The Global Youth Tobacco Survey - 2007

Comparison with the Global Youth Tobacco Survey 2001-2002 in Saudi Arabia

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ABSTRACT

الأهداف: دراسة اسخدام التبغ عند الشباب (GYTS) ومقارنة ذلك بنتائج المسح العالمي الذي أُجري على نفس الدراسة خلال العامين 2001م–2002م.

الطريقة: اعتمد هذا المسح على الدراسة المقطعية وكذلك على المنهجية التي تقوم على مرحلتين في اختيار عينات عشوائية يمثلها طلاب وفصول ومدارس المرحلة المتوسطة للذكور والإناث في كافة مناطق المملكة وذلك خلال الفترة من يناير 2007م إلى يونيو 2007م.

النتائج: لقد ارتفع معدل التدخين عند المدخنين السابقين والحاليين، وكذلك استخدام منتجات التبغ الأخرى، كما زادت نسبة التدخين في العام المقبل عند غير المدخنين من الذكور، غير أن هناك تحسن في معلومات وسلوك الطلاب تجاه التدخين وذلك عند مقارنة هذا المسح بنتائج عام 2001م. لم تكن معدلات التدخين القسري (التدخين السلبي) مختلفة عن سابقتها، وقد ارتفع معدل تدخين أحد الأبوين أو كلاهما بنسبة 6% خلال 6 أعوام. وزاد مستوى الوعي المضاد للتبغ في وسائل الإعلام، ومع ذلك لا زال لدى الطلاب مقتنيات (هدايا عينية) تحمل شعاراً لأحد منتجات السجائر، ومع تحسن طرق توعية الطلاب من مخاطر التدخين إلا أنه لم تتم بصورة متبادلة مناقشة الأسباب التي تجعل من هم في سنهم يدخنون. وأظهرت الدراسة بأن باستطاعة الإناث اللاتي تقل أعمارهن عن 18 عاماً (قاصرات) شراء السجائر وذلك بالمقارنة مع أقرانهم الذكور من نفس العمر.

خاتمة: يظهر أن برامج مكافحة التبغ باختلاف أنواعها تعطي ثمارها مع التأكيد على أهمية التقييم المنهجي للأنشطة وذلك لتكثيف البرامج للحد من تدخين الشباب في المملكة العربية السعودية.

Objectives: To primarily describe both smoking pattern in the youth population and a comparison with the Global Youth Tobacco Survey (GYTS) in 2001-2002.

Methods: The standard 2-stage methodology and a cross-sectional design were used to select randomly a representative sample of intermediate schools, classes, and students from all regions in the Kingdom of Saudi Arabia from January to June 2007.

Result: Comparing results with the 2001 GYTS, the prevalence of ever and current smoking, use of other tobacco products, and initiation of smoking by never smokers in the next year increased among males, but with improvement in the students' knowledge and attitudes towards smokers. The second-hand tobacco smoke items were not distinguished, however, one or both parent smokers increased by 6% over 6 years. Media anti-smoking messages and awareness improved, however, the widespread display and proliferation of items with a cigarette brand logo on it, encourages participants to buy more cigarettes. Teaching hazards of smoking to students improved, however, the reasons why people of their age smoke were not discussed interactively. Females less than 18 years of age (minors) were not denied cigarette purchase compared to male participants of the same age.

Conclusion: The National Tobacco Control Programs is apparently working effectively but differentially against smoking. The program needs to be evaluated systematically and accordingly and intensified further to reduce smoking among youths in the Kingdom of Saudi Arabia.

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Tobacco use, a major public health problem causes considerable morbidity and mortality worldwide. Evidently, smoking causes more than 5 million deaths/year in the world, and by the year 2020 tobacco-related deaths will exceed 10 million a year.[1-4] Approximately 100,000 youths use cigarette and other tobacco products for the first time, and expectedly 80% of them will smoke regularly in the future. Besides high morbidity and mortality, increased prevalence of smoking, interalia is attributed to multiple factors, such as tobacco marketing and promotional strategies of cigarette manufacturing companies.[2] In addition to the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) that was also ratified by the Kingdom of Saudi Arabia (KSA), Global Tobacco Surveillance System (GTSS) tracks tobacco use by globally conducting tobacco surveys using standard methodology and design among youths, adult health professionals, and school personnel.[5,6] The advantages of this planning were: adoption of policies and action plans by the WHO member states; production of huge epidemiological data on tobacco use globally; the comparison of data from one country to another country; and to control and evaluate effectively tobacco use across all countries.[7-14]

Although the prevalence of tobacco use and its serious consequences are on the decrease in high income countries, the reverse is reported in low and middle income countries.[8] In the Eastern Mediterranean Regional Office (EMRO) countries, the prevalence of tobacco use is impressively rising especially among youths, and females attributed possibly to relatively ineffective tobacco control measures, economic boom and globalization, strong marketing plans of tobacco companies, and hence, the need to re-innovate more effective antismoking programs targeting the youth population in KSA. Several studies[15-18] conducted among school students in the Gulf Cooperation Council (GCC) countries have confirmed alarming figures of tobacco use among boys, and shisha smoking, especially among girls. In one study,[15] male students in the intermediate grade showed that 25% of them were current smokers. In a Global Youth Tobacco Survey (GYTS) conducted in the schools of Riyadh region in 2001-2002, it showed that 20% of male students were current smokers of any tobacco product.[18] This paper describes its important findings and compares them with the GYTS 2001-2002.

The aims of GYTS were 2-fold: 1) to document and monitor the prevalence of tobacco use including cigarette smoking and current use of smokeless tobacco, cigars or pipes, and 2) to understand and assess students' attitudes, knowledge, and behaviors related to tobacco use and its health impact plus smoking cessation, environmental tobacco smoke, media and advertising, students access to cigarettes and school curriculum.[6-8] The GYTS will attempt to address the following issues; 1) determine the level of tobacco use, 2) to estimate the age of initiation of cigarette use, 3) to estimate levels of susceptibility to becoming cigarette smokers, 4) exposure to tobacco advertising by different means, 5) to identify key intervention variables, such as attitudes and beliefs on behavioral norms with regard to tobacco use among young people, which can be used in prevention programs, 6) to assess the extent to which major prevention programs are in reach of school-based population, and 7) to help develop opinion of participating students regarding antismoking interventions. Notably, in general the research design and methodology, objectives, and other related issues of present survey were similar to, and compatible with the several domains of GYTS and GYTS questionnaires.[6-8,19]

Methods. This survey conducted in Riyadh, KSA from January to June 2007 recruited intermediate school students of both genders countrywide by using similar standard methodology and design that ws also used in the previous GYTS 2001-2002. The GYTS, a school-based survey of students with 13 to 15 age bands used a 2-stage cluster sample design to produce a national representative sample of students in grades 7, 8, and 9 of intermediate schools. The first-stage sampling frame consisted of all regular schools with any of grades 7, 8, and 9. Schools were selected with probability proportional to school enrollment size. Fifty schools from all regions were selected; 25 were male intermediate schools, and the other 25 were female intermediate schools. The total number of both males and females were 3829 students. The second sampling stage consisted of systematic equal probability sampling with a random start of classes from each school that participated in the survey. All classes in the selected schools were included in the sample frame. All students in the selected classes were eligible to participate in the survey like those described by other researchers.[5-8] Survey procedures were designed to protect the students' privacy and confidentiality by allowing for anonymous and voluntary participation.[6-8] The adapted self-administered questionnaire[6] was administered in the classroom. Students recorded their responses directly on an answer sheet that could be scanned by a computer. Questionnaire used in the GYTS consisted of 56 core questions (total 85 questions) tailored to solicit information on the use of tobacco including its prevalence, access, brand of cigarette, use of other tobacco products, knowledge and attitudes towards smoking and smokers, environmental tobacco smoke, cessation, media and advertising, school curriculum, community response to smoking,

and others. In addition, there were optional questions which could be modified in accordance to the country's need. This questionnaire was translated into Arabic and back-translated by the investigators to check for accuracy, moreover, they agreed 100% on all questions. Notably, the exclusive approach for data collection from the specific population has been the self-administered questionnaire developed jointly by the WHO, Centers for Disease Control (CDC), and Prevention and Canadian Public Health Association (CPHA).[6-8,19]

We obtained permission from the Ministry of Education for conducting this survey in selected schools. This survey did not involve any minor or major risk to the participants, therefore, we easily got ethical clearance from the Internal Ethical Committee, Ministry of Education, Riyadh, KSA to conduct this study. Two of the team researchers briefed the students on the objectives and other details of this survey to the respective teachers prior to distributing the questionnaires. They also clarified any query especially on time taken to complete the questionnaire by the participating students, and the nature of the questions being not emotionally harmful to the medical students. Similarly, the students of selected classes were also informed of the objectives, significance of the problem of tobacco smoking, and the overall relevance of this survey. They were also ensured that their responses will be kept anonymous as most of them ask for this clarification. They were also informed that their participation is voluntary, and nonparticipation will not affect teacher-student relationship and academic performance. The students were requested to raise their hands for giving verbal consent to participate in this survey. An average of 87% of them consented, however, only 82% of them returned the completed questionnaires. Notably, a return of completed questionnaire is a reflection of verbal consent. We did not feel comfortable for written informed consent signed by the participants because it tends to increase the mistrust among students and considerable drop in the response rate. For the same reasons, written informed consent was not asked from the parents of the students. In addition, parents tend to return the informed consent form at different times haphazardly, which make it very difficult for researchers to decide the date of students' participation in the survey. A number of parents tend to hesitate to give informed consent for their minors' (13-15 years) participation in any survey including tobacco study.

All data was collected and the analysis was carried out by the Provisional Health Statistic Division in the WHO. Due to variable responses of the participants and complex design of surveys, the statistical department uses a data weighting formula[8,10] for calculating unweighted frequencies and weighted percentages, 95% confidence interval (CI), and odd ratios. Unlike the GYTS-2001 in which OR were calculated, the differences in proportions were considered statistically significant at the $p<0.05$ level assessed by non-overlapping CIs.

Results. The school response rate was 94%, the student response rate was 87.4%, and the overall response rate was 82.1%. Besides showing the sample characteristics (**Table 1**), the revealed pattern of ever smoking among participating students were as follows; 39.5% of male students had ever smoked cigarettes compared to 16% of their counterparts. From those who ever smoked cigarettes, 24% of them first tried a cigarette before age 10 compared to 17% of female students, and from the group of never smokers, 20% of male versus 17% of female students were susceptible to start smoking in the next year (**Table 2**). Males were significantly represented in all 3 component of smoking pattern compared to female students ($p=0.0001$). The prevalence of current smoking by gender were as follows; approximately 13% of male versus 2.7% female students were current cigarette smokers, and 15.8% of male students were users of other tobacco products compared to 9.9% of the female students. Notably, 16.7% of current smokers feel like having a cigarette first thing in the morning, which may be an indication of nicotine dependence compared to 9.2% of female students. With the exception of current smokers using other tobacco products ($p>0.05$), male students were significantly represented in other 2 components of current smoking pattern and addiction liability compared to female students (**Table 2**). Regarding other tobacco products current users, 8.7% of students reported using shisha-smoking through water pipe. However, 10.4% of male students used significantly shisha compared to 3.7% of female students ($\chi^2=15.73$, degrees of freedom

Table 1 - Sample characteristics of the studied population (n=3829).

Variables	n	(%)	Remarks
Total number of students, N= 4382			Overall good response rate
Response rate	3829	(87.4)	
Gender			
Males, n=2314			Response rate between 2 genders differed slightly
Response rate	1972	(85.2)	
Females, n=2068			
Response rate	1857	(89.8)	
Age			Participants with age 14 were slightly less represented
13	1374	(35.9)	
14	1128	(29.5)	
15	1327	(34.7)	
Grade			
7	1303	(34.0)	The number of participants decreases as the grade increases
8	1289	(33.7)	
9	1237	(32.3)	

Table 2 - Smoking patterns by gender - 2007 survey (N=3829).

Questions	Total		Male*		Female†	
	% (95% confidence interval)					
Ever smokers						
Ever smoked cigarettes, even one or 2 puffs	26.1	(22.9-29.7)	39.5	(30.2-41.8)	16.1	(12.8-20.1)
Ever smokers who initiated smoking before age 10	21.6	(17.9-25.9)	24.3	(19.8-29.4)	16.5	(11.7-22.7)
Never smokers likely to initiate smoking within a year	19.2	(17.1-21.5)	19.9	(17.4-22.7)	17.3	(14.1-20.9)
Current smokers						
Current cigarette smoker	6.7	(5.2-8.7)	13.0	(7.9-13.2)	2.7	(1.3-5.4)
Currently use other tobacco products	11.9	(10.3-13.8)	15.8	(12.2-14.4)	9.9	(6.8-12.9)
Current cigarette smokers who feel like having a cigarette/ chew first thing in the morning	15.5	(9.8-23.5)	16.7	(9.2-28.3)	9.2	(3.9-20.3)‡
Environmental tobacco use						
Participants exposed to smoke from others at home	27.9	(24.4-31.6)	28.9	(24.7-33.5)	26.4	(21.2-32.5)
Participants exposed to smoke from others in public places	38.2	(34.8-41.7)	45.1	(40.0-50.3)	31.6	(26.0-37.7)
Participants thought smoking should be banned in public places	73.2	(70.9-75.5)	75.8	(71.6-79.6)	72.2	(69.2-74.9)

*males = 1972, †females =1857, ‡<35 cases in the denominator

Table 3 - Comparison of the Global Youth Tobacco Survey (GYTS) 2001 and 2007 (13-15 years school students).[20]

Prevalence	GYTS 2001	GYTS 2007		
	M %	M %	F %	Total %
Ever smoked cigarettes	34.5	39.5	16.1	**29.7**
Current use of any tobacco products	22.2	24.2	11.2	**19.3**
Current cigarette smokers	10.8	13.0	2.7	**8.6**
Current use of other tobacco products	13.1	15.8	9.9	**14.2**
Currently smoke shisha	6.8	10.4	3.7	**8.7**
Never smokers to initiate smoking next year	6.7	19.9	17.3	**20.6**
Knowledge and attitudes				
Smokers have more friends - boys/girls think	58.3/42.6	44.1	32.2	-----
Smokers look less attractive - boys/girls think	36/27.1	32.9	24.6	-----
Access & availability - current smokers				
Smoke at home	15.5	-----	-----	**16.8**
Buy cigarettes in a store	46.7	52.9	29.0	**47.7**
No purchase refusal of cigarettes due to age	84.2	73.2	100	**77.7**
Environmental tobacco smoke				
Smoke exposure at home	30.6	28.9	26.4	**29.4**
Smoke exposure outside home	39.0	45.1	31.6	**38.9**
Ban on smoking in public places	74.2	75.8	72.2	**73.4**
ETS is harmful	60.1	-----	-----	**60.8**
One or both parent smokers	18.5	-----	-----	**24.8**
Most or all friends are smokers	10.6	-----	-----	**10.1**
Cessation - current smokers				
Desire to stop smoking	72.8	75.9	61.2	**70.9**
Tried to quit smoking during the last year	54.8	66.9	46.2	**62.8**
Ever received help to quit smoking	84.7	77.6	78.4	**80.3**
Media and Advertising				
Saw antismoking media messages in the last 30 days	69.4	-----	-----	**64.2**
Saw pro smoking ads on billboards in the last 30 days	66.2	63.3	58.4	**63.1**
Saw pro smoking ads in newspaper or magazine in the last 30 days	73.0	60.6	58.7	**63.0**
Have an object with a cigarette brand logo on it	12.2	12.8	9.1	**15.5**
Free cigarette offer by a tobacco company representative.	27.6	9.3	5.3	**13.3**
School				
Dangers of smoking taught in the class over the last 1 year	54.1	66.1	52.9	**59.3**
Reasons discussed why people their age smoke	47.1	46.2	22.2	**36.7**
Effects of tobacco use taught in the class over the last 1 year	49.5	52.2	36.4	**46.7**

ETS - environmental tobacco smoke, M - male, F - female

[df]=1, p=0.0005) in addition to significant differences between male versus male of the 2 GYTS (χ^2=64.23, df=1, p=0.0005) (**Table 3**).[20] We have used chi square after converting % into numbers especially for this variable. Shisha smoking is a tradition of Eastern world culture but certainly requires a separate investigation for detailed information update. Approximately 29% of male students reported to be exposed to secondhand smoke at home compared to 26% of female students, while a significant portion of male students (45%) were exposed to secondhand smoke at public places compared to female students (32%, p=0.0001). Furthermore, 76% of male students advocated banning smoking in public places compared to 72% of female participants (p=0.01) (**Table 2**).

Regarding teaching on the various effects of tobacco smoking, a significant proportion of male students (66%) reported that they were taught on the dangers of smoking and chewing tobacco compared to 53% of female participants (p=0.0001). Furthermore, 46% of male students discussed significantly the reasons why people of their age smoke and chew tobacco compared to only 22% of female students (p=0.0001). In addition, 52% of male participants as against 36% of their counterparts reported that they were taught the effects of smoking/chewing tobacco (p=0.0001) (**Table 4**). Sixty-one percent thought that smoke from others is harmful to them, while 25% of participants have one or more parents who smoke, and 10% have most or all friends who smoke cigarettes (**Table 3**).[20] Approximately 63% of male students have seen cigarette advertisements on billboards compared to 58% of female students in the last months (p=0.002), whereas 61% of male participants have seen cigarette ads in newspapers or magazines compared to 59% of female counterparts during the same period (p=0.23). Approximately 13% of male students has an object with a tobacco or cigarette company logo on it compared to 9% of the female participants (p<0.0001). All these components are pro-smoking strategies (**Table 4**). A total of 64.2% participants have seen anti-smoking media messages in the last 30 days, and 13.3% were offered free cigarettes by a tobacco company representative (**Table 3**).[20] Approximately 76% current male smokers expressed a keen desire to quit compared to 61% female smokers, whereas 67% current male smokers tried to stop smoking during the last one year compared to 46% current female smokers. Almost an equal percentage of male and female current smokers (78%) received help to stop smoking (**Table 4**). With regard to the results in knowledge and attitudes, 44.1% boys and 32.2% girls who smoke cigarettes had more friends, while 32.9% boys and 24.6% girls who smoke cigarettes looked more attractive (**Table 3**).[20] Approximately 53% current smokers reported to have bought tobacco in a store compared to 29% female participants. In addition, 73%

Table 4 - Smoking school curriculum, media advertising, cessation, and cigarette sources by gender responses in 2007 (N=3829).

Questions	Total		Male		Female	
	% (95% confidence interval)					
School curriculum						
Percent taught of the dangers of smoking/chewing tobacco	58.8	(53.4-64.1)	66.1	(58.9-72.6)	52.9	(44.7-61.0)
Percent discussed the reasons why people of their age smoke chew tobacco	33.5	(30.8-36.3)	46.2	(42.1-50.3)	22.2	(19.8-24.9)
Percent taught on the effects of smoking/chewing tobacco	43.6	(39.6-47.6)	52.2	(46.5-57.8)	36.4	(31.2-41.9)
Media advertising						
Percent who have seen a lot of ads for cigarettes on billboards in the last month*	60.9	(58.2-63.5)	63.3	(60.0-66.5)	58.4	(54.2-62.5)
Percent who have seen a lot of ads for cigarettes in newspapers or magazines in the last month*	59.8	(56.9-62.5)	60.6	(57.1-63.9)	58.7	(54.7-62.6)
Percent who have an object with a cigarette or tobacco logo on it *	11.7	(10.2-13.5)	12.8	(10.0-16.1)	9.1	(7.4-11.1)
Smoking cessation						
Percent of current cigarette smokers who desire to stop smoking	71.7	(61.7-80.0)	75.9	(62.4-85.7)	61.2	(36.2-81.4)†
Percent of current cigarette smokers who tried to stop smoking during the last year	62.3	(51.2-72.3)	66.9	(56.7-75.7)	46.2	(21.7-72.7)†
Percent of current smokers who ever received help to stop smoking	78.5	(69.2-85.5)	77.6	(66.2-86.0)	78.4	(61.6-89.1)†
Cigarette outlets						
Current smokers who usually buy their tobacco in a store	47.6	(36.6-58.8)	52.9	(42.4-63.2)	29.0	(11.4-56.4)†
Current smokers who were not refused cigarette purchase due to their age	76.4	(65.3-84.7)	73.2	(59.8-83.4)	100.0†	
Percent who have been offered free cigarettes by a tobacco company representative	7.9	(6.6-9.4)	9.3	(7.8-11.0)	5.3	(3.7 - 7.6)

*pro-smoking strategies, †<35 cases in the denominator

current smokers who tend to buy tobacco in a store were not refused purchase because of their age, such as 13-15 year age band compared to 100% female current smokers, and 9% percent of male students were offered free cigarettes by a tobacco company representative as compared to only 5% female participants (**Table 4**).

Comparison between the GYTS 2001 and 2007. With regard to the components of prevalence, most of the items including shisha smoking and initiation of smoking by never smokers in the next year increased over a 6-year period, which reflect that tobacco use is differentially increasing (some items related to smoking improved, while others did not) (**Table 3**).[20] Conversely, 2 items of knowledge and attitudes were improved. In contrast to no purchase, refusal of cigarettes due to age, the access and availability of cigarettes at 6 years interval were not differed. All the items of second hand smoke/ environmental tobacco smoke (SHS/ETS) were also not distinguished except one or both parent smokers between the 2 surveys that increased by approximately 6%. With regard to cessation, there were no remarkable differences between the findings of 2 surveys except an attempt to quit increased by 8%, but ever received help to quit decreased by approximately 5%. Media and advertising aspects of anti-smoking advertisements improved considerably, however, the widespread display and proliferation of items with a cigarette brand logo on it, entices the participants to buy more of these items. In school, classes teaching on the effects and hazards of smoking to students improved, except the reasons why people of their age smoke were not discussed interactively as was found in 2001 survey. The projected results of the 2 surveys should be considered cautiously because the GYTS 2001-2002 was conducted in intermediate male students in Riyadh region only, whereas the GYTS 2007 was national, and recruited both male and female intermediate students.

Discussion. The KSA ratified the WHO FCTC, and thereafter, GYTS was implemented in order to provide baseline data on tobacco use among youths. According to this survey, the prevalence of any tobacco products use was 19.3% reflecting the increasing magnitude of the problem in both genders. The previous prevalence rate (PR) of smoking any tobacco products among male students was 20.2%.[18] The PR of current smoking among intermediate male students was 11%,[18] which is comparable with the revealed PR in both genders (9%) that are consistent with the global rate of 9.5%.[8] According to GYTS,[8] the rate of current smoking was the highest in Europe (19.2%), and the lowest in EMRO countries (4.9%). The PR of smoking among children less than 15 years varies across nations, from a minimum of 10% to a maximum of 60%,[10] and in EMRO countries this figure is from 15-24%.[16] Most surveys conducted in the low- and middle income countries, the rates of ever smoking and current smoking were lower among females than males. The highest prevalence of early initiation of smoking was in China, Poland, and Zimbabwe, and 33% of the ever smoker students started tobacco use before age 10. Initiation of smoking before age 10 was the lowest both in Venezuela (12.1%) and Costa Rica (10.9%).[19] However, this survey revealed a wider margin but higher PR between male (24%) and female (17%) students initiating smoking before age 10, and this trend portends an increase in lifetime tobacco addiction, and a higher toll of tobacco-related deaths. The tobacco-related chronic diseases varied across countries. In the USA, the reported diseases are cardiovascular and lung cancer, whereas in China and India it is pulmonary tuberculosis, which causes considerable deaths.[14] In general, all this would inevitably raise the cost of health care across countries due to other related reasons, including huge investments for the prevention of smoking by implementing anti-smoking programs, and policies and measures to counter pro-smoking advertisements.[1-4,11,14]

Approximately 12% of the participants currently reported to use other tobacco products including smoking shisha (8.7%) as also found elsewhere;[8] the highest rate of 12% in EMRO countries, the lowest rate of 6.6% in the Western Pacific Region nations.[8] The use of other tobacco products including shisha and moasil is impressively associated with a myth among people that they cause less harmful health effects than smoking cigarettes needs to be effectively discouraged and corrected globally. Notably, 68.7%[8] versus 72% smokers desired to quit but were experiencing difficulties in quitting, though 80% of participants received help to quit smoking. This trend possibly attributed to equivocally ineffective smoking cessation services, and persistent nicotine addiction. By implications, smoking cessation services should be improved further throughout the KSA and innovative anti-smoking programs need to be implemented in all schools for targeting youths, and hence preventing proactively impending addiction problems in the student population. In addition, the desire to quit smoking by most participants (72%) is an opportunity to be channeled properly by concerned authorities for meeting their needs, especially offering effective clinical services throughout the Kingdom.

Studies conducted worldwide have shown a strong relationship between the prevalence of smoking and lung cancer; smoking takes 20 or more years to cause lung cancer.[14] According to this survey, most of the current smokers would presumably develop lung cancer before they reach age 35. Besides lung cancer, there are other diseases associated with cigarette smoking.[2] In

a Saudi study, coronary artery disease was attributed, among others factors, to current smoking (12.8%).[21] All diseases caused by smoking are certainly mirror reflections of chronic suicide behavior. In KSA, some of the tobacco control programs[14] are continuingly in place for raising public awareness on the potential dangers of tobacco use, and some of them have also been introduced in primary and intermediate schools targeting youths. Nonetheless 30-60% of the participants were not aware, or not taught on these programs. Globally, 59.3% of students reported having been taught of the dangers of tobacco during the preceding school year, and the rate was the highest in the Western Pacific Region (68.8%), and lowest in EMRO (47.5%) countries.[8] This revealed gap needs to be addressed by concerned authorities that is - teaching lectures on tobacco hazards is compulsory, and all school students must attend these lectures together with giving hand-outs to all of them. Defaulters need to be punished if concerned authorities decide so. In addition, there are some governmental regulatory measures and laws implemented globally[8,11,14] for controlling tobacco epidemic among youth population. These include prohibition both on selling tobacco products to people less than 18 years, and opening of tobacco products stores in or near school buildings. Their impact is doubtful because most participants under 18 (>70%) were not denied access to buying cigarettes, as also reported in a GTSS.[8] Although this dismal picture is not exclusive to one country, such defeating scenario needs to be addressed strictly by the regulatory agencies in KSA. Approximately 28-38% of participants were exposed to SHS/ETS both at home and public places, and surprisingly 40% of participants were not acknowledging that second-hand smoke is harmful to them. Unlike reports from the African Region (27.6%) and South East Asian Region (34.3%),[8] the relatively high revealed SHS also found in the European Region (77.8%) is possibly attributable to a relative lack of awareness programs on the hazards of SHS. Therefore community wide anti-smoking interventions[8,14] are necessary to educate young and adults on the harmful effects of SHS. In addition to some effective measures against revealed threats, such as 40% of participants were not acknowledging that second-hand smoke is harmful, and 73% male current smokers bought cigarettes in a store, and were not refused the cigarette purchase because of their age reflecting poor compliance with law, there is a potential opportunity to ban cigarette smoking in public places as expressed by most of the participants (73%).

Although 61% of students were exposed to extensive tobacco advertising, marketing and promotion, it is commendable that the new tobacco legislation including ban on TV advertisements began to be effective in controlling students' exposure to tobacco advertising and promotional strategies. It would be expedient to monitor how the tobacco industry adapts its strategy to recruit young smokers so that accordingly antismoking measures and strategies could be tailored to counterattack their pro-smoking programs.

The findings of this study have some limitations. First, because GYTS is limited to students the survey is not representative of all youths aged 13-15 years in the population. However, in KSA most people in this age group attend regular schools. Second, these data apply only to youths who were in school on the day of the survey, and who completed the survey. However, student response rates were high (>80%), suggesting that bias attributable to absence or nonresponse was limited. Finally the data were based on the self-report of students, who might underreport or overreport their behaviors or attitudes. The extent of this bias cannot be determined from the revealed data, however, reliability studies conducted elsewhere have indicated good test-retest results for similar tobacco-related questions.[22]

In conclusion, despite the tobacco control measures, school students are still significantly exposed to SHS and pro-smoking cigarette advertisements, constantly smoke at a young age, and use other tobacco products in the company of peers, not denied to buy cigarettes, have wrong beliefs and attitudes towards smoking, and susceptible to develop nicotine addiction with limited access to deficient tobacco use cessation services. It is recommended that the relevant health education programs, effective implementation of tobacco control measures, anti-smoking awareness campaigns through media, strategies to correct wrong beliefs and attitudes towards smoking, and the dangers of active and passive cigarette smoking, and other tobacco products need to be intensified in KSA. There should also be revision of school curriculum that encompasses all aspects of smoking, including development of skills to refuse tobacco use. There is a further need to develop more effective youth smoking cessation programs.[23,24] Support from parents, families, intersectoral anti-smoking agencies, governmental and nongovernmental health organizations, health providers, and teachers needs to be channeled to control tobacco use in school premises, homes, and communities. The GYTS should be repeated in a 4-5 year interval to monitor tobacco-use trends across the nation.

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