

# Epidemiology of Cigarette Smoking among Adolescent Male Students in Qassim, Saudi Arabia

Sultan Fahad Al Nohair

Department of Family and Community Medicine Department, College of Medicine, Qassim University, Saudi Arabia

**Abstract Background:** Although there are many published data on adolescents' cigarette smoking, few published data exist on epidemiology of smoking in Kingdom Saudi Arabia (KSA) especially Qassim region. The aim of this study was to determine the epidemiology of adolescent cigarette smoking in Qassim region. **Methods:** A school-based cross-sectional study was carried out in Qassim region. A multistage stratified cluster sample was conducted. Socio-demographic and smoking-related factors were gathered using questionnaire. **Results:** Of 710, 680 (95.7%) students responded. Out of these 680, 161 students (23.6%) were smokers. Around one third (56, 34.7%) of the students started smoking at 13 years of age. The place of their friend (Istraha) (40.0, 24.9%), public places (38.0, 23.6%), at home (37, 22.9%) were the places of smoking among these students. In binary logistic regression, while there was no significant association between the tested variables and smoking; students who had smoking friends were 2.3 times more likely to smoke (OR=2.35, 95% CI=1.49–3.70, P < 0.001). **Conclusion:** This study showed that the prevalence of smoking among adolescent boys is substantial, they initiate smoking at a young age, and it is reinforced by their peers. Future studies showed focus on culture-specific methods to prevent smoking initiation.

**Keywords** Smoking, Adolescent, Males, Schools, Qassim

## 1. Introduction

Smoking is a major public health problem worldwide, where the World Health Organization (WHO) reported that mortality due to smoking-related diseases was higher than the combination of all communicable diseases together [1]. The vast majority of the smokers started smoking during the adolescent time where exposure to smoking during this time definitely increases the duration of exposure to carcinogens, nicotine dependency and might have a lower cessation rates [2-4]. While there are many published data on smoking in the different region of kingdom Saudi Arabia (KSA) [5-7, 7-12], few of these publications were on adolescent males.

In order to inform public health officials regarding smoking prevention efforts, smoking habits among adolescents should be investigated. Hence, the current study was conducted to determine the prevalence and correlates of cigarette smoking among adolescent males in the Qassim Region, KSA during January-June 2014. I did not include female gender in this study because smoking consider as a social stigma especially among female which may effect on them in the future from their family so, we afraid from the bias result of the female in case of give us incorrect

information about the status of smoking. In this study, concentrate mainly on Qassim region which affect by some cultural factors may lead to decrease smoking prevalence compare to other region in Saudi Arabia as example ( more religious culture about the harmful of smoking giving to the adolescent, smoking not accepted socially in the open places). The results of this study may be useful to local officials to form health policies and prevention programs.

## 2. Methods

A school-based cross sectional study was conducted where adolescent males were recruited from the intermediate and secondary school students in Qassim Region, Saudi Arabia. Qassim, is one of the thirteen administrative regions of Saudi Arabia located at the heart of the country, and almost in the centre of the Arabian Peninsula. It has a population of 1,370,727 and an area of 58,046 km<sup>2</sup>. The region has 2,533 schools and 263,379 students. From 2533 schools, decide to select 25 % of the intermediate and secondary schools. The inclusion criteria of the participants were male students, age range from 13 years to 21 years, mean age was 17 years. Exclusion criteria Female gender, age less than 13 years.

The primary (six years), intermediate (three years) and secondary (three years) levels constitute the basic educational system in Saudi Arabia. All the intermediate and secondary schools in Qassim region were eligible, and

\* Corresponding author:  
sultanalnohair@qumed.edu.sa (Sultan Fahad Al Nohair)  
Published online at <http://journal.sapub.org/phr>  
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exclusion criteria were used for primary schools.

### Sampling

The study analyzed data from intermediate and secondary male adolescent school students from the Qassim Region. A multistage, stratified cluster sampling procedure was used where the final sample being proportional to the size of the stratum. The within each stratum, a cluster sampling was used where the school was the primary sampling unit. Schools were selected in proportion to their size. Finally, from each randomly selected school (in proportion of the size). In Qassim region, there were 5 area and every area consider as cluster then from each cluster select randomly 25% from their schools. The sample of this study was 681 adolescent male students guided by the averages of the estimated smoking prevalence among school students in previous studies in the Kingdom of Saudi Arabia (20-30%) [5-7, 7-12], an assumed precision of 5% and a confidence interval of 95% and 80% power where 10 % were expected to be non-responders or have incomplete data.

### Assessment

The questionnaire applied in this study was adapted from the Global Youth Tobacco Survey (GYTS) questionnaire which designed to gather data on the prevalence of cigarette smoking and its associated risk factors [13]. The GYTS is a self-administered questionnaire consisting of 56 core questions. The modified (GYTS) questionnaire was translated into Arabic covered data and were used in the previous studies in KSA [7, 9]. The questionnaires were about the socio-demographic and behavioral characteristics of the respondents, their smoking status, smoking related factors. Likert scale have been used to measure the variables and reliability.

### Ethics

The study was approved by the ethical committee of the College of Medicine, Qassim University and the written permission was taken from the Ministry of Education and School Health. A signed informed consent was taken from each participant prior to data collection. The right and confidentiality have been informed to the participants as the role and regulation figured from our University.

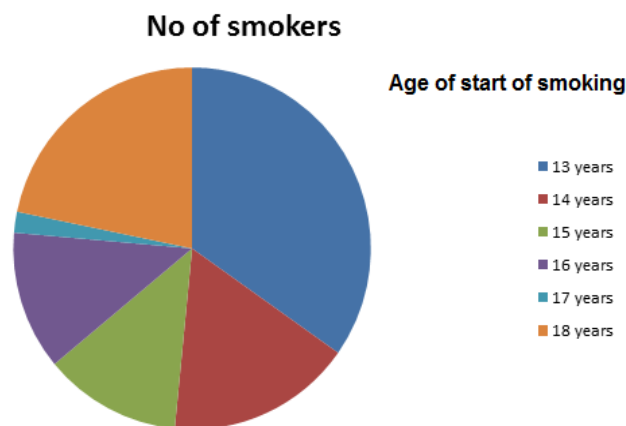
### Statistics

Data were entered into the computer using SPSS 18 for Windows for data analyses. Continuous and categorized data were compared between smokers and non-smokers using t-test and  $X^2$ , respectively. Logistic regression analyses were performed where smoking was the dependent variable and age, father education, father or friend smoker, were the independent variables. Odds ratios and 95% confidence interval were calculated. P value < 0.05 was considered statistically significant.

## 3. Results

Of 710, 680 (95.7%) students responded and had complete

data. Out of these 680, 161 students (23.6%) were smokers. Around one third (56, 34.7%) of the students started smoking at 13 years of age and around one fifth (35, 21.7%) of them started smoking at 18 years of age (Pie chart). The place of their friend (Istraha) (40, 24.9%), public places (38, 23.6%), at home (37, 22.9%), at social events (15, 9.4%) inside the school (14, 8.6%) and around the school (17, 10.6%) were the places of smoking among these students.



**The most common age of starting smoking (Pie chart)**

**Table 1.** Comparison of sociodemographic characteristics between smokers and non-smokers among adolescent male students in Qassim Region

Variables	Smoker (n=161)	Non-smoker (n=520)	P
<b>Father education level</b>			
Illiterate	13(8.1)	28(5.4)	0.438
Secondary	88(54.7)	299(57.5)	
University and above	60(37.3)	193(37.1)	
<b>Pocket money</b>			
< 300 Saudi Riyal	70(43.5)	228(43.8)	0.988
≥ 300 Saudi Riyal	91(56.5)	292(56.2)	
<b>Father smoking</b>			
Yes	40(24.8)	157(30.2)	0.198
No	121(75.2)	363(69.8)	
<b>Brothers smoking</b>			
Yes	50(31.1)	157(30.2)	0.845
No	111(68.9)	363(69.8)	
<b>Friends smoking</b>			
Yes	68(42.2)	157(30.2)	0.005
No	93(57.8)	363(69.8)	
<b>Belief that smoking is harmful</b>			
Yes	97 (60.2)	280 (53.8)	0.174
No	64(39.8)	240(46.2)	
<b>Belief that smokers have more friends</b>			
Yes	105 (65.2)	317(61.0)	0.354
No	56(34.8)	203(39.0)	
<b>Have seen cigarette advertisements in the mass media</b>			
Yes	81 (50.3)	288(55.4)	0.278
No	80(49.7)	232(44.6)	

In comparison with non-smokers, significant number of smokers had smoking friends (68(42.2) vs. 157(30.2),  $P=0.005$ ). There was no significant difference in the mean (SD) age (14.2 (1.2) vs. 14.5(1.3),  $P = 0.878$ ), fathers education, smoking in the family or the other tested variables (Table 1).

In binary logistic regression; while there was no significant association between the tested variables and smoking, student who had smoking friends were at higher risk of smoking (OR=2.35, 95% CI=1.49–3.70,  $P < 0.001$ ) (Table 2).

**Table 2.** Binary logistic regression analyses of the factors associated with smoking status among adolescent male students in Qassim Region

Variables	OR	95% CI	P
<b>Age</b>	1.0	0.87–1.1	0.89
<b>Father education level</b>			
Illiterate	1	1	Ref
Secondary	1.45	0.67–3.11	0.341
University and above	0.97	0.63–1.50	0.908
<b>Pocket money</b>			
< 300 Saudi Riyal	1	1	Ref
≥ 300 Saudi Riyal	0.94	0.62–1.41	0.769
<b>Father smoking</b>			
No	1	1	Ref
Yes	0.78	0.49–1.25	0.313
<b>Brothers smoking</b>			
No	1	1	Ref
Yes	1.14	0.72–1.80	0.574
<b>Friends smoking</b>			
No	Ref	Ref	Ref
Yes	2.35	1.49–3.70	< 0.001
<b>Belief that smoking is harmful</b>			
No	1	1	Ref
Yes	1.25	0.81–1.94	0.302
<b>Belief that smokers have more friends</b>			
No	1	1	Ref
Yes	1.25	0.85–1.94	0.302
<b>Have seen cigarette advertisements in the mass media</b>			
No	Ref	Ref	Ref
Yes	0.77	0.52–1.14	0.204

## 4. Discussion

The main findings of the current study were that the prevalence of smoking was among adolescent boys was 23.6%. Among smokers, 34.7% had started smoking at 13 years of age. Adolescents with smoking friends were at higher risk of smoking.

The prevalence of smoking in the current study was lower than the prevalence of smoking in the previous studies where

it has been reported that the prevalence of smoking was 29.8% among 2203 secondary school male students in central region of KSA [8]. Likewise it have been reported that 37% of secondary school male students in Jeddah were smokers and 83.7% of them started smoking at the age of 14 or less [7].

It is worth mentioning that the prevalence of smoking in this setting might have been under estimated. The investigated adolescent boys might have been ashamed to mention the truth about the smoking habit and identified themselves as a non-smoker due to cultural reason, family reason and religious issues. The second potential explanation for the low prevalence of smoking in the current study is the governmental policy, which prevents the sales of cigarettes to those less than 18 years of age even though the adolescent can take the cigarette through one of his friends who can sale the cigarette.

The current study showed that adolescent males who have smoking friends were 2.3 times more likely to be a smoker which may related to afford the cigarette by their friends who older than 18 years due to possibility to sale the cigarette easily. We have previously showed that “having a friend who smoked were strongly related to the habit of smoking (60.5%)” [12]. Likewise, Fida *et al.*, reported that around one-third of smokers (32.8%) in Jeddah had peer pressure from smoking friends [7]. In this study, the effect that peers and friends had on the smoking habit was evident by another valid objective point, which is “the place of their friend (Istraha)” was the most common place for smoking (reported by 24.9% of students). This is can be reduced by the education for teachers about the serious to smoke in front of the schools which may affect by indirect way on the students. Nationally representative Global Youth Tobacco Surveys in nine West African countries reported that males, exposures to parental or peer smoking, and industry promotions were the main significant factors for smoking [14].

## 5. Conclusions

This study showed that the prevalence of smoking among adolescent boys is substantial, they initiate smoking at a young age, and it is reinforced by their peers. Future studies showed focus on culture-specific methods to prevent smoking initiation.

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