared	5	25.0	15	75.0	
Moderately scared	8	10.8	66	89.2	
Scared	60	56.6	46	43.4	
Very scared	630	83.6	124	16.4	
<i>Median (IQ)</i>	5.0 (5.0,5.0)		3.7 (2.7,5.0)		<0.001
<b><i>Information about Health Warning</i></b>					
No informative at all	28	45.2	34	54.8	
Less informative	18	72.0	7	28.0	
Moderately informative	8	20.0	32	80.0	
Informative	105	60.3	69	39.7	
Very informative	553	79.1	146	20.9	
<i>Median (IQ)</i>	5.0 (4.3,5.0)		4.2 (3.0,5.0)		<0.001

*p-value reached by Mann Whitney U test*

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

Factors affecting perceived knowledge of health effects, attitude towards smoking and attempt to quit smoking: Multiple Linear Regression Analysis

A standard multiple regression was performed between perceived knowledge on the health effects of smoking as the dependent variables and age, gender, level of education, family size, marital status, smoking status and pictorial health warning in terms of clarity, scariness and information on cigarette packages. Evaluation of the results led to transformation of knowledge score, clarity, scariness and information of the pictorial health warning to reduce the skewness and improve the normality, linearity and homosceasticity of the residuals. With the use of a  $p < 0.001$  criterion for Mahalanobis distance, outliers were detected and excluded from the final model. A similar method was applied in analysis of attitude towards smoking with transformation of

attitude score. Initially, bi-variate correlation analysis was done between a dependent variable and selected independent variables. Nonsignificant variables were excluded from the model.

#### ***Perceived knowledge of health effects of smoking***

Table 4 displays the unstandardized regression coefficients (?) with 95% confidence interval,  $R^2=0.322$ ,  $F(9,847) = 92.90$ ,  $p < 0.001$ . The  $R^2$  value 0.32 indicates that about one-third of the variability in perceived knowledge of health effects predicted by a number of variables such as age, family size, marital status, scariness and information on cigarette packages. The size and direction of the relationships suggest that younger age and family size, marital status, scariness and in-formativeness of pictorial health warnings significantly contributed towards perceived knowledge of health effects of smoking ( $p < 0.05$ ). However, gender, level of education,

clarity of pictorial health warnings and smoking status significantly correlated in bi-variate analysis, but did not contribute significantly in regression analysis ( $p>0.05$ ).

**Attitude towards smoking**

Similarly, perceived attitude to smoking was analysed using multiple regression analysis with unstandardized regression coefficients (?) with 95% confidence interval,  $R^2=0.217$ ,  $F(9,848)=26.189$ ,  $p<0.001$ . The  $R^2$  value 0.217 indicated that about one-fifth of the variability in perceived attitude to smoking was predicted by independent variables such as level of education, perceived knowledge of health effects of smoking, smoking status and nature of information printed on cigarette packages ( $p<0.05$ ). Analysis revealed that level of education, perceived knowledge of health effects and information on cigarette packages have significant positive contribution in attitude towards smoking i.e. knowledge on bad health effects on smoking significantly influence preventive attitude towards smoking, whereas smoking status negatively influenced attitude. This indicated that current smoker had no preventive attitude towards smoking. This indicated that non-smokers had negative impact on smoking, i.e. non smoker had preventive attitude

towards smoking. However, age, gender, marital status, clarity and scariness of pictorial health warning did not contribute significantly ( $p>0.05$ ).

**Attempt to quit smoking**

Multiple regression was also done with a view to determine the factors associated with attempt to quit smoking in the last year. A dummy code '1' was given for attempt to quit smoking and '0' who did not attempt to quit. Analysis with unstandardized regression coefficients (?) with 95% confidence interval,  $R^2=0.195$ ,  $F(8,258)=7.837$ ,  $p<0.001$ . The  $R^2$  value 0.195 indicated that about one-fifth of the variability in attempt to quit was predicted by independent variables such as marital status, nature of the job, clarity and information on pictorial health warning in the cigarette packages ( $p<0.05$ ). The analysis found that marital status, clarity and nature of information on the cigarette packages have significant positive contributory effects for quitting attempts ( $p<0.05$ ), whereas the nature of jobs such as business and service have no influence in quitting smoking ( $p<0.05$ ). However, age, scariness of the pictorial health warnings, perceived knowledge of health effects, attitude towards smoking did not have any impact on quitting smoking ( $p>0.05$ ).

**Table 4 Factors affecting perceived knowledge of health effects, attitude towards smoking and quitting attempt: Multiple Regression Analysis**

Characteristics	Knowledge		Attitude		Quitting attempts	
	$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI
Age in years	-0.006***	(-0.01,0.00)	0.001	(0.000,0.003)	-0.003	(-0.008,0.002)
Gender (0=F, 1=M)	-0.022	(-0.06,0.02)	-0.01	(-0.051,0.031)	-	-
Level of education	-0.017	(-0.04,0.00)	0.053***	(0.035,0.071)	-	-
Family size	0.017***	(0.01,0.03)	-	-	-	-
Marital status (0=UN, 1=MA)	0.078**	(0.03,0.13)	0.031	(-0.017,0.079)	0.181*	(0.031,0.332)
Nature of job (0=others, 1=Business and 2=Service)	-	-	-	-	-0.098**	(-0.159,-0.038)
Attractiveness (Inv.)	-0.008	(-0.11,0.09)	-0.039	(-0.139,0.062)	0.296*	(0.055,0.537)
Fearfulness (Inv.)	0.248***	(0.13,0.37)	-0.074	(-0.184,0.036)	0.095	(-0.100,0.290)
Information (Inv.)	0.207***	(0.11,0.30)	0.135**	(0.034,0.236)	0.234*	(0.028,0.440)
Smoking (0=NS, 1=S)	0.017	(-0.03,0.07)	-0.222***	(-0.272,-0.173)	-	-
Knowledge on smoking (Inv.)	-	-	0.081*	(0.011,0.152)	0.231	(0.027,0.436)
Attitude (Inv.)	-	-	-	-	0.21	(-0.016,0.437)
Constant	0.611***	(0.49,0.73)	0.604***	(0.483, 0.726)	-0.327*	(-0.601,-0.053)
n	857		858		267	
R <sup>2</sup>	0.322		0.217		0.195	
F ratio(df)	44.662(9,847)***		26.189(9, 848)***		7.837(8,258)***	

\* $p<0.05$ ; \*\* $p<0.01$ ; \*\*\* $p<0.001$

CI= Confidence interval, Inv=Inverse transformation

F=Female, M=Male; Un=Unmarried, MA=Married; NS=Non-smoker, S=Smoker

## **Discussion**

This study was conducted in order to identify factors associated with knowledge, attitude and attempt to quit smoking among adult population in Sarawak. The study indicated that the perceived knowledge of health effects was found to be higher among the non-smokers than the smokers. This findings are consistent with previous studies which showed significant difference in knowledge between smoker and non-smoker<sup>15,16</sup>. This might be due to the fact that the smokers have the knowledge, but they did not internalize those knowledge<sup>17</sup>.

It is not surprising to find from this study that the non smokers have a higher preventive attitude and a better perception towards the pictorial health warnings compared to the smokers.

Age, family size, marital status as well as scariness and nature of information in pictorial health warning contributed to the perceived knowledge of health effects of smoking. The bigger the family size, the more informative the pictorial health warning and a married individual as well as younger individual has higher knowledge of health effects of smoking. This finding corresponds to the facts that the family is an important institution in the Asian cultural perspective<sup>18</sup>. The family member's advice and encouragement on smoking cessation and hazard of smoking may influence individual to stop smoking or prevent them from initiating smoking<sup>16</sup>.

Factors that contributed in attitude towards smoking include level of education, perceived knowledge of health effects and information on cigarette packages. This finding was consistent with the previous study<sup>19</sup>. Therefore, in order to change the attitude, an approach that focuses on long term and short term knowledge as well as making the cigarette package more informative is needed.

The same factors also contributed towards quitting

attempt. In addition, the attractiveness on cigarette packages and nature of jobs are also part of the contributing factors. While marital status, clarity and nature of information on the cigarette packages have positive contribution for quitting attempts, the nature of jobs such as business and service negatively influence in quitting attempt of smoking.

This study has some limitations. One of the limitations of the study was that smoking status was based on self-report. However, there are evidences showing that self-reported study is reasonably accurate enough for classifying smoking status. Studies done by the US Department of Health and Human Services, 1990 and Scottish Health Survey showed that self-reported study have less than 5% false negative results<sup>20</sup>. The second limitation was that this study was cross-sectional. Therefore, the causal relationship between attitude, knowledge and practice could not be made. However, a study by Steptoe *et al.*, 1995 found an associations between change of smoking status and cognitive factors such as attitude and knowledge after a period of one year<sup>21</sup>.

## **Conclusion**

Despite these limitations, the findings do add to the knowledge of smoking among Sarawakians in particular. This study shows how their demographic status and knowledge of health effects of smoking influence their attitude towards smoking, and subsequently towards quitting smoking. These findings are especially important for policy makers in the development of a better plan and strategies to tackle this problem.

## **Acknowledgement**

We acknowledged the financial help rendered by Universiti Malaysia Sarawak through a grant (FPI (F05)/70/2012 (30)). We also acknowledged the data collectors and the respondents of this study.

**Conflict of Interest:** None

**References:**

1. World Health Organization. Smoking in china, a time bomb for the 21st century. Geneva: WHO.1997.
2. World Health Organization. World Health Statistics 2008. Available from: www.who.int/whosis/who stat/EN\_WHS08\_Full.pdf.
3. Ministry of Health. Information and Documentation System (IDS), Ministry of Health Malaysia, *Annual Report 2006*
4. Peto R, Darby S, Deo H, Silcocks P, Whitley E, Doll R. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case-control studies. *BMJ*. 2000;*321*:323-9. DOI: 10.1136/bmj.321.7257.323. <https://doi.org/10.1136/bmj.321.7257.323>
5. Anthonisen NR, Skeans MA, Wise RA, Manfreda J, Kanner RE, Connett JE. The effects of a smoking cessation intervention on 14.5-year mortality: a randomized clinical trial. *Ann Intern Med*. 2005;*142*:233-9. DOI: 10.7326/0003-4819-142-4-200502150-00005. <https://doi.org/10.7326/0003-4819-142-4-200502150-00005>
6. Keeler TE, Hu TW, Barnett PG, Manning WG. Taxation, regulation and addiction: a demand function for cigarettes based on time-series evidence. *J Health Econ*.1993;*12*:1-18. [https://doi.org/10.1016/0167-6296\(93\)90037-F](https://doi.org/10.1016/0167-6296(93)90037-F)
7. Wasserman J, Manning WG, Newhouse JP, Winkler JD. The effects of excise taxes and regulations on cigarette smoking. *J Health Econ* .1991;*10*:43-64. [https://doi.org/10.1016/0167-6296\(91\)90016-G](https://doi.org/10.1016/0167-6296(91)90016-G)
8. Charlton A & Blair V. Predicting the onset of smoking in boys and girls. *Social Science and Medicine*. 1989; *29*: 813-18. [https://doi.org/10.1016/0277-9536\(89\)90080-4](https://doi.org/10.1016/0277-9536(89)90080-4)
9. Spear SE & Akers R.L. Social learning variables and the risk of habitual smoking among adolescent. The Muscatine Study. *American Journal of Preventive Medicine*.1988;*4*:336-42.
10. Taylor SM, Ross NA, Cummings, KM, Glasgow RE, Goldsmith, CH, Zanna MP & Corle DK. Community Intervention Trial for Smoking Cessation (COMMIT): changes in community attitudes toward cigarette smoking. *Health Education Research* .1998;*13*(1):109-22. <https://doi.org/10.1093/her/13.1.109>
11. McMaster C & Lee C. Cognitive Dissonance in Tobacco Smokers. *Addictive Behaviors* .1991;*16*: 349-53. [https://doi.org/10.1016/0306-4603\(91\)90028-G](https://doi.org/10.1016/0306-4603(91)90028-G)
12. Parerri-Wattel P. Cognitive dissonance and risk denial: The case of cannabis use in adolescents. *The Journal of Socio-Economics* .2006;*35*: 1032-49. <https://doi.org/10.1016/j.socec.2005.11.023>
13. Rahman MM, Arif MT, Razak MFA, Suhaili MR, Tambi Z, Akoi C, Peak D. Does Menthol-Brand Cigarette Initiate Early Smoking? Evidence from a Cross Sectional Study in Sarawak, Malaysia. *Iranian J Publ Health*. 2014;*43*(3):385-86.
14. Global Adult Tobacco Survey (GATS): Sample Design Manual, Version 2.0. Atlanta, GA: Centers for Disease Control and Prevention. 2000.)2010(14. Global Adult Tobacco Survey Collaborative Group,
15. Nabile CGA, Anfosso R, Pavial M & Angelili IF. Cigarette smoking, attitude and behaviour in an adult population in Italy. *Public Health* ;*114*:348-62. [https://doi.org/10.1016/S0033-3506\(00\)00362-0](https://doi.org/10.1016/S0033-3506(00)00362-0)
16. Ma GX, Fang CY, Tan Y & Feeley RM. Perceptions of risks of smoking among Asian Americans. *Preventive Medicine* .2003;*37*: 349-55. [https://doi.org/10.1016/S0091-7435\(03\)00143-9](https://doi.org/10.1016/S0091-7435(03)00143-9)
17. Chhea C & Koeut P. Health knowledge and gender attitudes related to women and tobacco use in Kratie Province, Cambodia. The Collaborative Funding Program for Southeast Asia Tobacco Control Research. 2006
18. Lafferty CK, Heaney CA & Chen MS Jr. Assessing decisional balance for smoking cessation among Southeast Asian males in the US. *Health Education Research* .1999; *14*(1):139-46. <https://doi.org/10.1093/her/14.1.139>
19. Lim KH, Sumarni MG, Amal NM, Hanjeet K, Wan Rozita WM and Norhamimah A. Tobacco use, knowledge and attitude among Malaysians age 18 and above. *Tropical Biomedicine* .2009;*26*(1): 92-99.
20. Henderson S, Lewis IC, Howell RAH, Rayner KJ. Mental Health and the use of alcohol, tobacco, analgesics and vitamins in secondary school population. *Acta Psychiatrica Scandinavica* .1981; *63*(2):186-89. <https://doi.org/10.1111/j.1600-0447.1981.tb00664.x>
21. Steptoe A, Sanserman R & Wardle J. Stability and changes in health behaviours in young adults. *Psychology and Health* .1995;*10*: 155-69. <https://doi.org/10.1080/08870449508401945>