THE FREQUENCY OF HEALTH-RELATED BEHAVIORS AMONG SAUDI ADOLESCENTS VISITING PRIMARY HEALTH CARE CENTERS IN RIYADH CITY

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Background: The primary aim of the study was to calculate the prevalence of some of the health risk associated behavior like insufficient amount of exercise, cigarette smoking, alcohol intake, illicit drug use, driving below age of 18, and illegal sexual practices among the Saudi adolescents in Riyadh city. The second was to study the association between cigarette smoking and the above behaviors.

Material and Methods: It was a cross-sectional survey with 1473 Saudi adolescents, 852 males (57.8%) and 621 females (42.2%) aged 11 to 21 years attending the selected 10 Primary Health Care Centers (PHCCs) were invited to complete a 23-item questionnaire. Part of the questionnaire was used to measure the frequency of

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some adolescent behavior. These questionnaires were collected within a period of one month from 15 May to 15 June 1998. The PHCCs were selected randomly in Riyadh city.

**Results:** The prevalence of cigarette smoking was 12.7%, males smoking more than females (19.0% vs. 4.0%); male smokers exercised significantly less than nonsmokers (p<0.025). Only 4.5% of the sample reported alcohol use, 6.4% reported illicit drug use, and 8.0% reported illegal sexual practice. There is a statistically significant association between smoking and other risk behavior. It was found that 41.1% of males below the age of 18 drive a car, and 45.1% of the study sample that drive had a car accident.

**Conclusions:** The prevalence of illicit drug use, alcohol intake, and illegal sex in Riyadh city is much less than in the west. Cigarette smoking is an antecedent to more negative behavior. Antismoking programs including the prevention of the sale and use of cigarettes in public places are needed to decrease its prevalence. The application of firm traffic laws is also essential.

**Key Words:** Saudi adolescents, primary health care centers, behaviours.

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**INTRODUCTION**

Adolescence is a transitional period from childhood to adulthood characterized by rapid physical, social, mental, and psychological development. The definition of this period differs from one country to another. The American Medical Association and the American Academy of Pediatrics define adolescents as persons between 11 to 21 years of age. The World Health Organization (WHO) considers 10-19 years as the period of adolescence, while some literature defines adolescents as those aged between 13-19 years.

Estimates suggest that approximately 30% of the world's population is currently between 10 and 24 years of age, three-quarters of whom are in developing countries. About 25% of the population in the Kingdom of Saudi Arabia is aged between 11-21 years.

Most causes of mortality and morbidity in adolescents, such as car accidents, alcohol use, drug addiction and cigarette smoking can be prevented by simple preventive health measures including health education and counseling, the cornerstone of medical care for adolescents. Saudi society is different from western societies in many respects. It is a conservative society with a clear Islamic culture. The pattern of adolescent problems is expected to be different from that in the west. For example, teenage pregnancy is considered an adolescent problem in the west since most are illegitimate and may end in abortion with its attendant medico-legal complications, as well as social and financial problems.

Few local studies have been done on adolescent medicine and health problems, and the prevalence of the associated health risk factors. It is hoped that this study will be the first of many further studies.

The aims of this study are (1) to calculate the prevalence of some health-related behaviors including amount of exercise, cigarette smoking, drug abuse, alcohol intake, driving below age of 18, and illegal sexual behavior among the Saudi adolescents in Riyadh city, and (2) to study the association between cigarette smoking and the above practices.
METHODS AND MATERIALS

Background
Riyadh city, the capital of Saudi Arabia has a population of 3.1 millions, 69% of which are Saudis. It is served by 58 primary health care centers. Each primary care center is divided into two; one half served by male doctors for male patients, the other by female doctors for female patients.

Study Design
This was a cross sectional survey.

Subjects [Study population] and Setting
The study population consisted of Saudi adolescents of both sexes, aged between 11 and 21 years who attended 10 PHCCs over a period of one month from 15 May to 15 June 1998. The ten centers in Riyadh city were randomly selected.

Source of Data and Data Collection
A two-page questionnaire was designed. A pilot study was done in the Al-Rabwa Health Center, where 50 questionnaires were distributed to 35 males and 15 female Saudi adolescents. Some changes were made accordingly.

A letter of authorization was obtained from the Department of Health Affairs of the Riyadh Region, Department of Primary Health Care to perform the study in the PHCCs. Each questionnaire had a brief introduction stating the aim of the survey, and asking for the subjects' cooperation. It also indicated that the information given would be treated with extreme confidentiality.

The questionnaires were distributed to the selected centers. Each doctor in the selected PHCCs was given the questionnaires and asked to invite the Saudi adolescents attending his clinic to participate in the study during the study period. The purpose of the research was fully explained to the doctors in the chosen PHCCs. The doctors were informed to write “subject refused” on the questionnaire when the subject refused to fill in the second part (see below).

The questionnaires consisted of 23 items. It was divided into two parts to assure the subject of his/her security in disclosing sensitive information. The first part, written in English, was to be filled in by the doctor. This had seven items on age, sex, height, weight, diagnosis of current problem, and any chronic illnesses. The second part in Arabic was to be filled by the subject in the clinic. It had 16 items on marital status, number of children, pregnancies, abortions, level of education, occupation, whether parents were alive, whom he/she lived with. The remaining items were used to measure health-risk associated behavior, including exercise or the lack of it, such as swimming, walking, playing football, etc., defined as at least three hours weekly; cigarette smoking; alcohol and drug intake; sexual activity; driving below the age of 18, etc. These items were close-ended questions with Yes or No answers.

There were no questions on income, family size, or ethnic or social classification. Also, no questions were asked on the type of the drug used, frequency of the use of alcohol or when the habit of smoking began. There were no questions either on the number of sexual partners with regard to those who were sexually active.

The study sample consisted of 1473 Saudi adolescents, 852 males (57.8%) and 621 females (42.2%). Generally, both of the questionnaires were completed. However, a small percentage, especially among the younger and female adolescents, did not respond to the final items.

Data analysis and statistical methods
The data was entered in the computer using program DATASTAR and was analyzed with the SYSTAT program. The data entered were counterchecked. Frequency distributions and cross tabulations of the
variables were done. Further, the analysis of the association between cigarette smoking and other negative behavior was done using Chi square test.

RESULTS

Socio-demographic data

Table 1 shows the age and sex distribution of the study subjects. It indicates that two thirds of the sample was 16 years old and above. Subjects aged 19-21 years old constitute 35.8%, 44.7% of the subjects were 15-18 years old, and 19.6% were 11-14 years old. The mean age of the study sample was 17.1 ± 2.7.

Table 1: The age and sex distribution of study sample (Saudi adolescents) in Riyadh city, May 1998

| Age | Male n=852 | Female n=621 | Both sexes n=1473 |
|-----|------------|--------------|-----------------|
|     | No. (%)    | No. (%)      | No. (%)         |
| 11  | 14 (1.6)   | 19 (3.0)     | 33 (2.2)        |
| 12  | 31 (3.6)   | 36 (5.8)     | 67 (4.5)        |
| 13  | 41 (4.8)   | 38 (6.1)     | 79 (5.4)        |
| 14  | 61 (7.1)   | 48 (7.7)     | 109 (7.4)       |
| 15  | 74 (8.7)   | 52 (8.4)     | 126 (8.6)       |
| 16  | 84 (9.9)   | 63 (10.1)    | 147 (10.0)      |
| 17  | 121 (14.2) | 57 (9.2)     | 178 (12.1)      |
| 18  | 129 (15.1) | 78 (12.6)    | 207 (14.1)      |
| 19  | 112 (13.1) | 75 (12.1)    | 187 (12.7)      |
| 20  | 98 (11.5)  | 92 (14.8)    | 190 (12.9)      |
| 21  | 87 (10.2)  | 63 (10.1)    | 150 (10.2)      |
| TOTAL | 852(100) | 621(100) | 1473(100) |

Health risk associated behaviors among Saudi adolescents

Table 2 displays the practice of some health-related behavior among Saudi adolescents. It was found that male adolescents tend to exercise more often than females, 643 (75.5%) vs. 169 (27.2%). The overall prevalence of cigarette smoking is 12.7% (n=187) among the study sample, the habit being more common in males (19.0%) than females (4.0%). Of the adolescents aged less than 14, 1.4% (n= 4) reported smoking cigarettes. It was also found that male smokers exercised significantly less than non-smokers. The percentages were 68.5% vs. 77.4%, respectively ($\chi^2= 6.44$, $df=1$, $P<0.025$).

Only 52 (6.1%) of the males and 14 (2.3%) of the females reported that they had used alcohol (at least once). Despite this low prevalence of alcohol use, i.e. 4.5% in the whole sample, it was found that there was a strong association between alcohol intake and cigarette smoking in both sexes. Of the males, 23.5% of the smokers took alcohol whereas only 2.0% of the non-smokers did ($\chi^2= 100.5$, $df=1$, $P<0.001$). In female adolescents the percentages were 35.3% vs. 1.4% ($\chi^2= 47.7$, $df=1$, $P<0.001$).

The prevalence of drug use in this survey was 6.4% (10.6% and 0.8% in male and female subjects, respectively). It was also found that more smokers used illicit drugs than non-smokers. Of the males, 9.3% of smokers used drugs against only 1.1% of non-smokers, but the association was not statistically significant ($\chi^2=0.123$, $df=1$, $P=0.72$). The percentages were 8.0 % vs. 0.5% among the female adolescents, and the association between the cigarette smoking and drug use among females was statistically significant ($\chi^2=9.15$, $df=1$, $P<0.01$).

The prevalence of illegal sexual activity among adolescents in this survey was 8.0%; it was more among males than females (11.9% vs. 2.7%). It was also found that there was statistically significant association between smoking and illegal sexual activity. Of the male smokers, 33.3% had been sexually active as against 6.9% of non-smokers ($\chi^2= 81.6$, $df=1$, $p < 0.001$). Also, 40% of the female smokers had been sexually active as against only 1.2% of the female non-smokers ($\chi^2= 107.1$, $df=1$, $P<0.001$).
### Table 2: The prevalence of exercise practice and risk behaviors among Saudi adolescents Riyadh city, May 1998

| AGE GROUP | Do you do any type of exercise? | Do you smoke? | Do you ever drink alcohol? | Do you ever use drugs? | Do you ever practice illegal sex? |
|-----------|---------------------------------|----------------|---------------------------|------------------------|----------------------------------|
|            | (11 – 14) Male | (11 – 14) Female | Both sexes | (15 – 18) Male | (15 – 18) Female | Both sexes | (19 – 21) Male | (19 – 21) Female | Both sexes |
| No (%)     | No (%)           | No (%)          | No (%)       | No (%)            | No (%)           | No (%)       | No (%)            | No (%)           | No (%)       |
| 1          | Yes              | No              | No answer    | Yes                | No answer        | Yes          | No                | Yes                | No answer    |
|            | 110 (74.8)       | 39 (27.7)       | 149 (51.7)   | 149 (72.6)         | 137 (47.6)       | 288 (51.7)   | 133 (55.7)       | 133 (58.1)       | 286 (51.7)   |
|            | 36 (24.5)        | 101 (71.6)      | 137 (47.6)   | 82 (44.8)          | 89 (29.6)        | 209 (38.4)   | 89 (29.6)        | 62 (25.6)        | 152 (25.8)   |
|            | 1 (0.7)          | 1 (0.7)         | 2 (0.7)      | 1 (0.5)            | 1 (0.5)          | 2 (0.4)      | 1 (0.5)          | 1 (0.5)          | 2 (0.4)      |
| 2          | Yes              | No              | No answer    | Yes                | No answer        | Yes          | No                | Yes                | No answer    |
|            | 3 (2.0)          | 1 (0.7)         | 4 (1.4)      | 72 (17.6)          | 7 (2.8)          | 79 (12.6)    | 87 (29.3)        | 17 (7.4)          | 104 (19.7)   |
|            | 144 (98.0)       | 133 (94.3)      | 277 (96.2)   | 335 (82.1)         | 240 (96.0)       | 575 (87.4)   | 207 (70.7)       | 205 (92.6)        | 412 (78.2)   |
|            | 0 (0.0)          | 7 (2.7)         | 7 (2.4)      | 1 (0.2)            | 3 (1.2)          | 4 (0.5)      | 3 (1.0)          | 8 (3.5)          | 11 (2.1)     |
| 3          | Yes              | No              | No answer    | Yes                | No answer        | Yes          | No                | Yes                | No answer    |
|            | 0 (0.0)          | 3 (2.1)         | 3 (1.0)      | 23 (5.6)           | 4 (1.6)          | 27 (4.1)     | 29 (9.8)         | 7 (3.0)          | 36 (6.8)     |
|            | 143 (97.3)       | 130 (90.1)      | 270 (93.8)   | 374 (91.7)         | 239 (95.6)       | 613 (93.2)   | 261 (87.9)       | 211 (91.7)        | 472 (89.6)   |
|            | 4 (2.7)          | 11 (7.8)        | 15 (5.2)     | 11 (2.7)           | 7 (2.8)          | 18 (2.7)     | 7 (2.3)          | 12 (5.2)          | 19 (3.6)     |
| 4          | Yes              | No              | No answer    | Yes                | No answer        | Yes          | No                | Yes                | No answer    |
|            | 4 (2.7)          | 1 (0.7)         | 5 (1.7)      | 49 (12.0)          | 3 (1.2)          | 52 (7.9)     | 37 (12.5)        | 1 (0.4)          | 38 (7.2)     |
|            | 139 (94.6)       | 130 (92.3)      | 269 (93.4)   | 353 (86.5)         | 239 (95.6)       | 592 (90.9)   | 252 (84.8)       | 220 (95.7)        | 472 (89.6)   |
|            | 4 (2.6)          | 10 (7.1)        | 14 (4.9)     | 6 (1.5)            | 8 (3.2)          | 14 (2.1)     | 8 (2.7)          | 9 (3.9)           | 17 (3.2)     |
| 5          | Yes              | No              | No answer    | Yes                | No answer        | Yes          | No                | Yes                | No answer    |
|            | 5 (3.4)          | 2 (1.4)         | 7 (2.4)      | 41 (10.0)          | 5 (2.0)          | 46 (7.0)     | 55 (18.5)        | 10 (4.3)          | 65 (12.3)    |
|            | 130 (88.4)       | 105 (74.5)      | 235 (81.6)   | 339 (83.1)         | 202 (80.8)       | 541 (82.2)   | 225 (75.8)       | 186 (80.9)        | 411 (78.0)   |
|            | 12 (8.2)         | 34 (24.1)       | 46 (16.0)    | 28 (6.9)           | 43 (17.2)        | 71 (10.8)    | 17 (5.7)         | 34 (14.8)         | 51 (9.7)     |
Car driving
In response to the question: Do you drive a car? 526 (35.7%) answered yes (i.e. 60.4% of males and 1.8% of females have driven a car). Of those who drove, 237 (45.1%) had had a car accident. Of these 44.1% were males and 90.9% females. The number of male subjects below the age of 18 years who drove was 175, making 41.1% of the total number at this age.

DISCUSSION
Adolescents and exercise
In this survey, only 55.1% of the whole sample took any exercise. It was found that male adolescents did more exercise than females. Most exercise is done in groups e.g. football games; unlike female adolescents, males are allowed to practice these sports outside their homes. So, the only exercise that the girls have is done indoors (mainly at home) which is rather irregular. It was reported that 71% of the adolescents in the USA exercised regularly. Low physical activity was found to be associated with other risk behaviors in teenagers. This study shows that those who smoke cigarettes take less exercise.

Risk behaviors among Saudi adolescents
As we know, the most common causes of morbidity among adolescents are behavioral, and most risky behavior patterns start in adolescence. For example, it has been found that over three fourths of smokers begin to smoke as teenagers.

Cigarette smoking is a bad habit. Its prevalence rate in this study among Saudi male adolescents attending the PHCCs was 19.0%. This is higher than that reported by Jarallah and his colleagues who found that 13.2% of Saudi male adolescents aged 12-19 years old smoked. Other studies have reported that about 12% of Saudi adolescents in intermediate and high schools are current smokers. Additional studies have estimated that the prevalence rate of cigarette smoking among Saudi secondary school boys in Riyadh City was 21.8%. The prevalence of smoking among female adolescents was less; among the 19-21 year-olds in this survey it was 7.4%. One study estimated its prevalence as between 8.6% and 11.6% among female university students in Riyadh City. A comparison with studies from other countries showed that in Egypt, the percentages are 7% and 0.2% among male and female adolescents, respectively. In developed countries it ranges from 20% to 42% with equal sex ratio. There was no way to make an adequate comparison between the prevalence of illicit sexual activity of 8.0% among Saudi adolescents, considerably less than its prevalence in the west.

The prevalence of drug use among males in this survey is 10.6%, but the types of drugs used were not identified. One of the local studies showed that the prevalence rate of volatile substance abuse among Saudi male students was 5.3% and it was significantly associated with cigarette smoking. A study, done by Bewley and his colleagues in the UK, found that only 6% of British adolescents used drugs. This is less than our figure. In the USA, it is more prevalent, since over 30% of high school students report using marijuana. This risky behavior increased in prevalence with the increasing ages of the subjects because of the difficulty of control. Why is this risky behavior more common...
among males than females? In western countries adolescent girls are freer to travel abroad with little supervision from parents and society, unlike Saudi girls who are not. Besides, the risky behavior is less common in Saudi society than in western societies, because of: (1) Islamic laws that prevent the use of alcohol and prohibit the sex trade, (2) the presence of the religious police "an old organization where civilians are responsible for the supervision of people and punishment of anybody who does not follow Islamic rules in the society of Saudi Arabia" and (3) the strict adherence to the rules of Islam in the Kingdom.

Bad habits lead to more bad habits because of peer pressure. In this study, a strong association was found between alcohol, illicit sex, illicit drug use and cigarette smoking. The same findings also generally resulted from previous studies.

Car accidents among adolescents
In Saudi Arabia, females are not allowed to drive but some drive in the villages and the desert. Most of those who drove have had car accidents. Motor vehicle accidents constitute a large proportion of the deaths among US adolescents. It is the leading cause of death in this age group. This study showed 45.1% of males who drive have had an accident that ended in injury. More effort, therefore, is needed to reduce the prevalence of these accidents.

CONCLUSION
From this study, it is concluded that the prevalence of illicit drug use, alcohol intake, and illegal sexual activity in Riyadh, Saudi Arabia is much less than in most countries of the world. It has also been found that illegitimate pregnancies are rare. This is attributed to the adherence of Islamic rules and the educational system that emphasizes religious teaching. Religion is, therefore, an important factor that should be taken in consideration in any health education program.

It is vital to emphasize the importance of school health clinics that provide a variety of health services such as counseling, health education, immunization, and other preventive measures that help reduce adolescent morbidity and mortality.

Antismoking programs should be established, including the prohibition of the sale and use of cigarettes in public places, along with application of firm traffic laws, including those forbidding adolescents aged less than 18 years from driving.

ACKNOWLEDGEMENTS
I would thank all the doctors working in the selected PHCC for their cooperation. Also, I would thank Dr. Lubna Alansari for her help in critical reading and advice.

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