

PREVALENCE AND FACTORS INFLUENCING SMOKING AMONGST MALAY PRIMARY SCHOOL CHILDREN IN TUMPAT, KELANTAN

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Abstract. The aims of this study were to determine the prevalence, knowledge and factors that influence smoking in Malay primary school children in Tumpat, Kelantan. A cross-sectional study was conducted in February 2004 among primary school children in Tumpat District. Two hundred-twelve children in standard one to six were randomly selected from three rural schools. An interview that included information on history of ever smoking, knowledge related to smoking and health, and potential factors that could influence smoking was done. Twenty-five children had previously smoked, with a prevalence of 11.8% (95%CI=8.0, 17.0) and 8 were current smokers (3.8%, 95%CI=1.2, 6.4). More than half (64.6%) of the children had a good knowledge of smoking. However, only 105 (49.5%) of them knew that passive smokers have a higher risk of developing diseases. Of those who had ever smoked, 12 (36.6%) were influenced by peers and 17 (51.5%) had a self-desire to smoke. The earliest age to start smoking was at 6 years. Factors found to be significantly associated with smoking on multivariate analysis were increasing age (OR=2.8, 95%CI=1.6, 5.1), being boys (OR=5.8, 95%CI=2.0, 16.8), being at second school level (standard 4, 5, 6)(OR=7.8, 95%CI=1.3, 45.3) and having other family members (excluding father) who smoked (OR=2.8, 95%CI=1.2, 6.5). However, having a father who smoked and a good knowledge were not reported as influencing factors.

INTRODUCTION

Smoking remains the most important preventable cause of death in our society. The prevalence of smoking in Malaysian adolescents has increased from 9.5% in 1986 to 16.9% in 1996 (National Health and Morbidity Survey II). A further increase was seen in 1999, in which the prevalence was 18.2%. Forty to fifty youth take up smoking everyday (Anonymous, 2003). Tobacco smoking in children is a public health concern. The earlier the children begin to smoke, the less likely they are going to quit the habit (Escobedo *et al*, 1993; Storr *et al*, 2004). Generally, it is very difficult for a person to quit smoking once he has become a regular smoker. Important factors associated with smoking among adolescents include having a smoking family

member, particularly a father who smokes, peer influences, advertisements and magazines (Peter *et al*, 1997; Fielding *et al*, 2004; Milton *et al*, 2004). Other factors reported include living in low income household and a deprived area (Milton *et al*, 2004). A study done by Peter *et al* (1997) found that children who had ever smoked tended to have mothers who were working, fathers were unemployed, and less educated parents. A good knowledge of the adverse effects of smoking did not prevent children from smoking. Curiosity, and the fact that others had tried smoking, also played an important role for children to start smoking. Initial smoking behavior begins with buying cigarettes, then inhaling the smoke, increasing consumption gradually, and eventually beginning to smoke more openly in front of others.

In Malaysia, studies on smoking among secondary school students have been widely reported. The prevalence of smoking among Form 4 and 5 male students in Kelantan had been between 34.6% and 44.2% (Naing *et al*, 1997, 2004; Fadhli *et al*, 2002). However, little

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is known about smoking among primary school children. Stop smoking campaigns are actively carried out in Malaysia, focusing on adults and adolescents. This study broadened the focus to a younger age group to identify the extent of smoking problems in our community. The objectives of this study were to determine the prevalence and knowledge of smoking among Malay primary school children in Tumpat, Kelantan, and identify factors that influenced them to start smoking.

MATERIALS AND METHODS

Tumpat District is one of ten districts in Kelantan. It is a coastal area, about 21 kilometers from Kota Bharu, the capital of Kelantan and about 1 kilometer from the Thailand border. Most of the people are farmers, fishermen or others with low income; the majority are Malays. The educational system in our country consists of primary school (age 7 to 12 years) and secondary school (13 to 17 years).

A cross-sectional study was conducted from 8 to 13 February 2004 with the target population of Malay primary school children aged 7-12 years old in Tumpat, Kelantan. Taking a precision of 0.05 at a 95% confidence interval, the minimum required sample size determined by a single proportion formula based on a 15% estimated prevalence of smoking was 196 subjects. Permission was taken from the headmasters of the three selected schools in Tumpat District. A list of the names of pupils in the three schools was obtained from the teachers and simple random sampling was done to select the students. They were divided into two groups that were phase one (standard 1 to 3) and phase two (standard 4 to 6). The students were told that the results are confidential and no reports would be made to school authorities if they were found to be smokers.

The students were interviewed individually by the researcher regarding a knowledge of smoking and the practice of smoking. Five questions were asked to reveal their knowledge regarding smoking and health. "Ever smoked" was defined as a history of smoking at any time regardless of amount, frequency or duration. "Current smokers" were defined as those who, at the time of the study, smoked at least one cigarette a week (Robertson *et al*, 1994). The children who never took up smoking in their lives were defined as "never smokers". "Good knowledge of smoking" was defined as having a score of 80% or more.

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Statistical analysis

Age was presented as mean and standard deviation, since it is normally distributed. The mean ages were compared by independent *t*-test between "ever smoked" and "non-smoker" group. The categorical variables were expressed as frequencies and percentages. The chi-square test was used to determine the associated factors for smoking on univariate analysis. The level of significance was set at 0.05. The results of univariate analysis were presented with crude odds ratios with 95% confidence intervals, test statistics and corresponding p-values.

Multiple logistic regression was applied to determine associated factors for smoking. All variables were included on the multivariate analysis. Backward and forward stepwise logistic regression was used for the variable under interest (never and ever smoked) which was binary in nature. Current smokers were grouped together with ever smokers on the analysis. The final model was obtained using the likelihood ratio test based on maximum likelihood estimates. The fit of the final model was checked by applying the Hosmer-Lemeshaw test, overall classification of correct outcome and area under the receiver operating characteristic (ROC) curve. The multivariate analysis results were presented with adjusted odds ratios with 95% confidence intervals, likelihood ratio test statistics and p-values. Data entry and data analysis were done using Statistical Package for Social Science (SPSS).

RESULTS

Two hundred and twelve children in standard one to six were recruited for the study. One hundred and one students (47.6%) were from phase one and 111 (52.3%) were from phase two. The mean age was 9.58 years (SD 1.65). More than half, 113 (53.3%) of them were boys.

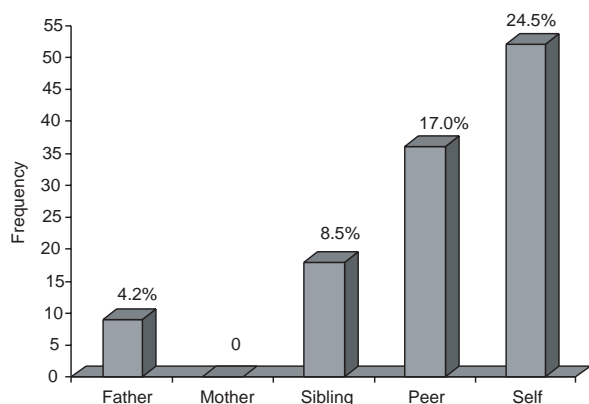


Fig 1—Percentage and frequency of factors that influenced smoking amongst ever smokers.

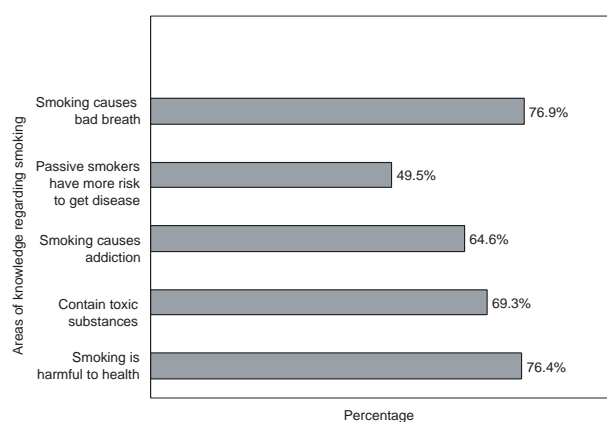


Fig 2—Percentage of correct response on knowledge about smoking.

A total of 126 (59.4%) claimed that their fathers were smokers and 61(28.8%) had brothers who smoked.

The prevalence of ever and current smokers were 11.8% (95%CI 8.0, 17.0) and 3.8% (95%CI 1.2, 6.4), respectively. Most of them smoked handrolled cigarettes without tobacco (23, 72.2%) followed by branded cigarettes (6, 18.2%) and handrolled cigarettes with tobacco (4, 12.1%). The majority (30, 90.9%) smoked one cigarette each time they smoked. The youngest age to start smoking was 6 years old.

Among ever and current smokers, a total of 17 (51.5%) students started smoking on their own, followed by those who were influenced by

peers (12, 36.6%), siblings (6, 18.2%) and fathers (3, 9.1%) (Fig 1). Regarding a knowledge of smoking, correct responses were reported as smoking causes bad breath (163, 76.9%), harmful to health (162, 76.4%), cigarettes contain toxic substances (147, 69.3%), smoking causes addiction (137, 64.6%) and passive smokers have more risk to get disease (105, 49.5%) (Fig 2). As a whole, (137, 64.6%) had a good knowledge of the effects of smoking.

Univariate analysis of factors associated with smoking showed that significant differences in the proportions of never smokers and ever smokers were found only in gender and smoking status of family members (Table 1). Multiple logistic regression analysis revealed that age and phase of the students were also found as significant factors. The final model indicated that additional one year increase in age had 2.83 times odds of being an ever smoker (OR=2.83, 95%CI 1.58,5.10; $p=0.001$), an ever smoker had 5.8 times odds of being a boy (OR=5.8 95%CI 2.01,16.77; $p=0.001$), an ever smoker had 7.76 times odds of being a phase two student (OR=7.76 95%CI 1.33,45.36; $p=0.023$) and an ever smoker had 2.70 times odds of having family members who smoked (OR=2.76 95%CI 1.18,6.46; $p=0.020$) (Table 2). The fit of the model was checked by applying the Hosmer Lemershow test ($p= 0.894$), overall percentage of correct outcomes (86.3%) and area under the ROC curve (0.82, 95%CI 0.74,0.90).

DISCUSSION

The prevalence of ever smoking in Malay primary school children in Tumpat, Kelantan was 15.6%. The figure was higher than reported by Peters *et al* (1997), Emri *et al* (1997) and Fielding *et al* (2004) which were 12.0, 11.7 and 3.8%, respectively. However, Milton *et al* (2004) in Liverpool has reported a higher prevalence of children aged 11 years who ever smoked, which was 27%. Pressure from peers, family members who smoked and self intention to try smoking were the influencing factors for the children to start smoking. In our study, the ever smokers were nearly three times more likely to have a family members who smoked, particularly a brother.

Table 1
Univariate analysis showing associated factors for smoking.

Variable	Never smokers n (%)	Ever smokers n (%)	Crude OR (95% CI)	χ^2 statistic	p-value
Age	9.4 (1.6) ^a	10.5 (1.4) ^a		-3.384 ^b	0.001
Sex					
Boy	85 (47.5)	28 (84.8)	6.2 (2.3, 16.8)	15.626	<0.001
Girl	94 (52.5)	5 (15.2)			
Phase					
1	88 (49.2)	11 (33.3)	1.1 (1.0, 1.2)	2.805	0.094
2	91 (50.8)	22 (66.6)			
Father who smokes					
No	74 (41.3)	12 (36.4)	1.2 (0.6, 2.7)	0.286	0.593
Yes	105 (58.7)	21 (63.6)			
Other family members who smoke					
No	134 (74.9)	14 (42.4)	4.0 (1.9, 8.7)	13.91	<0.001
Yes	45 (25.1)	19 (57.6)			
Knowledge					
Good	113 (63.1)	24 (72.7)	1.1 (1.0, 1.2)	1.123	0.289
Poor	66 (36.9)	9 (27.3)			

^aMean(SD); ^bt statistic from independent t-test; level of significance was set at 0.05

Table 2
Final model for the factors associated with smoking amongst primary school children by multiple logistic regression.

Variable	Adjusted OR ^a (95% CI)	LR test statistic ^b	p-value
Age	2.83 (1.58, 5.10)	12.56	0.001
Sex			
Girl	1.00		
Boy	5.80 (2.01, 16.77)	15.03	0.001
Phase			
1	1.00		
2	7.76 (1.33, 45.36)	3.86	0.023
Family members who smoke			
No	1.00		
Yes	2.76 (1.18, 6.46)	4.70	0.02

^aThe fit of the final model was checked by using the Hosmer-Lemeshaw test ($p=0.894$), overall classification percentage (86.3%) and ROC curve (0.8%, 95%CI 0.74,0.90)

^bLikelihood Ratio test was applied

Having a father who smoked was not a statistically significant associated factor but the association had been reported elsewhere (Peters *et al*, 1997; Fielding *et al*, 2004; Milton *et al*, 2004). However, 9% of the children in this study claimed that they were influenced by their fathers who

smoked. There were children who took up smoking due to the influence of other family members. These children had easy access to cigarettes at home with which they tried to smoke. In our society, cigarettes are easily available, although legislation has banned sale of tobacco

products to persons under age 18 years. Ninety-seven percent of school students have been able to buy tobacco products (Zulkifli and Rogayah, 1998). This is related to lack of supervision by parents.

The inverse relationship between smoking prevalence and socioeconomic status has been reported in many studies (Bellew and Wayne, 1991; Peters *et al*, 1997; Milton *et al*, 2004). The majority of fathers in this study were fishermen who had a low educational level and socioeconomic status. These factors indirectly may have been other reasons for the high prevalence of ever smoking in this area. Although a high percentage of children only took handrolled cigarettes without tobacco, this is still worrying, as they had already have a smoking behavior and the tendency to smoke in later life seems high. Storr *et al* (2004) reported that 66% of schoolchildren had become daily users of cigarettes during 15 years of follow-up. Thirty-one percent had moderate numbers of dependence features and 19% were more severely affected.

Compared to the never smokers, the ever smokers had six times the odds of being boys. This finding is supported by Peters *et al* (1997) and Milton *et al* (2004). This was probably due to different ways of spending leisure time in which boys may have spent their time in more unsupervised behavior outside the home. They also had more access to cigarettes and would have been more exposed to the reported influencing factors. Increasing age had increased risk of ever smoking, which was also found by Peters *et al* (1997), which was attributed to the same stated reasons.

This study evaluated the knowledge level of smoking among primary school children. More than half (64.6%) had a good knowledge, where the majority knew that smoking was dangerous to their health, caused addiction, contained "poison" and caused bad breath. Less than half knew that passive smokers had a high risk to get diseases. This finding may be attributed to an inadequate knowledge of passive smoking in the respondents.

Several limitations were observed in this study. The questions on sociodemographic characteristics were limited, as it was difficult to ob-

tain accurate information from young children. Another limitation was the self reporting of smoking by the children, which may have led to under reporting, despite the earlier assurance of confidentiality regarding the smoking status of the respondents.

The high prevalence of previous smoking found in this study is a public health concern as the children are at high risk of becoming tobacco-dependent in later life. The primary school years represent a key stage for intervention to prevent a smoking habit. Awareness of the hazards of smoking incorporated into the school curriculum at schools as early as preschool need to be addressed. These programs should focus on prevention of first episode of smoking, and moving to regular tobacco use. Another important aspect is cessation of smoking in family members, who are role models, so as to reduce rates of taking up smoking among children. Ongoing interventions with appropriate monitoring and evaluation are urgently needed with approaches to legislation and policies to prevent smoking among children.

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