The effect of graphic cigarette warning labels on smoking reaction among university students in Selangor, Malaysia

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ABSTRACT

Substantial literature revealed that graphic tobacco warnings are effective in assisting smoking cessation. However, there is limited evidence among university students in Malaysia. This research was designed to assess the effect of graphic cigarette warning labels on warning salience, cognitive and behavioural reaction among university students. A survey was conducted among 300 UniKL MFI male students. Respondents were assessed on smoking habits, knowledge and responses towards graphic cigarette warning. This research found that graphic warnings had impacted the smokers on the label salience (61%). However, the graphics label least impacted the cognitive reaction and intention to quit. This indicated that graphic warning labels failed to influence the smokers to forgo cigarettes and avoid the warning label (91% and 75% respectively). In contrast, smokers who were aware of the health risk as well as having the intention to quit smoking increased statistically the odds of noticing and reading the label (odds ratio [OR]=17.232; 95% CI=5.496–54.028) and behavioural reaction of forgoing cigarettes and avoiding the warning label (OR=16.528, CI=3.087–38.494). The finding has clearly shown that creating awareness of the health risks of smoking yield positive results in pictorial warning label salience and behavioural reactions towards the warning label.

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INTRODUCTION

The adverse health effects of tobacco use are well known and documented (Centre for Disease Control and Prevention, 2008). Globally, the annual smoking-attributable deaths are estimated to be 6 million, with 600,000 non-smokers are being exposed to environmental tobacco smoke (WHO, 2011). In addition, up to half of the current users will eventually die due to tobacco-related diseases (WHO, 2008). In Malaysia, a quarter of its population smoked tobacco, and more than 10,000 deaths were reported due smoking-related illness (Global Adults Tobacco Survey (GATS), 2011). In order to address the rising global smoking epidemic, the WHO Framework Convention on Tobacco Control (FCTC) instructs the member countries to exercise measures aimed to reduce the demand for tobacco products (WHO, 2011). The Article 11 of the FCTC provides guidelines for warning messages on cigarette packages which suggest the use of rotating, large, clear, and visible graphic warning messages and they should cover 50% or more of the principal display areas of the package (WHO, 2011). In line with the global effort to curb the rising smoking epidemic, the Malaysian Government implemented several measures to discourage smoking. Malaysia has enforced text-only warning label on the cigarette packaging before 2009. Commencing January 2009, warning graphics were added and

this was a requirement for every cigarette packaging sold in the country (Southeast Asia Tobacco Control Alliance (SEATCA), 2010).

Several studies have assessed the effectiveness of graphic warnings in discouraging smoking (Hammond *et al.,* 2003). A large body of evidence showed that graphic warnings particularly large, prominent, and comprehensive warnings are effective in discouraging smoking initiation (European Commission, 2009; Vardavas *et al.,* 2009) and encouraging smoking cessation (Hammond *et al.,* 2003; Miller *et al.,* 2009). Evidences from other countries (Health Promotion Board Singapore, 2004; Nascimento *et al.,* 2008; Webster and Wakefield, 2008; Li and Grigg, 2009; Miller *et al.,* 2009) and cross-country studies (Hammond *et al.,* 2006; Borland *et al.,* 2009; Givel, 2007) have shown that graphic health warnings are effective. In Australia for example, Miller et al. (2009) noted that the call volume to the 'help quit' line increased following the introduction of warning messages on cigarette packs. Similarly, 47% of smokers in Singapore reported decreased cigarette consumption after pictorial warning labels were introduced (Health Promotion Board Singapore, 2004).

Numerous research postulated that graphic warnings were more effective than text-only messages. Graphic warnings induced a greater emotional response were more likely to retain their salience over time, and increased awareness of health risks, compared to text warnings (Hammond *et al.,* 2006; Hammond, 2011). Similarly, cross-country studies have found that large and graphic health warning images were more effective in stimulating cognitive reactions (i.e., quit intentions as a result of increased knowledge of the health risks of smoking) compared with text-only warnings (Hammond *et al.,* 2006; Hammond *et al.,* 2007; Borland *et al.,* 2009). When comparing Canadian cigarette pictorial warning labels to the U.S. text-only messages it was found that Canadian pictorial labels were more effective in promoting smoking cessation. In Malaysia, only one study conducted among secondary school students in Manjung, Perak, Malaysia assessed the impact of cigarette warning labels. From the study, it was found that the graphics affected smokers' cognitive reaction and smoking perception (Masyita *et al.,* 2015). Nevertheless, little is known on the effect of a graphic warning on the cognitive and behavioural reactions among Malaysian university students. The university years provide an opportunity for interventions to prevent future premature morbidity and mortality by discouraging initiation or continuation of harmful health-related behaviours such as tobacco use (Evangalos *et al.,* 2010). Hence, the current research objectives are to assess smoking characteristics, the effect of graphic cigarette warning labels among university students, and the predictors related to smoking behaviours, cognitive reaction and smokers' salience towards the pictorial warning labels.

MATERIALS AND METHODS

This study employed a cross-sectional design. A total of 310 undergraduates from mechanical engineering programme students were purposively sampled in Universiti Kuala Lumpur, Malaysia France Institute, (UniKL MFI) in Bangi, Selangor, Malaysia. The sample size was determined according to Krejcie and Morgan (1970) sample table based on the given population of bachelor's degree students in UniKL MFI. Students were recruited among male smokers who smoked packed cigarettes with warning graphic label. Recruitment was conducted from June 2017 to August 2017.

The students were briefed and consented before completing the questionnaire. A set of bi-language (Malay and English language) questionnaire was self-administered and collected on the same day. The researcher was available during the completion of questionnaires to clarify any ambiguity. The questionnaire consisted of socio-demographic and smoking characteristics adapted from Md. Numan (2005) and several questions on warning salience, cognitive and behavioural reactions towards graphic warning label (Monàrrez-Espino et al.2014). A set of pictorial warning labels that are commonly used on Malaysia packed cigarettes were incorporated in the questionnaire to assist respondents on their reactions towards the graphic warning label. In order to ensure the consistency of the questionnaire wording and clarity, the questionnaire was pre-tested on a group of students at Universiti Kuala Lumpur, Institute of Medical Science Technology (UniKL MESTECH) that fulfilled the criteria of male smokers and smoked packed cigarettes with warning graphic label.

The SPSS version 18 (SPSS Inc., Chicago, USA) was used to perform statistical analysis. All data were checked on the completeness. Results were presented as n (percentage (%)) for categorical data, mean±SD for continuous data with normal distribution, or median±interquartile range (IQR) for skewed distribution. In order to predict variables associated with the impact of warning graphic, the following variables were analyzed using binary logistic analysis; warning salience, cognitive reaction and behavioural reaction. These variables were calculated using the Enter method. P values of less than 0.05 were considered statistically significant (Brace *et al.,* 2012).

RESULTS AND DISCUSSION

Socio-Demographic and Smoking Characteristics

A total of 300 students completed the survey (response rate: 96.7%) with the mean age of 22.92±1.73 years old. Majority of the respondents were Malay, and half of the students came from a family where both parents obtained a tertiary education and with a monthly family income of more than RM4,000 (Table 1). In addition, the result revealed the earliest age of smoking was at 8 years old (1 respondent). However, 62% of them initiated smoking in the age range of 15- 18 years old. Most of the respondents were daily smokers with a mean duration of smoking of 5 years (Table 2).

The mean expenditure for cigarette smoking was RM 11.00 per day with more than half students smoked at least 10 cigarettes per day. 'Stress release', 'Trying for fun and 'Friend ask to try' were some of the most factors reported for smoking initiation (Table 2).

Smoking among university students has been acknowledged in several studies in tertiary education institutes (Al-Naggar *et al.,* 2011; Monàrrez-Espino *et al.,* 2014). The early age of smoking initiation reported in this study is similar to those found in previous studies ranging between 15 to 20 years old (El-Sharkawy, 2011, Monàrrez-Espino

et al., 2014). Half of the respondents had both parents whose highest level of education is university graduates similar to the study by El-Sharkawy (2011) where most of the smokers came from a family whose father obtained a university education. This scenario might occur when either parent are working thus became unaware of the rapid progression of smoking problems among their children (El-Sharkawy, 2011).

In addition, the study observed that trying for fun and peer influence were the top reasons of smoking initiation, and these were similar from previous findings that reported peer influence as the main factor of smoking initiation among adolescents (Puente *et al.,* 2010; Redhwan Ahmed *et al.,* 2011). As such, supervising the selection of peers among the youth is vital and peers involvement should be considered for involvement in smoking cessation programmes (El-Sharkawy, 2011).

Smokers' Reaction towards Graphic Warning Label

The smokers' reactions towards graphic warning labels were assessed in three dimensions: warning label salience, cognitive, and behavioural reaction. A set of graphic health warning was given to the respondents prior to the survey. The findings revealed that most of the smokers did notice the graphic (72.7%), but only 27.3% read the label often. Surprisingly, the graphic did not impact the

Table 1: Socio demographic characteristic of respondents (n=300)

Demographic Variables	Categories	Frequency (n=300)	Percentage (%)
Age	Mean (SD) 22.92(1.73)		
Ethnic	Malay	290	96.7
	Chinese	5	1.7
	Indian	4	1.3
	Other	1	0.3
	Primary	2	0.7
	Secondary	59	19.7
	College (Certificate, A-Level, Matriculation)	60	20.0
Father Education Level	University (Diploma, Degree, Master, PhD)	173	57.7
	College (Certificate, A-Level, Matriculation)	60	20.0
	No formal education	6	2.0
	Primary	4	1.3
	Secondary	89	29.7
Mother educational level	College (Certificate A-Level, Matriculation)	67	22.3
	University (Diploma, Degree, Master, PhD)	132	44.0
	No formal education	8	2.7
	<RM 1000	3	1.0
	RM 1000-RM 1999	22	7.3
Total monthly income	RM 2000-RM 2999	32	10.7
	RM 3000-RM 3999	113	37.7
	>RM 4000	130	43.3

Data were presented as presented as± mean SD for continuous variables and n (%) for categorical variables.

Table 2: Smoking characteristics of respondents (n= 300)

Smoking characteristics	n (%)
Smoking Status	
Daily	258 (86)
Non-daily	42 (14.0)
Mean duration of smoking (years)	Mean (S.D)
	5.32 (2.33)
Smoking initiation age	
8- 14 years	24 (8)
15 – 18 years	185 (61.66)
19 – 24 years	80 (26.66)
Cigarette Smoked Per Day	
0-10	196 (65.3)
11-20	96 (32)
21-30	8 (2.7)
Mean expenses for cigarettes per day (RM)	Mean (S.D)
	11.12 (4.71)
Reasons Start Smoking	
My friend asked to try	76 (25.3)
I think it is stylish to smoke	43 (14.3)
To release stress	68 (22.7)
My parent smoke, so I smoke too	29 (9.7)
Try for fun	77 (25.7)
Others	7 (2.3)

Data were presented as± mean SD for continuous variables and n (%) for categorical variables.

Table 3: The effect of the graphic warning label on cognitive salience, cognitive reaction and behavioural reaction (n=300)

Graphic warning label effect	n (%)	
(a) Warning label salience	Notice	Read
• Often	183 (61%)	82 (27.3%)
• Never or once in a while	117 (39%)	218 (72.7%)
(b) Cognitive reaction	Thinking about risk	Thinking to quit
• A lot	45 (15%)	29 (9.7%)
• Not at all or a little	255 (85%)	271 (90.3%)
(c) Behavioural Reactions to Labels	Forgo	Avoid
• Many times/Yes	26 (8.7%)	76 (25.3%)
• Never or A few times/ No or Unsure	274 (91.3%)	224 (74.7%)

Data were presented as n (%) for categorical variables.

Table 4: Prediction of the effect of graphic warning label in terms of cognitive reaction (Think about risk and quit)

Significant predictors	Wald X^2	*p*-value	Odds ratio	95% confidence interval	
				Lower	Upper
Warning Salience[a] (Read and Notice)	23.840	0.001*	17.232	5.496	54.028
Behavioural Reaction[a] (Forgoing and avoiding of cigarettes)	10.737	0.001*	16.528	3.087	88.494

Logistic regression was conducted. *denotes significant variable(s) that associated with cognitive reaction, p<0.05. [a]denotes variable(s) that increase the odds of cognitive reaction (lower and upper bound >1)

smokers' cognitive reaction on thinking about the health risk and intention to quit (Table 3). Similarly, a small number of smokers were found to be impacted in terms of the behavioural reaction of forgoing the cigarettes and avoiding the warning label (8.7% and 25.3% respectively).

Logistic regression analysis showed that smokers' salience on the graphics and behavioural reactions (forgoing cigarettes and avoiding warning label) were significantly associated with smokers' cognitive reaction (thinking about the smoking risk and quitting). Both factors increased the odds of smoking health risks perception and quitting intention (warning label salience OR=17.232; 95% CI=5.496–54.028 and behavioural reaction OR=16.528, 95% CI=3.087-88.494) (Table 4).

The incorporation of pictorial health warning label on the cigarette pack as part of the smoking cessation initiative demonstrated positive effects on the smokers' warning label salience. Nonetheless, Strahan et al. (2011) emphasized that most smokers will notice the warning graphic, but not for the subsequent behavioural reactions (forgoing and avoiding cigarettes) as warnings are subject to wear-out. On the other hand, the warning graphic may have failed to affect smokers' cognitive reaction. The finding contradicts with a previous Canadian and Tehran study in which smokers were significantly reported thinking about health risks of smoking and quitting because of the health warnings (Hammond *et al.,* 2007; Heydari *et al.,* 2011). Similarly, most of the smokers reported that the warning did not make them deter cigarette. This is in contrast from Hammond et al. (2007) and Borland et al. (2009) which reported that graphic health warning label significantly increased quitting-related thought and behaviour such as forgoing cigarette. Nevertheless, these previous studies (Borland *et al.,* 2009; Hammond *et al.,* 2007; Heydari *et al.,* 2011) were conducted prospectively and this may provide advantages over the current study which employed cross-sectional design. The cross-sectional design has been demonstrated unable to determine the direction of behavioural changes over a period of time (Heydari *et al.,* 2011).

The current finding also suggests that in order for the smokers to engage with the label (warning salience) and forgoes cigarettes (behavioural reaction), they should be thinking on quitting and the smoking health risks. The result was in contrast with Borland et al. (2009) which concluded that label warning salience was not associated with cognitive and behavioural reactions. This study is in agreement that awareness of smoking health risk may impose a greater impact on the cognitive and behavioural reactions of smoking (Monàrrez-Espino *et al.,* 2014).

CONCLUSION

This study noted significant contributors to the efficacy of graphic warning label on smokers. Since there is a limited study on the effectiveness of graphic warning label in Malaysia, this finding serves as preliminary information to empower current smoking cessation initiatives in the country. Despite the findings, it is important to consider the limitations of the study. The nature of cross-sectional design in the current study might limit the causal inferences, and therefore it is proposed that a follow-up would be useful as attention to the impact of graphic warning label wear out over time. In addition, this current study only was restricted to a few demographic variables (male gender, UniKL MFI students, Malay) which might limit the causal of other demographic factors such as education level, number of family in the household and different ethnicity, with the impact of graphic warning label.

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