TOBACCO TEENS: CIGARETTE SMOKING AMONG ADOLESCENTS AT A RURAL SETTLEMENT, JEMPOL

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Abstract:

Introduction: Smoking has become among the important current public health issues in Malaysia, as about one in four adult Malaysians currently smoke, and about one in ten adolescents smoke. The aim of this study was to assess the prevalence of cigarette smoking among adolescents and its associated factors in a rural community of Jempol, Malaysia.

Methodology: A cross-sectional study was conducted in 2013, involving rural settlements in Jempol, a district in the state of Negeri Sembilan, 147km south of Kuala Lumpur. Two rural settlements were randomly selected. The sampling unit was an adolescent (aged between 10-19 years) who fulfilled the inclusion criteria. The instrument used in this study was a self-administered questionnaire adapted from the National Youth Tobacco Survey (NYTS) 2011. Questions on religiosity were included.

Results: A total of 167 respondents participated in this study. Among them, 31.1% (n=52) were identified as smokers; while 68.9% (n=115) were non-smokers. Mean age of smoking initiation was 14 years old. Being male, being employed, having large number of smokers in the family and among friends, having home smoking policy, being offered cigarettes, academic achievement, religiosity and perception of smoking being normal, cool and relaxing are factors significantly associated with smoking habits among adolescents (P=.05). Most preferred location to smoke was friend’s house (44.2%) compared to own home (28.8%). Premises most visited to purchase cigarettes was the grocery store (59.9%), and majority of the adolescent smokers buy their own cigarettes (57.7%).

Conclusion: Suitable anti-smoking programs should be tailored to and focus on factors most significantly associated with smoking in this age group. Enforcement efforts should be focused on grocery stores to prevent the sale of cigarettes to minors. Future studies need to be carried out to detect a trend of the age of initiation, where or not it is becoming younger.

Key words: smoking, adolescents, rural, religiosity, Malaysia.
1.0 Introduction:

Smoking has become among the important current public health issues in Malaysia. A worldwide survey on tobacco use or also known as Global Adult Tobacco Survey (GATS) carried out in 2011 found that in Malaysia, as much as 43.9% of men, 1.0% of women, and 23.1% overall (4.7 million) adults smoked tobacco; and majority of them smoke on a daily basis (39.9% of men, 0.7% of women, and 20.9% overall (4.3 million adults). Among those who have ever smoked on a daily basis, only 9.5% have quit smoking (GATS Report, 2011).

Adolescent smoking prevalence was captured through the Malaysian National Health and Morbidity Survey (NHMS) carried out every ten years. The second NHMS (NHMS 2) in 1996 showed that 16.7% of male adolescent (aged 12-16 years) were smokers (defined as ever smoked or current smokers). This prevalence decreased slightly to 11.7% and 8.7% in the third (2006) and third (2011) surveys respectively (National Health and Morbidity Survey Report, 2006; National Health and Morbidity Survey Report 2011).

Adolescence is a transitional developmental stage characterized by significant psychological, social and physiological changes (Gluckman, Beedle, & Hanson, 2009; Santrock, 2010). While many individuals go through the adolescent transition relatively uneventfully, some suffer from significant physical and psychological health problems, including obesity, emotional distress and harmful health behaviours including substance abuse and unprotected sex (Knopf, Park, & Mulye, 2008; Mulye et al., 2009).

There are many factors associated with adolescent smoking. Among those widely studied are sociodemographic factors which include age, gender, mother’s educational level, pocket money and working status of the adolescent. Environmental factors have also been commonly studied, which include smoking habits among household members, smoking habits among peers, school factors and accessibility to cigarette. A rather novel factor more recently being studied is religiosity or the relationship between religious behavior and smoking habits.

Age of initiation of smoking is an important predictor to the chance for long-term tobacco use and levels of dependence (Hymowitz et al., 1997). The younger the age at which smoking began, the higher is the likelihood of long term dependence on smoking (Breslau, Fenn, & Peterson, 1993; Taioli & Wynder, 1991). Taioli and Wynder (1991) observed that those who began smoking before age 14 were more likely to become heavy smokers than those who began when they were 20 years of age or older. A Malaysian study by Lim et. al (2010) in Petaling district of Selangor showed that among boys, the youngest age at which smoking started was 5 years old. Most boys started smoking from age 12 to 14, peaking at 14. Among female students however, there was no visible pattern. Median age of smoking initiation for boys was 14, while among girls it was 15 years old. A study by Lim et al. (2006) found a statistically significant association between gender and smoking habits.

Mother’s educational level has also been found to be associated with adolescent smoking. A study by Erbaydar, Lawrence, Dagli, Hayran and Collishaw (2005) showed that adolescents whose mothers had low level of education were more likely to be current smokers compared with those whose mothers have high level of education. Meanwhile, educational level of father was not related to adolescent smoking (Hedman, Bjerg-Ba¨cklund, Perzanowski, Sundberg, & Ro´nmark, 2007; Leatherdale, McDonald, Cameron, Jolin, & Brown, 2005). These findings demonstrate the significance and influence of the mother in children and adolescent smoking habits.
Being able to buy cigarettes is associated with prevalence of smoking habit. According to the International Tobacco Control Policy Evaluation Project Report of Malaysia (2012), adolescents with plenty monthly pocket money have high prevalence of smoking. Employment was also a significant factor associated with smoking. Adolescents who were working were also more prone to smoking. Working adolescents were six times more likely to smoke than students (Aloise-Young, Cruickshank, & Chavez, 2002).

Environmental factors have also been found to be associated with smoking habits among adolescents. These factors include smoking among household members and peers, school actors and accessibility to cigarettes. According to a study by the Royal College of Physicians (2010), any household smoking can increase the risk in prevalence of smoking among adolescent by an odds ratio of 1.92. The role of the family in adolescent smoking habit is further emphasized by the findings of a local study by Nor Afiah, Rahmah, Salmiah, Fazilah, and Shamsul Azhar (2012) which stated that there is a statistically significant association between never discussing the danger of smoking between parents and the children with adolescent smoking status. Peer smoking habits also influence adolescent smoking habits. Nor Afiah et al. (2012) also found that having friends who smoke is significantly associated with smoking among adolescents. Lim et al. (2010) found that 80% of adolescent starts smoking with friends. Students who scored well in academics showed fewer tendencies to smoke (Lim et al., 2006).

Smoking habit is also related to the ease of requiring the cigarettes. In one study it was found that slightly more than half (52.8%) of the adolescents bought their own cigarettes (Hammond, et al., 2008). Knowledge and perceptions on smoking are also associated with smoking. In a study by Naing et al. (2004), significant association between health knowledge and adolescents smoking were noted, where adolescents who are more educated on the health effects of smoking are less likely to smoke. In the same study, the authors also discovered that 11.7% of the adolescents stated that smoking is a normal behaviour, 13.5% of them said they smoked for relaxation and 17.1% of them smoked for enjoyment. Interestingly, religiosity does have a role to play in the smoking habit. A study by Nor Afiah et al. (2012) found that there is significant association between religiosity and smoking behavior, where adolescents who are committed to religion are protected from become a regular smoker. Another study by Nonnemaker, McNeely and Blum (2005) also found significant association between religiosity and the reduced initiation and escalation of smoking as well as increase in the cessation of smoking.

High prevalence of smoking among adults in Malaysia forced government to continuously conduct many activities and campaigns in order to stop or prevent people from smoking. However, as studies have shown that smoking initiation begins at the early teenage years, efforts must be focused into understanding factors which are associated with this phenomenon and tailor the programs accordingly. Unfortunately, most studies mainly focused on the school-going adolescents in the urban or rural areas. As a result, these studies missed out the adolescents who had stopped going to schools. This study however focuses on all adolescents including school-going and those who do not hence making it a more comprehensive study. This study aimed to determine the prevalence of smokers among adolescents in rural settlements and to determine the association between sociodemographic, environmental, behavioural and personal factors with adolescent smoking.
2.0 Methods:

2.1 Study design

This cross sectional study was carried out from April to July 2013. Two rural settlements in Jempol were randomly selected. In each of these settlements, all houses were selected. The sampling unit was an adolescent. Adolescents who have been living in the settlement for more than 5 years were included. The exclusion criteria of subjects were adolescents with physical and/or mental disability. Sample size required was 320 respondents.

2.2 Study instrument

The instrument used in this study was a set of self-administered questionnaire adapted from the National Youth Tobacco Survey (NYTS) 2011. Content validity was ascertained through discussion with local subject matter experts. Questions about religiosity (also known as religious personality) and smoking habit were also included based on the questionnaire by Nor Afiah, et al. (2012). The Cronbach Alpha on the religious personality questions was 0.94 (Nor Afiah, et al. 2012). Face validity of the questionnaire was ascertained by distributing the questionnaire to a similar group of adolescent in a neighboring village who were not included in the study; and subsequent improvement of the questionnaire was carried out based on the comments of these respondents. The final questionnaires were then distributed manually along with an information sheet and consent forms. Respondents were given time to complete the questionnaires.

The questionnaire comprised of three sections. Section A consisted of questions on socio-demographic characteristics. Section B consisted of questions on smoking and the following factors - family, home smoking policy, friends, school, belief on smoking and knowledge about smoking. Section C asked about the respondent’s smoking status and smoking habits. For sections A, B and C, respondents were required to choose the best options from a selection of answers already provided. Section D asked about respondent’s religious habits using a Likert scale of 1 to 5. The working definitions of “adolescent”, “current smoker” and “non-smoker” were adopted from the World Health Organization (WHO). In this study, “adolescents” referred to any person aged from 10 years old to 19 years old. “Current smoker” refers to any person who had smoked at least once during the last 30 days (regardless of the number of puffs or cigarettes), and “non-smoker” is a person who never have tried smoking or have not smoked in the past 30 days.

2.3 Statistical analysis

Chi square and Fisher Exact test performed to determine the associations between individual categorical variables and the smoking status of adolescents. The level of significance is set at $P$ equals to 0.05. The knowledge level of adolescents was determined by calculating the score on knowledge in the given questionnaire. Each correct answer was given one mark. The scores were then categorized into two: high knowledge (score more than 4) and low knowledge (score between 0 and 4). The association between level of knowledge and smoking status was determined using the chi square test. The religiosity score was calculated from the Likert Scale. This score was then categorized into “religiously committed” and “religiously not-committed” according to the score. Because the score distribution was not normal, the median score was chosen as the cut-off point between the two abovementioned categories. Median score less than 53 was defined as “religiously committed”. Chi square test was then carried out to determine the association between religiosity and the smoking status.
3.0 Results:

3.1 Baseline characteristics of respondents

There were 167 respondents, giving the response rate of 72.6%. The distribution of the respondents in terms of gender was almost equal (51% male vs. 49% female). Almost all of the respondents were unemployed (students) compared to those who were employed (94.6% vs. 5.4%). Majority of the respondents (86.8%) had less than RM50.00 (approximately USD 15.00) of pocket money per week, or less than 25% of the minimum monthly wage of RM900.00 in Malaysia (Ministry of Human Resource Malaysia).

Almost all (97.0%) of respondents had mothers whose highest level of education was the secondary school. Out of 167 respondents involved in this study, 31.1% (n=52) were identified as smoker; while 68.9% (n=115) were non-smokers. Majority of the adolescent smokers initiated smoking at the age of 14 years old. The mean age of the initiation smoking was 13.94 (SD ± 1.1) years old. In this study, chi-square test was used to determine the association between categorical variables and the value of p<0.05 is considered to indicate significance. Significant factors associated with smoking status of adolescents in this study were – gender (being male), were employed, those having more than one smoker in the house, those who were allowed to smoke anytime and anywhere at home, those who have more than 15 friends who smoke, those who will smoke if offered cigarettes and those who believe that smoking is acceptable and cool. Interestingly, the proportions of those who claim to have disciplinary problems and often have low marks in their examinations were higher among the non-smokers compared to the smokers. These factors are summarized in Table 1.

Table 1: Factors significantly associated with smoking among adolescents in rural settlements, Jempol (n= 167)

<table>
<thead>
<tr>
<th>Socio-demographic factors</th>
<th>Total</th>
<th>Smoker Frequency (%)</th>
<th>Non-smoker Frequency (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>86</td>
<td>48 (55.8)</td>
<td>38 (44.2)</td>
<td>P = .001</td>
</tr>
<tr>
<td>Female</td>
<td>81</td>
<td>4 (4.9)</td>
<td>77 (95.1)</td>
<td>P = .05</td>
</tr>
<tr>
<td>Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>158</td>
<td>45 (28.5)</td>
<td>113 (71.5)</td>
<td>P = .004</td>
</tr>
<tr>
<td>Employed</td>
<td>9</td>
<td>7 (77.7)</td>
<td>2 (22.2)</td>
<td>P = .05</td>
</tr>
<tr>
<td>Number of smokers in family</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>112</td>
<td>24 (21.4)</td>
<td>88 (78.6)</td>
<td>P = .001</td>
</tr>
<tr>
<td>More than one</td>
<td>55</td>
<td>28 (50.9)</td>
<td>27 (49.1)</td>
<td>P = .05</td>
</tr>
<tr>
<td>Home smoking policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowed (anytime &amp; anywhere)</td>
<td>62</td>
<td>32.9 (51.6)</td>
<td>30 (48.8)</td>
<td>P = .001</td>
</tr>
<tr>
<td>Allowed (certain time &amp; areas)</td>
<td>41</td>
<td>11 (26.8)</td>
<td>30 (73.2)</td>
<td>P = .05</td>
</tr>
<tr>
<td>Not allowed</td>
<td>64</td>
<td>9 (14.1)</td>
<td>55 (85.9)</td>
<td>P = .05</td>
</tr>
<tr>
<td>Number of friends who smoke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 15</td>
<td>150</td>
<td>40 (26.7)</td>
<td>110 (73.3)</td>
<td>P = .001</td>
</tr>
<tr>
<td>15 or more</td>
<td>17</td>
<td>28 (70.6)</td>
<td>5 (29.4)</td>
<td>P = .05</td>
</tr>
<tr>
<td>Have friends who ever offered cigarettes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>43</td>
<td>26 (60.5)</td>
<td>17 (39.5)</td>
<td>P = .001</td>
</tr>
<tr>
<td>No</td>
<td>124</td>
<td>26 (21.0)</td>
<td>98 (79.0)</td>
<td>P = .05</td>
</tr>
</tbody>
</table>
Factors which were not found to have any significant statistical association with smoking status of adolescents in rural settlements in Jempol were mother’s level of education, amount of pocket money per week, ability to discuss with parents about smoking, parent’s interest in discussing about smoking, disciplinary problem in school, time spent in extra-curricular activities in school, belief that smoking makes one thinner; and knowledge about the dangers of smoking.

Among the adolescents who smoked, most (44.2%) preferred to smoke at their friends’ houses compared to their own homes, schools and other places as shown in Figure 1.

**Figure 1**: Preferred locations to smoke cigarettes among adolescent smokers

Majority of the adolescents bought their cigarettes at the grocery stores (59.6%). They also bought cigarettes from their friends, at the minimarts and gas stations as shown in Figure 2.
Figure 2: Preferred locations to purchase cigarettes among adolescent smokers

More than half of the adolescent smokers actually bought cigarettes themselves (57.7%) compared to other methods of acquiring cigarettes as shown in Figure 3.

Figure 3: Preferred ways to obtain cigarettes among adolescent smokers

4.0 Discussion:

The prevalence of smoking in this study was 31%, which was about three times the national level detected during the National Health and Morbidity Survey conducted in 2011. This finding is alarming. The contributing factors to this high prevalence could not be compared precisely with the national results, however, due to the lack of comparable variables between this study and the national survey. One explanation could be because of the enclosed nature of the community, which rendered the adolescents more prone to smoking as most of their peers are also smoking. Majority of our respondents initiated smoking at age 14 years old. Similarly, a study done by Lim et al. (2010) found that most boys started smoking between the ages of 12 to 14 years, peaking at 14 years.

There was significant association between gender and smoking among adolescents. Our study showed more males among the adolescent smokers compared to females. This finding was supported by a study conducted by Lim et al. (2006) who also found that there is an association between gender and smoking behaviour in which the prevalence of smoking are higher among male students.
The status of employment of the adolescent also showed a significant relationship with their smoking status. This is consistent with a study by Tyas and Pederson (1998) who found a higher number of adolescent smokers who had part-time job and have their own personal income, compared to those who were unemployed.

Our results also show that the number of family members who smoke has a significant association with the adolescent’s smoking status. Leonardi-Bee, Jere, and Britton (2011) also found that adolescents who live with their parents or siblings smokers were three times more likely to become smokers than children with non-smoking households. This demonstrated the significance of family influence on adolescent smoking. Family members must be made to realise that their habits have profound effect on the younger members of the household.

We found that home smoking policy was a significant factor in determining adolescents smoking status. Households which have limited allowance for smoking at home had lower numbers of adolescent smokers. Previous study done by Wakefield et al. (2002) also reported that home smoking restrictions had a much greater effect to reduce smoking habit among adolescents compared to bans of smoking programmes which were held in public places.

Our study showed that the number of best friends who smoke was significantly associated with adolescents smoking. This was similar to the findings of Lim et al. (2010) and Nor Afiah et al. (2012) who found that the number of best friends who smoke is associated with the smoking status among adolescents and 80% of the adolescents admitted to have started smoking while being with their friends. In our study, most adolescent smokers have been offered cigarettes by friends and they also smoked when being offered that cigarette.

We also found that religiosity was significantly associated with adolescents’ smoking status. This finding was consistent with other studies done by Naing et al. (2004) and Nor Afiah et al. (2012) who found that religion was the strongest protecting factor for the non-smokers adolescent for not smoking. In this study also, we found that there was an association between the perception of adolescents that ‘smoking is a norm’ with their smoking status. This finding is supported by other studies conducted which found that adolescent considered smoking as a part of the culture and is common everywhere among men (Nawi, Weinehall, & Othman, 2007). Our study was supported by a report from Nor Afiah et al. (2012) which found that smoking status definitely has significant association with belief that smoking is relaxing and can reduce stress. Based on our study, the perception that smoking is “cool” was significantly associated with adolescents smoking status. This was similar to other study findings where the majority of adolescents had stated that smoking makes them feel more matured and appears cool (Khairani, Norazua, & Zaiton, 2007). In this study, we also found that having disciplinary problems in school was not significantly associated with adolescent smoking habit.

Several studies showed that maternal education level was influential on smoking onset of her children, compared to paternal smoking (Hedman et al., 2007; Leatherdale et al., 2005). However, our study showed that mother’s level of education was not significantly associated with adolescents smoking status. This may be contributed by the lack of communication or discussion between the adolescents and their mothers regarding smoking, which could be secondary to local cultural factors unique to the Malay rural communities, where teenage boys rarely have discussions with their mothers. Because of this lack of sharing of information, the mother’s educational level becomes irrelevant. More studies on cultural factors and smoking habits need to be conducted.
Our study found that pocket money of adolescents had no significant association with adolescent smoking status, where approximately 30% of adolescents who had less than RM50 per week were smokers, and approximately 30% of adolescents who had more than RM50 per week were smokers. This was in contrast to the finding of Tyas and Pederson (1998) who reported that young people with more spending money show higher levels of smoking presumably because money is needed for purchase of cigarettes.

We also found that parental discussion about smoking with their children and parents’ interest to discuss on smoking did not show any significant relationship with adolescents smoking behaviour. This finding was similar with previous study by Nor Afiah et al. (2012). This may be due to the fact that discussion between parents and children at home in our community is often limited. Contributing factors to this could be cultural, knowledge or attitude, and more research needs to be done to address this issue.

Based on our study, we found that more than half of the adolescents bought cigarette on their own and mostly at the grocery stores. This may be because of the accessibility and availability of grocery stores in their area as opposed to minimarts and gas stations. In addition, minimarts and gas stations often have closed circuit TV (CCTV) cameras, hence limiting their activity in cigarette buying. The accessibility of cigarettes in grocery stores may indicate the poor attitude of shop owners in preventing smoking habits especially among minors and adolescents and also lack of implementation of related regulations by authorities. More research may need to be done to address these issues. Most adolescents also smoke in their friends’ houses hence parents need to be more vigilant in monitoring the activities their children do at home.

There are several limitations to our study. The sample obtained was less than the sample size required which potentially have impacted on the precision of the estimates and the power of the study. This was a cross-sectional study among a select group of people, namely the adolescents in rural settlements which have a unique cultural and societal make-up. Being a cross-sectional study, we have limited attributions about the directions of causality between the variables hence it limits the establishment of causal relationships between risk factors and smoking. In addition, smoking status of the respondents was not confirmed by using biomarkers such as nicotine levels in saliva or exhaled carbon monoxide; hence the results may not be accurate. Some respondents may underreport or overreport some information regarding their smoking habits in the questionnaire, despite being informed that the information that they gave are strictly confidential. In addition to this, the use of the same questionnaire to adolescents from age 10 – 19 years may also affect the results as the level of understanding may differ across the age range. Nonetheless, this matter has tried to be overcome by assisting the respondents in understanding the questions.

5.0 Conclusion and recommendation:

Among adolescents in rural settlements in Negeri Sembilan, the average age of smoking initiation was 14 years old and factors associated with the smoking habits were gender, status of employment, number of family members and close friends who were smokers, home-smoking policy, level of religiosity and the belief that smoking is something a normal thing to do. These adolescents were also found to prefer buying cigarettes on their own especially at grocery stores and smoking them at their friends’ house. Therefore suitable anti-smoking programs should be tailored to and focus on these factors. Religious-based anti-smoking
program would be an option which can be explored based on the findings of this study. Enforcement efforts should be focused on grocery stores to prevent the sale of cigarettes to minors. Future studies need to be carried out to detect the trend of the age of initiation of smoking, whether or not it is becoming younger; and also to further explore the effect of culture and societal structure on smoking habits and its role in control measures among adolescents.

**Ethical**

The authors have obtained the ethical approval from The University Research Ethics Committee UPM [Reference number: FPSK_Mei (13) 25]; and confirm that this study is not against the public interest, and that the release of information is allowed by legislation.

**Declaration of conflict of interest**

We authors of the article declare that there is no conflict of interest regarding publication of this article.

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