RESEARCH ARTICLE

Stages of Smoking Cessation among Malaysian Adults - Findings from National Health Morbidity Survey 2006

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Abstract

Increasing the rate of smoking cessation will reduce the burden of diseases related to smoking, including cancer. Understanding the process of smoking cessation is a pre-requisite to planning and developing effective programs to enhance the rate of smoking cessation.The aims of the study were to determine the demographic distribution of smokers across the initial stages of smoking cessation (the pre-contemplation and contemplation stages) and to identify the predictors of smoking cessation among Malaysian adult smokers. Data were extracted from a population-based, cross-sectional survey carried out from April 2006 to July 2006. The distribution of 2,716,743 current smokers across the pre-contemplation stage (no intention to quit smoking in the next six months) or contemplation stage (intended to quit smoking in the next six months) was described. Multivariable logistic regression analysis was used to examine the relationship between socio-demographic variables and the stages of smoking cessation. Of the 2,716,743 current smokers, approximately 30% and 70% were in the pre-contemplative and contemplative stages of smoking cessation respectively. Multivariable analysis showed that male gender, low education level, older age group, married and those from higher income group and number of cigarettes smoked were associated with higher likelihood of pre-contemplation to cease smoking in the next six months. The majority of current smokers in Malaysia were in the contemplative stage of smoking cessation. Specific interventions should be implemented to ensure the pre-contemplative smokers proceed to the contemplative stage and eventually to the preparation stage.

Keywords: Quit smoking - adult smokers - population study - staages of cessation - Malaysia.

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Introduction

Smoking-related diseases are the main causes of mortality and morbidity in Malaysia over the last three decades (Division for Disease Control, 2003). As such, the main priority of the Malaysia Ministry of Health is to reduce the burden of smoking-related diseases and implement strategies to achieve an increase in the smoker cessation intent rate among smokers (Norsiah, 2013). Understanding the process of smoking cessation is important to formulate and develop specific and effective tobacco control programmes. The Transtheoretical Model (TTM) is based on human behavioural theory by Proschaska and Di Clemente in 1983 and explains the process of smoking cessation. The theory suggests that smoking cessation involves several stages: (1) the pre-contemplation stage- the individual is not interested to stop smoking and does not intend to stop in the next six months; (2) the contemplation stage- the individual plans to quit smoking within a period of six months; (3) the preparation stage- the individual plans to quit within one month or less; (4) the action stage- the individual has made specific changes to their smoking behavior since the last six months; and finally (5) the maintenance stage- the individual maintains the changed behavior.

A population-based study among American adults by Wewer et al in 2003 revealed that the prevalence of smokers in pre-contemplation and contemplation stage was 40%. In 2007, Spigner et al reported that 51.1% of American Chinese and 52.3% of Vietnamese from American were in pre-contemplation stages, whilst the percentages of American Chinese and American

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Vietnamese in contemplation stages were 31.1% and 25.2%, respectively. On the other hand, in 1997 Etter et al reported that 73.6% of smokers in Switzerland were in pre-contemplation stage, but only 22.3% were at the contemplation stage (Etter et al., 1997) These rates were consistent and comparable to the prevalence rates in Spain, and Finland (Pallonen et al., 1992; Becona 1994). Several factors have been identified to be related to the stages of smoking cessation among smokers. Moeschberger et al. (1997) and Ma et al. (2003) conducted research among Asian-Americans and reported that smokers from older smokers tend to be at the advanced stages of smoking cessation. Additionally, Wiccha (1998), Velicer et al. (1997) and Tessaro et al. (1997) reported that certain immigrant ethnicities such as Cambodians and Laotians were more willing to cease smoking within six months as compared to other ethnicities, such as Vietnamese. Furthermore, John et al. (2003) reported that the proportion of smokers who were at the contemplation stage were higher among those of higher income and educational level. However, gender and durations of smoking were not significantly associated with the stages of smoking cessation (John et al., 2003).

Studies of the stages of smoking cessation among Malaysians are scarce. However, there have been several publications which revealed that the difference in social norms of smoking (eg. smoking practice among females which is not acceptable in Malaysia) may contribute to variation in the stages of smoking cessation and the associated factors. In light of the lack of evidence, a local study is required to enable a formulation of suitable policies or programs of stages of cessation to increase the smoking cessation rate among Malaysian smokers. This study intends to describe the prevalence of the initial stages of smoking cessation, namely the pre-contemplation and contemplation stages, and their relationship with socio-demographic variables and number of cigarettes smoked among adult current smokers in Malaysia.

Materials and Methods

Sampling procedure

The data was extracted from the Third National Health and Morbidity (NHMS III) survey in 2006. The respondents to the survey were selected using a two-stage stratified sampling which was proportionate to the population size. The sampling frame was obtained from the Labour Force Survey (LFS) 2004 by the Department of Statistics (DOS), Malaysia. The first strata encompassed all states in Malaysia, which were then further stratified into urban and rural residential areas. The Enumeration Blocks (EBs), which are artificially created geographically contiguous areas consisting of 80-120 households, constituted the primary sampling units; while Living Quarters (LQs) constituted the secondary sampling units. Consequently, a total of 2,150 EBs consisting of 17,251 LQs were randomly selected and of these, 1,424 EBs were urban and 726 rural. The selection of number of households was based on an expected 4.4 respondents per LQ. The total sample size was based on a previous finding on prevalence rate of 24.8% with a margin of error of 1.2 and a design effect of 2. The sampling method has been described in detail in the NHMSIII official report. (Public Health Institute, 2008).

The instrument used to identify the initial stages of smoking cessation was a set questionnaires developed by a panel of experts. This instrument was pre-tested in urban and rural areas (Klang, Bangsar and Sepang) to ensure its validity. Findings from the pre-test study were used to develop the final set of questions, which was later translated into Mandarin and Tamil. Face-to-face interview was employed to obtain data from selected respondents by trained interviewers. The respondents were informed about the study process before starting the interview and informed consent was obtained prior to the conduct of the study. In order to minimize the attrition rate among the respondents, each household was visited three times during the study period. The study was approved by the Medical Research Ethics Committee, Ministry of Health, Malaysia.

Measurements

The current smoking status of respondents was determined by the use of questions "did you ever smoke" and " did you smoke in the last 30 days". Those who answered "yes" to both questions were categorized as current smokers and only current smokers were required to answer the questions on stages of smoking ('are you going to stop smoking in the next six months', with the choice of answer "yes", "No" "don't know" or " don't want to answer"). Those who answered "yes" were categorized as "Contemplation", "No" as pre-contemplation, while those who answered "don't know" or "don't want to answer" were excluded from further analysis.

The independent variables used in the analysis were gender and ethnicity (Malay, Chinese, Indian, other Bumiputeras or other indigenous groups and others). The level of education of respondents was determined by the years of formal education that the respondents have received and was subsequently categorized into four categories: (1) No formal education, (2) Primary education (1-6 years), (3) Secondary education (7-12 years), and (4) Tertiary education (more than 12 years and enrolled in University). The residential areas (urban or rural) were determined in accordance to the DOS, Malaysia and age group was classified into five categories: 18-19, 20-29, 30-39, 40-49 and 50 and above. The respondents' income level was evaluated by an open-ended question whereby each respondent was asked to report the exact monthly household income, which was later classified into four categories: (1) less than MYR 1000, (2) MYR 1000-MYR 1999, (3) MYR 2000- MYR 2999 and (4) MYR 3000 and above. The number of cigarettes smoked among current smokers was determined by an open-ended question and was categorized three groups, which were light smoker (smoked less than 10 cigarettes per day), moderate smoker (smoked 10-20 cigarettes per day) and heavy smoker (smoked more than 20 cigarettes per day).

The quality of data collected was determined by double manual data entry method. Analyses were performed using STATA version 10 and SPSS version 16. Data were weighted to account for the complex study design and non-

response rate. Descriptive statistics were used to estimate the prevalence of smoking stages (pre-contemplation and contemplation) by social demographic variables. Multivariable logistic regression analysis was used to determine the real effect of each variable on smoking stages while simultaneously controlling for potential confounding factors. Only 95% confidence intervals were reported without p values as the large sample size would give significant results even if the difference or association were small.

Results

The present study showed that more than 70% of current adult smokers intended to stop smoking in the next six months (contemplation stage). Approximately three quarters of both Malay and "other Bumiputras", or other indigenous groups, were at the contemplation stage compared to only 50% of Chinese contemplators. The proportion of those who were at the contemplation stage of smoking cessation was inversely associated with their age. A significant higher number of contemplators were of higher educational level. The light smokers were significantly more prevalent at the contemplation stage of smoking cessation than the heavy smokers (Table 1).

Multivariate analysis revealed that the male (OR 1.35, 95%CI 1.01-1.81), those who earn more than MYR 3000, those with no formal education (OR 2.02; 95%Cl 1.51-2.75) or primary educational level (OR 1.31; 95%Cl: 1.04-1.66), older aged smokers, particularly those aged 50 years and above (OR 2.08; 95%Cl: 1.46-2.92), urban and married residents were less likely to plan to quit smoking within six months (Table 2).

Discussion

To our knowledge, this is the first paper which describes the stages of smoking cessation among a representative sample of adult Malaysian smokers. While this study found that 70% of adult Malaysian smokers were at the contemplation stage, previous findings have reported that only 11.3% of Malaysian smokers are contemplators (Lee at al., 2011). This could be due to the use of different definitions of smokers. Lee et al. in 2011 defined smokers as those who have smoked at least once in the last 7 days, while the present study defined smokers as those who have smoked at least one time during the last 30 days. Thus, it is likely that the frequency and number of tobacco products used was higher among weekly smokers as compared to those who only smoked once in a month.

Further, previous reports have shown a wide range for the proportion of those who pre-contemplated to quit smoking (Velicer et al., 1995; LaForge et al., 1999; and John et al., 2003). In addition to the non-standard definitions of 'smokers', these discrepancies may have resulted from different periods of study. Data for the present study was collected in 2006, approximately five years after the Malaysia Ministry of Health embarked on comprehensive anti-tobacco campaigns. It was found that smokers who lived in societies where there were

Table 1. Stages of smoking cessation (pre-contemplation and contemplation) by social demographic among Malaysian adult smokers

Variables		N	Pre-con	95 CI	Contemplation	95 CI
Ethnics	Malay	1651288	391300(23.7)	22.4-25.0	1259988(76.3)	75.0-77.6
	Chinese	448971	217821(48.5)	45.5-51.5	231150(51.5)	48.5-54.5
	Indian	151643	42838(28.2)	23.4-33.6	108805(71.8)	66.4-76.6
	Other Bumis	311403	74543(23.9)	21.2-26.8	237361(76.1)	73.2-78.8
	Others	152935	50953(33.9)	28.9-38.1	101981(66.7)	61.9-71.1
Gender	Male	2594759	743743(28.7)	27.5-29.8	1851015(71.3)	70.2-72.5
	Female	121984	33712(27.6)	23.1-32.7	88271(72.4)	67.3-76.9
Age group	18-19	128398	23545(18.3)	14.4-23.0	104853(81.7)	77.0-85.6
	20-29	693938	162713(23.4)	21.6-25.4	531225(76.6)	74.6-78.4
	30-39	635258	181333(28.5)	26.4-30.8	453925(71.5)	69.2-73.6
	40-49	562739	168446(30.0)	27.7-32.4	393793(70.0)	67.6-72.3
	≥50	696407	240918(34.6)	32.5-36.8	455489(65.4)	63.2-67.5
Marital Status	Single	729310	185973(25.5)	23.5-27.6	543333(74.5)	72.4-75.5
	Married	1888700	551515(29.2)	27.9-30.5	1337184(70.8)	69.5-72.1
	Divorce/widower	91917	38026(41.4)	35.3-47.8	53891(58.6)	52.2-64.7
Education attainment	None	195411	78743(40.3)	36.3-44.4	116668(59.7)	55.6-63.7
	Primary	879744	292323(33.2)	31.3-35.3	587421(66.8)	64.7-68.7
	Secondary	1424359	341238(24.0)	22.5-25.4	1083120(76.0)	74.6-77.5
	Tertiary	193997	56991(29.4)	25.5-33.5	1376006(70.6)	66.5-74.5
Income level	RM <1000	1002788	265455(26.5)	24.8-28.3	737332(73.5)	71.7-75.2
	RM 1000-1999	751398	201386(26.8)	24.9-28.9	550012(73.2)	71.1-75.2
	RM 2000-2999	406933	123255(30.1)	27.4-33.1	285678(69.9)	66.9-72.6
	RM ≥3000	463739	155204(33.5)	30.6-36.5	308535(66.5)	63.5-69.4
Residential area	Urban	1561213	475743(30.5)	28.9-32.1	1085469(69.5)	67.9-71.1
	Rural	1155530	301712(26.1)	24.5-27.7	853817(73.9)	72.3-75.5
Category of smoker	Light smoker	1510411	348348(23.1)	21.7-24.4	1162063(76.9)	75.6-78.3
	Moderate smoker	536927	167912(31.3)	28.8-33.8	369014(68.7)	66.2-71.2
	Heavy smoker	634887	249340(39.3)	30.5-34.7	385546(60.7)	58.3-63.1

Table 2. Multivariable Analysis of Association between Social Demography, Smoking Status and Stages of Smoking Cessation among Adult Smokers in Malaysia

Variable		Adjusted odd ratio	95CI
Ethnic group	Malay	1	
	Chinese	2.61	2.24-3.03
	Indian	1.24	0.95-1.63
	Other Bumis	0.47	0.81-1.16
	Others	1.49	1.15-1.92
Gender	Male	1.58	1.16-2.15
	Female	1	
Age Group	18-19	1	
	20-29	1.78	1.30-2.60
	30-39	1.84	1.30-2.60
	40-49	1.85	1.30-2.65
	≥50	2.08	1.46-2,97
Marital Status	Single	1.15	0.97-1.37
	Married	1	
	Divorce	1.76	1.30-2.38
Education Attainment	None	1.75	1.24-2.37
	Primary	1.08	0.85-1.37
	Secondary	0.82	0.66-1.02
	Tertiary	1	
Income level	>RM 1000	0.82	0.69-0.99
	RM 1000-1999	0.83	0.69-0.99
	RM 2000-2999	0.92	0.76-1.12
	≥RM 3000	1	
Residential area	Urban	1.27	1.12-1.44
	Rural	1	
Smoking Category	Light Smoker	1	
	Moderate smoker	1.59	1.40-1.80
	Heavy Smoker	2.47	1.93-3.14

more aggressive anti-smoking policies felt motivated to quit smoking and move into the advanced stages of change (Etter, 2004). Demographic differences between these studies (i.e. studies conducted in different countries on different populations) may have also contributed to differing rates of pre-contemplation and contemplation.

The present study found that female smokers were more likely to contemplate to quit smoking within the next six months than male counterparts. In contrast, John et al. (2003) revealed that the proportion of contemplation stage German smokers did not vary across gender. One explanation for this discrepancy may be that in Malaysia smoking among females is not the social norm and that societal pressures cause a higher rate of contemplation among Malaysian females.

It was also found that smokers aged 50 years and above were less likely to quit smoking within six months as compared to the younger smokers aged 18-19 years. These findings were in agreement with previous reports (Ma et al., 2003; Marques-Valdaze et al., 2011). This effect can be explained by Strecher and Rosenstock's (1997) Health Belief Model theory, suggesting that behavior change is likely to happen when individuals perceive that the overall threat of an undesirable behaviour outweighs their perceived benefits. In other words, smokers will be more likely to quit smoking if they perceived that smoking may cause severe smoking related diseases or cancers. However, older smokers do not feel that changing their smoking practice at their age would bring much benefit to their health.

Supporting the findings of this study, previous studies have shown that the prevalence of smoking is higher among those whose jobs are lower of social value, which is frequently associated with low educational attainment (Daponte-Codinaet et al., 2009, Lim et al., 2013). This group of smokers were less motivated to quit smoking as smoking practice was reported to be of social milieu among this group. On the other hand, higher prevalence of smokers with contemplation to quit smoking was observed among those with higher educational attainment (Tsoh et al., 2011). The relationship between knowledge and behavioral change has been reported by Ma et al. (2003). which found a high proportion of smokers with higher educational level were at the pre-contemplation stage.

This study also revealed that smokers who were married or single were more likely to be in the contemplation stage than participants who were divorced. This finding corresponds to a previous report that men who live with their partner are more likely to plan to quit smoking than single men (Waite and Gallagher, 2000). A supportive relationship with a spouse or partner may help the smokers to deal with their problems more adaptively and make them less likely to smoke as a short term relief to manage psychological stress. The correlation of single smokers with increased contemplation stage may be due to the fact that majority of the parents do not favour the smoking behaviour of their children.(Lim et al., 2011), driving younger aged and single smokers to contemplate quitting smoking.

Heavy smokers were more likely to be at the pre-contemplation stage as compared to their moderate and light smoker counterparts. This finding is consistent with other studies in which the pre-contemplators have smoked more cigarettes per day than contemplators (DicClemente et al., 1991; Fava et al., 1995; Jhun and Seo, 2006). Additionally, a previous study in North America and Ethiopia showed that a high number of cigarette consumption among smokers was associated with lower motivation to quit smoking (Etter et al., 1997; Girma et al., 2011; Fu et al., 2011). Higher nicotine addiction and tolerance levels may hinder heavy smokers from planning to cease smoking within six months. Additionally, the adverse nicotine withdrawal effects such as restlessness, craving, and irritability may further hamper heavy smokers' smoking cessation (Tsoh et al., 2011). This explaination further supports our findings that Chinese smokers, who are predominanty heavy smokers, are less likely to plan smoking cessation than other ethnic groups.

In summary, the majority of smokers in Malaysia are in the contemplation stage of smoking cessation. Strategies to mobilise smokers from the current smoking cessation stage to more advance stages are urgently needed. This could be accomplished through individualized self-help materials such as written materials, computerized programs, or audio-visual programs (Prochaska et al., 1997; Wiecha et al., 1998; Lancaster and Stead, 2005) or through face-to-face, telephone or group counselling by health professionals (Pisinger et al., 2005). Importantly, smokers in the pre-contemplation stage should be given equal attention. Health promotion programmes to create

the awareness (Chouinard and Robichaud-Ekstrand, 2005; Gunes et al., 2007) and utilisation of nicotine therapy to help the smokers to move from the pre-contemplation stage to the contemplation stage are strongly recommended (Carpenter et al., 2004)

The large sample size of the study and its sound methodology has ensured the external validity of the result of the study and has reflected the real situation of smoking cessation stages among Malaysian current smokers. Moreover, the interview techniques employed were standardized and reliable. The use of a personalized approach during the interview may reduce the incidence of under reporting of smoking practices among specific group particularly among female smokers. However, the cross sectional study design limits the finding of causal relationship between variables and stages of smoking cessation among currents smokers in Malaysia. The study provides insight into the stages of smoking cessation among Malaysian smokers according to their social demographic and smoking habit characteristics. The finding can be used to help the stakeholder or policy makers to formulate appropriate policies or programs based on the stages of smoking cessation intent based on the needs of smokers of different social demographic background. It is with high hope with such a successful implementation of the aforementioned policy, it would help to curb and reduce the prevalence of health problem related to smoking among Malaysia population.

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