Family Influence on Current Smoking Habits Among Secondary School Children in Kota Bharu, Kelantan

K Shamsuddin, M Abdul Haris

ABSTRACT

Objectives: To measure the prevalence of cigarette smoking among male secondary school children and assess their family influence especially that of their fathers' smoking habits on their current smoking habits.

Methodology: A cross-sectional study was carried out in Kota Bharu, Kelantan in April 1997 where 460 male form four students, aged 15 - 16 years were randomly selected from six secondary schools. Data on smoking habits, sociodemographic profile and family characteristics particularly parents and siblings' smoking habits, perceived parental supervision and communication were collected through self-administered questionnaires.

Results: The prevalence of cigarette smoking among male secondary school children was 33.2%. Crude analysis shows family factors, fathers' and siblings' smoking habits, and lack of parental supervision were significantly associated with the students' current smoking habit. Among students who smoked compared to non-smokers, father's smoking habit gives a crude Odds Ratio = 1.8, 95% C.I. 1.08 - 3.16. Further analysis shows that the effect of their father's smoking habit on the student's current smoking habit is still significant after controlling for other familial and non-familial factors including parental supervision, academic performance, reported influence of cigarette advertisement, having friends who smoked and the student's poor knowledge of the ill-effects of smoking and other factors (Odds Ratio = 1.9, 95% C.I 1.05 - 3.32).

In conclusion, family factors especially the father's smoking habit is an important factor that influences a student's current smoking habit and the presence of negative role models within the home need to be seriously considered in any cigarette smoking prevention programs among secondary school adolescents.

Keywords: smoking, male students, adolescents, family influence, father's smoking habit

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INTRODUCTION

Many studies have shown significant association between smoking habit of family members especially that of the father's smoking habit on a student's smoking habit[1-3]. This could be explained by Bandura's Cognitive Social Theory which believes that through observational learning or modelling of the behaviours of others, we adopt these behaviour ourselves[4,5]. Bandura et al contend that behaviours are imitated more often when models are of the same sex, well respected, receive tangible rewards for their actions and are perceived as similar to the observer[6]. Thus family especially parental behaviours strongly influence children's and adolescents' behaviours both positively or negatively.

Smoking, a well-known health risk, is increasingly acquired at younger ages, during late childhood and adolescence[7]. Cigarette manufacturers are known to target young children with their aggressive advertising[12] but they could well be helped unwittingly by adult members of hundreds of thousands of families to promote their deadly products.

The prevalence of cigarette smoking, based on a survey of 4,106 urban form four secondary school children, aged between 15 - 16 years old, in Kuala Lumpur in 1984 was found to be 9.8%. In this study, the rate of smoking was 17.3% for male students and 1.9% for female students[8]. In a later study conducted on 8,625 students from form 1 to form 6, aged 13 - 18 years, in Kuala Lumpur, the smoking prevalence was found to be 3.6% and of these, 88.7% were males[9]. A 1989 study on the smoking prevalence among male form five secondary school students, aged between 16 - 17 years, in rural Pasir Mas, Kelantan, showed the level of smoking to be at 41.4%[10].

The objectives of this study were to measure the smoking prevalence of male form four students, aged between 15 - 16 years in Kota Bharu, Kelantan and to specifically study the influence of family members particularly that of the father's smoking habits on a student's current smoking habits and to assess whether this influence remains when other familial and non-familial factors are controlled.

Department of Community Health
Faculty of Medicine
Universiti Kebangsaan Malaysia
Jalan Yaacob Latiff, Bandar Tun Razak Cheras, 56000 Kuala Lumpur Malaysia

K Shamsuddin, MBBCh, MPH, SM, DrPH

M Abdul Haris, MD, SKM

Correspondence to:
Dr K Shamsuddin

METHODS

A cross sectional survey was conducted in Kota Bharu, Kelantan in April 1997. Six secondary schools were randomly selected from a total of 34 government secondary schools in the district. Four hundred and sixty male form four students, aged 15 - 16 years, were then randomly chosen from the 6 schools to participate in this survey.

Data was obtained through self-administered questionnaire which were filled in the presence of the researcher and in the absence of teachers and other school staff. All personal identification including names and identity card numbers were not taken to assure confidentiality and students were promised that their individual answers would not be given to the school authority.

For the purpose of this study, 'smokers' refer to students who are regular smokers (smoking at least 1 cigarette per day for at least a month) and 'occasional smokers' are smokers who smoke at least 1 cigarette per month. 'Non smokers' is as the name implies are those who have stopped smoking and those who experimented with cigarettes. Besides biological parents, the main male and female guardians are included as 'fathers' and 'mothers' in this study. Interpersonal communication was measured using a 20-item 'Parent-adolescent Communication Scale' based on Olson et al's Family Inventories Scale. The items are based on a 1 - 5 Likert scale where 1 represents 'strongly disagree' and 5, 'strongly agree' with each item in the scale. Good interpersonal communication is defined as one with a total score which is more than the median and vice-versa. Perceived parental supervision was measured by asking students a question that has 5 possible responses on whether their parents knew of their whereabouts. These responses included: 'always know', 'sometimes know', 'not sure', 'rarely know' or 'never know'. In this study, good parental supervision refers to which students perceived their parents always or sometimes knew of their whereabouts.

Method of analysis

In the analysis, the smoking status of male students was first described. Then among smokers, the number of cigarettes smoked and their reasons for smoking were described. The frequencies and percentage distribution of the smoking status of different family members, and various other family and non-family risk factors among smokers and non-smokers were compared. The Chi-square tests were used to measure the association between these risk factors and students' the smoking status.

In subsequent analysis, using a data set with 244 students who had complete information on the factors being explored and adjusted, separate logistic regression analyses were used to determine the extent of father's smoking habit on students' smoking habit estimating both the odds ratio and 95% confidence intervals. Multiple logistic regression analyses were then carried out to determine the change in the association between father's smoking habits on student's current smoking habits when other risk factors are controlled singly or as a group. Changes in the adjusted odds ratio and their 95% confidence intervals of father's smoking habits on student's smoking habit were then compared to the crude estimates. The data in this study was analysed using SPSS version 7 statistical package.

Table I. Current smoking status among secondary school students in the study (n = 422)

Student's current smoking status	Number	Percent
SMOKERS	140	33.2
Regular smoker	65	15.4
Occasional smoker	75	17.8
NON-SMOKERS	282	66.8
Ex-smokers	40	9.5
Non smokers but experimented smoking	104	24.6
Never-smokers	138	32.7

RESULTS

From the 460 male students in this study, 38 respondents (8.3%) were dropped from the analysis since they did not fill up the important parts of the questionnaire. Thus analysis was based on 422 respondents. All respondents in this study are Malays and their average age is 15.6 $\pm$ 0.4 years.

Smoking among male form four students

Table I shows that 140 (33.2%) students are current smokers while 282 (66.8%) are non-smokers. Non-smokers are students who had either stopped smoking, students who experimented smoking or those who never smoke. In this study, the minimal age for trying smoking was 5 years old and 39.3% of these students had tried smoking while still in primary schools (age 12 years or less).

Among smokers, most of the students smoked between 1 to 5 cigarettes per day (62.9%) while 3 students (2.1%) smoked more than 20 cigarettes per day. Of the 227 responses given as reasons for smoking, 74 (52.9%) reported addiction to cigarettes as the main reason for smoking while 52 (37.1%) and 41 (29.3%) respectively gave to be looked as matured and to be trendy as reasons for smoking (Table II).

Family influence

Table III shows the number of different family members who smoked among smokers and non-smokers. 82.1% of smokers and 73.4% of non-smokers reported at least one family member in their families smoked. In general, the prevalence of smoking among all categories of family

members is higher among smokers compared to non-smokers. Among smokers, 85 (60.7%) had fathers who smoked while among non-smokers, 137 (48.6%) had fathers who smoked. Among the 282 students with siblings, 70 (66.7%) smokers had siblings who smoked in contrast to 86 (48.6%) siblings of non-smokers who did the same. The associations between father's and sibling's smoking habit are found to be statistically significant based on chi-square tests ($p < l 0.05$).

The prevalence of other family factors, interpersonal communication with mothers and fathers and perceived maternal and paternal supervisions are generally lower among smokers compared to non-smokers (Table IV). However the associations between the level of interpersonal communication with either parent and cigarette smoking are not statistically significant. In contrast perceived level of parental supervision by either fathers or mothers, are found to be significantly associated with current smoking habit.

Non-family influence

Table IV also shows the association between non-family factors, academic performance, level of knowledge on ill effects of smoking, reported influence of advertisement and friends' smoking status with student's current smoking status. The prevalence of low academic achievement is higher among smokers compared to non-smokers. Low level of knowledge on the ill effects of smoking is also prevalent among smokers compared to non-smokers (32.8% versus 21.2%). 37.1% of smokers compared 19.9% of non-smokers reported being influenced by cigarette advertisement. In general both smokers and non-smokers reported having friends who are smokers but significantly higher percentage of current smokers had friends who are smokers compared to non-smokers. Thus in this study, all the non-family factors investigated are found to be significantly associated with current cigarette smoking among secondary school students.

Relationship between father's smoking habit with student's current smoking habit

Crude analysis shows that father's smoking habit is significantly associated with current cigarette smoking among students. Using logistic regression technique on a sample of 244 respondents who answered all questions being investigated, Table V shows the crude odds ratio for current smoking among students with fathers who are smokers compared to those whose fathers are non-smokers is 1.8 (95% CI = 1.08, 3.16).

Multiple logistic regression analysis controlling for each selected factor singly along with father's smoking status and later with all other selected risk factors of current smoking among male student with father's smoking habit shows that the estimated odds ratio of the effects of father's smoking status remain constant and significant. Table V shows that when all other factors are controlled for, the odds ratio of current smoking among students with fathers who smoke compared to those with fathers who do not smoke is 1.9 (95% CI = 1.05, 3.32). Thus father's smoking status continues to be a significant risk factor of son's current smoking status during mid-adolescence (form four or approximately 15 - 16-year-old) even after controlling for other risk factors.

Table II. Number of cigarettes smoked and reasons given for smoking among smokers (n = 140)

Variables	Number	Percent
NUMBER OF CIGARETTE SMOKED		
Less than 1 cigarette per month	25	17.9
1 - 5 cigarettes per day	88	62.9
6 - 10 cigarettes per day	19	13.6
11 - 20 cigarettes per day	5	3.6
More than 20 cigarettes per day	3	2.1
REASONS FOR SMOKING*		
addicted to cigarettes	74	52.9
to look matured	52	37.1
to be "trendy"	41	29.3
to be stylish	32	22.9
to be accepted by peers	28	20.0

** can be more than one answer (n = 227, total number of responses)*

Table III. Relationship between family member's smoking status and student's smoking (n = 422)

Family member's smoking status	Student's smoking status: Smokers No. (%)	Non-smokers No. (%)	p-value
Family smoking status$^{\alpha}$			0.05*
Yes	115 (82.1)	207 (73.4)	
No	25 (17.9)	75 (26.6)	
Father's smoking status			0.02*
Yes	85 (60.7)	137 (48.6)	
No	55 (39.3)	145 (51.4)	
Mother's smoking status			0.89^{c}
Yes	3 (2.1)	4 (1.4)	
No	137 (97.9)	278 (98.6)	
Sibling's smoking status$^{\beta}$			0.00*
Yes	70 (66.7)	86 (48.6)	
No	35 (33.3)	91 (51.4)	
Grandfather's smoking status			0.31
Yes	29 (20.7)	47 (16.7)	
No	111 (79.3)	235 (83.3)	
Grandmother's smoking status			0.06
Yes	18 (12.9)	19 (6.7)	
No	122 (87.1)	263 (93.3)	

** Significant ($p < 0.05$);*
α Any close family members, father, siblings or either grandparents;
β Analysis of sibling's smoking status is based on n = 282, since not all students had an older or younger brothers or sisters;
c With Yates correction.

Table IV. Relationship between other family factors and non-family factors with student's smoking status

Factors	n**	Student's smoking status: Smokers No. (%)	Non-smokers No. (%)	p-value
FAMILY FACTORS				
Maternal communication	416			0.09
Good		61 (44.5)	149 (53.4)	
Poor		76 (55.5)	130 (46.6)	
Paternal communication	396			0.23
Good		62 (47.0)	141 (53.4)	
Poor		70 (53.0)	123 (49.6)	
Maternal supervision	419			0.00*
Good		82 (59.0)	217 (77.5)	
Not very good		57 (41.0)	63 (22.5)	
Paternal supervision	411			0.03*
Good		60 (44.1)	152 (55.3)	
Not very good		76 (55.9)	123 (44.7)	
NON-FAMILY FACTORS				
Academic performance	417			0.00*
High		38 (27.7)	122 (43.6)	
Low		99 (72.3)	158 (56.4)	
Student's knowledge on the effects of smoking	384			0.01*
High		84 (67.1)	204 (78.8)	
Low		41 (32.8)	55 (21.2)	
Cigarette advertisement	422			0.00*
Reported influence		52 (37.1)	56 (19.9)	
No influence		88 (62.9)	226 (80.1)	
Friend's smoking status	422			0.01*
Smokers		138 (98.6)	262 (92.9)	
Non-smokers		2 (1.4)	20 (7.1)	

* *Significant ($p < 0.05$)*
** *No. of respondents used in the analyses*

Table V. Change in odds ratios and 95% confidence intervals for smoking among students whose father is a smoker compared to those whose father is a non-smoker when controlled for specific family and non-family factors (n = 244)

Factors controlled for (Along with father's smoking habit)*	Odds ratio	95% C.I.
CRUDE ANALYSIS		
Father's smoking habit	1.8	(1.08 - 3.16)
CONTROLLED ANALYSIS		
(Friend's smoking habits)	1.9	(1.08 - 3.18)
(influence of cigarette advertisement)	1.8	(1.07 - 3.19)
(Knowledge on the ill effects of smoking)	1.9	(1.08 - 3.20)
(Friends' smoking habits Influence of cigarette advertisement Knowledge on the ill-effects of smoking)	1.9	(1.08 - 3.28)
(Education stream)	1.9	(1.09 - 3.21)
(Academic achievement)	1.8	(1.05 - 3.09)
(Education stream Academic achievement Knowledge on the ill-effects of smoking)	1.8	(1.06 - 3.18)
(Sibling's smoking habit)	1.8	(1.02 - 3.03)
(Parental supervision)	1.9	(1.12 - 3.36)
(Sibling's smoking habit Parental supervision)	1.9	(1.06 - 3.22)
All of the above factors at once (?)	1.9	(1.05 - 3.32)

** The comparison groups used in the above analyses are having father who does not smoke, having friends who do not smoke, reported poor influence of cigarette advertisement, having high knowledge of the ill-effects of smoking, being in a non-Art academic stream, having good academic achievement, having siblings who do not smoke and having good parental supervision.*

DISCUSSION

The prevalence of smoking among school children varies with place and population where the studies are conducted. It also depends on the age group of the students surveyed. From this study, the prevalence of smoking among male students, 15 - 16 years of age, was 33.2%. This is worrisome since out of every three 15 to 16-year-old, male students in Kota Bharu, Kelantan, one is a smoker. In addition, this study shows that initiation of smoking among smokers began very early where 39.3% of students had tried smoking before the age of 12, while still in their primary schools. Among 16 to 17-year-old form five students in Pasir Mas Kelantan in 1989, Wan Mansur reported an even higher prevalence of smoking which was 41.4%[10]. In contrast the studies on secondary school students in Kuala Lumpur in 1984 and 1994 showed a lower prevalence of smoking[8,9]. In fact the 1994 study by Harjeet et al showed a lower prevalence of smoking compared to the 1984 study. These studies are however not directly comparable since the age groups being studied differed markedly.

Although this study focused on family influence especially father's smoking habit on student's current smoking habit, other well-known risk factors were also explored. Table IV shows that similar to the findings of other studies, the crude analysis of many other risk factors, especially perceived influence of advertisement, having peers who smoked, and lack of knowledge on the ill-effects of smoking showed significant association with students' current smoking habits[12-14].

With regards the association between father's smoking habit and student's current smoking habit, based on crude analyses of the differences in rates (Table III) and logistic regression analysis (Table V), this study shows significant association between the two. Table V shows that based on crude analysis, students whose fathers are smokers are almost twice at higher risk of smoking compared to those whose fathers are not smokers (O.R = 1.8, 95% C.I = 1.08 - 3.16). The association between father's smoking habit and student's current smoking habit remains significant when other risk factors which were statistically significant by crude analyses were controlled singly or together. Table V shows that when all other risk factors considered in this study were controlled, the risk did not change significantly (O.R = 1.9, 95% C.I = 1.05 - 3.32).

This result concurred with Bandura's Cognitive Social Theory which believes that through observational learning or modelling of the behaviours of others, we adopt these behaviours ourselves especially if the model is someone respected like the father[4,6,15]. The evidence from this study showed that father's smoking habit is strongly associated with student's current smoking habit and remained so when other risk factors are controlled for. This finding

among Malay male students is similar to that found in studies outside Malaysia[1,2,16]. The study on student's smoking habit among school children in Singapore also concluded that fathers were the main models for the development of smoking habits among children[16].

This study also shows that within families, sibling's smoking habits are also significantly associated with student's smoking habit. 66.7% of smokers had siblings who also smoked compared to 48.6% of non-smokers who had siblings with similar habits. This result is consistent with that found in studies conducted in both developed and developing countries[1,2].

Analysis shows significant inverse association between good parental supervision and student's smoking habits. Non-smokers perceived their parents knew of their whereabout more often than smokers. Perceived strong parental supervision will decrease their chances of being involved in smoking.

The effects of good interpersonal communication between adolescents and their parents with students' current smoking habits was also studied. Good parental communication has been seen as a way to prevent high-risk behaviours among adolescents. In this study, although a higher percentage of non-smokers reported having good interpersonal communication with their parents, their association with current smoking habits is not statistically significant.

This study showed that the smoking habits of family members especially that of the father's is significantly associated with students' current smoking habits even after controlling for other risk factors. Fathers are important role models for their sons. Among boys, besides smoking, other high-risk behaviours such as substance abuse, alcohol abuse, gambling and violence may be modelled through family members especially fathers. Studies on the negative influence of family members on smoking and other high risk behaviours involving adolescents of both sexes and of different levels of development and age groups need to be conducted in order to develop a more comprehensive prevention program targeting secondary school children.

This study focused on family influences on current smoking habit and did not assess its influence on cigarette experimentation. Among students surveyed in this study, cigarette experimentation was as early as 5 years old, and 39.3% of these students had tried smoking while still in primary schools (age 12 years or less). It would be interesting to assess family influence, especially father's own smoking habit on cigarette experimentation. In such a study, the association between smoking experimentation and school performance, current level of knowledge of the ill effects of cigarette smoking and the other family and non-family risk factors may differ from the result of our analysis on current smoking habits. Early experimentation may not only be due to role modelling but also accessibility of cigarettes around the house.

CONCLUSION

Based on the study findings, we conclude that any smoking prevention programs or campaigns among students in their mid-adolescence should not only focus on the school children themselves but also on adults within their own homes especially fathers who are themselves smokers. Innovative ways of imparting or increasing parents' knowledge of the high likelihood of their own high risk behaviours being followed by their children should be incorporated in such programs.

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REFERENCES

1. Bewley BR, Bland JM, Harris R. Factors associated with the starting of cigarette smoking by primary school children. Br J Soc Med 1974; 28:37-44.
2. Zhu BP, Liu M, Wang SQ, He GQ, Chen DH, Shi JH, Shang JZ. Cigarette smoking among junior high school students in Beijing, China, 1988. Int J Epid 1992; 21:854-61.
3. Emmanuel SC, Ho CK, Chen AJ. Cigarette smoking among school children in Singapore, Part I - Smoking prevalence. Singapore Med J 1990; 31:211-6.
4. Green M. Theories of human development: A comparative approach. New Jersey: Prentice-Hall Inc., 1989.
5. MacFarlane A, McPherson A, McPherson K, Ahmed L. Teenagers and their health. Arc Dis Childhood 1987; 62:1125-9.
6. Santrock JW. Life span development (5th Edition). Madison: Brown & Benchmark Publ., 1995.
7. Bartecchi CE, MacKenzie TD, Schrier RW. The global tobacco epidemic. Sci Am 1995; 272:26-33.
8. Thambypillai V. Smoking among Malaysian school children. Soc Sci Med 1985; 21:819-23.
9. Hanjeet K, Lye MS, Ahmad Nizam, Zanariah O, Shaikh Hamdan SR, S Haslinda MD. Licit and illicit substance use among urban Malaysian secondary school children in Kuala Lumpur. Berita Pemadam 1996; 2:28-9.
10. Wan Mansur Hamzah. A study of knowledge, attitude and practice of cigarette smoking among Malay secondary school students in the district of Pasir Mas, Kelantan. Master of Public Health Thesis, University of Malaya, 1990.
11. Olson DH, Barnes H. Family inventories: Parents-adolescent communication (2nd Edition) 1992; 29-44.
12. Davis RM. Current trends in cigarette advertising and marketing. NEJM 1987; 316:725-32.
13. Fischer PM, Richards JR Jr., Berman EJ, Krugman DM. Recall and eye tracking study of adolescents viewing tobacco advertisements. JAMA 1989; 261:84-9.
14. Pomrehn P, Sciandra R, Shipley R, Lynn W, Lando H. Enhancing resources for smoking cessation through community intervention. Int Quar Healt Edu 1990-91; 11:259-69.
15. Houston JP, Bee H, Rimm DC. Essentials of Psychology (2nd Edition), Orlando: Academic Press Inc., 1985.
16. Emmanuel SC, Ho CK, Chen AJ. Cigarette smoking among school children in Singapore, Part II – Development of the smoking habit. Singapore Med J 1991; 32:146-50.