

# SMOKING BEHAVIOR AMONG 14-17 YEAR OLD STUDENTS: A COMPARISON BETWEEN PAKISTAN AND THE UK

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**Abstract.** Smoking is a major public problem concern the world over. It is one of the major preventable causes of premature death and disease in the world. Fourteen to seventeen year olds are among a vulnerable group of individuals in society and susceptible to cigarette smoking. Older students act as role models to younger pupils and could influence smoking behavior. In a cross-sectional study we compared the differences in smoking between high school students in Pakistan and the United Kingdom. A self-administered anonymous questionnaire, adapted from a WHO questionnaire about tobacco smoking, was distributed to the students. In the UK, 235 participants were recruited; 16% ( $n=38$ ) were regular smokers. In Pakistan, 350 participants were recruited; 17% ( $n=58$ ) were regular smokers. In both countries males were significantly more likely to smoke. Reasons for smoking varied between the UK and Pakistan. In the UK, the majority smoked for recreational or social purposes and in Pakistan peer pressure played the major role. Beliefs regarding smoking were similar between the two countries. The lifetime prevalence of smoking was higher in the UK, but more students in Pakistan smoked daily. There were important differences in the smoking patterns between the two countries, which have potential public health implications.

**Keywords:** smoking behavior, high school students, Pakistan, United Kingdom

## INTRODUCTION

Tobacco smoking is one of the major preventable causes of premature death and disease worldwide (Warren *et al*, 2006). Studies from both developed and developing countries have shown a high prevalence of smoking in student populations (Warren *et al*, 2008). Many

adult smokers begin using tobacco, most commonly in the form of cigarettes, as adolescents or young adults (White *et al*, 2002; Dearden *et al*, 2007). The Office of National Statistics reported 22% of 16-19 year olds in the UK were smokers (Office for National Statistics, 2010). Such data is not readily available in Pakistan. The prevalence of smoking among high school males in Karachi, Pakistan was 13.7% (Rozi *et al*, 2004). It is important to understand factors that influence initiation of smoking in this group.

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Students attribute tobacco use to several factors: these include exposure to cigarette smoke at home, pro-tobacco advertising, enhancement of self-image, relieving boredom and relief of stress (Nichter *et al*, 2005; Warren *et al*, 2008). In the United States, educational programs, anti-smoking campaigns, and fiscal regulation (increasing the cost of cigarettes) have been reported to result in a decline in adolescents smoking (Chen *et al*, 2003). However, such programs are not often found in the developing world despite research suggesting a rise in tobacco use in these countries (Mackay, 1994). Studies that improve understanding of students' beliefs and reasons for smoking may guide the development of culture-specific programs to address the problem of smoking among students.

We studied smoking behavior among high school students in Pakistan and the United Kingdom to explore student beliefs regarding smoking and their smoking behavior in two cultures.

## MATERIALS AND METHODS

We conducted a cross-sectional survey, at four high schools, three in Karachi, Pakistan and one in Cheadle, United Kingdom, during June to August, 2007. Questionnaires were distributed, filled out and collected during one day at each of the schools. The study was approved by the relevant institution review boards.

Participating schools were chosen primarily on the basis of convenience and accessibility. This project was initially conceived of (and implemented) as a student project when one of the authors (MH) was a student at Cheadle Hulme School in 2007. For this reason, Cheadle Hulme School was used for the UK sample. The Pakistan Institute of Learning and Liv-

ing (PILL) was approached to help identify similar schools in Karachi, Pakistan (where the author collected the Pakistan data). In Karachi, three schools were randomly chosen (using a random numbers table) where the PILL was carrying out a "Learning through Play" project for training school teachers.

Karachi is a large cosmopolitan city and an important economic hub in Pakistan. Its population has a wide range of social and economic backgrounds. The study was conducted in state schools in central Karachi. The students in those schools were predominantly from a lower-middle socio-economic background.

Cheadle is a small town in the Metropolitan Borough of Stockport in Greater Manchester, England. The study was conducted at an independent school for boys and girls aged 4-18 years. The majority of students came from a higher socio-economic background.

This study compared students from a semi-urban part of a developed country with an urban part of a developing country. The study was conducted to reflect cultural disparities between the two countries as this would allow differences in smoking to stand out. It was for this reason students from an urban working class in Pakistan were chosen to compare with students from a semi-urban upper class in the United Kingdom.

The study sample consisted of students aged 16-18 years. After informed consent was given the students filled out the questionnaires anonymously. The questionnaires were available in both English and Urdu. A total of 350 out of 380 students surveyed in Karachi completed the questionnaire (response rate 92.1%), and 235 out of 250 students surveyed in Cheadle completed the questionnaire

Table 1  
General characteristics of two groups of study subjects.

	Cheadle (UK) N=235	Karachi (Pakistan) N=350
Gender		
Male	116 (49%)	193 (55%)
Female	119 (51%)	157 (45%)
Mean age (standard deviation)		
Male	16 years and 11 months (SD 0.35)	17 years and 6 months (SD 1.16)
Female	16 years and 10 months (SD 0.39)	16 years and 5 months (SD 0.89)
Ethnicity		
White Caucasian	195 (83%)	-
Asian (Indian/Pakistani)	29 (12%)	350 (100%)
Others	11 (5%)	-

(response rate 94%). Given the exploratory nature of the study, a sample size calculation was not carried out, but the intention was to maximise the sample size so as to improve the robustness of the study findings.

The study questionnaire was adapted from a WHO questionnaire previously used to study tobacco smoking among health professionals (Minhas and Rahman, 2009). It included information about age, gender, ethnicity, smoking status, reasons for smoking and smoking beliefs. It consisted of 20 questions and took approximately 2-3 minutes to complete.

Statistical analysis was carried out using SPSS version 12 (SPSS, Chicago, IL). The data were analyzed descriptively for each of the samples. Differences between samples were tested for significance using a chi-square test and *p*-values.

## RESULTS

Of the 350 students in Karachi who completed the questionnaire, 193 (55%) were males and 157 (45%) were females.

The mean age was 17 years 6 months for males and 16 years 5 months for females (Table 1). Of the 235 students in Cheadle who completed the questionnaire, 116 (49%) were males and 119 (51%) were females. The mean age of the males was 16 years 11 months and females 16 years 10 months. The majority of students in Cheadle ( $n=195$ , 83%) were of white British ethnicity, and most of the rest ( $n=29$ , 12%) were of Pakistani/Indian background (Table 1).

### Prevalence of smoking

Seventy-two (21%) of the Pakistani students stated they had smoked at least once in their lives. Thirty-three (46%) stated they had smoked more than 100 cigarettes. Fifty-eight students (81%) stated they had smoked during the past month, and 36 (62%) said they had smoked every day. All the above rates were significantly higher among the male students than the female students in this sample ( $p<0.05$ ) (Table 2).

In Cheadle, 123 students (52%) stated they had smoked at least once in their lives. Twenty-four students (20%) stated

Table 2  
Prevalence of smoking.

	Cheadle (UK)			Pakistan			Chi-square test (DF)	p-value
	Male (n=116)	Female (n=119)	Total (n=235)	Male (n=193)	Female (n=157)	Total (n=350)		
Have you ever smoked?								
Yes	65 (56%)	58 (49%)	123 (52%)	67 (35%)	5 (3%)	72 (21%)	63.8 (1)	<0.001
No	51 (44%)	61 (51%)	112 (48%)	126 (65%)	152 (97%)	278 (79%)		
If yes, have you smoked more than 100 cigarettes in your life?								
Yes	14 (22%)	10 (17%)	24 (20%)	32 (48%)	1 (20%)	33 (46%)	15.2 (1)	<0.001
No	51 (78%)	48 (83%)	99 (80%)	35 (52%)	4 (80%)	39 (54%)		
In the past 30 days have you smoked a cigarette?								
Yes	25 (38%)	13 (22%)	38 (31%)	54 (81%)	4 (80%)	58 (81%)	44.8 (1)	<0.001
No	40 (62%)	45 (78%)	85 (69%)	13 (19%)	1 (20%)	14 (19%)		
If you have, how often do you currently smoke?								
Every day	5 (20%)	1 (8%)	6 (16%)	35 (65%)	1 (20%)	36 (62%)	19.9 (1)	<0.001
Some days	20 (80%)	12 (92%)	32 (84%)	19 (35%)	3 (80%)	22 (38%)		
How many cigarettes do you smoke?								
Less than 1/week	11 (44%)	7 (54%)	18 (47%)	9 (17%)	0	9 (16%)		
More than 1/week, less than 1/day	6 (24%)	4 (31%)	10 (26%)	12 (22%)	3 (75%)	15 (26%)		
More than 1/day, less than 15/day	8 (32%)	2 (15%)	10 (26%)	23 (42.5%)	1 (25%)	24 (41%)		
More than 15/day, less than 25/day	0	0	0	10 (18.5%)	0	10 (17%)		

Chi-square test used to test differences in proportions in the total Cheadle and Karachi samples.

Table 3  
Reasons for smoking.

	Cheadle (UK)			Pakistan			Chi-square test (DF)	p-value
	Male	Female	Total	Male	Female	Total		
Do you smoke when you are stressed?							12.0 (1)	<0.001
Yes	10 (29%)	7 (22%)	17 (26%)	38 (58%)	1 (20%)	39 (55%)		
No	24 (71%)	25 (78%)	49 (74%)	28 (42%)	4 (80%)	32 (45%)		
Do you smoke for recreation?							4.4 (1)	0.040
Yes	20 (59%)	15 (47%)	35 (53%)	24 (36%)	1 (20%)	25 (35%)		
No	14 (41%)	17 (53%)	31 (47%)	42 (64%)	4 (80%)	46 (65%)		
Do you smoke to socialize?							0.2 (1)	0.733
Yes	18 (53%)	17 (53%)	35 (53%)	37 (56%)	3 (60%)	40 (56%)		
No	16 (47%)	15 (47%)	31 (47%)	29 (44%)	2 (40%)	31 (44%)		
Do you smoke because of peer pressure?							17.4 (1)	<0.001
Yes	4 (12%)	0	4 (6%)	25 (38%)	0	25 (35%)		
No	30 (88%)	32 (100%)	62 (94%)	41 (62%)	5 (100%)	46 (65%)		
Do you smoke because of cravings?							2.4 (1)	0.134
Yes	6 (18%)	3 (9%)	9 (14%)	17 (26%)	0	17 (24%)		
No	28 (82%)	29 (91%)	57 (86%)	49 (74%)	5 (100%)	54 (76%)		

Chi-square test used to test differences in proportions in the total Cheadle and Karachi samples.

Table 4  
Smoking beliefs.

	Cheadle (UK)			Karachi (Pakistan)			Chi-square test (DF)	p-value
	Male	Female	Total	Male	Female	Total		
Do you think smoking is addictive?							19.1 (1)	<0.001
Yes	105 (91%)	110 (92%)	215 (91.5%)	120 (62%)	152 (97%)	272 (78%)		
No	11 (9%)	9 (8%)	20 (8.5%)	73 (38%)	5 (3%)	78 (22%)		
Does smoking decrease life expectancy?							23.1 (1)	<0.001
Yes	115 (99%)	119 (100%)	234 (99.9%)	158 (82%)	156 (99%)	314 (90%)		
No	1 (1%)	0	1 (0.1%)	35 (18%)	1 (1%)	35 (10%)		
Smoking as cause of heart disease?							20.5 (4)	<0.001
Major cause	56 (48%)	51 (43%)	107 (45.5%)	98 (51%)	84 (54%)	182 (52%)		
Contributing cause	49 (42%)	64 (54%)	113 (48.09%)	51 (26%)	71 (45%)	122 (35%)		
Do not know	5 (4%)	1 (1%)	6 (2.5%)	36 (19%)	0	36 (10%)		
Associated	5 (4%)	3 (3%)	8 (3.4%)	5 (3%)	2 (1%)	7 (2%)		
Not associated	1 (1%)	0	1 (0.4%)	3 (2%)	0	3 (0.8%)		
Smoking as a cause for lung cancer?							59.9 (4)	<0.001
Major cause	99 (85%)	102 (86%)	201 (85.5%)	104 (54%)	97 (62%)	201 (57%)		
Contributing cause	14 (12%)	17 (14%)	31 (13.2%)	36 (19%)	56 (36%)	92 (26%)		
Do not know	0	0	0	36 (19%)	1 (1%)	37 (11%)		
Associated	3 (3%)	0	3 (1.3%)	13 (7%)	3 (2%)	16 (0.5%)		
Not associated	3 (3%)	0	3 (1.3%)	4 (2%)	0	4 (0.01%)		
Do you think smoking should be banned in public places?							7.1 (1)	0.010
Yes	85 (73%)	102 (86%)	187 (79.6%)	153 (79%)	154 (98%)	307 (88%)		
No	31 (27%)	17 (14%)	48 (20.4%)	40 (21%)	3 (2%)	43 (12%)		

Chi-square test to test differences in proportions in the total Cheadle and Karachi samples.

they had smoked more than 100 cigarettes. Thirty-eight students (31%) stated they had smoked during the past month, and 6 (16%) stated they smoked every day. In contrast to the Karachi sample, there were no significant gender differences in smoking prevalence rates (Table 2).

### Reasons for smoking

The students were asked whether they smoked due to stress, for recreation, due to peer pressure, as a means to socialize or due to cravings.

In Karachi, 39 (55%) and 40 (56%) students stated stress and socialization were the reasons for smoking, respectively. A smaller proportion ( $n=25$  each, 35% each) identified peer pressure and recreation as reasons for smoking and only 17 students (24%) reported cravings as the reason for smoking (Table 3).

In Cheadle recreation and socialization ( $n=35$  each, 53% each) were stated as the main reasons for smoking. Much smaller proportions of students reported stress ( $n=17$ , 26%), peer pressure ( $n=4$ , 6%) and craving ( $n=9$ , 14%) as reasons for smoking (Table 3).

### Smoking beliefs

Seventy-eight percent of Pakistani students thought smoking was addictive, 90% thought it decreases life expectancy, 87% knew of the link between smoking and heart disease, 83% knew of the link between smoking and lung cancer and 88% thought it should be banned in public places (Table 4).

Significantly higher proportions of Cheadle students knew smoking is addictive, and decreases life expectancy; nearly all recognized its link with lung cancer and heart disease (significantly higher than the Pakistani sample), but only 79.6% supported banning smoking in public places ( $p<0.05$ ) (Table 4).

## DISCUSSION

We studied attitudes about smoking among high school students in the United Kingdom and Pakistan. A number of methodological limitations need to be acknowledged. The participants in Cheadle were from a middle class background, while the participants in Karachi were from a predominantly working class background. The findings are not generalizable to the entire student populations of both countries. The questionnaire used was based on items drawn from the Global Youth Tobacco Survey to which additional items were added to elicit specific information about beliefs, attitudes and reasons for smoking in this population. The questionnaire was translated into the Urdu language.

A total of 16.5% of the Karachi sample admitted to smoking during the past month (regular smokers). The majority of these were male, and the difference between genders was significant. The rate in our study is nearly 4-times higher than that reported by the National Health Survey of Pakistan (1990-1994) (4.4% among 15-19 year olds) (Ahmad *et al*, 2005). Other studies have reported similar rates; Rozi *et al* (2007) found the prevalence of smoking among male students in Karachi aged 15-17 years to be 19.2%. The same study compared prevalence of smoking between privately educated students, and publicly funded schools and reported that the latter were more likely to smoke. In another study conducted by Rozi *et al* (2005) the prevalence of smoking in high school students was 13.7%.

The higher prevalence of smoking among men than women in Pakistan is consistent with previous studies. Gender differences may be explained by the observation that in Pakistan, smoking by

women is not perceived as socially acceptable; therefore, fewer women smoke (Ahmad *et al*, 2005). Alam *et al* (2008) found the prevalence of smoking among women in Pakistan to be 4.7% compared to a global smoking rate of 12%. It is unclear whether other more socially acceptable forms of tobacco use (*eg*, chewing tobacco, etc) compensate for the low prevalence of smoking among women. This may be an area for future research.

Fifty-two percent of Cheadle students had 'ever' smoked, which is much higher than the Karachi sample (21%). However, a higher proportion of Karachi students than Cheadle students smoked daily. There was no significant gender difference in the prevalence of smoking in Cheadle. Other studies have reported similar smoking prevalence rates in the UK. A UK Health Education Authority Survey (Owen and Bolling, 1995) found 17% of 15 year olds sampled smoked regularly. Withers *et al* (2000) found 14% of UK adolescents sampled smoked regularly.

The majority of Karachi students sampled (both current smokers and others) thought smoking was addictive ( $p>0.05$ ). Seventy-nine percent of students who smoked during the previous month (current smokers) believed smoking reduces life expectancy compared to 76% of non-smokers ( $p<0.05$ ). Seventy-six percent of current smokers in our study believed that smoking should be banned in public places, compared to 90% of non-smokers.

In the Cheadle sample, 78% of current smokers thought smoking was addictive while 95% of non-smokers thought smoking was addictive ( $p<0.05$ ). Nearly all participants in Cheadle thought smoking reduces life expectancy. Forty-five percent of current smokers felt smoking should be banned in public places, as opposed

to 77.5% of non-smokers.

The Karachi students reported stress and socialization as the most important reasons for smoking, while Cheadle students identified recreation and socialization as the most important reasons for smoking. Fewer Karachi students seemed to be aware of the potential reduction in life expectancy due to smoking but a larger proportion supported banning smoking in public places. Students that smoked in Karachi were more likely to do so at times of stress despite knowing the harmful effects of smoking. This highlights that not just education and health promotion campaigns are needed, providing alternate means to manage stress may be of equal importance in reducing smoking. The predominantly recreational and social roles of smoking in the UK may underlie the reluctance of UK students to endorse a ban on public smoking. Further work needs to be done to explore what students in the UK feel would be the best acceptable intervention.

The high prevalence of smoking despite an awareness of its negative consequences in the UK students suggests health education alone may not be sufficient as a public health preventative measure. An understanding of the beliefs underlying smoking may allow for interventions to be tailored accordingly.

The results from this study confirm the recent trend of an increase in smoking among the young people in Pakistan, and are a cause for concern. Tobacco use is a major public health problem and the prevalence of smoking amongst high school students was high in both settings. Adolescent smoking has been associated with other unhealthy behavior such as unsafe sex (Aras *et al*, 2007), alcohol misuse (Brook *et al* 2007; White *et al* 2007a)



and truancy (White *et al*, 2007b). Cigarette smoking among adolescents and young adults has also been described as a gateway substance, possibly leading to use of illicit drugs (Khan *et al*, 2006). Smoking cessation and prevention in adolescents has both short and long term benefits. Intervention strategies that incorporate promotion of healthy recreational activities, tobacco control programs, education about the ill effects of smoking, peer led intervention programs and cessation assistance programs need to be discussed and implemented.

Our findings raise particular concerns about Pakistan, in view of the higher genetic cardiovascular risk of heart disease among South Asians, which is likely to be compounded further by the increased prevalence of smoking in recent years (Ahmad *et al*, 2005). Prevention of smoking among adolescents is likely to have long term socio-economic benefits as well as individual health benefits.

The main limitations of the present study include selection bias in recruiting the two student samples. Only students who were present on the study day were invited to participate. It is difficult to say whether the samples are representative of high school students throughout their respective countries. Since the study was based on a self-reported questionnaire there is potential for under or over-reporting. To our knowledge, this is the only study comparing smoking among student populations in developing and developed countries. This may serve as a basis for work in developing effective smoking prevention/ cessation programs.

Future work needs to explore smoking-related beliefs among different populations (eg, amongst Pakistani and British male and female adolescents) so as to help

develop tailored strategies to prevent smoking in these populations or to help with smoking cessation.

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