Prevalence and Risk Factors of Smoking, and Tobacco use among Secondary School Boy Students in Tabuk Region, Saudi Arabia

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Abstract. As tobacco epidemic continues to increase among adolescents, tobacco control programs based on actual field studies are crucially needed. A cross-sectional study was conducted in Tabuk region to determine the prevalence and risk factors of tobacco use among secondary school boy students. A three-stage stratified random sampling design was used to recruit a sample of 1,680 students from 15 secondary schools. A self-administrated Arabic questionnaire was used to collect the required data. A descriptive and analytic statistical analysis was done. Overall prevalence of cigarette and shisha smoking was 25.7% and 25.9%, respectively. Prevalence of current daily and non-daily smokers was 16.3% and 9.4%, respectively. Prevalence of shisha smokers was 4.3% and 21.6% on regular and non-regular basis, respectively. Odds ratios of important risk factors were: Nationality (1.42), fathers' smoking (1.42), mothers' smoking (2.74), school absenteeism (2.96), sleep disturbance (2.26), and mothers' living status (1.80). Important reasons for smoking were entertainment (43.2%), overcoming the feeling of oppression (36.1%) and peer pressure (11.0%). The majority of students (70.5%) addressed the desire for quitting smoking for health promotion (48.9%); Islamic rules (25.5%) and family dislike (19.9%) reasons. In conclusion, a quarter of the high school students were smokers which necessitate an urgent intervention.

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Introduction

Tobacco use is one of the leading preventable causes of premature
death, disease and disability around the world[1]. Currently,
approximately 5.4 million people die each year due to tobacco-related
illnesses - a figure expected to increase to more than 8 million a year
by 2030[2]. Globally, 14% of all non-communicable deaths among
adults are attributable to tobacco[3].

As global patterns in tobacco use change, it has been estimated
that over the next two decades, 70% of tobacco deaths will be in
developing countries[4,5]. About 80% of the world's smokers now live
in low and middle income countries, at least in part due to the lack of
adequate tobacco control programs[6]. The recent trend in tobacco
prevention activities is to target and intensify the tobacco control
measures in the youth[7].

The Global Youth Tobacco Survey (GYTS) is targeting the
population group of 13- to 15-years-old and analyses the data
yearly[8]. The global data indicated that 12% of boys and 6% of girls
are current smokers[9,10].

Gulf Cooperation Council (GCC) Countries have a prevalence of
14.4% to 23.9% of ever smokers and 14.3% to 21.1% current smokers
among school children. It is interesting to note that shisha smoking is
common in GCC and used even more than cigarettes as few studies
indicated[11].

There is anecdotal evidence that consumption of tobacco in Saudi
Arabia has increased in recent years. This has been attributed to
improving economic conditions, higher incomes and exposure to
smoking lifestyle behaviors in the media[12]. The overall prevalence
of smoking among the Saudi population ranges from 2.4 to 52.9%
with a median of 17.5%[13]. The variability of the overall prevalence
has been assessed to a certain extent in the youth by utilizing the
GYTS[14]. The Saudi GYTS was conducted in 2010 and results
revealed that 14.9% of students currently use any form of tobacco,

8.9% currently smoke cigarettes, 11.0% currently use some other form of tobacco, and 9.5% currently smoke shisha[15].

To the best of the investigator's knowledge, a study on the smoking habits of boys attending secondary schools in Tabuk region, Saudi Arabia using GYTS is lacking. The study objectives were to determine the prevalence level of cigarette and shisha smoking among the secondary school boy students in Tabuk region; to describe the main risk factors of smoking, and to identify the reasons and pattern of tobacco use of the study subjects.

Materials and Methods

Research Setting

Tabuk is one of the provinces of Saudi Arabia, located on the Northwest part of the country. The region is composed of 6 governorates and has a surface area of 108,000 km² with a population size of 791,535 (2010). Its capital is Tabuk city and it has 103 boys secondary schools enrolling 31,418 students in 2012[16,17].

Study Design

A cross-sectional analytic survey (point prevalence) has been chosen as a suitable method to investigate the current research problem.

Target Population

The target population was the secondary school male students enrolled in 103 schools in Tabuk region. Out of these, 15 schools were randomly chosen from Tabuk city and 5 other towns (Taimaa, Haqel, Duba, Alwajh and Umlujj).

Sample Design

The calculation of the sample size was based on the assumption of a margin of error at 5%, a confidence interval of 95%, and a prevalence of smoking among teenagers = 21% which was obtained from a study conducted in three regions of Saudi Arabia[18].

The calculated sample size was 560 students (minimum sample size), but the investigator has decided to enlarge the sample size to ensure an adequate geographical coverage of Tabuk region, especially for remote governorates that have certain demographic and cultural characteristics and to overcome any problem regarding response rate. However, the investigator has adequately considered the proportional allocation of the original sample size. Therefore, a sample of 120 students from each randomly chosen school was necessary for the survey *i.e.,* the total sample size was 1,680 students recruited from 15 different secondary boy's schools.

The multi-stage random sampling technique has been utilized to recruit the required students. At the first stage, Tabuk city and the 5 towns (Taimaa, Haqel, Duba, Alwajh and Umlujj) have been chosen as the strata for the random sampling technique. During the second stage, 15 secondary schools have been randomly chosen by the simple random sampling technique from all towns. At the third stage, classes were chosen by the simple random sampling technique, and thereafter, the students were selected by the systematic random sampling technique. All students in the selected classes were eligible to participate.

Defining Dependant Variables

The Nominal Group Technique (NGT) has been utilized in order to define working and practical definitions for the main independent variables of tobacco smoking status (ever smoker, current daily smoker and current non-daily smoker) for cigarettes smokers and also for shisha smokers (regular and non-regular) that suite the current research problem and the target subjects. The subject who answered the question of "have you ever smoked?" was defined as ever cigarette smoker. A current daily smoker is defined as a student who smoked one cigarette at least per day in last 30 days. A current non-daily smoker is defined as a person smoked more than one day in last 30 days but not on a daily basis.

Regular shisha smoker has been defined as a student who smokes shisha at least once per week and on a regular basis, meanwhile, the non-regular shisha smoker has been defined as an occasional shisha

smoker and not on a regular basis. The experts of NGT were 4 professors of community medicine, 3 professors of chest diseases, 2 professors of behavior medicine and 2 doctors from the Saudi Ministry of Health who are working in pulmonary health care programs.

Measuring Tobacco Prevalence

The author has utilized the following definitions proposed by the Global Tobacco Surveillance[19] and adapted by the current study (NGT) experts: Current cigarette smokers (percentage of respondents who currently smoke cigarettes); current daily cigarette smokers (percentage of respondents who currently smoke cigarettes daily); and current non-daily cigarette smokers (percentage of respondents who currently smoke tobacco but not daily).

Data Collection Tool and Technique

A self-administrated Arabic questionnaire which is a modified version of the global youth tobacco survey questionnaire was used as the main data collection tool. It contained a set of closed ended questions; in addition to very few open ended questions that have been coded after the conduction of pilot study. The students were asked to fill out all the questions after explaining the objectives and usefulness of the research. To avoid revealing uncomfortable information, the name or other identifying features of the subject were not asked and this was stressed in the instructions given prior to the completion of the questionnaire.

Pretest Study

It has been carried out during the preparatory research phase (1st and 2nd months) in order to: Formulate the research problem for more precise investigation, refine the study variables, and test the validity (internal and external) and reliability of the study tools and instruments.

Ethical Approval and Consent

Ethical approval was obtained from the Research and Ethics Committee of Tabuk Medical College. Consent from students was obtained after explaining the study contents in details and confirming the confidentiality in handling and storing the survey data.

Statistical Analysis

The collected data have been analyzed using SPSS statistical package version 20. Descriptive and analytic statistics were performed including chi-squared test and Pearson's contingency coefficient (PCC). Risk assessment based on odds ratio analysis has been performed. Level of significance was set at P value of < 0.05 throughout.

Results

Table 1 shows the main socio-economic and demographic characteristics of the studied students and their parents. The highest mean age (years) was of the current daily smokers (18.5 ± 1.52). Low educational levels have been observed among the students' fathers and mothers, and only 16.4% of fathers and 14.5% of mothers were university graduates or have postgraduate studies. Statistically significant differences regarding mothers' education have been noticed between cigarette smokers' groups and non-ever smoking group ($P = 0.01$). The main occupations of the students' fathers were military (48.1%) and non-professional jobs (21.0%); meanwhile, most of the students' mothers were housewives (82.2%). Statistically significant differences regarding fathers' occupation have been were observed in Haqel and Taimaa governorates, respectively.

Table 2 shows that the overall prevalence of current cigarette smokers is 25.7%, current daily smokers is 16.3% and current non-daily smokers is 9.4%. The highest (35.8%) and lowest (15.5%) prevalence rates of current smokers were observed in Haqel and Taimaa governorate, respectively. In addition, the highest (24.1%) and lowest (9.3%) prevalence rates of current daily smokers were found in Haqel and Taimaa governorates, respectively. Moreover, the highest (11.7%) and lowest (6.2%) prevalence rates of non-daily

Table 1. **Important demographic characteristics of the studied students and their parents in Tabuk region.**

Charac-teristic	Cigarette Smokers						Non-Ever Smokers (N = 399)		Total (N = 1680)	
	Ever Smokers[1] (N = 850)		Current Smokers							
			Daily (N = 273)		Non-Daily (N = 158)					
	Father (%)[2]	Mother (%)[2]	Father (%)[2]	Mother (%)[2]	Father (%)[2]	Mother (%)[2]	Father (%)[2]	Mother (%)[2]	Father (%)[2]	Mother (%)[2]
Age (years): (X±SD)	17.9 ± 1.42		18.5 ± 1.52		18.0 ± 1.33		17.7 ± 1.32		17.8 ± 1.37	
Parent Education:										
Illiterate	12.8	25.2	15.2	27.5	16.5	25.2	13.7	31.7	13.8	27.1
Read and Write	16.1	18.3	18.5	19.3	15.1	16.8	18.4	26.4	16.9	20.3
Primary School	20.4	15.8	20.0	15.2	15.1	18.7	19.0	10.9	19.5	14.8
Preparatory School	18.8	14.0	16.7	11.5	22.4	16.1	16.3	8.4	18.2	12.5
Secondary School	14.8	11.5	13.7	10.0	13.8	9.7	17.6	10.4	15.2	10.9
University Graduates	11.2	11.1	8.9	10.8	8.6	11.6	9.7	8.6	10.2	10.5
Postgraduate Studies	6.0	4.0	7.0	5.6	8.6	1.9	5.3	3.6	6.2	4.0
Significance	X^2_a= 4.56, P=0.60, PCC[3]=0.05 ; X^2_b = 4.00, P=0.68, PCC[3]=0.09 X^2_c=15.10, P= 0.01, PCC[3]=0.10; X^2_d = 4.01, P= 0.54, PCC[3]=0.09									
Parent Occupation:										
Professional jobs	13.6	11.6	11.1	11.6	8.0	9.8	16.1	9.5	13.2	10.8
Non-Professional jobs	21.1	3.1	18.4	3.4	23.8	2.6	21.3	2.8	21.0	3.1
Military	50.1	-	48.3	-	43.1	-	45.5	-	48.1	-
Traders	10.3	-	14.6	-	18.5	-	8.7	-	11.4	-
Laborers	3.6	-	4.6	-	4.0	-	3.8	-	3.8	-
Housewife	NA	83.2	NA	82.8	NA	85.0	NA	84.4	NA	82.2
Others	1.4	2.2	3.1	2.3	2.7	2.6	4.6	3.3	2.5	4.0
Significance	X^2_a= 28, P=0.0001, PCC[3]=0.13 ; X^2_b = 5.99 , P=0.42, PCC[3]=0.12 X^2_c= 1.82, P=0.61, PCC[2]=0.33; X^2_d = 0.58, P=0.90, PCC[3]=0.04									

Ever Smokers[1] (excluding current smokers); (%)[2] Valid Percent; X^2_a, between Current Smokers and Non-ever Smokers in relation to Fathers' Education/Occupation; X^2_b between the Current Daily Smokers and Non-daily Smokers in relation to Fathers' Education/Occupation; X^2_c, between Current Smokers and Non-ever Smokers in relation to Mothers' Education/Occupation; X^2_d between the Current Daily Smokers and Non-daily Smokers in relation to Mothers' Education/Occupation; PCC[3], Pearson's Contingency Coefficient; NA, Not Applicable.

smokers were observed in Haqel and Taimaa governorates, respectively.

Table 3 illustrates that the prevalence rates of regular, non-regular and overall shisha smokers were 4.3%, 21.6% and 25.9%, respectively. The distribution of current regular smokers and current non-regular smokers by city or town was statistically significant (P = 0.046).

T.M. Ghabrah

Table 2. Distribution of the studied students by their governorate and prevalence of smoking in Tabuk region.

Governorate	Sample Size No. (%)	Cigarette Smoking Prevalence (Current Smokers)						Non-Smokers
		Daily		Non-Daily		Total		
		Students No. (%)^a	Prevalence (%)^a	Students No. (%)^a	Prevalence (%)^a	Students No. (%)^a	Prevalence (%)^a	No. (%)^a
Tabuk City	1019 (60.7)	168 (61.5)	16.5	95 (60.1)	9.3	263 (61.0)	25.8	756 (60.5)
Taimaa	97 (5.8)	9 (3.3)	9.3	6 (3.8)	6.2	15 (3.5)	15.5	82 (6.6)
Haqel	137 (8.2)	33 (12.1)	24.1	16 (10.1)	11.7	49 (11.4)	35.8	88 (7.1)
Duba	141 (8.4)	20 (7.3)	14.2	12 (7.6)	8.5	32 (7.4)	22.7	109 (8.7)
Alwajh	127 (7.6)	14 (5.1)	11.0	12 (7.6)	9.5	26 (6.0)	20.5	101 (8.1)
Umluji	159 (9.5)	29 (10.6)	18.2	17 (10.8)	10.7	46 (10.7)	28.9	113 (9.0)
Total	1680 (100)	273 (100)	16.3	158 (100)	9.4	431 (100)	25.7	1249 (100)

Significant Tests

X^2_a = 1.46, P=0.92, PCC^1=0.06; X^2_b=16, P=0.007, PCC^1=0.097

%^{a} *Valid Percent;* X^2_a *between current daily and non-daily smokers' groups,* X^2_b *between current smokers and non-smokers groups; PCC^1, Pearson's Contingency Coefficient*

Table 3. Prevalence of Shisha smoking among the studied students by their governorate in Tabuk region.

| Governorate | Shisha Smoking Prevalence (Current Smokers) | | | | | | Non-Smokers | TOTAL |
| | Regular | | Non-Regular | | Total | | | |
	Students No. (%)^a	Prevalence (%)^a	Students No. (%)^a	Prevalence (%)^a	Students No. (%)^a	Prevalence (%)^a	No. (%)^a	No. (%)^a
Tabuk City	48 (66.7)	4.7	237 (65.8)	23.4	285 (66.0)	28.1	729 (58.9)	1014 (60.8)
Taimaa	0 (0.0)	0.0	16 (4.4)	16.5	16 (3.7)	16.5	81 (6.6)	97 (5.8)
Haqel	6 (8.3)	4.6	27 (7.5)	20.6	33 (7.6)	25.2	98 (7.9)	131 (7.8)
Duba	10 (13.9)	7.0	23 (6.4)	16.1	33 (7.6)	23.1	110 (8.9)	143 (8.6)
Alwajh	6 (8.3)	4.8	26 (7.2)	20.8	32 (7.4)	25.6	93 (7.5)	125 (7.5)
Umlujj	2 (2.8)	1.3	31 (8.6)	19.5	33 (7.6)	20.8	126 (10.2)	159 (9.5)
Total	72 (100)	4.3	360 (100)	21.6	432 (100)	25.9	1237 (100)	1669 (100)

Significant Tests X^2_a =11.28, P=0.046, PCC¹=0.15; X^2_b =9.87, P=0.08, PCC¹=0.077

%a Valid Percent; X^2 a, between current regular and non-regular smokers' groups, X^2 b, between current smokers and non- smokers groups;
ᵖCC1, Pearson's Contingency Coefficient

Table 4 shows results for risk assessment of important risk factors. The following risk factors were associated with the smoking status of the current smokers groups (daily and non-daily) with their corresponding odds ratios (OR) and confidence intervals (CI): Nationality (Saudi or non-Saudi) (OR=1.57, CI: 0.59-4.14), mothers' smoking status (smoker or non-smoker) (OR=1.16, CI: 0.34-3.92), school absenteeism (OR=1.40, CI: 0.91-2.15), and mothers' living status (alive or deceased) (OR=2.32, CI: 0.51-10.49).

In addition, Table 4 demonstrates that the following risk factors were associated with the current smokers and non-smokers' groups with their corresponding odds ratios (OR) and confidence intervals (CI): nationality (Saudi or non-Saudi) (OR=1.42, CI: 0.83-2.45), fathers' smoking status (smoker or non-smoker) (OR=1.42, CI: 1.11-2.80), mothers' smoking status (smoker or non-smoker) (OR=2.74, CI: 1.24-6.05), school absenteeism (OR=2.96 CI: 2.33-3.76), sleep disturbance (OR= 2.26, CI: 1.72-2.96), and mothers' living status (alive or deceased) (OR=1.80, CI: 0.79-4.07).

As shown in Table 5, the main smoking reasons were entertainment (43.2%) and overcoming a feeling of oppression (36.1%). The difference in the distribution among the smokers' groups (ever, daily and non-daily smokers) by their governorates was statistically significant (P< 0.0001).

Table 6 shows that the mean age at initiation of cigarette smoking was 14.5 ± 2.53 years. Immediate and usual morning wake up smoking was high (56.0%) among the daily smokers compared with the non-daily smokers (10.1%). The average number of cigarettes per day was 13.0 ± 8.10 (daily smokers) and 5.8 ± 7.13 (non-daily smokers). Meanwhile, the usual places of smoking were the public areas (56.2%) and home (26.5%). About 70% of smokers have

Table 4.   Assessment of important risk factors associated with cigarettes smoking among the studied students in Tabuk region.

Risk Factor	Tobacco Current Smokers			Non Smokers (N = 1249) No. (%)[a]	Total (N = 1680) No. (%)[a]	Odds Ratio (OR)	
	Daily (N = 273) No. (%)[a]	Not Daily (N = 158) No. (%)[a]	Total (N = 431) No. (%)[a]			OR[1] (CI)[3]	OR[2] (CI)[3]
Type of School:							
Governmental	191 (70.0)	119 (75.3)	310 (71.9)	965 (77.3)	1275 (75.9)	0.76 (0.49-1.19)	0.75 (0.59-0.97)
Private	82 (30.0)	39 (24.7)	121 (28.1)	284 (22.7)	405 (24.1)		
Nationality:							
Saudi	264 (96.7)	150 (94.9)	414 (96.1)	1180 (94.5)	1594 (94.9)	1.57 (0.59-4.14)	1.42 (0.83-2.45)
Non-Saudi	9 (3.3)	8 (5.1)	17 (3.9)	69 (5.5)	86 (5.1)		
Father's Smoking:							
Smoker	81 (30.1)	48 (30.8)	129 (30.4)	291 (23.5)	420 (25.2)	0.97 (0.63-1.49)	1.42 (1.11-2.80)
Non-Smoker	188 (69.9)	108 (69.2)	296 (69.6)	948 (76.5)	1244 (74.8)		
Mother's Smoking:							
Smoker	8 (3.0)	4 (2.6)	12 (2.8)	13 (1.1)	25 (1.5)	1.16 (0.34-3.92)	2.74 (1.24-6.05)
Non-Smoker	262 (97.0)	152 (97.4)	414 (97.2)	1228 (98.9)	1642 (98.5)		
Sch. Achievement[b]:							
Succeeded	213 (78.6)	145 (92.4)	358 (83.7)	1165 (94.2)	1523 (91.5)	0.30 (0.16-0.59)	0.32 (0.22-0.45)
Failed	58 (21.4)	12 (7.6)	70 (16.3)	72 (5.8)	142 (8.5)		
School Absenteeism:							
Yes	202 (74.5)	107 (67.7)	309 (72.0)	573 (46.5)	882 (53.1)	1.40 (0.91-2.15)	2.96 (2.33-3.76)
No	69 (25.5)	51 (32.3)	120 (28.0)	659 (53.5)	779 (46.9)		
Sleep Disturbance:							
Present	214 (79.3)	134 (85.4)	348 (81.5)	816 (66.1)	1164 (70.1)	0.66 (0.39-1.12)	2.26 (1.72-2.96)
Absent	56 (20.7)	23 (14.6)	79 (18.5)	418 (33.9)	497 (29.9)		
Physical Exercise:							
Practicing	112 (41.0)	86 (54.4)	198 (45.9)	704 (56.8)	902 (54.0)	0.58 (0.39-0.86)	0.65 (0.52-0.81)
Not Practicing	161 (59.0)	72 (45.6)	233 (54.1)	536 (43.2)	769 (46.0)		
Father's Living Status:							
Alive	242 (90.3)	144 (91.1)	386 (90.6)	1124 (91.4)	1510 (91.2)	0.91 (0.46-1.79)	0.91 (0.62-1.33)
Deceased	26 (9.7)	14 (8.9)	40 (9.4)	106 (8.6)	146 (8.8)		
Mother's Living Status:							
Alive	264 (98.9)	152 (97.4)	416 (98.4)	1198 (97.1)	1614 (97.4)	2.32 (0.51-10.49)	1.80 (0.79-4.07)
Deceased	3 (1.1)	4 (2.6)	7 (1.6)	36 (2.9)	43 (2.6)		

%[a] *Valid Percent; Scholastic Achievement[b], Last year performance; OR[1], between tobacco current daily and non-daily smokers; OR[2], between current smokers and non-smokers; CI[3], Confidence Interval.*

Table 5. Distribution of smoking reasons among the studied students' smokers in Tabuk region.

Smoking Reasons	Smoking Status						Total (N=1281)[1]	
	Ever Smokers (N=850)[1]		Daily Smokers (N=273)[1]		Non-Daily Smokers (N=158)[1]			
	F^2 (%)	RO^3	F^2 (%)	RO_3	F^2 (%)	RO^3	F^2 (%)	RO^3
For entertainment	342 (44.5)	1st	104 (35.0)	2nd	88 (51.8)	1st	534 (43.2)	1st
Overcome oppression feeling	250 (32.5)	2nd	145 (48.8)	1st	51 (30.0)	2nd	446 (36.1)	2nd
Peer pressure	95 (12.4)	3rd	23 (7.7)	3rd	18 (10.6)	3rd	136 (11.0)	3rd
Looks like adults	56 (7.3)	4th	13 (4.4)	4th	10 (5.9)	4th	79 (6.4)	4th
To be civilized	26 (3.4)	5th	12 (4.0)	5th	3 (1.8)	5th	41 (3.3)	5th
Total	769 (100)	NA	297 (100)	NA	170 (100)	NA	1236 (100)	NA
Significance	X^2= 34.39, P<.0001, PCC[4]=0.16							

N^1, Number of students; F^2, Frequency, Number of responses (Multiple response questions); RO^3, Rank Order, X^2, among the smokers' groups, **NA**, Not Applicable; **PCC[4]**, Pearson's Contingency Coefficient

Table 6. Pattern of cigarette smoking among the studied students in Tabuk region.

Pattern Characteristics	Smoking Status				Total (N=431)	
	Daily (N=273)		Not Daily (N=158)			
	No.	$\%^1$	No.	$\%^1$	No.	$\%^1$
Age at starting smoking (years): (X ± SD)	14.4 ± 2.37		14.7 ± 2.83		14.5 ± 2.53	
Immediate morning wake up smoking:						
Usually	149	56.0	15	10.1	164	39.5
Sometimes	74	27.8	48	32.2	122	29.4
No	43	16.2	86	57.7	129	31.1
Number of cigarettes per day:						
≤ 1	7		46		53	
2-5	44		53		97	
6-10	92		12		104	
11-20	56		9		65	
≥ 20	69		12		81	
(X±SD)	13.0 ± 8.10		5.8 ± 7.13		10.7 ± 7.78	
Tobacco Quitting Desire:						
Present	191	71.0	100	69.4	291	70.5
Absent	78	29.0	44	30.6	122	29.5

Table 6. *(Continuation)*

Pattern Characteristics	Smoking Status				Total (N=431)		
	Daily (N=273)		Not Daily (N=158)				
	No.	%[1]	No.	%[1]	No.	%[1]	
Tobacco Quitting Trial:							
Tried	179	66.8	88	74.0	267	69.0	
Did not try	89	33.2	31	26.0	120	31.0	
Usual Smoking Place:	F[2]	%	F[2]	%	F[2]	%	Rank Order
Public areas	126	50.4	92	66.7	218	56.2	1st
Home	79	31.6	24	17.4	103	26.5	2nd
Recreation house	21	8.4	13	9.4	34	8.8	3rd
School	18	7.2	7	5.1	25	6.4	4th
Friend's home	6	2.4	2	1.5	8	2.1	5th
Tobacco Quitting Trial Reason:							
Health promotion	31	44.9	38	52.8	69	48.9	1st
Islamic rules forbidden it	19	27.5	17	23.6	36	25.5	2nd
My family do not like it	15	21.7	13	18.1	28	19.9	3rd
Peer Pressure	2	2.9	3	4.2	5	3.6	4th
Saving money	2	2.9	1	1.4	3	2.1	5th

%[1] Valid Percent; F[2]=Frequency, Number of responses (Multiple response questions).

expressed their desire to give up smoking. However, 66.8% of daily smokers have tried to quit compared with 74.0% of non-daily smokers. Tobacco quitting desire has been addressed by 70.5% of smokers for health promotion (48.9%); Islamic rules (25.5%) and family dislike (19.9%) reasons.

Discussion

Prevalence of tobacco use among male adolescents varies markedly from country to country, ranging from 2.7 to 65.8 percent among the 157 countries with surveys since 2000[20]. In this study, the investigator found that the overall prevalence of tobacco smokers among secondary boy school students was 25.7%. This is a comparable figure with other Saudi studies that found the prevalence

of smokers among school students ranged from 12.0-29.8% (median = 16.5%)[13].

Shisha smoking is common among young people in Middle Eastern countries, with prevalence estimates of regular smoking of 11%–32%[21-25], and there is evidence of a recent increase in these prevalence rates[26,27]. The prevalence of shisha smokers found in the current study was 4.31% for regular smokers and 21.57% for non-regular smokers.

It is evident that the current study reported a comparable high prevalence rates of tobacco smoking as compared with other Saudi studies *e.g.,* Al Nohair[28], Al Ghobain *et al.*[14], and Jarallah *et al.*[18]. The investigator found only one study conducted in Tabuk city which reported a smoking prevalence of 34% for male students[29] but it was limited to Tabuk city only and conducted in April, 2005. Therefore, one cannot generalize from its findings to Tabuk region. The differences among the reviewed studies may partly be explained by differences in the definition of smoking status, time factors, sampling and methodological issues, besides the differences in demographic and socio-economic characteristics of the studied regions.

Cigarette and shisha smoking prevalence rates varied among the studied governorates in Tabuk region. The current research found that the prevalence of current cigarette smokers ranged from 15.5% to 35.8%, meanwhile, the prevalence of current shisha smokers ranged from 16.5% to 28.1%. The disparities identified here add another layer of data to our knowledge about the importance of epidemiological pattern of tobacco prevalence distribution. These findings addressed the important need for the decision makers to carefully consider the actual tobacco use influencing factors at the program(s) delivery levels.

The high prevalence of tobacco use in Tabuk region can be partly contributed to the insufficient tobacco control programs and the aggressive tobacco industry behavior. In addition, as the current study indicated, more factors could be incriminated, which include: More commonly affected students were with smoking fathers and

mothers; irregular school attendance; presence of sleep disturbance; and deceased father and/or mother.

The most important identified reasons for smoking were entertainment followed by overcoming feeling of oppression and peer pressure. This would be in line with the fact that, a range of socio-demographic, environmental, behavioral and personal indicators predicts the likelihood of adopting or rejecting smoking, particularly in early adolescence.

This study confirms that the most important age to start smoking was around 15 years (14.0 ± 2.53 years). This should enforce the tobacco controlling decision makers to start their programs about smoking prevention in primary and intermediate schools. The American Cancer Society (ACS) addressed the importance of this finding and stated that nearly all cases of first time tobacco use take place before a person finishes high school; the younger people are when they begin to smoke, the more likely they will become adult smokers[30].

The common place of smoking in the current study was public areas, home and recreation places. Therefore, legislations like restricted sales of tobacco products and ban of smoking in public places might be helpful in reducing the tobacco use among these students.

Indicators of socioeconomic position vary across studies; often education, occupation, and income level are used interchangeably to measure socioeconomic position[31]. It is important, however, to examine multiple indicators of socioeconomic position simultaneously if one is to understand their combined impact and thereby, provide more complete descriptions of social inequalities in tobacco use[32]. In current study, only 16.4% of fathers and 14.5% of mothers have a university degree and/or postgraduate studies. Also, 13.2% of fathers and 10.8% of mothers have professional jobs. Many studies have consistently documented a strong socioeconomic gradient in tobacco use, with higher rates of use among those of greater social disadvantage[31.32]. In fact, Jarvis and Wardle[33] concluded that any marker of disadvantage that can be envisaged and

measured, whether personal, material or cultural is likely to have an independent association with cigarette smoking. Recent evidence documents the same socioeconomic tobacco use gradient; tobacco use has been found to be higher among individuals at lower levels of education and with lower standards of living[32-34].

The investigator found that 70.5% of the studied students had a desire to quit smoking and 69.0% of them have tried quitting it. This is in accordance with the results of GYTS that showed a very high percentage of students who were current smokers wanted to quit. They also revealed that these students were not receiving adequate support or guidance they needed to quit tobacco[35]. The main reasons for trying to quit Tobacco use by the studied students in the current study were health promotion, Islamic rules and family dislike.

In conclusion, the study has provided support of a particularly high prevalence of tobacco use by the secondary school male students in Tabuk region, Saudi Arabia, where the prevalence of smoking is among the highest levels in the country. Hence, there is an urgent need for health decision makers to decrease the prevalence of tobacco use and for regulation of tobacco marketing and selling to minors. Similarly, tobacco preventive programs should consider actual situation of the target population and sites based on scientifically sound research studies. School-based interventions like counseling to promote cessation among current users and tobacco education to prevent initiation are necessary. Enforcement of legislations is essential to reduce the tobacco use among school students. Finally, an efficient and systematic tobacco surveillance system should be developed.

References

[1]   **Ezzati M, Lopez AD, Rodgers A, Vander Hoorn S, Murray CJ; Comparative Risk Assessment Collaborating Group.** Selected major risk factors and global and regional burden of disease. *Lancet* 2002; **360**(9343): 1347-1360.

[2]   **Centers for Disease Control and Prevention.** Smoking and tobacco use. Accessed 2013. <http://www.cdc.gov/tobacco>.

[3]   **[No authors listed].** WHO Global Report, Mortality Attributable to Tobacco, 2012, Geneva; WHO, 2012. 14.

[4]   **Scollo MM, Winstanley MH.** Tobacco in Australia: Facts and Issues. Third Edition. Melbourne: Cancer Council Victoria; 2008. Accessed 2013. <http://www.tobaccoinaustralia.org.au>.

[5]   **Hammond SK.** Global patterns of nicotine and tobacco consumption. In: *Handbook of Experimental Pharmacology 192*. JE Henningfield *et al.* (eds.), Nicitube Psychopharmacology. Berlin Heidleberg: Sprinder-Verlag, 2009. 3–28. Accessed 2013. <http://www.springerlink.com/content/t353k255747342h6>.

[6]   **[No authors listed].** The World Health Report 1999: Making a Difference. Geneva: WHO, 1999. Accessed 2013. <http://www.who.int/whr/>.

[7]   **[No authors listed].** Cigarette use among high school students - United States, 1991-2009. *MMWR* 2010; 59(26): 797-801.

[8]   **Ali M, Bassiony M.** Smoking in Saudi Arabia. *Saudi Med J* 2009; **30**(10): 1368.

[9]   **Szilagyi T.** Global progress report on the implementation of the WHO Framework Convention on Tobacco Control. WHO 2010. 46. Accessed 2013. <http://www.who.int/fctc/reporting/summaryreport.pdf.>

[10] **Al-Bedah AM, Qureshi NA, Al-Guhaimani HI, Basahi JA.** The Global Youth Tobacco Survey - 2007. Comparison with the Global Youth Tobacco Survey 2001-2002 in Saudi Arabia. *Saudi Med J* 2010; **31**(9): 1036-1043.

[11] **Moh'd Al-Mulla A, Abdou Helmy S, Al-Lawati J, Al Nasser S, Ali Abdel Rahman S, Almutawa A, Abi Saab B, Al-Bedah AM, Al-Rabeah AM, Ali Bahaj A, El-Awa F, Warren CW, Jones NR, Asma S.** Prevalence of tobacco use among students aged 13-15 years in Health Ministers' Council/Gulf Cooperation Council Member States, 2001-2004. *J Sch Health* 2008; **78**(6): 337-343.

[12] **Mohamed MK.** WHO smoke-free city case study; Tobacco-free cities for smoke-free air: a case study in Mecca and Medina. *WHO* 2011; 7.

[13] **Bassiony M.** Smoking in Saudi Arabia. *Saudi Med J* 2009; **30**(7): 876-881.

[14] **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**(3): 137-140.

[15] **World Health Organization (WHO).** Global Youth Tobacco Survey (GYTS), Saudi Arabia (Ages 13-15) Fact Sheet, 2011; 2.

[16] **[No authors listed].** Health Statistical Year Book, Department of Statistics, Ministry of Health. Jeddah: MOH. 2010. 36.

[17] **El-Anzy A.** [Statistical Guide of Schools in Tabuk Region, General Administration of Tabuk Region, Information Management Unit, Ministry of Education, Saudi Arabia] (in Arabic), 2012. 2.

[18] **Jarallah JS, al-Rubeaan KA, al-Nuaim AR, al-Ruhaily AA, Kalantan KA.** Prevalence and determinants of smoking in three regions of Saudi Arabia. *Tob Control* 1999; **8**(1): 53-56.

[19] **Global Tobacco Surveillance System.** Tobacco Questions for Surveys: A Subset of Key Questions from the Global Adult Tobacco Survey (GATS), 2nd Edition. Atlanta, GA: Centers for Disease Control and Prevention, 2011; 3.

[20] **Pan American Health Organization.** Prevalence of tobacco use. Accessed 2013. <http://new.paho.org/hq/index.php?option=com_content&view=article&id=4348&Itemid=2391>.

[21] **Akl EA, Gunukula SK, Aleem S, Obeid R, Jaoude PA, Honeine R, Irani J.** The prevalence of waterpipe tobacco smoking among the general and specific populations: a systematic review. *BMC Public Health* 2011; **11**: 244.

[22] **Refaat A.** Practice and awareness of health risk behaviour among Egyptian university students. *East Mediterr Health J* 2004; **10**(1-2): 72-81.

[23] **Zoughaib SS, Adib SM, Jabbour J.** Prevalence and determinants of water pipe or narghile use among students in Beirut's southern suburbs. *J Med Liban* 2004; **52**(3): 142-148.

[24] **Tamim H, Terro A, Kassem H, Ghazi A, Khamis TA, Hay MM, Musharrafieh U.** Tobacco use by university students, Lebanon, 2001. *Addiction* 2003; **98**(7): 933-939.

[25] **Maziak W, Fouad FM, Asfar T, Hammal F, Bachir EM, Rastam S, Eissenberg T, Ward KD.** Prevalence and characteristics of narghile smoking among university students in Syria. *Int J Tuberc Lung Dis* 2004; **8**(7): 882-889.

[26] **Momenan AA, Etemadi A, Ghanbarian A, Azizi F.** The rising prevalence of waterpipe smoking among Iranian adolescents: Tehran Lipid and Glucose Study. The 13th World Conference on Tobacco OR Health. Washington DC, USA. 2006.

[27] **Chaaya M, El Roueiheb Z, Chemaitelly H. Azar G, Nasr J, Al-Sahab B.** Argileh smoking among university students: a new tobacco epidemic. *Nicotine Tob Res* 2004; **6**(3): 457-463.

[28] **Al Nohair S.** Prevalence of smoking and its related behaviors and beliefs among secondary school students in Riyadh, Saudi Arabia. *Int J Health Sci* (Qassim) 2011; **5**(1): 51-7.

[29] **Abdalla AM, Al-Kaabba AF, Saeed AA, Abdulrahman BM, Raat H.** Gender differences in smoking behavior among adolescents in Saudi Arabia. *Saudi Med J* 2007; **28**(7): 1102-1108.

[30] **[No authors listed].** Child and teen tobacco use. American Cancer Society. Accessed 2013.
<http://www.cancer.org/cancer/cancercauses/tobaccocancer/childandteentobaccouse/child-and-teen-tobacco-use-child-and-teen-tobacco-use>.

[31] **Bobak M, Jha P, Nguyen S, Jarvis M.** Poverty and smoking, In: *Tobacco Control in Developing Countries*. Jha P, Chaloupka FJ, eds.New York, NY: Oxford Uni P, 2000. 41-61.

[32] **Sorensen G, Gupta PC, Pednekar MS.** Social disparities in tobacco use in Mumbai, India: the roles of occupation, education, and gender. *Am J Public Health* 2005; **95**(6): 1003-1008.

[33] **Jarvis MJ, Wardle J.** Social patterning of individual health behaviors: the case of cigarette smoking. In: *Social Determinants of Health*. Marmot M, Wilkinson RG, eds. Oxford, England: Oxford Uni P, 1999. 240-255.

[34] **Gupta PC.** Socio-demographic characteristics of tobacco use among 99,598 individuals in Bombay, India, using hand-held computers. *Tob Control* 1996; **5**(2): 114-120.

[35] **[No authors listed].** Regional Strategy for Utilization of Global Youth Tobacco Survey Data, Regional Office for South-East Asia. *WHO* 2005; 11.

معدل الانتشار و عوامل الخطورة للتدخين و استخدام التبغ بين طلاب المدارس الثانوية بمنطقة تبوك في المملكة العربية السعودية

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المستخلص. كلما استمر وباء التدخين في الازدياد بين المراهقين والشباب أصبح لزاماً على المعنيين توفير برامج لمكافحة هذا الوباء مبنية على البحوث و الدراسات الميدانية. تم إجراء دراسة مقطعية في منطقة تبوك من المملكة العربية السعودية لتحديد معدل الانتشار و عوامل الخطورة للتدخين بين طلاب المدارس الثانوية، و ذلك باستخدام عينة عشوائية متعددة المراحل شملت ١٦٨٠ طالباً من ١٥ مدرسة ثانوية وتم استخدام استبانة ذاتية التعبئة لجمع البيانات المطلوبة. بلغ معدل الانتشار لتدخين السجاير و الشيشة ٢٥٫٧٪ و٢٥٫٩٪ تباعاً و قد كانت نسبة المدخنين يومياً للسجاير ١٦٫٣٪ والمدخنين بشكل منتظم للشيشة ٤٫٣٪. أظهرت نتائج التحليل الإحصائي الخاصة بمعامل الخطورة أن العوامل المهمة المرتبطة بالتدخين شملت التالي مع القيم التالية لمعامل الخطورة: الجنسية (١٫٤٢)، تدخين الأب (١٫٤٢)، تدخين الأم (٢٫٧٤)، الغياب المتكرر من المدرسة (٢٫٩٦)، اضطراب النوم (٢٫٢٦)، و ما إذا كانت الأم متوفاة

(١,٨٠). أما الدوافع الأكثر شيوعاً للتدخين فشملت: الاستمتاع (٤٣,٢٪)، التغلب على الشعور بالقهر (٣٦,١٪)، و تأثير الأصدقاء (١١,٠٪). غالبية الطلاب (٧٠,٥٪) كانت لديهم الرغبة لترك التدخين إما من أجل تحسين صحتهم (٤٨,٩٪)، أو بسبب المبادئ الإسلامية (٢٥,٥٪)، أو بسبب كره العائلة للتدخين (١٩,٩٪). لقد لوحظ أن ما يقارب ربع طلاب الثانوية من المدخنين مما يستدعي تدخلاً عاجلاً من الجهات المعنية لمكافحة هذه الآفة.