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Do Warning Labels on Cigarette Pack matters?

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ABSTRACT

Six million people die each year worldwide due to tobacco use. About 23.1% adults older than 15 years old in Malaysia smoke cigarettes. The aim of this study was to determine the knowledge of tobacco risks and perception towards warning labels on cigarette packages in Malaysia. This cross-sectional study was done at community of Bandar Baru Sungai Buloh, Section U20, Selangor, Malaysia from 14-23May 2015. All consenting individuals of >18 years old were included, and respondents who cannot read or understand Malay were excluded. Respondents were randomly selected using True Random Number Generator. The questionnaire used was modified and adapted from the International Tobacco Control Four Country Survey (ITC-4) questionnaire. Data was analyzed using the Statistic Package for Social Science program (SPSS 20.0). A total number of 414 participated in this study. The median age of respondents was 37 + 27 years. 63.3% were non-smokers, 23.4% were smokers, and 13.3% were ex-smokers. Knowledge of tobacco risks in community was poor with mean score of 24.39 (3.749) out of total score of 30. Significant relationship between education level (p=0.006), religion (p=0.004), chronic obstructive pulmonary disease (p=0.001), and personal income (p=0.038) and knowledge score of tobacco risks were found. Perception towards warning labels in community was low with mean score of 11.02 (3.927) out of total score of 19. Significant relationship between gender (p=0.007), smoking status (p=0.001), and knowledge score of tobacco risks (p=0.004) and perception score towards warning labels in community were found. Perception towards warning labels in smokers and ex-smokers was also low with mean score of 23.98 (7.317) out of total score of 52. Significant relationship between age (p=0.046) and perception score towards warning labels in smokers and ex-smokers were found. More intervention programs need to be done to improve knowledge of tobacco risks and perception towards warning labels on cigarette packages to promote smoking cessation in community.
Keywords: knowledge, tobacco risks, perception, warning labels, cigarette packages, smoking

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INTRODUCTION

Tobacco use is one of the most public health threats the world has ever faced. Currently, tobacco is responsible for death of 6 million people all over the world each year [1]. It is the second major cause of death and the fourth most common risk factor for diseases worldwide, killing 4.9 million people each year worldwide [2].Smoking leads to disease and disability and harms nearly every organ of the body. Smokers are more likely to die of a heart attack compared to non-smokers [8], associated with risk of stroke [9], erectile dysfunction [10], increased HbA1c level [11], and lung cancer in active [12] and passive smokers [13].It is estimated that 23.1% adults more than 15 years old in Malaysia smokes cigarettes in which, among men (43.9%) and among women (1.0%) [3]. A total of 45.8% of the smokers thought of quitting because of the warning labels where 45.7% of them were male and 51.7% of them were female [3].

Previous study showed that younger Malay men, low education level, reside in rural residential area and with lower socio-economic status have the higher tendency to become smokers [4]. It was found that majority of smoking habit among smokers' starts before the age of 20[5]. Factors that are related to smoking habits include information on history of smoking, type of tobacco used and frequency of smoking [6]. A study on smoking awareness conducted among hospitalized men with cardiovascular disease showed that less than 50% of participants were aware of health effects of smoking such as stroke. Most participants believe that by quitting smoking, risk for health problems is reduced [14].

A lot of intervention programs have been done in Malaysia since 1993 [15]. Control of Tobacco Product regulations are also included in the program such as restriction of smoking in public places, display of warning labels on cigarette packs and sale of tobacco products regulation [16].Recently, Malaysia implemented a World No Tobacco Day in line with WHO recommendations to stop illicit trade of tobacco product and to raise awareness that creates a major global concern especially on health [17]. Cigarette warning labels are one of the several national level policies that have been introduced to address the economic and health burden of tobacco use[18].The warning labels are unique among the initiatives of tobacco control and virtually all smokers are exposed to the intervention as they are delivered at the time of smoking[19]. Recent studies showed that graphic warning labels on cigarette packages can increase cessation behavior among smokers [18]. However, only a few studies have assessed the impact of different product warning policies on smoker's knowledge of tobacco risks [19]. Therefore the aim of this study is to determine the knowledge of tobacco risks and perception towards warning labels on cigarette packages in Malaysia.

METHODOLOGY

A cross-sectional study was done in 2 weeks duration from 14 May 2015 to 23 May 2015. Our study was conducted in a specific community. Our probability sampling method was simple random sampling. In section U20, Shah Alam, we had selected Bandar Baru Sungai Bulohas the place of study by simple random sampling. Phase 1B and 1Cwas also selected by using simple random sampling. There are a total 484 houses in the residential area. Only one individual in a house was selected to answer the questionnaire. Our sample size was 370 after calculation by using Epi Info software with the estimated population size of 10,000. In addition, assuming 20% of non-response rate, our target respondents became 444. Every 41 researchers (Medical students year 4) were responsible to collect 10 or 11 questionnaires each after being trained for this purpose. From 484 houses that we had numbered on the list, we select 444 houses by True Random Number Generator application. We selected randomly the respondents to be included in this study according to the inclusion and exclusion criteria. Our inclusion criteria was individuals age of more than 18 years old while we exclude those who unable to read or understand Malays. If there was more than one individual who were eligible to be a respondent, we picked one of them by simple random sampling method.

Our questionnaire was adapted and modified version from the International Tobacco Control Four Country Survey (ITC-4). It is previously used in a study to determine the effectiveness of cigarettes smoking labels in informing smokers regarding the risks of smoking. The questionnaire was in Malay language and has a total of 25 questions consisting 4 components: Socio-demographics Details (Age, gender, religion, occupation, education level, marital status, personal income and co-morbidities). Smoking Habits: Smoking status (active smoker, ex-smoker, non-smoker). Duration of smoking and number of cigarettes answered by active smoker; exposure to smokes and any trial of smoking answered by non-smoker; intervention of stop smoking answered by ex-smoker. Knowledge of Health Effects And Tobacco Constituents (Risks of heart disease, stroke,

impotence, increased HbA1c level, lung cancer in smokers and passive smokers. Contents in cigarettes are cyanide, mercury, arsenic and carbon monoxide). Perception towards Warning Labels: (In the Community – Notice and read or look closely at warning label. In Smokers and Ex-smokers only – efforts to avoid looking at warning label, efficacy of warning label in encouraging to stop smoking). Pilot study was done as a pre-test to evaluate feasibility of the questionnaire in an attempt to improve upon the study design prior to performance of a full-scale research project. Fifty participants were chosen randomly to complete the pilot study. Ethical aspects of the study have been addressed and ethic approval was obtained from research ethics committee of Research Management Institute of Universiti Teknologi MARA (UiTM).

Researchers went to the place of study over the weekends and also weekdays. The questionnaires were distributed to the community and were filled by them with the assistance from interviewers. All 444 houses had been approached by researchers. We managed to gather 414 questionnaires in total. This outcome generated a response rate of 93.24%. Another portion which was 6.76% as the individuals in a particular houses refused to participate (n=18) and also there were houses with no occupant (n=12). Our researchers were being told by the neighbours, that the owner of the empty houses went back to hometown, overseas or relatives' houses. The data was entered, cleaned, and analyzed by using SPSS software. Analysis performed will be descriptive such as frequency and analytical/ inferential such as, Independent t-Test, Chi-square test, one way Analysis of Variance (ANOVA), and simple correlation and regression analysis were used to look into the relationships between these variables. The categories of knowledge scores and perception score were decided by using arbitrary scoring system.

RESULTS

PART A. SOCIO-DEMOGRAPHIC DETAILS

A total of 414 respondents from the community of Bandar Baru Sungai Buloh, Section U20, Selangor and the response rate was 7.25%.

Table 1: Socio-demographic characteristics of the participants (N=414)

	Frequency (%)
Gender	
Male	245 (59.2)
Female	169 (40.8)
Race	
Malay	305 (73.7)
Indian	65 (15.7)
Chinese	29 (7.0)
Others	15 (3.6)
Religion	
Muslim	318 (76.8)
Hindus	59 (14.3)
Buddhist	25(6.0)
Christian	11 (2.7)
Others	1(0.2)
Occupation	
Unemployed	139(33.6)
Private employee	122 (29.5)
Government employee	71(17.1)
Self-employee	60 (14.5)
Employer	18 (4.3)
Unpaid family worker	4(1.0)
Education level	156 (37.7)
Secondary	121 (29.2)
Pre-university	107 (25.8)
Tertiary	25 (6.0)
Primary	5 (1.2)
No formal education	
Marital Status	275 (66.4)
Married	125 (30.2)

Single	9 (2.2)	
Widowed	5 (1.2)	
Divorced		
Co-morbidities		
Diabetes Mellitus	48 (11.6)	
Asthma	32 (7.7)	
Coronary Artery Disease	17 (4.1)	
Stroke	4 (1.0)	
Osteoporosis	4 (1.0)	
Chronic Obstructive Pulmonary Disease	3 (0.7)	
Impotence	1 (0.2)	
Lung Cancer	0 (0.0)	

The majority of participants were male (59.2%), Malay (73.7%) and married (66.4%). About 33.6% of the study population were unemployed. The total respondents with co-morbidities were 109 with Diabetes Mellitus being on top the list accounting for about 11.6% out of the total population (Table 1).

The most use intervention to quit smoking among ex-smokers was self-help (92.7%). Only about 14.5% use behavioural and psychological intervention to help quit smoking.

Table 2: Socio-demographic details and smoking status (N=414)

Variables	Smoking Status		X^2 value	p-value
	Currently smoking (n=97)	Currently not smoking (n=317)		
Gender				
Male	95(38.8%)	150 (61.2%)	78.780	**<0.001***
Female	2 (1.2%)	167 (98.8%)		
Occupation				
Employed	77 (28.0%)	198 (72.0%)	9.535	**0.002***
Unemployed	20 (14.4%)	119 (85.6%)		
Race				
Malay	74 (24.3%)	231(75.7%)	3.927	0.269*
Chinese	5 (17.2%)	24 (82.8%)		
Indian	12 (18.5%)	53 (81.5%)		
Others	6 (40%)	9 (60.0%)		
Religion				
Muslim	79 (24.8%)	239 (75.2%)	1.526	0.217*
Non-muslim	18 (18.8%)	78 (81.2%)		
Education Level	44 (23.7%)	142 (76.3%)	0.010	0.922*
Pre-SPM	52 (23.2%)	175 (76.8%)		
Post-SPM				
Marital Status	32 (23%)	107 (77%)	0.019	0.889*
Single	65 (23.6%)	210 (76.4%)		
Married				
COPD	3 (100.0%)	0 (0.0%)	9.876	**0.013***
Yes	97 (23.4%)	317 (76.6%)		
No				

*Chi-square test

Only gender (p≤ 0.001) and occupation (p=0.002) showed significant association with smoking status. Odd ratio for gender is 52.88 (12.813, 218.275) thus the odds of becoming a smoker in male is 53 times higher than female. Odd ratio for occupation is 2.314 (1.346, 3.978), thus the odds of becoming a smoker in employed is 2 times higher than in unemployed. Race, religion, education level, age, income and marital status showed no significant association with smoking status. Diabetes Mellitus shows significant association with smoking status with p<0.001. Chronic Obstructive Pulmonary Disease (p-=0.013) showed significant association with smoking status. The Chronic Obstructive Pulmonary Disease is significantly associated with smoking status. Odd ratio is 4.327 (3.661, 5.222) thus the odds of having Chronic Obstructive Pulmonary Disease is 4 times higher in smokers than non-smokers (Table 2).

For knowledge, the majority of the community knew that tobacco smoke can cause heart disease (83.1%), lung cancer in active smoker (89.4%), lung cancer in passive smoker (83.1%) and more than half know smoking can cause stroke (57.7%), and impotence (54.8%). However, about half did not know that smoking can increase blood sugar level. More than half (58.7%) of the community knew that carbon monoxide is one of the constituents in cigarette but they did not know cyanide (64%), mercury (61.6%) and arsenic (59.9%) are among the tobacco constituents.

Table 3: Socio-demographic and co-morbidities in relation to knowledge about tobacco risks

Variable	N	Mean Knowledge (SD)	p-value
Race			
Malay	305	24.49 (3.62)	
Chinese	29	24.55 (4.03)	0.13**
Indian	65	24.35 (3.92)	
Others	15	22.13 (4.60)	
Occupation			
Employer	18	24.17 (5.238)	
Government employee	71	24.79 (3.809)	
Private employee	122	24.30 (3.485)	0.952**
Self employed	60	24.20 (4.250)	
Unpaid family worker	4	24.00 (2.449)	
Others	139	24.39 (3.564)	
Education level			
No formal education	5	25.40(3.435)	
Primary Education	25	22.24(3.370)	
Secondary education	156	24.03(3.868)	0.006**
Pre-university	121	24.64(3.587)	
Tertiary education	107	25.07(3.664)	
Marital status			
Single	125	24.48(3.669)	
Married	275	24.44(3.720)	0.333**
Widowed	9	22.56(5.981)	
Divorced	5	22.60(1.517)	
Religion			
Muslim	318	24.42 (3.662)	
Christian	11	28.09 (2.508)	0.004**
Buddhist	25	23.80 (3.937)	
Hindu	59	23.75 (4.011)	
Gender			
Male	245	24.24(3.873)	0.347t
Female	169	24.60(3.563)	
Coronary artery disease			
Yes	17	24.12 (3.655)	0.476t
No	397	24.40 (3.757)	
Stroke			
Yes	4	23.75 (5.315)	0.732t
No	410	24.40 (3.739)	
COPD			
Yes	3	17.00 (4.583)	0.001t
No	411	24.44 (3.695)	
Asthma			
Yes	32	24.69 (2.688)	0.640t
No	382	24.36 (3.831)	
Diabetes Mellitus			
Yes	48	23.56 (3.913)	0.104t
No	366	24.50 (3.719)	
Impotence			
Yes	1	21.00 (0.000)	0.366t
No	413	24.40 (3.751)	

Osteoporosis			
Yes	4	24.25 (2.872)	0.941
No	410	24.39 (3.759)	
Smoking Status			
Smoker	97	24.02 (4.028)	0.191**
Ex-smoker	55	23.84 (4.246)	
Non-smoker	262	24.64 (3.516)	
Education level			
No formal education	5	25.40(3.435)	
Primary Education	25	22.24(3.370)	0.006**
Secondary education	156	24.03(3.868)	
Pre-university	121	24.64(3.587)	
Tertiary education	107	25.07(3.664)	

[t]Independent t-test, **One-way ANOVA

Educational level (p=0.006) and religion (p=0.004) had significant relationship with knowledge score of tobacco risks. Personal income had significant relationship between personal income and level of knowledge of tobacco risk (p=0.038). The mean knowledge score differed significantly across the five education groups, $F_{(4, 413)} = 3.624$, p=0.006. Bonferroni post-hoc test indicates that pre-university [24.64(3.587)] and tertiary education [25.07(3.664)] show significantly higher mean knowledge score than primary education [22.24(3.370)]. The mean knowledge score of the tobacco risks differ significantly across the four religion groups, $F_{(3; 412)} = 4.469$, p = 0.004. Bonferroni post hoc test indicates that Christian has statistically higher mean knowledge score of tobacco risks [28.09 (2.508)] than Muslim [24.42(3.662)], Buddhist [23.80(3.937)] and Hindu [23.75(4.011)]. There is statistically significant difference in mean knowledge score of tobacco risks in those with COPD [18.60 (3.975)] and those without COPD [24.46 (3.695)]. Those without COPD has significantly higher mean knowledge score of tobacco risks than those with COPD (Table 3).

For perceptions towards warning labels, only about 31.4% noticed the warning labels very often, but had never looked closely. 51.9% claimed that warning labels will not be able to prevent them from smoking. Yet, 38.9% actually think about health risks when they look at warning labels.

Table 4: socio-demographic details and perception score towards warning labels in community (continued)

Variable	n	Mean score (SD)	p-value
Gender			
Male	245	11.44 (3.907)	**0.007t**
Female	169	10.40 (3.884)	
Co-morbidities			
CAD			
Yes	17	12.29 (4.701)	0.171
No	397	10.96 (3.888)	
Stroke			
Yes	4	12.50 (4.655)	0.449
No	410	11.00 (3.923)	
COPD			
Yes	3	9.33 (1.155)	0.457
No	411	11.03 (3.938)	
Asthma			
Yes	32	11.75 (3.427)	0.272
No	382	10.96 (3.964)	
Diabetes mellitus			
Yes	48	10.98 (4.133)	0.944
No	366	11.02 (3.905)	
Impotence			
Yes	1	9.00 (0.00)	0.608
No	413	11.02 (3.930)	
Osteoporosis			
Yes	4	10.25 (6.131)	0.695
No	410	11.02 (3.910)	

Smoking status	97	12.42 (3.319)	<0.001**
Active smoker	55	10.05(3.865)	
Ex- smoker	262	10.70 (4.028)	
Non- smoker			

**One-way ANOVA, tIndependent t-test

Gender showed significant relationship (p=0.007) with perception score towards warning labels in community. Smoking status (p ≤ 0.001) showed significant relationship with perception score towards warning labels in community. There is statistically significant difference in mean perception score on warning labels between male [11.44(3.907)] and female [10.40 (3.884)]. There is higher mean perception score towards warning labels in male compared to female. There is statistically significant difference in mean perception score across the 3 smoking status groups, F (2, 413) = 9.069, p = 0.001. Dunnett's C post-hoc test indicates that: Active smoker show statistically significant higher mean perception score [12.42 (3.319)] than ex-smoker [10.05 (3.865)] and non-smoker [10.70 (4.028)]. There is significant difference in mean perception score towards warning labels between different smoking status in which the active smoker has higher mean perception score than ex-smoker and non-smoker (Table 4).

DISCUSSION

Tobacco smoking is one of the major health risks factors for various diseases. Many studies which includes ITC wave 4 Malaysia have been done to evaluate the knowledge of tobacco risks and perception towards warning labels in which focusing among smokers and young smokers. To date, there is limited studies have been done involving the community especially non-smokers which consist of second-hand smokers. Our study was carried out to evaluate the public knowledge of tobacco risks and their perception towards warning label in the community of Shah Alam, Malaysia.

Majority (97.9%) of the smoker were male and we found that male have 53 times higher tendency to become a smoker in opposed to female. This finding was consistent with a study done on gender roles and smoking behaviour in Austria that reported more male were smoking compared to female [20]. The reason for male to have higher tendency in developing smoking habits is mainly due to peer influence [21].

We found that most smokers were employed (79.4%) with government sector being the top. Smokers with higher income are more likely to smoke cigarette compared to lower income group [22]. Occupational factors such as stressful work condition, including high job demand, high workload [23], and exposure to occupational hazards [24], may contribute to increased smoking habit and difficulties with cessation [25]. Those with higher income also have higher purchasing power to buy cigarettes.

Association of Diabetes Mellitus And Smoking Status

Majority of the non-smokers (43.8%) and ex-smokers (31.2%) have Diabetes Mellitus in contrast to active smokers (25%). In contrast, based on 3rd National Health and Morbidity Survey-Smoking 2006, found that the risk to develop type 2 Diabetes Mellitus among youth is higher in smoker compared to non-smoker [26]. The risk to get diabetes mellitus also increase with the number if cigarette [27]. However, this is probably because risks to develop diabetes mellitus were not only affected by smoking but other factors as well such as sedentary life style, family history and diet. Previous study showed that low exercise levels, sedentary behaviours, especially watching television, were associated with significantly elevated risk of obesity and type 2 diabetes mellitus [28].

Active smokers have 4 times higher risk of having COPD than non-smokers. Smoking is well known to be the primary risk factor in 80% of COPD deaths [29]. Previous study among 1500 subjects showed that half of the elderly smoker developed COPD [30].

There are various ways to gain knowledge of tobacco risks. One of them is from the warning labels itself. It also serves to provide information of the tobacco constituents [31]. However, the level of knowledge of tobacco risk in community was poor with mean of 24.4 (3.749) with small difference between smokers 24.02(4.028), ex-smokers 23.84 (4.246) and non-smokers 24.64(3.516). Majority of the community knew that tobacco smoke can cause heart disease (83.1%), lung cancer in active smoker (89.4%), lung cancer in passive

smoker (83.1%), stroke (57.7%), and impotence (54.8%). This is supported by ITC Malaysia which showed that smokers knew that smoking can cause heart failure (91%), stroke (83%), impotence (67.5%), and lung cancer in second-hand smokers (89.7%) [32] [33]. Alarmingly, 49.3% in community did not know that smoking can increase their glycaemic control [11]. We concluded that knowledge on cigarette constituents in community was still low. 58.7% of the community knew that carbon monoxide is one of the constituents in cigarette but they did not know cyanide (64%), mercury (61.6%) and arsenic (59.9%) are among the tobacco constituents. Their knowledge about cyanide, mercury and arsenic still low with only 28.0%, 27.3% and 31.4% knew respectively. It differs from a developed country, the United States whereby the community knew that carbon monoxide (90%), cyanide (52%) and arsenic (57%) are the tobacco constituents [34].

Pre-university and tertiary education level has higher mean knowledge score of tobacco risk than primary education level. ITC-4 Country Survey of United State, United Kingdom, Canada and Australia, showed that those who went to university has higher knowledge of tobacco risks than those with diploma or lower education [35]. Higher education level means they had education for a longer period, hence their knowledge of tobacco risks are better than those of primary education level [36].

Our study, showed that the Christian (n=11) had higher knowledge of tobacco risks in opposed to other religions. This might be influenced by the socioeconomic status such as education level, occupation, and income. Almost half of our total Christian (45.5%) respondents completed their study up to the tertiary education level (n=5). 90.9% of them are working (n=10), and majority were in middle and high income group (n=8). Basically, most of the religions encourage stopping smoking. Majority of Muslims and Buddhist believe that their religions discourage smoking and their religion leader told them to quit smoking [37]. Religion can play role in encouraging people to stop smoking [37] but it depends on individual themselves.

Respondent without COPD had higher mean knowledge than respondent with COPD. A study done among the respiratory department outpatient in London showed that non-COPD patients have better knowledge of the tobacco risks than COPD patients [38]. This is due to the desensitization effect towards graphic health warning labels among COPD patients [38].

Our study showed that there is significant association between personal income and level of knowledge of tobacco risk. Those with high and moderate personal income had higher level of knowledge compared to those with low income. Community with higher income had better knowledge of tobacco risks [35] [39]. Personal income is also associated with the education level. Person with high income had higher education level so they had better knowledge of tobacco risks.

The level of perception towards warning labels in the community is low. As the majority of the community were non-smokers (63.3%), they tend to ignore the warning labels on the cigarette packages. Only about 31.4% noticed the warning labels very often, but had never looked closely. 50% of the community claimed that warning labels will not be able to prevent them from smoking. Yet, only 40% of them actually thought of health risks when they looked at warning labels.

Males had higher perception score towards warning labels in contrast to females in our community. This contradicts a previous study in Canada which found that female current smokers were significantly more likely to think about trying to quit after viewing the labels than male current smokers [40]. This finding is probably because female smokers were less than male smokers, hence are less exposed to the warning labels. Active smokers and ex-smokers had higher mean perception score towards warning labels than non-smokers. Smokers were more aware of the warning labels and talk about them more compared to those who never smoke [18]. The warning labels also resulted in increased motivation to quit smoking [41]. Non-smokers may take the warning label as irrelevant for them without realizing second-hand smokers also had effects on their health [42].

Knowledge of tobacco risks is weakly and positively correlated with perception score towards warning labels in community. Recent anti-smoking campaigns in Taiwan, including display of warning labels, have significantly positive effect on the public's health knowledge [43]. In addition, smokers were more likely to acknowledge health risks if they noticed the warning labels [19]. Local study done also showed that Malaysian warning labels have improved knowledge of health effects of smoking [41]. However, this study only assessed immediate reactions, but did not reflect longer term effects [41]. Graphic health warnings were displayed in

attempt to show health risks due to smoking appear more realistic, hence promotes the action of avoiding the risk. In this regard, ideally there should be a strong positive relationship between knowledge score of tobacco risks and perception score towards warning labels. Linear regression analysis showed that only 1.9% of perception score towards warning labels in community can be explained by regression equation; Perception score = 7.478+0.145 (Knowledge score). The higher the knowledge score of tobacco risks, the higher the perception score towards warning labels in community.

Majority of smokers and ex-smokers had never made any effort to avoid looking or thinking about the warning labels by means of covering the warning labels up (67.8%), keeping the pack out of sight (65.8%), using cigarette case or some other pack (78.9%), and not buying packs with particular labels (79.6%). 87% of smokers did not attempt to avoid looking or thinking about the warning labels [44]. Smokers who noticed the warning labels are significantly more likely to realize the health risks of smoking [19]. Hence, more intervention programs need to be done in effort to make the smokers notice the warning labels on cigarette packages.

In our study, we found a weak negative correlation between age and perception score towards warning labels in smokers and ex-smokers. This finding showed that the perception of elderly smokers and ex-smokers towards warning labels were lower than the young adults. More than half young adults felt that graphic warning labels would make them think about not smoking [45]. 71.5% of respondents in India also thought of quitting smoking after reading the warning labels [46]. The reason that the elderly have low perception towards warning labels is probably due to the fact they become less sensitive to the messages as they aged [47]. Linear regression analysis showed that only 2.6% of perception score towards warning labels in smokers and ex-smokers can be explained by regression equation; Perception score = 27.284 - 0.078 (Age). The higher the age, the lower the perception score towards warning labels in smokers and ex-smokers.

Good knowledge about the danger of smoking is a major contributing factor to quit smoking [19] [48]. However, in this study we did not find any significant correlation between knowledge score and perception towards warning labels in smokers and ex-smokers. This is probably due to overall low knowledge level of tobacco risks which might affect their judgment and perception about the warning labels on the cigarette packages.

There are few limitations that were critical in our study. The first limitation was the respondent in this research is limited to a small study population. Our results are biased towards the majority which is Malay race and this accounts for 73.7% of the community. Hence, this clearly shows that it cannot be represented for the whole Malaysian population. this study provides a baseline regarding the perception of the community towards warning labels on cigarette packages in the community as well as in smokers and ex-smokers only. On top of that, the inferences from this study can be used for future planning of smoking intervention programs in order to promote smoking cessation in our community.

CONCLUSION

More intervention programs need to be done to improve knowledge of tobacco risks and perception towards warning labels on cigarette packages to promote smoking cessation in community. The study should involve other populations so that the study result can represent Malaysian population. We should also notify the residents properly prior to the data collection.

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