

Prevalence and characteristics of cigarette smoking among 16 to 18 years old boys and girls in Saudi Arabia

Mohammed O. Al Ghobain, Mohamed S. Al Moamary, Sulieman N. Al Shehri¹,
Mohamed S. AL-Hajjaj²

College of Medicine,
King Saud bin
Abdulaziz University
for Health Sciences,
¹Department of School
Health, Ministry of
Education, ²King Saud
University, Riyadh,
Saudi Arabia

**Address for
correspondence:**

Dr. Mohammed O. Al
Ghobain,
College of Medicine, King
Saud bin Abdulaziz
University for Health
Sciences,
Riyadh, Saudi Arabia.
E-mail: alanezi@hotmail.
com

Submission: 07-03-11
Accepted: 05-05-11

Abstract:

OBJECTIVE: To study the prevalence and characteristics of cigarette smoking among secondary school students (16- to 18-year-old boys and girls) in Riyadh city, Saudi Arabia.

METHODS: We applied a standard two-stage, cross-sectional study design. Secondary schools for both boys and girls in Riyadh city were randomly selected using a cluster sampling method. We used the global youth tobacco survey (GYTS) tool to achieve our objectives.

RESULTS: Among 1272 students (606 boys and 666 girls), the prevalence of those ever smoked cigarettes was 42.8% (55.6% of boys and 31.4% of girls). The prevalence of current smoking was 19.5% (31.2% of boys and 8.9% of girls). Despite the fact that the majority of students think smoking is harmful, most do not wish to stop smoking, and they had not tried to stop in the past year. Cigarette smoking is significantly associated with the male gender, having friends who smoke, and having parents who smoke, but is not significantly associated with the type of school attended.

CONCLUSION: Smoking prevalence among secondary schools students in Saudi Arabia is high and alarming. There is a need to implement an education program about the risks of smoking and to include parents and friends as healthy models to prevent students from beginning to smoke.

Key words:

Cigarette smoking, prevalence, Saudi Arabia

Smoking is considered as a significant health problem in youth around the world, particularly in developing countries. Recent data from the World Health Organization (WHO) revealed that approximately 12% of adolescent boys and 7% of adolescent girls smoke cigarettes.^[1] Moreover, more than 6 million children might die at an earlier age due to smoking-related diseases.^[2] As a result of smoking at an early age, smokers will have a higher risk for developing many diseases with an earlier onset, including chronic obstructive pulmonary disease (COPD), lung cancer, and heart disease, particularly in developing countries.^[3]

Although there are many surveys addressed the prevalence of smoking in Saudi Arabia, most of these surveys end up with different conclusions, likely because the studies did not follow a standardized protocol, sample size, or sample selection.^[4-11] Overall, the prevalence of smoking among the Saudi population ranges from 2.4 to 52.9% with a median of 17.5%.^[12] The variability of the overall prevalence has been assessed to a certain extent in the youth by utilizing the global youth tobacco survey (GYTS). This survey was developed by the world health organization (WHO) as a tool to collect data using

standardized methodology. To our knowledge, the only available GYTS from Saudi Arabia was published by Al-Bedah and his colleagues who conducted the survey in intermediate schools (13 to 15 years old) in 2001 (male students only) and 2007 (males and female students).^[13] When compared to the 2001 survey, the 2007 survey revealed an increase in tobacco use among male adolescents. Between 2001 and 2007, the percentage of male students who indicated that they had "ever smoked" increased from 34.5% to 39.5% and the percentage of current cigarette smokers among male students increased from 10.8% to 13.0%

On the other hand, the prevalence of smoking among Saudi university students over the age of 18 has been investigated in several studies.^[4-11] These studies also did not follow a standardized protocol, and therefore showed variability in the data, which ranged between 13 and 20% of male students and 9–11% of female students.^[4-11] The most recent survey, which used a modified version of GYTS, was conducted in 2010 at a university in Riyadh, Saudi Arabia and revealed an overall smoking prevalence of 14.5% (32.7% of male students and 5.9% of female students).^[14]

Access this article online
Quick Response Code:

Website: www.thoracicmedicine.org
DOI: 10.4103/1817-1737.82447

Most of the available data in the literature covered age groups younger than 15 years and older than 18 years. However, to our knowledge, a study on the smoking habits of boys and girls attending secondary schools in Saudi Arabia using GYTS has not been reported to date. This study was designed to fill this gap in knowledge, and focused on the prevalence and characteristics of cigarette smoking among secondary school students (16- to 18-year-old boys and girls) in Riyadh city, Saudi Arabia.

Methods

A cross-sectional survey was conducted using GYTS of secondary school students (16- to 18-year-old boys and girls) in Riyadh city, Saudi Arabia from the 24th of April, 2010, to the 16th of June, 2010.

Riyadh education department provided a list of all secondary schools in Riyadh city, the number of students in each school, and the grade level of the students. The city hosts 160 secondary schools for boys (72 private schools) and 245 schools for girls (113 private schools). The overall number of Saudi secondary school students in Riyadh city during 2009-2010 academic years was 161223 students, or 83056 (51.5%) boys and 78167 (48.5%) girls.

Schools and students were selected using a two-stage cluster sample. In the first sampling stage, a computer-generated random selection method was used to choose 46 secondary schools in Riyadh city from a list of 405 schools for a total of 19834 Saudi students (9771 boys and 10063 girls). To conduct the sampling, we divided Riyadh city into four districts based on their proximity to two major highways (North, East, South, and west). Fifteen percent of boys' schools and 10% of girls' schools from each district were selected based on proportional probability. Fourteen schools were selected from the east district (7 boy's schools and 8 girls' schools), 12 schools from north district (6 boy's schools and 6 girl's schools), 10 schools from west district (5 boy's schools and 4 girl's schools), and 10 schools from south district (5 boy's schools and 5 girls' schools).

During the second sampling stage, 3 classes, or one for each grade level, were selected from each school. Thus, a total of 138 classes were identified in the sample. Each class was considered to be a cluster and all students in the selected classes constituted the target group of the present study. Thirty boys and 30 girls were selected from each school (10 students from grade 1, 10 students from grade 2, 10 students from grade 3).

Students were interviewed by trained medical students and they completed questionnaires by themselves in the classroom under the supervision of the medical students. The medical students received half a day training session that covered an overview of the study and its methodology and they were taught to avoid explanations that could interfere with the participants' answers. The GYTS is a school-based anonymous self-administered questionnaire designed to gather data on the following domains: Knowledge and attitudes of young people toward cigarette smoking, the prevalence of cigarette smoking and other tobacco use among young people, the role of the media and advertising in young people's use of cigarettes, access to cigarettes, and

environmental tobacco smoke. The Arabic-language version of the GYTS was available from the WHO, and to address the objectives of this study, certain questions related to cigarette smoking were selected from the survey.

Smoking prevalence is defined as the percentage of students who are current smokers. The Center for Disease Control (CDC) defines current smokers as persons who have smoked cigarettes on one or more days during the 30-day period before the survey was administered.^[15] A person who had "ever smoked" was defined as a student who had tried or experimented with cigarette smoking, even one or two puffs, at any stage of his or her life. Any student who did not fulfill the definition of "ever" or "current" was considered to be "never" smoked.

The survey was conducted with permission from the Ministry of Education. We received an approval from the Research and Ethics Committee of the Saudi Thoracic Society. Verbal consent was given by the students after explaining the purpose of the study and highlighting that surveys would be anonymous and data would be kept confidential during handling and storage.

Statistical analysis

Data were analyzed using STATA V9.1 (SAA Institute, NC). All variables were summarized and reported across the study sample using descriptive statistics. Continuous variables such as age at time of interview and age at first cigarette smoking were collected and entered as categorical variables and then summarized and reported as frequency distributions in the same manner as all other categorical variables such as gender and grade level. A logistic regression analysis was used to analyze the relationship between the dependent variable "ever smoking" and independent variables including gender, friends who smoke, parents who smoke, and type of school. All results were summarized using an odds ratio with a 95% confidence interval. A *P*-value of 0.05 or less was considered as significant.

Results

Out of a total of 1380 students, 108 refused to participate, making the response rate 92% and the total sample size was 1272 participants. Boys completed 606 questionnaires (47.6%) and girls completed 666 (52.3%) [Table 1]. Total prevalence of those who had ever smoked a cigarette was 42.8% (55.6% of boys and 31.4% of girls). The prevalence of students who had smoked at least one cigarette in the past 30 days ("current smokers") was 19.5% (31.2% of boys and 8.9% of girls) [Table 2].

For students who had ever smoked a cigarette, 13.5% smoked their first cigarette before age 10, 31.8% wanted to stop smoking cigarettes now, 32.4% tried to stop smoking cigarettes during the past year, and 20.6% did not ever receive help or advice on how to stop smoking cigarettes [Table 3]. For students who never smoked, 35.1% of had considered initiating cigarette smoking in the next year (54.9% of boys and 32.4% of girls). 16.6% of students thought cigarette smoking helps people look more comfortable while 32.5% of students think cigarette smoking makes boys look more attractive, and 20% of them think cigarette smoking makes girls look more attractive. The percentage of students who think smoking makes smokers gain weight was 38.2%. Lastly, 88.4% of students think smoking is harmful to a person's health [Table 3].

Table 1: Characteristics of the study population

	Total n (%)	Boys n (%)	Girls n (%)
Participants	1272	606 (47.64)	666 (52.36)
Age (missing = 60)			
16 years (Grade 1)	416 (34.32)	195 (16.34)	221 (18.02)
17 years (Grade 2)	413 (34.08)	210 (17.98)	203 (16.19)
18 years (Grade 3)	383 (31.60)	163 (13.72)	220 (18.15)

Table 2: Frequency distribution of cigarette smoking (1257 available data on smoking status out of 1272*)

	Ever smokers n (%)	Current smokers n (%)	Never smokers n (%)
Boys	331 (55.63)	186 (31.26)	264 (44.36)
Girls	208 (31.41)	59 (8.91)	454 (68.51)
Total	539 (42.87)	245 (19.50)	718 (57.12)

*Not available = 15 (11 for boys and 4 for girls)

Table 3: Cigarette smoking characteristics by gender

Variables	Overall n (%)	Boys n (%)	Girls n (%)
Ever smoked who smoked first cigarette before age 10 years Missing = 9	74 (13.5)	50 (14.8)	24 (11.5)
Ever smoked who want to stop smoking cigarettes now Missing = 48	161 (31.81)	112(35.22)	49 (26.06)
Ever smoked who tried to stop smoking cigarettes during the past year Missing = 54	162 (32.40)	115 (36.50)	47 (25.40)
Ever smoked who did not ever receive help or advice to stop smoking cigarettes Missing = 50	104 (20.63)	48 (15.14)	56 (30.00)
Never smoked who are thinking of initiating smoking in the next year Missing = 22	250 (35.16)	145 (54.92)	105 (32.48)
Students who think that smoking help people look more comfortable Missing = 28	207 (16.64)	93 (15.65)	114 (17.43)
Students who think smoking makes boys look more attractive Missing = 44	363 (29.56)	190 (32.53)	173 (26.05)
Students who think smoking makes girls look more attractive Missing = 52	245 (20.08)	125 (21.55)	120 (18.75)
Students who think smoking makes smokers gain weight Missing = 45	469 (38.22)	226 (38.76)	223 (33.58)
Students who think smoke from other people is harmful Missing = 46	1084 (88.41)	495 (84.50)	589 (91.60)

Table 4: Logistic regression for predictors of smoking status (N = 1269*)

Variables	S.E	P value	OR	95% C.I.
Friend smokes	0.068	0.0001	3.5	(2.72, 4.63)
Parent smokes	0.071	0.0001	2.5	(1.88, 3.77)
Type of school	0.064	0.3949	1.1	(0.88, 1.44)
Gender	0.068	0.0001	1.9	(1.43, 2.43)

*Values were missing for three observations

Our findings indicate that cigarette smoking is significantly associated with male gender, having friends who smoke, and having a parent who smokes, but it is not significantly associated with type of school attended (private versus government) [Table 4]. Students with at least one parent who smokes are 2.5 times more likely to be smokers compared to students whose parents do not smoke. Students with friends who smoke are 3.5 times more likely to smoke compared to students with friends who do not smoke. Boys are 1.9 times more likely to smoke than girls. Students in private schools are 1.1 times more likely to smoke than students from government schools.

Discussion

Our study showed that the total percentage of students who had ever smoked a cigarette was 42.8%, (55.6% of boys and 31.4% of girls). The percentage of students who currently smoked was 19.5% (31.2% of boys and 8.9% of girls). This study addressed the prevalence of cigarette smoking in the secondary school age group (16 to 18 years old) in Saudi Arabia. Most of previous studies on smoking prevalence in Saudi Arabia focused on children under the age of 15 years or adult subjects over the age of 18. For students below the age of 15, the GYTS undertaken in Saudi Arabia in 2001 indicated that, among a total of 1,830 male students aged 13-15, the prevalence of students who had ever smoked was 34.5% and 10.8% of students currently smoked. In the same survey repeated in 2007 that included a total of 3,829 male and female students aged 13-15, the prevalence of students who had ever smoked was 26% (39% boys and 16% girls) and the percentage of current smokers was 6.7% (10.2% of boys and 2.6% of girls).^[13]

Very limited number of studies addressed the smoking prevalence among secondary school students in Saudi Arabia. A study examining the smoking habits of male secondary school students in Al-Qassim, Saudi Arabia indicated that 29.8% were current smokers, and, of these, 83.7% began smoking at age 15 or before.^[16] Another study ascertained the prevalence of smoking among high school students in Alkharj City, Saudi Arabia. Out of 819 correspondences, 166 (20%) were current smokers and 134 (16%) were ex-smokers.^[17] A small pilot study done in 1993 in a rural Saudi secondary school found that 17% of the 358 students smoked.^[18] However, these studies were conducted only among male students, and the authors did not use the GYTS tool. Therefore, our study is the first to use the GYTS tool to address the prevalence of cigarette smoking among both boys and girls in secondary schools in Saudi Arabia.

The fact that current smokers were more likely to be boys (31.2%) than girls (8.9%) was an expected result. However, the prevalence of cigarette smoking among girls in our study may be even higher because of the recent increase in smoking habit observed in young Saudi women in last few years. Nevertheless, the prevalence of smoking among girls reported in our study could reflect a real problem or could reflect under-reporting by female students because of the social stigma associated with Saudi women who smoke. Contrarily, boys may over-report smoking rates as they think smoking is a sign of maturity. Despite such limitations, our study reveals a high rate of cigarette smoking among this understudied age group and reflects significant health problems, which are expected to increase in the near future.

Less than one third of smokers (31.8%) reported that they wanted to quit smoking now or had tried to quit smoking during the past year (32.40%). The majority of students agreed that smoking would not make them more comfortable or make boys or girls look more attractive. This finding indicates that the majority of smokers have no intention to quit and will continue smoking throughout their lives. For this reason, intervention measures for this age group are critical.

Our study also showed that cigarette smoking is significantly associated with male gender, having friends who smoke, and having a parent who smokes. This result is consistent with results from many other studies.^[7,4,16,19-21] In a male-dominated culture like that in Saudi Arabia, males have more access to cigarettes, have more financial resources and experience less social stigma than females in regards to smoking. These facts may explain why significantly more males than females smoke.^[7,4,16,20] The WHO requests that countries repeat the GYTS every three years for 13- to 15-year old students, and we recommend that such request should be extended to include students 16- to 18-year-olds as well. Anti-smoking programs should be implemented to encourage parents to quit smoking, advice students to make non-smoking friends, and control tobacco use among young people.

References

1. WHO Women and health: Today's evidence, tomorrow's agenda. Geneva: WHO; 2009.
2. Peto R, Lopez AD, Boreham J, Thun M. Mortality from smoking in developed countries 1950-2000: Indirect estimation from National Vital Statistics. Available from: <http://www.ctsuo.ac.uk/~tobacco/> [Last cited on 2010 October].
3. Knishkowsky B, Amitai Y. Water-Pipe (Narghile) Smoking: An Emerging Health Risk Behavior. *Pediatrics* 2005;116:e113-9.
4. Abolfotouh MA, Abdel Aziz M, Alakija W, Al-Safy A, Khatatb MS, Mirdad S, et al. Smoking habits of King Saud University students in Abha, Saudi Arabia. *Ann Saudi Med* 1998;18:212-6.
5. Al-Arifi MN. Smoking habits among pharmacy students at a university in central Saudi Arabia. *Saudi Med J* 2005;26:893-5.
6. Almas K, Al-Hawish A, Al-Khamis W. Oral hygiene practices, smoking habit, and self-perceived oral malodour among dental students. *J Contemp Dent Pract* 2003;4:77-90.
7. Al-Turki YA, Al-Rowais NA. Prevalence of smoking among female medical students in the college of medicine, Riyadh, Saudi Arabia. *Saudi Med J* 2008;29:311-2.
8. Al-Turki YA. Smoking habits among medical students in Central Saudi Arabia. *Saudi Med J* 2006;27:700-3.
9. Felimban FM. The smoking practices and attitudes towards smoking of female university students in Riyadh. *Saudi Med J* 1993;14:220-4.
10. Hasim TJ. Smoking habits of students in college of applied medical science, Saudi Arabia. *Saudi Med J* 2000;21:76-80.
11. Merdad LA, Al-Zahrani MS, Farsi JM. Smoking habits among Saudi female university students: Prevalence, influencing factors and risk awareness. *Ann Saudi Med* 2007;27:366-9.
12. Bassiony MM. Smoking in Saudi Arabia. *Saudi Med J* 2009;30:876-81.
13. Al Bedah AM, Qureshi NA, Al Guhaimani HI, Basahi JA. The global youth tobacco survey – 2007, comparison of the global youth tobacco survey 2001-2002 in Saudi Arabia. *Saudi Med J* 2010;31:1036-43.
14. Mandila A, BinSaeed A, Ahmad S, Al-Dabbagh R, Alsaadi M, Khan M. Smoking among university students: A gender Analysis. *J Infect Public Health* 2010;3:179-87.
15. Center of the disease control (CDC). Available from: http://www.cdc.gov/tobacco/data_statistics/state_data/state_highlights/ [Last cited on 2011 Feb 17].
16. Al-Damegh SA, Saleh MA, Al-Alfi MA, Al-Hoqail IA. Cigarette smoking behavior among male secondary school students in the Central region of Saudi Arabia. *Saudi Med J* 2004;25:215-9.
17. Al-Yousaf MA, Karim A. Prevalence of smoking among high school students. *Saudi Med J* 2001;22:872-4.
18. Al-Faris EA. Smoking habits of secondary school boys in rural Riyadh. *Public Health* 1995;109:47-55.
19. Al-Haqwi AI, Tamim H, Asery A. Knowledge, attitude and practice of tobacco smoking by medical students in Riyadh, Saudi Arabia. *Ann Thorac Med* 2010;5:145-8.
20. Siddiqui S, Ogbeide DO, Al Khalifa I. Smoking in a Saudi community: Prevalence, influencing factors, and risk perception. *Fam Med* 2001;33:367-70.
21. Al-Dawood K. Parental smoking and the risk of respiratory symptoms among schoolboys in Al-Khobar City, Saudi Arabia. *J Asthma* 2001;38:149-54.

How to cite this article: Al Ghobain MO, Al Moamary MS, Al Shehri SN, Al-Hajjaj MS. Prevalence and characteristics of cigarette smoking among 16 to 18 years old boys and girls in Saudi Arabia. *Ann Thorac Med* 2011;6:137-40.

Source of Support: Nil, **Conflict of Interest:** None declared.