International Journal of Public Health Research Vol 2 No 1 2012, pp (85-92)

PUBLIC HEALTH RESEARCH

Perceived Norms and Smoking Status among Secondary School Students in Kota Tinggi, Johor, Malaysia

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ABSTRACT

Accepted 8 February 2012

Introduction Social norms, though an important contributing factor of adolescent smoking in developed countries, has not been extensively studied in Malaysia. The objective of this study was to determine the association between certain perceived norms regarding smoking with smoking status among Malaysian secondary school students in Kota Tinggi, Johor.

Methods Data were collected from 2311 respondents consisting of 1379 male and 923 female secondary school students in Kota Tinggi district via a self administered questionnaire. Five perceived norms regarding smoking were assessed, namely: perceived peer smoking prevalence, perceived parental reaction towards adolescent smoking, perceived public perception of adolescent smoking, ever noticed peers smoking inside and outside school and perceived enforcement of anti-smoking policy in school and their association with smoking status. Multiple logistic regressions controlling for gender, peer smoking and family smoking was performed.

Results Of the five perceived norms, four were associated with smoking status, (perceived peer smoking prevalence ($p<0.001$value), ever seen friends smoking inside or outside school ($p <0.001$), perceived parental reaction towards adolescent smoking ($p<0.001$ value) and perceived public disapproval ($p <0.001$)). Higher odds for smoking was observed for adolescents who: perceived a few (aOR 3.22), many (aOR 3.01) or a lot (aOR 3.52) of their peers smoke; had ever observed friends smoking in or outside of school (aOR 1.79); perceived their parents will react badly to smoking (aOR 0.84) or perceived the public disapprove of smoking (aOR 0.93).

Conclusions These results suggest that perception of social norms influence adolescents' decision to smoke, thus measures to curb smoking incidence amongst adolescents should address these perceptions of social norms.

Keywords Perceived social norm - smoking - secondary school students.

INTRODUCTION

Smoking is a learned behaviour initiated mainly during adolescence[1]. The majority of adolescent smokers will continue smoking into adulthood[2]. Thus, to prevent future smoking-related health problems among adults, it is essential to reduce adolescent smoking using effective strategies for which knowledge of the factors related to smoking is prerequisite.

Adolescents' perception of social norms has been identified as among the main risk factors contributing to smoking in several studies in developed, western countries. Perceived social norms such as perceived prevalence of smoking [3,4] and ever seeing peers smoking [3,5,7] have been associated with smoking intention and initiation among non smokers. While On the other hand, perceived parental and community disapproval of smoking have been associated with reduced risk of smoking among adolescents. [7,8]

However these findings may not be applicable in Malaysia due to sociocultural differences. There have been studies that investigate the influence of perceived social disapproval among significant others and social norm in the society on smoking cessation among adults aged 18 years and above.[9,10] However, to date, there have been no studies on the relationship between social norms and smoking among adolescents in this country. The present study thus aims to determine the relationship between perceived social norms with smoking among secondary school students in Malaysia. We hypothesize that adolescents who perceive smoking as a social norm are at higher risk of smoking.

METHODOLOGY

The data analysed in this paper are baseline data from a three year longitudinal study on adolescent smoking which began in March 2007. This project was a collaborative effort 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 protocol was approved by the Ministry of Education and the Johor State Health Department, while ethical approval was given by the Ministry of Health, Malaysia.

Sampling

A sample size of 2700 students was calculated based on smoking prevalence of 3.5% (based on pilot study) for Form 1 (13 year olds) and Form 2 (14 year olds) and 6% for Form 4 (16 year olds), maximum tolerable error of 3%, design effect of 0.67, assumed intraclass correlation coefficient of 0.5 and average proportion of students per strata at 0.33 as well as a non response rate of 30%.

Two-stage stratified sampling was carried out. In the first stage the district was stratified into urban/rural/FELDA settlements and taking a proportionate random sample of secondary schools from each stratum. Six schools were selected from the FELDA settlement areas, three schools from town areas and one from the rural areas. In the second stage, a sampling frame of Form 1, Form 2 and Form 4 students was obtained from the schools and students were then selected by simple random sampling using random numbers generated by Epi Info version 6.04d. The number of students selected from each school was proportionate to the school's student population size.

Study instrument

A validated questionnaire was used in the study by Hanjeet *et al*.[11] in 2001 and Lim *et al*[120] in 2006. The instrument was pilot-tested on Forms 1, 2 and Form 4 students in three schools in Kota Tinggi district in November 2007. One school each from the urban, rural and FELDA areas (those schools were thereafter excluded from the sampling frame). Minor improvements were made to the questionnaire following the pilot test.

The dependent variable in the study was smoking status (smoker or non smoker), which was assessed in the questionnaire by the question "In the past 30 days, on how many days did you smoke?" Smokers were defined as those who had smoked on at least one day in the past 30 days and non smokers were those who have never smoked or have not smoked in the last 30 days [2]. The independent variables assessed were perceived public perception of adolescent smoking, perceived parents' reaction towards adolescent smoking, perceived prevalence of smoking among peers, ever seen friends smoking and perceived enforcement of school anti-smoking policy.

"Perceived public perception of adolescent smoking" and "Parents reaction towards adolescent smoking" were both measured using 7-point Likert scales, where 1 represented "strongly disapprove" and 7 represented "strongly approve". Perceived prevalence of smoking among peers was gauged by the question "In your opinion, how many of your peers smoke?" Respondents were given answer choices of "None", "A few", "Many" and "A lot". For "Ever seen friend/s smoking inside or outside school area" and "School anti-smoking policy is strictly enforced" respondents had to answer "Yes" or "No". Gender, peer and family member who smoked was also measured to serve as control variables.

Data collection protocol

Passive consent was employed in the study. Before data collection was carried out, consent forms with an accompanying letter were sent to parents of selected respondents to inform them of their children's participation in the study. The letter contained a statement of the objectives of the study, assurance of confidentiality and volunteerism and a request to return the signed form to the school management if they did not consent to their children's participation in the study. No letter was received by the school management on data collection day, implying all consented.

Questionnaires were self-administered. For Forms 1 and 2 students, detailed explanations were given on each question, while 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 sought further clarification on any of the items.

Anonymity was ensured through omission of the students' names. The questionnaires could only be identified by the respondents from their signatures. In addition, no school staff was allowed to observe the students completing the questionnaires on site. All questionnaires were checked to ensure that they were answered and in the correct manner. Completed questionnaires were packed into envelopes and the envelopes were then sealed in the presence of the respondents.

Statistical Analysis

Chi-square test was used to test for significant associations between categorical variables. The independent samples t test was used to analyze differences in mean scores for the variable "perceived parents reaction if you smoke" and "perceived public approval of adolescent smoking" between smokers and non smokers. To determine the actual association between the social norm and smoking status, other established factors associated with adolescent smoking from the literature (such as peer smoking) were also entered into the model to remove potential confounding. Variables from the chi square and independent t tests with p values lower or equal to 0.25 were included in a binary logistic regression model. The independent variables were entered into the model at step 1 and subsequently all the control variables (i.e., gender, peer smoking, family member who smoked) were entered at step 2. The final model was checked for fitness using Hosmer-Lemeshow goodness of fit test. The p value was not significant (p= 0.494) indicating the model had fit. All statistical analyses were performed at 95% confidence level. The data were analyzed using SPSS version 16.

RESULTS

The response rate was 85.6 % (2311 /2700); mean age of respondents was 14.6 years. Respondents consisted of 35.7% (n=824) Form One students, 39.8% (n=917) Form Two students and the remaining 24.5% (n=565) were Form Four students. Seventy six point three percent of respondents reported they did not smoke during the past 30 days. Approximately a quarter of respondents had family members who smoked and 23.8% of them reported more than 40% of their friends smoked (Table 1).

Table 1 Demographic background of respondents

Variable	N	%
Form		
Form 1	634	35.7
Form 2	701	39.8
Form 4	425	24.5
Percentage of friends who smoked		
0 - 40%	1743	76.2
41 - 100%	545	23.8
Family member smoked		
Yes	1514	75.6
No	477	24.0
Gender		
Male	1379	59.9
Female	923	40.1
Smoking in the past 30 days		
Yes	1760	76.3
No	546	23.7

Table 2 shows respondents who perceived higher prevalence of smoking among peers, perceived strict enforcement of anti-smoking rules in school and had ever seen peers smoking inside or outside school were more likely to smoke ($p<0.05$). Among these variables, perceived higher prevalence of peer smoking was the most significant factor associated with smoking status.

Table 2 Univariate analysis of association between social norm and smoking status

	Smoking status, n (%)				
	Smoker	Non smoker	χ^{2*}	df	P-value
Gender (n=2296)					
Male	522(37.4)	854(62.1)	388.15	1	<0.001
Female	21(2.3)	899(97.7)			
Form (n=2306)					
Form 1	190(23.1)	831(76.9)	0.44	2	0.803
Form 2	215(23.5)	700(76.5)			
Form 4	139(24.6))	425(75.4)			
Family member/s smoke (n=1986)					
Yes	173(19.3)	724(80.7)	19.67	1	<0.001
No	303(27.8)	786(72.2)			
Percentage of best friends who smoke (n=2272)					
0 – 40%	145(9.6)	1373(90.4)	507.25	1	<0.001
41 - 100%	348(52.1)	366(47.9)			
Perceived smoking among peers (n=2272)					
None	21(6.9)	284(93.1)	73.01	3	<0.001
A few	206(23.4)	675(76.6)			
Many	211(26.4)	588(73.6)			
A lot	102(35.5)	185(64.5)			
Perceived strict school regulations against smoking (n=2281)					
Yes	61(17.5)	288(82.5)	9.32	1	p=0.002
No	484(25.1)	1448(74.9)			
Ever seen friend/s smoking inside or outside school compound (n=2290)					
Yes	348(30.0)	812(70.0)	48.33	1	<0.001
No	199(17.6)	931(82.4)			

* Chi-square test for independence

Respondents who perceived higher public disapproval and parents negative reaction toward adolescent smoking were less likely to be current smokers, this was shown by the significantly lower scores among non-smokers for both variables ($p<0.05$) and mean score for parents reaction toward smoking was lower among non-smokers compared to among smokers ($p<0.05$) (Table 3).

Table 3 Differences in mean perception scores between smokers and non-smokers

	Smoking status			
	Smoker Mean score (SD)	Non-smoker Mean score (SD)	t*	P-value
Perceived parents' reaction to adolescent smoking	3.17 (2.33)	2.39 (1.97)	-7.81	<0.001

Perceived public perception of adolescent smoking	1.98 (1.66)	1.44 (1.27)	-6.86	<0.001

* Independent t-test

In Table 2, the likelihood of smoking was reduced for respondents who perceived that the general public disapproves of adolescent smoking (OR 0.95 (95%CI 0.86, 0.99)) or that parents/guardian would react negatively towards smoking among adolescents (OR 0.84, (CI 0.76, 0.92)). Compared to those who perceived that none of their peers smoked, the likelihood of smoking was 3-4 times higher for those who perceived that a few, many and a lot of their peers were smokers: a few OR 3.22 (CI 1.78, 5.83); many OR 3.01, (CI 1.64, 5.26); a lot 3.52 (CI 1.80, 6.90) and respondents who had ever seen their peers smoking were 79% more likely to smoke (OR 1.79 (CI 1.08, 2.95)) after controlling for the effect of gender, percentage of friends who smoke, family member smoking (father or brother/s) and form, Perception of strict enforcement of anti-smoking regulation was not significant after adjusting for other factors (Table 4).

Table 4 Multivariable analysis of association between social norm and smoking status

	Crude OR	95% CI	Adjusted OR*	95% CI
Gender				
Male	26.17	16.75-40.88	13.18	7.78-22.31
Female	1		1	
Family member smoke				
Yes	1.61	1.31-2.00	1.28	0.98-1.67
No			1	
Percentage of friends who smoke				
0 - 40%	1		1	
41 - 100%	10.30	8.24-12.86	4.21	3.18-5.58
Perceived smoking among peers				
None	1		1	
A few	4.13	2.58-6.60	3.22	1.78-5.83
Many	4.85	3.03-7.77	3.01	1.64-5.54
A lot	7.46	4.50-12.35	3.52	1.80-6.90
Ever seen friend/s smoking in school				
Yes	2.01	1.65-2.44	1.79	1.08-2.95
No	1		1	
Perceived strict school regulations against smoking				
Yes	1		1	
No	1.58	1.18-2.12	1.43	0.94-2.18
Perceived parents' reaction to adolescent smoking	0.79	0.74-0.84	0.84	0.76-0.92
Perceived public perception of adolescent smoking	0.84	0.80-0.86	0.93	0.86-0.99

Hosmer-Lemeshow Chi Square value 7.40 df=8 , p=0.494

DISCUSSION

This is the first report on the relationship between smoking status and social norms in Malaysia, to our knowledge. Our study showed smokers were more likely to perceive higher prevalence of peer smoking. It was the most significant independent variable associated with smoking status among our respondents. This finding is consistent with findings reported by Franca *et al.* in 2009 [13], who reported the odds of smoking increase significantly if respondents believed more than half of their peer smoked compared to less than one third. Similar findings were also reported by Iannotti *et al.*[15] in 1996, Rimal & Real [14] in 2002, and Lipperman-Kreda & Grube [16] in 2009 all of whom found perceived peer smoker prevalence as the main

independent variable associated with current smoking status. However, Eisenberg and Forster [3] in 2003 reported no association between perceived smoking prevalence among peers and various categories of smokers (daily smoker, past week smoker and last month smoker) in a study among adolescents in the United States. The findings in the present study can be explained by the nature of adolescents. Adolescence is a period of soul searching and forming of identity, in which peers are the main reference points for adolescents. Adolescents tend to emulate peer behaviours in order to ensure that they are not lagging behind in current peer development. Thus it follows that, perceiving smoking is highly prevalent among peers leads to smoking initiation among adolescents. An alternative explanation is, adolescents who smoke tend to befriend peers who smoke as well[18]. Frequent interaction with smoking peers may promote the perception of smoking as a norm among members in the group which will influence other group members to initiate smoking [4]. When a majority of peers are smokers, they tend to generalize the behaviour as a normal practice of the majority of adolescents in their society.

Parents' reactions or attitudes toward certain unhealthy behaviours influence their children's engagement in those behaviors [7, 18, 19]. Adolescents who perceived that their parents would react negatively if they smoked were less likely to be smoking. This finding is consistent with the outcome of research by Cartrucci *et al.*, [3i]n 2002 and Kristjansson *et al.*[7] in 2010. In their study, likelihood of smoking among adolescents was reduced if they perceived that their parents would react negatively if they smoked [6, 7]. Wiium *et al.*, in 2006 [20] reported that respondents who perceived their parents will mind if they smoked in 2 years times were less likely to smoke. The present study also shows that adolescents tend to appreciate the opinion of other significant persons such as their parents before they practice certain behaviours, like smoking [21]. Therefore, parents' stance against smoking, whether verbally or non verbally expressed, will reduce the risk of adolescents smoking. Furthermore, parental advice is presumably more effective in eastern cultures which emphasize filial piety [22].

Perceived public disapproval of adolescent smoking was a protective factor against smoking in the present study, consistent with the finding by Eisenberg and Forster [3] in 2003, who reported that respondents who perceived adult disapproval of smoking are 20% less likely to be past week smokers. Lipperman-Kreda & Grube [16] in their study among 17,256 teenagers in 2009 in Oregon revealed that students' perception of community disapproval was indirectly related to adolescent smoking and Ahern *et al* [6] in 2009 reported permissive norms in a society increased the likelihood of smoking by 34%. Our finding may be explained by collective nature of our society in which community social values and opinion precede individual opinion or values. Therefore if the adolescents perceive that society frowns on smoking, they will be less inclined to smoke.

Respondents who smoked were more likely to have ever seen peers smoking inside or outside school. Studies among adolescents in China and United states revealed that respondents who ever notice their peer smoking are more likely to be smokers [5, 7]. Respondents who have ever seen peers smoking inside or outside school will assume the behavior as a norm practiced by majority of adolescents, therefore they behave in such a way as to ensure their behavior conforms to the norm.

We found that perceived strict school regulation against smoking was not associated with smoking status after controlling for other independent variables (gender, family member smoke, percentage of friends who smoke, perceived smoking among peers, ever seen friend/s smoking in school, perceived strict school regulation against smoking, perceived parents' reaction to adolescent smoking and perceived public perception at adolescent smoking). The present study's finding is in line with the finding of Darling *et al.,* [23] in 2006 who similarly found no such association This is contradictory to the finding by Overland *et al.*,[24] in 2010 who observed that the smokers were 3.5 more likely to perceived that school regulation against smoking are lenient compared to non smokers. Lipperman-Kreda *et al*. [25] in the same year also reported an inverse association between current smoking and high level of anti-smoking policy enforcement in school. Perceived strict regulation may not be significant because adolescents spend less time in school compared to outside and adolescents are not bound to school anti smoking regulation outside school. Another plausible explanation is adolescents may perceive the school's role as solely academic and unrelated to the other social aspects of their lives and therefore school smoking regulations have minimal impact on their decision to smoke.

There was relatively low correlation between the four perceived social norms measured here namely perceived peer smoking prevalence, perceived parental reaction towards adolescent smoking, perceived public perception and ever seen peer smoking inside or outside school. This suggests that different preventive measures need to be implemented to reduce the incidence or prevalence of smoking among adolescents.

There are several limitations in the present study. Firstly, the study design was cross-sectional, thus only associations can be measured and not causation. Establishment of smoking habits due to social norm need to be confirmed through a follow-up study. Secondly, the study was conducted only

in Kota Tinggi District, Johor, Malaysia and therefore the findings cannot be generalized to the entire country. Future studies representative of the state or national level are recommended. Finally, smoking status was self-reported and not verified by objective measurement of cotinine levels in blood or saliva, which may contribute to under-reporting of smoking status among respondents. Future studies are recommended to include objective measurement of smoking status.

In this study, we show that social norms are associated with smoking status among adolescents. Perceived high prevalence of smoking among peers, ever seen friends smoking inside and outside the school, perceived parental and societal disapproval of teen smoking were associated with smoking status among adolescents. Several measures are suggested to be carried out concurrently. Firstly, to correct the misperception among adolescents that smoking is a norm among adolescents through health promotion by revealing the actual prevalence of smoking among adolescents in the country of 7.7% [26]. Secondly, the status of public places as smoke-free zones, particularly in the schools, should be protected as stipulated by the tobacco control regulations 2004 [27]. Thirdly, adolescents' access to cigarettes and other tobacco products should be made more difficult by stricter enforcement of the existing ban on the sales of tobacco products to minors. And finally, parents and the community at large should be educated through anti smoking campaigns and talks in order to successfully create an anti-smoking norm in the community.

ACKNOWLEDGEMENT

We would like to thank the Director-General of Health Malaysia for his permission to publish this paper. We would also like to thank the Ministry of Education, the schools involved in the study and all who assisted in data collection and management for their support and co-operation.

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