Malaysian Journal of Public Health Medicine 2010, Vol. 10 (1): 28-37

ORIGINAL ARTICLE

PREVALENCE, SMOKING HABIT AND FACTORS RELATED TO SMOKING AND NICOTINE ADDICTION AMONG LOWER SECONDARY SCHOOL MALE STUDENTS IN KOTA TINGGI DISTRICT, JOHOR, MALAYSIA

Lim KH [1], Sumarni MG[1], Kee CC[1], Norhamimah A[2], Wan Rozita WM[1]& Amal NM[1]

[1]Division of Epidemiology Research, Institute for Medical Research, Jalan Pahang, 50588, Kuala Lumpur
[2] Kota Tinggi Health Office, Johor.

ABSTRACT

Many studies on adolescent smoking have been conducted in Malaysia, but very limited information is available on smoking amongst lower secondary school male students (Forms 1 and 2). We present data from a baseline study in Kota Tinggi District, Johor on the psychosocial factors, stages of smoking acquisition and susceptibility to smoking initiation and their relationship to adolescent smoking. The study is the first wave of a 3-year longitudinal study which was conducted from March 2007 to May 2009, aimed to describe the prevalence of smoking among students in the lower secondary classes. A three stage stratified sampling was performed to obtain a sample. The Bogus Pipeline Method was employed to confirm smoking status. Prevalence of smoking was 35.5%. Smoking prevalence among students of schools located in the Federal Land Development Authority (FELDA) settlement areas (42.9%) was two-fold higher than in the rural and town schools combined (20.29%). Using the Fagerstrom scale, 90% of current smokers had lower addiction to nicotine. Smoking was associated with peer smoking [OR, 4.19 (95% CI, 2.57-6.82)], having a brother smoking [2.17 (1.31-3.61)], parental smoking [1.73 (1.17-2.80)] and locality where respondents attend school [1.94(1.11-3.39)]. The study indicates that, the prevalence of smoking was high in all areas especially FELDA settlement areas. Measures such as teaching of skills to resist social pressure to smoke, establishment of peer support groups and involvement of parents in anti-smoking programs are recommended to curb the high prevalence of smoking among lower secondary school students in Kota Tinggi.

Key words: *Adolescent smoking, addiction, lower secondary school, Kota Tinggi*

INTRODUCTION

Many scientific studies have been conducted in the preceding decades that point to smoking as a cause of various preventable diseases[1].

Nevertheless, smoking-related diseases have remained as the main causes of death in this country for the last three decades[2]. Hospital data from Peninsular Malaysia shows that mortality from Cardiovascular Diseases (CVD) increase from 15.6% in 1975 to 18.3% in 1991[3]. The prevalence of smoking in the population is still considerably high, with half of the adult male population in this country are smoking. It is among the highest in the region[4]. Besides the adverse effects of smoking on smokers' health, the economical costs incurred are also substantial. It is estimated that 2.9 billion ringgit is spent on treating three major diseases related to smoking, namely cancer of the lung. Ischemic heart disease (IHD) is a chronic obstructive pulmonary disease (COPD)[5].

Since adolescence is an intermediate stage of growth between childhood and adulthood, it is a particularly turbulent period of physical, cognitive and emotional change, and of searching for a personal identity that frequently involves experimentation with various risky behaviors, including smoking[6]. The majority of smokers start smoking in adolescence, i.e. 15% at 18 and 4% at 21 years of age[7]. Thus, to prevent health problems related to smoking in the long term, the logical strategy is by tackling adolescent smoking. As quitting smoking is the most difficult task owing to the addictive nature of nicotine, advocating nonsmokers to avoid smoking is seen to be a relatively easier route compared to persuading smokers to quit[8].

In Malaysia, the government provides 11 years of free education where the first 6 years of primary school education is compulsory. Therefore, for most children, the entire childhood and adolescent years are spent in school[9]. Consequently, the school plays vital role not only in academic instruction but also in shaping values, attitudes and habits in our children; thus

its importance is second only to the home/family institution.

Many smoking studies have been carried out for the past three decades among adolescents. Studies in various locations have reported a smoking prevalence of adolescents ranging from 19% to 33%[8,9,10]. The National Health and Morbidity Survey (NHMS III) conducted in 2006 reported the prevalence of current smokers among adolescents was 7.8%.

Previous studies mainly examined smoking amongst upper secondary students (Forms 4 and 5)[8,9,10,12,13]. Currently there is a dearth of investigations and reports on students at the lower secondary level whose recent entrants to secondary school and immaturity make them at a high risk to initiate smoking.

Differing cognitive maturity between these age groups suggest the probability that differences exist in the pattern of tobacco use and factors that influence it. In this study, we aimed to investigate the prevalence of smoking, age at which adolescents initiate smoking, prevalence of nicotine addiction (using the Fagerstrom scale) as well as the influence of psychosocial factors such as smoking among family members and friends and environmental factors on smoking among lower secondary school students in the district of Kota Tinggi, Johor, Malaysia.

METHODOLOGY

The data presented in this paper are baseline data from a three year longitudinal study on adolescent smoking which began in March 2007. This project is collaboration between the Institute for Medical Research (IMR) and the Kota Tinggi District Health Office. Study design, instrument design and expertise were provided by the IMR while data collection was coordinated and managed by the District Health Office. Data collection was jointly conducted by the two collaborators, comprising the principal investigator, assistant research officers and trained public health nurses.

The study was approved by the Ministry of Education and the Johor State Health Department. Ethical approval was given by the Ministry of Health, Malaysian. Questionnaires were self-administered. For Forms 1 and 2 students, detailed explanations were given on each question, whilst for Form 4 students, brief explanations on the questions and instructions on how to complete the questionnaire were attached with the forms. Help was given to those who seek further clarification on any of the items.

As part of the procedure for ensuring anonymity, students who agreed to participate were asked to put only their signatures on their questionnaires which only they themselves will be able to identify. They were also instructed not to write down their names on the questionnaires to ensure there were no means by which their questionnaires may be traced back to them by people other than themselves. In addition, no school staffs were allowed to observe the students completing the questionnaires on site.

The data was analyzed using SPSS version 11.5. The chi-square test or Fisher's exact test were used to test for a significant association between categorical variables. A Spearman Rho Correlation analysis was conducted in order to analyze the relationship between the level of addiction and age of commencement of smoking, smoking frequency, and number of sticks smoked. Significant variables from the chi-square test were included in multivariate analysis using Binary Logistic Regression. The enter method of logistic regression was used to test the association between smoking and the factors. The final model of factors was checked for fitness using Hosmer- Lemeshow goodness of fit test. The p value was not significant indicating the model had fit. The final model was also analyzed for all possible two-way interaction, revealing no significant interaction in the final model. All statistical analysis was done at 95% confidence level.

Definitions

Current smoker – Smoked at least once within the past 30 days.

Lower secondary students – Students in Form 1 or Form 2

Sampling

A three-stage stratified sampling was carried out. The first stratum was the division of the district into urban/rural/FELDA settlements, the second stratum consisted of secondary schools. Six schools were selected from the FELDA settlement areas, three schools from town areas and one from the rural area. A list of selected students was then obtained from the schools administrators and simple random sampling was used from random numbers generated by Epi Info version 6.04d.

A total of 2700 students were selected based on smoking incidence of 3.5% for Forms 1 and 2 and 6% for Form 4 , setting the maximum tolerable error at 3%, design effect of 0.67, assuming an intraclass correlation coefficient of 0.5 and average proportion of students per strata at 0.33 as well as a no response rate of 30%. The number of students selected from each school

was calculated in proportion to the total number of students in the school.

Study instrument

The instrument used in this study was adapted from questionnaires by Hanjeet *et al* (2003)[12] and Lim et al (2006)[13] and validated. Nevertheless, the instrument was tested on Forms 1, 2 and Form 4 students in a pilot test in three schools in Kota Tinggi district in November 2007 (1 school each from the urban, rural and FELDA areas). Minor improvements were made to the questionnaires following the pilot test. The dependent variable in this study was the current smoking status of respondent (current smoker or non smoker), while independent variables were residential locality (FELDA, rural, urban), family members who smoke (father, mother, siblings), percentage of friends who smoke and ethnicity. Smoking addiction level was assessed by a validated Malay translation of the Fagerstrom scale.

All questionnaires were checked to ensure that they were answered and in the correct manner. Completed questionnaires were packed into envelopes and the envelopes which were then sealed in the presence of the respondents.

RESULTS

The response rate was 94.7% (1117/1180). Of the 1117 respondents, 705 (63.1%) were former smokers and 397 (35.5%) current smokers. Among the current smokers, thirty six (9.1%) were daily smokers, 48(12.1%) smoked once every two days, 131 (33.0%) smoked once or twice a week, the rest smoked once a week.

Prevalence of smoking was higher among students in FELDA settlements (44.0%0) compared to the other areas, urban and rural (21.2%), $p<0.001$ (Table1).

Table 1. Smoking status

Variable	Smoking status		x^2	p value
	Smoker N (%)	Non-Smoker N (%)		
Percentage of friends who smoke (n=1062)				
0-40%	106(19.2)	445(80.8)	150.67	p<0.001
41-100%	281(55.6)	227(44.4)		
Perception of percentage of friends who smoke (n=1059)				
None-Few	194(31.5)	422(68.3)	16.2	p<0.001
Many-A lot	193(43.6)	250(56.4))		
Father smokes (n=921)				
Yes	222 (44.5)	277(55.5)	26.02	p<0.001
No	119(28.2)	303(71.8)		
Mother smokes (n=989)				
Yes	3 (37.5)	5 (62.5)		p=0.12*
No	350 (35.7)	631 (64.3)		
Elder brother smokes (n=658)				
Yes	208 (51.9)	193 (48.1)	46.97	p<0.001
No	64 (24.9)	193 (75.1)		
Younger brother smokes (n=724)				
Yes	12 (44.4)	15 (55.6)	4.35	p=0.037
No	268 (35.9)	479 (64.1)		
Location of school (n= 1045)				
FELDA settlement	304(44.0)	387 (56.0)	52.68	p<0.001
Urban and rural	75(21.2)	279(78.8)		

* Fisher's exact test

Students started smoking as early as the age of 4 years old and begin to peak at upper primary level. The mean age of those who started smoking was 11.28 years (95%CI 11.12 to 11.45) (Figure 1). The majority of current smokers (approximately 80%) smoked less than three cigarettes a day (Figure 2).

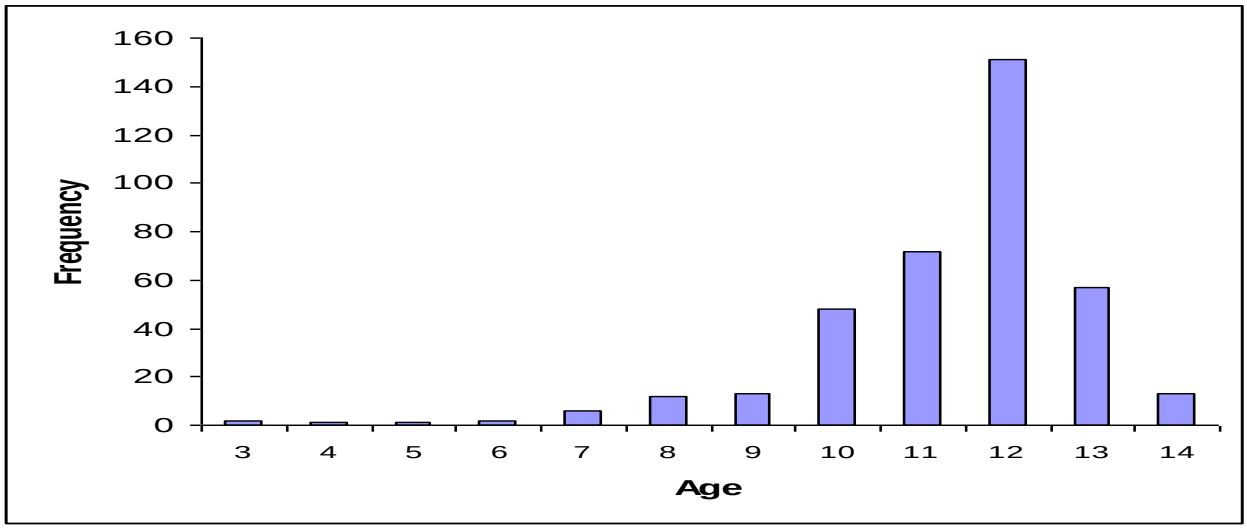

Figure1. Age started smoking

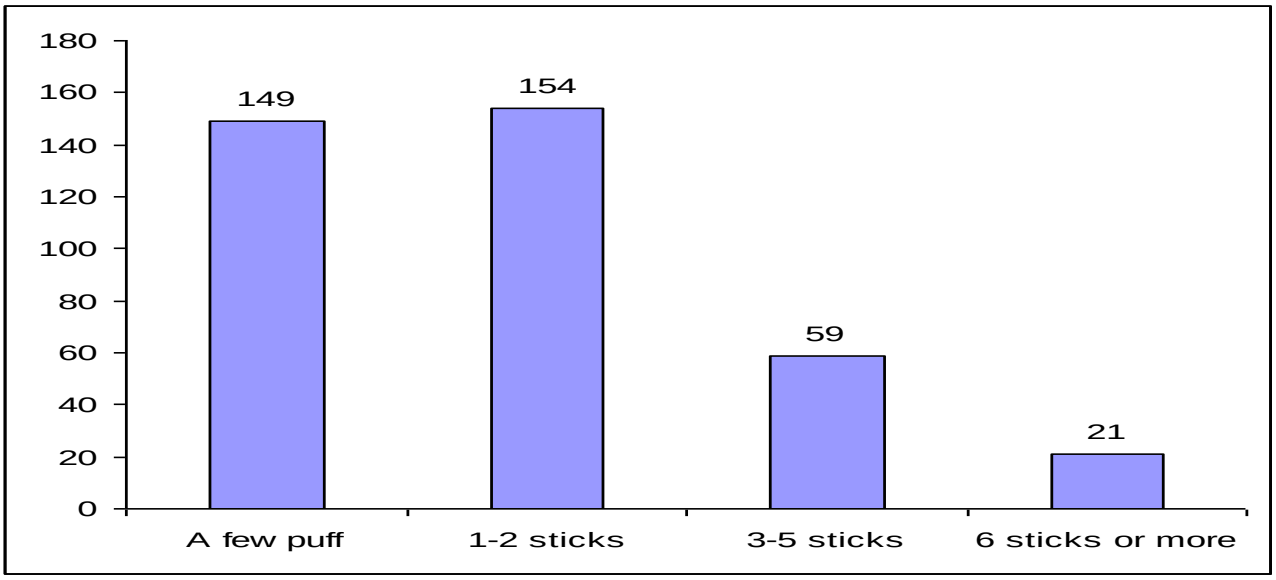

Figure 2. Number of cigarettes smoked in the past 30 days

Most of the current smokers (more than 80%) started smoking with friends. Almost half of all current smokers obtained cigarettes from other people (social sources) while 27.9% bought their cigarettes from stores (commercial sources) (Table2).

Table 2. Person next to you at the time you started smoking

	N (%)
Who was sitting next to you when you first smoked	
Father	7(1.8)
Brother/Sister	18(4.7)
Friend	341(85.3)

Relatives	9(2.4)
Others	32(5.8)
Source of cigarettes	
Bought from a shop	145(37.9)
Bought by someone else	22(5.7)
Obtained from friend	189(49.3)
Others (stole from father, etc.)	12(3.1)

It was found that the majority of current smokers had low level of addiction (Table 3).

Table 3. Level of nicotine dependency (n=324)

	N (%)
Very low dependency	246 (63.1)
Low dependency	66 (16.9)
Moderate dependency	7 (1.8)
High dependency	2(0.5%)
Very high dependency	3 (0.8)

Only amount of cigarettes smoked was significant related to addiction level. (Table 4)

Table 4. Correlation between addiction level, age of smoking initiation, number of cigarettes smoked (daily) and frequency of cigarettes smoked last 30 days.

Variable/s	**Addiction level (Spearman Rho Coefficient)**	**p value**
Number of cigarette/s smoked daily	0.31	<0.001
Age of Initiated smoking	- 0.12	0.005
Frequency of cigarette/s smoked last 30 days	-0.13	0.007

From multivariate analysis we found that, having more than 40% of friends who smoke, brother smokes and father smokes contributed to smoking among lower secondary school students in this study (Table 5).

Table 5. Multivariate analysis of factors related to smoking

Variable	Crude Odds Ratio (95% CI)	Adjusted Odds Ratio[a] (95% CI)
Percentage of friends who smoke (n-1100)		
0-40%	Reference	Reference
41-100%	5..25 (3.99 - 6.91)	4.45 (2.72.7.30)
Perception of percentage of friends Who smoke (n-1096)		
Non-few	Reference	Reference
Many- a lot	1.68 (1.30-2.16)	0.96 (0.59-1.57)
Father smokes (n-956)		
Yes	2.04 (1.55-2.69)	1.66 (1.02-2.70)
No	Reference	Reference
Mother smokes ((n-1025)		
Yes	3.01 (0.71-12.65)	
No	Reference	
Elder brother smokes (n-681)		
Yes	3.25 (2.30-4.58)	2.19 (1.31-3.67)
No	Reference	Reference
Younger brother smokes (n-806)		
Yes	2.23 (1.03-4.84)	0.81 (0.23-2.84)
No	Reference	Reference

Location of school (1084)		
FELDA	2.92 (2.17-3.93)	1.99 (1.13-3.50)
Urban and rural	Reference	Reference

Hosmer Lemeshow goodness of fit test statistical test x2= 8.47 p = 0.389 [a] Adjusted for each variable in the table

DISCUSSION

To the best of our knowledge, this is the first report on prevalence and factors related to smoking among Forms 1 and 2 students in Johor. The prevalence of smoking found (37.5%) is higher than the previously reported national prevalence of 16.6% in male adolescents[5]. It is also higher compared with what was reported by several local researchers, i.e. 30% in Kota Bharu[10], 25% in Petaling Jaya[14] but is lower than the prevalence reported by Lim et al, 2006 [13] which was 54.1% among Form 4 students in the same locality. Prevalence rate among males was almost double in FELDA settlement areas compared with town and rural students. Multivariate analysis showed that students attending schools in FELDA areas need more serious attention. Asmah Nabiha in 2004 identified that adolescent smoking was a major social problem among communities in FELDA settlement in Johor[15]. This phenomenon may be linked to the social atmosphere and local community norms. Nevertheless, the root cause requires further and in-depth investigations. The high prevalence rate is alarming in light of the fact that past studies have shown that smoking rate increases with age[16].

The majority of current smokers obtained cigarettes from social sources (friends) and the remainder from commercial/retail sources[17,18]. Similar to previous findings, almost half of all cigarettes smoked by these adolescents were obtained from social sources. Further research is required to identify the mechanisms involved, how tobacco products are obtained and other related aspects. Furthermore, this indicates that enforcement authorities need to be more proactive, as the sales of tobacco to under-aged minors (18 years and below) is a legal offence under the Control of Tobacco Products Regulation 2004[19] and yet students are not deterred. Proactive measures such as more efficient policing are needed. That is in view of the fact that effective enforcement not only deter adolescents from obtaining cigarettes but will also reduce social sources, meaning that adolescents who bought cigarettes will not able to sell them to smoking peers[20]. This approach has been shown to be effective in reducing the prevalence of adolescent smoking[21].

The mean age for commencement of smoking among current smokers in this study was 11.28, which is younger than the national data of 13.6[5]. The majority of students started smoking in primary school. Addiction is inversely related to the age of starting smoking, meaning that the earlier a child started smoking, the higher the probability of addiction to smoking which makes breaking the habit more difficult[20], not to mention the health effects the child may suffer in adulthood. More in depth research related to this aspect needs to be conducted to ascertain the actual causal factors. This is because the majority of adolescents at this age are still at a level referred to as the "concrete thinking" level according to Piaget's Cognitive Theory. Personal Fable (a form of egocentrism normally exhibited during adolescence) in which adolescents feel that they are invulnerable and tend to involve in risk are not yet prevalent at this age (11.25 years old)[6].

Social learning theory suggests that learning (of an attitude or habit) occurs through or from observation and is gender-specific[22], i.e. the father's behavior is normally copied by the son while daughters tend to copy their mothers. This phenomenon may be observed in smoking, as shown by the significant association between father smoking and adolescent smoking. This finding has been consistently reported in previous studies[23,24.] However, contradicting results were found by Lim [13] in a study conducted in the same district (Kota Tinggi) in 2005. This situation might be explained by the fact that study population were of different ages, the latter population consisted of late adolescence from ages 16 to 18. Adolescents tend to turn to their peers for reference as the family's influence on their personality diminishes[5]. Nevertheless at the age of the respondents in this study; it shows that the family influence is still prevalent, albeit at a lower intensity (based on the odds ratio).

Peer influence was found to be related to smoking. This finding is consistent with findings from other studies conducted in other localities with differing socio-cultural norms[25]. Peer influence being stronger than family influence. Peer group behavior and norms will be learnt and adopted. This is what can be construed by the

findings[6]. In spite of that, whether adolescent were influenced by smoking peers to smoke or whether smoking adolescents sought the friendship of peers who smoke too was unable to be determined from this study. This requires further research in the future.

The findings showed that a majority of current smokers were at a low level of addiction to nicotine. Approximately 90% were experimental or occasional smokers and thus there is greater possibility for them to successfully reform and abandon smoking. The school authorities and health department should make efforts to provide these adolescents with counseling or pharmaceutical therapy such as nicotine replacement to assist them to quit smoking as a short-term intervention measure.

The study indicates that smoking at a very young age and risk factors linked to smoking .For instance, father smoking, brother smoking, 40% friends who smoke, schooling in FELDA settlement area requires careful planning and implementation of interventions in order to solve the problem in the long term. Internal and external modifiable factors related to smoking need to be implemented. Among the steps that may be taken is increasing adolescent resilience against the inclination to smoke. Among others is by increasing awareness of smoking with emphasis on immediate effects such as dizziness and nausea. Emphasis should be stressed on the short-term effects because it is much more effective in eliciting change/action compared to the long-term effects[26]. This measure needs to be instituted very early, i.e in primary schools. Other measures that can be incorporated are counseling on how to refuse/decline (how to say no) invitations to smoke. Families should be involved in prevention programmes. Parents or other adult family members need to do the right thing by showing good examples. The "do as I say and not as I do" attitude will not prevent adolescents from smoking. Periodic discussions on the fatal effects of smoking between parents/caregivers and adolescents may reduce the tendency for adolescents to smoke and should be practiced[27].

Apart from this, prevention programmes using the peer approach could be enhanced, especially for the high risk groups. Peers groups can be utilized to guide adolescents and steer them away from vices such as smoking[28].

There are several limitations in this study. Firstly, we only analyzed baseline data of the study, thus, factor associations remain as just that. Secondly, smoking status was not biochemical verified, however, in spite of this, the bogus pipeline is considered a reliable method for ensuring response accuracy/credibility as for previous studies[29]. Intrapersonal and interpersonal factor such as self efficacy[30], self esteem[31], attitude[32] and family dynamics such as communication about smoking in the family[33] etc which have been shown to be associated with smoking association in other studies were not investigated in the current study. Inclusion of those factors in future studies will ensure more definitive factors will be identified.

CONCLUSION

The findings showed that there was a high prevalence of smoking among lower secondary school students in the district of Kota Tinggi especially in the FELDA settlement areas. Holistic steps should be taken involving stakeholders, parents, peers, school authorities and health authorities coming together to find effective solutions to address this problem before things get out of hand.

ACKNOWLEDGEMENT

This project was supported by a research grant from the National Institute of Health, Ministry of Health, Malaysia. The authors would like to thank Chief Staff Nurse Rusnani Che Fa and all staff nurses of the Kota Tinggi District Health Office for helping in the data collection and the staff of the Epidemiology Unit, Institute for Medical Research who helped in data entry. We would also like to thank the Director of the Institute for Medical Research for giving the support needed to carry out this study and the Director General of Health of the Malaysian Ministry of Health for his permission to publish this paper.

REFERENCES

1. Gavin A. Smoking is a major cause of premature death worldwide. *Evidence Based Health Care* 2004; **8**(2): 95-96.

2. Press Statement by the Minister of Health, The Hon Dato' Chua Jui Meng on tobacco control in Malaysia on 7 November 1996. Available from: http://www.globalink.org/tobacco/docs/ap-docs (accessed 13 January 2007).

3. Ministry of Health Malaysia. Institute of Public Health. The second national health and morbidity survey, 1997. Smoking.

4. WHO. The tobacco atlas 2003. Geneva: World Health Organization, 2002.

5. Ministry of Health Malaysia. Institute of Public Health. The third national health and morbidity survey, 2006. Smoking.

6. Santrock JW. Adolescence. Boston: McGraw-Hill, 2005.

7. US Department of Health and Human Service. Preventing tobacco use among young people: A Report of the surgeon general. Atlanta, Ga: US. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Centre in Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1994.

8. Thambypillai I. Factors associated with the smoking behavior of school children in Kuala Lumpur. *Journal of the Malaysian Society of Health* 1985; **5**(2): 1-8.

9. Buntat Y. Program sekolah ke kerjaya (SKK): Program sekolah ke kerjaya (SKK): Konsep dan model pelaksanaannya di sekolah-sekolah Malaysia. Buliten Fakulti Pendidikan: *Wadah;* 2002. Bil 5.

10. Naing NN, Ahmad Z, Musa R, Abdul Hamid FR, Ghazali H, Abu Bakar MH. Factors related to smoking habits of male adolescents. *Tobacco Induced Diseases* 2004; **2**: 133-140.

11. Hamzah WM. A study of the knowledge, attitude and practice of cigarettes smoking among Malay secondary students in the district of Pasir Mas, Kelantan. Master of Public Health, University of Malaya, 1990. in K Shamsuddin and M Abdul Haris "Family influence on Current Smoking Habits Among Secondary School Children in Kota Bharu, Kelantan". *Singapore Med J* 2000; **41**(4): 167-171.

12. Hanjeet K, Wan Rozita WM, Amal NM. Risk factors of smoking among secondary school adolescents in Kuala Lumpur. *International Medical Research Journal* 2001; **5**(2): 59-63.

13. Lim KH, Amal NM, Hanjeet K, et al. Prevalence and factors related to smoking among secondary school students in Kota Tinggi District, Johor, Malaysia. *Tropical Biomedicine* 2006; **23**(1): 75-84.

14. Afiah MZ, Hejar AR, Kulanthayan KC, Fadhilah J, Law TH. Prevalence of smoking and drinking habits among form six students in Petaling district, Selangor. *Med J Malaysia* 2006; **61**(1): 41-7.

15. Nabihah A, AR. Faktor-faktor yang mendorong Pelajar Felda Ponteng Sekolah.Satu Kajian di Sekolah Menengah Air Tawar, Kota Tinggi Johor. Available from: http://www.fp.utm.my/ePusatSumber/pdffail/ptkghdfwP/ASMANABIHAHAP000032D2004TTD.pdf (accessed December 2008).

16. Unger JB, Yan L , Chen XG , Jiang X, Azen S, Qian G, et al . Adolescent smoking in Wuhan, China: Baseline data from the Wuhan smoking prevention trial. *American Journal of Preventive Medicine* 2001; **21** (3): 162-169.

17. Widome R. Forster JL, Hannan PJ, Perrya CL. Longitudinal patterns of youth access to cigarettes and smoking progression: Minnesota Adolescent Community Cohort (MACC) study (2000-2003). *Preventive Medicine* 2007; **45**(6): 442-446.

18. Croghan E, Aveyard P, Griffin C, Cheng KK. The importance of social source of cigarettes to school students. *Tob. Control* 2003; **12**: 67-73.

19. Malaysian Food Act (1993). The control of tobacco product (Amendment) regulation, 2004. Government Gazette P.U. (A) 324.

20. DiFranza JR. Adolescent's acquisition of cigarettes through noncommercial source. *Journal of Adolescent Health 2003*; **32**(5): 331-332.

21. Pierce JP, Gilpin E. How long will today's new adolescent smoker be addicted to cigarettes? *Am J Public Health* 1996; **86**: 253-256.

22. Bandura A. Social learning theory. New Jersey: Prentice-Hall Inc, 1975.

23. Wen XZ, Chen WQ, Muscat JE, et al. Modifiable family and school factors associated with smoking status among adolescents in Guangzhou, China. *Preventive Medicine* 2007; **45**(2-3): 189-197.

24. Shakib S, Hong Z, Johnson CA, Chen XG, Ping S, Palmer PH. Family characteristics and smoking among urban and rural adolescents living in China. *Preventive Medicine* 2005; **40**(1): 83-91.

25. Unger JB, Yan L, Shakib S, et al. Peer influences and access to cigarettes as correlates of adolescent smoking: a cross - cultural comparison of Wuhan China and California. *Preventive Medicine* 2002; **34** (4): 476-484.

26. Kerr J, Weitkunat R, Moretti M. ABC of behavior change. A guide to successful disease prevention and health promotion. Edinburg: Elsevier Churchill Livingstone, 2005.

27. Chassin L, Presson C, Rose K, Sherman S. Maternal socialization of adolescent smoking: intergenerational transmission of smoking-related beliefs. *Psychol Addict Behaviors* 1998; **12**: 206-216.

28. Niu WY, Zhu XY, Jiang RM. The short-term effect of a group intervention program on smoking among medical students. *Chinese J Health Educ* 1995; **11**(11): 4–8.

29. Adams J, Parkinson L, Sanson-Fisher RW, Walsh RA. Enhancing self-report of adolescent smoking: the effect of Bogus pipeline and anonymity. *Addictive Behaviors* 2008; **33**: 1291-1296.

30. Fafan P, Eisenberg M, Frazier L, Stoddard AM, Avrunin JS, Sorensen G. Employed adolescents and beliefs about self efficacy to avoid smoking. *Addictive Behaviors* 2003; ***28****(4): 613-62*.

31. Kokkevi A, Richardso C, Florescu S, Kuzman M, Stergar E. Psychosocial correlates of substance use in adolescence: a cross-national study in six European countries. *Drug and Alcohol Dependence* 2007; **86**(1): 67–74.

32. Haddad LG, Malak MZ. Smoking habits and attitudes towards smoking among university students in Jordan. *International Journal of Nursing Studies* 2002; **39**(8): 793-802.

33. Engels RC, Willemsen M. Communication about smoking in Dutch families: associations between anti-smoking socialization and adolescent smoking-related cognitions. *Health Education Research* 2004; **19**(3): 227–238.