Prevalence of Smoking and Its Associated Factors among Female Medical Students in King Abdulaziz University, KSA, Jeddah

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Abstract: Background: Today's medical students will play a prominent role in future efforts to prevent and control tobacco use in the community, in addition they are considered as a paradigm for safe and healthy behavior, nevertheless the published literature revealed that they are not the least to be smokers. The current study aimed to estimating the prevalence of smoking among this group and to elaborate the risk factors associated with the smoking habit among them.

Material and subjects: This is a cross sectional study, where randomly selected 400 female medical students from 2nd-6th academic year in the faculty of medicine at King Abdul Aziz University were invited to be enrolled in the study and to respond to a predesigned self-administered questionnaire. The response rate was 77.5%.

Results: Thirty two students out of 310 (10.3%) were current smokers, and the prevalence varied among students according to their academic year, it accounted for 10.5% among 2nd year, 11.3% in 3rd year, 8.5% in 4th year, 8.6% in 5th year and 12.0% in 6th year. We found that 21% of all smokers were daily smoker, regarding smoking status of the parents it was found that 13% of the smoking fathers have smoking daughters (p=0.285), and 29% of the smoking mothers have smoking daughters (p=0.002).

Conclusion and recommendations: 10% of our female medical students were smokers, significant factor associated with likelihood of being smoker was smoking status of the mother, and other factors are not statistically significant including smoking status of the father, brother or sister, age of the student, marital status and level of grades. We recommended initiating and supporting antismoking health education campaign using different media and targeting various sectors in general and females in specific.

1. Introduction

Tobacco use is the one of most leading preventable cause of death worldwide. (1;2) and it is considered as a major risky behavior which adversely affect public health and has reached to epidemic proportions in the last decades.(3) It is well accepted that diseases associated with smoking are a foremost cause of premature death in the world, both in developed and developing countries.(4)

Overall, smoking reduces life expectancy, increases overall medical cost and contributes to loss of productivity during the lifespan of an individual,(5) and its grave consequences on health, such as lung cancer, chronic bronchitis, and carcinoma of the oral cavity (larynx, esophagus, and tongue) and urinary bladder, is all well documented.(6)

Years of researches in developed countries has identified certain factors that commonly play a role in initiation of tobacco use. These include exposure to tobacco marketing efforts, role modeling by parents/other adults, peer pressure, collateral addiction to other drugs, inadequate knowledge about injurious effects of tobacco use, etc.(3)

In the Western world, multifaceted anti-tobacco and anti-cigarette smoking campaigns, and smoking control programs are in full force. Such restrictions include limitations on advertising, higher taxes, and increased retail prices. In addition, these restrictions include prohibition of smoking in public places and in all government buildings. Further, there is an extensive attempt to introduce public health education messages into all levels of education in both the public and private school systems. (6)

Although medical students and health professionals expected to play a key role in controlling tobacco use, many of them smoke cigarettes. Although vast data have showed very common smoking rates among the general population, numerous studies have also pinpointed that smoking among medical students is of great concern because of their prevalence and influence.(7)
In many developing countries, physicians represent an important asset in the fight against tobacco, owing to their respectability in the society as a credible source of health information. (1)

Moreover, as future doctors, they are the role models for the laity regarding to smoking habits. World Health Organization (WHO) has included prevalence of tobacco use among subgroups such as physicians, nurses, other health workers, etc. among the indicators which should be monitored by each country. (3)

Nevertheless, a worldwide survey revealed that among 9000 students from 51 medical universities in 42 countries, smoking prevalence varied remarkably from 0% to 48% among male medical students and from 0% to 22% among female students. Smoking among health providers, including medical students, is not only harmful to their own health but also to the public, due to their exemplary behavioral role. Their smoking behavior affects not only their health and their families’ health but also the health care services they provide to their future patients. (7)

Since tobacco use practices and beliefs about tobacco are formed early in life, it becomes interesting to look at the development of tobacco use among medical students, and how their education may have influenced their beliefs and practices. (1).

2. Rationale of the study

Smoking among medical students, is not only harmful to their own health but also to the public, due to their exemplary behavioral role. Therefore, it is crucial to know the magnitude of this problem among our medical students.

3. Aim of the study

To study and elaborate the magnitude of smoking problem among the female medical students at King Abdul Aziz University (KAU), Jeddah, 2009.

4. Objectives

1. To estimate the prevalence of the smoking habits in female medical students at King Abdul Aziz University, Jeddah, 2009.
2. To explore the associated factors among those smokers.

5. Literature review

Smoking behavior and prevalence rates among medical students and medical professionals are important public health issues, as physicians’ attitudes and interventions are decisive for the patients’ success in quitting smoking. (8) Therefore, several studies had been conducted to assess the magnitude of the problem and its associated factors among this cohort in an attempt to find out a disciplinary intervention to reduce its prevalence among them.

Prevalence of smoking habits

In France at 2002, a cross sectional study was conducted in Rennes & Paris; on 1,551 medical students from multiple academic years to assess the prevalence of smoking. It found that 40% of them were smokers, which exceeded the rate among French population 33%. (9)

In Germany, to assess smoking habits of future physicians, a cross-sectional study conducted in 1992/1993 among 817 students enrolled in the first, third, and fifth years of medical school at the University of Ulm. The overall participation rate was 85.2%. Prevalence of current smoking was 17.6% among female participants and 29.2% among male participants. (10)

Also, a cross sectional descriptive study done in Japan in 2000 on 356 students (283 females) to assess their practice of smoking. They found that 14% of the females are smokers. (11)

In 2005 at Jordan, a study of the prevalence of smoking among 812 university students found that 35% were smoker (out of them 11% were females, and the rest were males). (5)

In Syria 2006, a cross sectional study done on 570 medical students to investigate tobacco use habit. The prevalence was 11% for cigarette (female 3%, male 16%), 23% for water pipe (female 13%, male 30%), both 7.3% (female 3%, male 10%). (1)

In the University of Siena and Florence, Italy 1998, a study conducted to evaluate the smoking habits, beliefs and attitudes of nurses and medical students, among 200 medical students (68% were females) they found that 30% were current smokers, and 5% former-smokers. (12)

In the Faculty of Medicine in the Autonomous University of Barcelona, Spain 1992, a cross Sectional study done on 490 students registered in the first year of Medicine to evaluate the spread of tobacco addiction among them, the results showed that 25.7% were smokers, 25% were ex-smokers and 49% were nonsmokers. (13)

In Poland, the incidence of smoking is increasing among the youngsters. This study designed to assess the rate of smokers among 412 first-year students at the Medical University of Gdansk and define their attitudes towards tobacco smoking. The rate of response was 100%. With current smokers 17% females and 28% men. (14)

In Vietnam 2008, study conducted to assess the prevalence of smoking among 4720 medical students from three universities, they were interviewed using an adopted global youth tobacco survey questionnaire, the global prevalence was 25% and among female medical students was 7%. (7)
A study on Colombian medical students' smoking prevalence and tobacco attitudes, done in Colombia 2001, among 2,021 students from First- and fifth-year students from 11 medical schools in seven Colombian cities, average response rate was 89.9%. Globally, 25.9% of students were current smokers (males 27.9%, females 24.0%). (15)

In Tunisia, there was a cross sectional study to analyze the effects of medical training on the smoking habits of Tunisian medical students. Two groups of medical students were studied. One group was 257 first year students at the Medical Faculties of Tunis and Safax cities, in 1987, the other 211 final year students at the same Faculties in 1994 and who had been in the first year in 1987. 54 % were men and 46% women. The smoking rates among women were 1.8% and 2% 1st & final year respectively. (16)

In addition, another Pakistani cross sectional study in 2005 carried out to estimate the smoking prevalence among 1024 medical students, by using self-administered WHO questionnaire found that 21% had smoked at least once, while 10% were current smokers and 13% of the smokers were females. (17)

Another cross sectional study performed at the University of Tirana from Albania during October 2000, to evaluate the smoking behavior among their medical students and found that the percent of smoking among female medical students were 5% in 1st year and 34% in 5th year. (18)

An Indian study among 200 randomly selected medical students (including 28 girl students), was carried out in a medical college during July-August 2001. The participants were administered a self-administered structured questionnaire recommended by WHO Prevalence of smoking; out of the 200 students, 108 (54%) were non-smokers. The remaining 92 (46%) were smokers, out of which 63 (31.5%) were regular smokers, and 29 (14.5%) were occasional smokers. All 28 female students were non-smokers. (19)

A Chinese study examines cigarette smoking among a sample of medical students in Wuhan, People’s Republic of China 1995. A self-administered questionnaire was distributed to 1611 students and smoking status was 37.7% of males were smokers and none of the females were smoker. (20)

In Kyrgyz state medical academy in Bishkek, Kyrgyzstan, a cross-sectional randomized study was conducted in which 297 students (146 males and 151 females) completed a questionnaire and exhaled carbon monoxide (CO) with overall prevalence of smoking was 35% (47.9% among males and 22.5% among females). (21)

In Saudi Arabia 1999, a study done in Riyadh to explore smoking habit in medical science students. Out of 647 respondents, 186 (29%) were current smokers. Of those who indicated that they were currently smokers, 127 (20%) were male and 59 (9%) were female. (6)

Associated factors

A French study done in 2002, to estimate the prevalence of smoking among 1, 551 medical students showed association with age, it was reported that older students (23 years or more) smoke more cigarettes per day than their younger counterparts. Adjusted Multiple Linear Regression analysis revealed that older students (23 years and older) were less likely to be smokers than younger one. (9)

A German study in 1992 among 490 students from 1st, 3rd, 5th year medical students showed that among female students, there were only minor differences in smoking prevalence between the first, third and fifth years at medical school. Factors associated with regular smoking of medical students, after adjustment for potential confounders in multivariable analysis, were age, sex, and maternal smoking. (10)

In Japan 2000, a study conducted to explore practice and attitude of smoker students, with regards to the reasons of smoking were stress 31%, fun 12%, nice image 7%, and habit 7%. (11)

In Jordanian study among the university students showed associated factors as follow, sex, faculty, academic year, academic achievement, family income, number of family members who smoke and number of close friends who smoke. Male sex, higher income, lower academic attainment and increased number of friends or family members who smoke were associated with increased smoking. Compared with 1st year students, 2nd, 3rd and 4th year students had higher odds of being smokers. Of literature, economic and administrative sciences, fine arts and sport, and science were more likely to smoke compared to those in the faculty of religion and law. (5)

In Syria 2006, a cross sectional study showed that smoking was more popular among 5th year medical students (15% and 27%) compared to 1st year students (7% and 20%) for cigarettes and water pipe, respectively. (1)

In an Italian study to evaluate the smoking habits, beliefs and attitudes of nurse(205) and medical (200) students at the University of Siena and Florence, Italy. Students who entered the 1st year of school in 1998 were asked to come. The prevalence of maternal smoking were higher among nurse students than in medical students. (22)

On the other hand, in 2006, there was no correlation between incidence of smoking among students and their parents in the Poland study among 412 from first year medical students. (23)

In a cross sectional, study done in Vietnam Smoking tended to increase across academic years, being highest in years 5 to 6 (35.0%). Lack of strict regulations on smoking restrictions is a critical
determinant of smoking. 21% of daily smokers had a history of smoking family member, and 51% had exposure to smoking social member. (7)

In Colombia 2001, Prevalence was similar among 2,021 students from first- and fifth-years, but fifth-year students were more compliant with smoking in health centers and showed a lesser desire to quit, but Living at higher altitude and attending private universities were associated with higher prevalence.(15)

In Syria 2006, a cross sectional study showed that smoking was more popular among 5th year medical students (15% and 27%) compared to 1st year students (7% and 20%) for cigarettes and water pipe, respectively. (1)

Among Tunisian females medical students in 1994, the prevalence of occasional smoking increased from 5.5% in 1st year to 16.8% in final year. (16)

In 2001 an Indian study showed that Prevalence of parental smoking: out of the 200 medical students, 70 (35%) reported history of parental smoking, out of which 27.5% were regular smokers and 7.5% of parents were occasional smokers. There was a significant association between the smoking habits of parents and their habit. Similarly, there was a significant association between peer pressure and smoking behavior. 95% of the smokers stated peer pressure to smoke compared to only 4.6% of non-smokers. (3)

The results of a Chinese study done in 1995 among 1,611 medical students showed that major reasons for first smoking were stress 42.8%, curiosity 34.4%, and loneliness 33.7%. Multivariate analysis suggested that age, college year, and having a family member who smoked were significantly associated with smoking. (19)

Across the years of study among medical students in Kyrgyzstan, the prevalence of smoking among medical students increased and reached its peak at 6th year. (21)

In Riyadh study that conducted in 1999, the significantly associated factors for smoking in medical science student were age, closest friends 25%, parents as father 12%, mother 5%, and brothers or sisters 19%, none significantly associated factors were socioeconomic status, mother & father education, and gender. (6).

6. Methodology

Study area:

This study conducted in Jeddah city, which is considered as the second largest city after Riyadh in KSA; it is the main port of the kingdom on the red sea. The study conducted in the medical college at king Abdul Aziz University.

Study design:

Cross sectional Descriptive study.

Study population:

Female medical student, from 2nd to 6th grade, they were estimated to be about 1111 students.

Sampling:

Sampling size:

The sample size was calculated by using EPI version 6. Based on the following criteria; expected frequency of 50% to ensure maximum sample size, with acceptable interval of +5%, with confidence of 95% and power of 80%, the sample size accounted for 385 which was rounded to 400.

Proportionate allocation of the sample was carried out as following:-

The equation is \( x = \frac{N_i * S}{N} \)

Where \( x \) is the sample need to be selected from each subgroup, "n" is the number of students in each group, and "N" is the total number of students in all groups and "S" stands for the total sample size.

Accordingly;

The sample needed from 2nd year= 180*400/1111 = 65 students
3rd year= 220*400/1111 = 79 students
4th year= 230*400/1111 = 83 students
5th year= 265*400/1111 = 95 students
6th year= 216*400/1111 = 78 students

Sampling technique

The students are usually gathered in the lecture hall in the college or the auditorium in the hospital, the researcher used the convenient systematic random sampling, where she attended the break time between lectures and distributed the questionnaire among the students while they are sitting and waiting for the next lecture. To ensure randomness of choice, every third student was selected and requested to be enrolled in the study and fill the questionnaire.

Data collection tool:

A self-administered questionnaire (Appendix) distributed individually to female students and was collected at the same day. The questionnaire structured at Riyadh study and the author was contacted for permission. (6)

The participants’ smoking status was defined as current smoker and Non-smoker. Smokers were defined as those who are currently smoking at least one cigarette per day. (6)

Dependent variables:

Smoking status of the participants.

Independent variables:

The independent variables included the age, academic year, marital status, family monthly income, smoking status of the parents, the smoking status of their brothers and sisters, as well as smoking status of the friends.

Data entry and analysis:
Data were coded and checked for accuracy then entered into (statistical package for social science) SPSS ver.16 in a personal computer. Analysis performed by using the same statistical software package. Data presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and mean and standard deviation for quantitative variables. Qualitative variables compared using chi-square test. For 2X2 tables, whenever the expected values in more than 20% of the cells are less than 5 or the expected value in one or more cells is less than one, Fisher exact test was used instead. In bigger tables when these conditions are violated, the Chi Square test is not applicable (NA) and the tables were presented as cross tabulations without statistical significance testing. P value less than 0.05 was considered significant throughout the study.

A pilot study was conducted on 20 students from pharmacy colleges to test the applicability of the questionnaire and time needed for completion. The results of the data collected from the pilot study were not included in the main results of the research.

Ethical consideration
- Official letter from joint program of family and community medicine was collected to the deputy of KAU.
- Approval for conducting the study was taken from the authority of the faculty of medicine at King Abdul Aziz University.
- Anonymity of the questionnaire was adopted to ensure confidentiality of the response.
- All the information were kept confidential and would not be used except for the study purposes.
- Consent of the students is prerequisite for inclusion of the study.

Budget:
Self-funded
Limitation: Time, Response from the students

7. Results

1. Characteristics of the study group:
   Demographic characteristics of the study group
   Table 1: Demographic characteristics of the study group (n=310).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-19 years</td>
<td>46</td>
<td>14.8</td>
</tr>
<tr>
<td>20-21 years</td>
<td>125</td>
<td>40.3</td>
</tr>
<tr>
<td>22-23 years</td>
<td>121</td>
<td>39.0</td>
</tr>
<tr>
<td>24-25 years</td>
<td>18</td>
<td>5.8</td>
</tr>
<tr>
<td><strong>Academic year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>38</td>
<td>12.3</td>
</tr>
<tr>
<td>3rd year</td>
<td>71</td>
<td>22.9</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>28</td>
<td>9.0</td>
</tr>
<tr>
<td>Single</td>
<td>282</td>
<td>91.0</td>
</tr>
<tr>
<td><strong>Socio-economic class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td>234</td>
<td>75.5</td>
</tr>
<tr>
<td>High</td>
<td>76</td>
<td>24.5</td>
</tr>
<tr>
<td><strong>Education level of the father</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary or below</td>
<td>34</td>
<td>11.0</td>
</tr>
<tr>
<td>High school</td>
<td>54</td>
<td>17.4</td>
</tr>
<tr>
<td>University or above</td>
<td>222</td>
<td>71.6</td>
</tr>
</tbody>
</table>

The table describes the demographic characteristics of the study group, it shows that the majority of the students (79.3%) were in the age groups (20-23 years), and only few minorities (9%) are married. Almost three quarters of the students, (75.5%) rated their socio-economic class as being middle. The percentage of fathers who have university qualifications (71.6%) is higher than that for mothers (59.4%).

2. Smoking status of the students:

The figure demonstrates that 32(10.3%) of the students are currently smokers. The following section describes the pattern of smoking, in addition to the characteristics of the smokers and factors correlated to smoking.
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Figure 2:- Types of smoking as indicated by the smokers (n=32).

The figure demonstrates that the commonest type of smoking is Moassel (water pipe) which is used by almost two thirds of the smokers (21; 65.6%) followed by cigarettes (12; 37.5%), and the least to be used is the Shisha (7; 21.9%).

Six of the smokers were using more than one type, out of them, four smokers were using two types and two smokers were using the three types.

Table 2:- Frequency and age of starting smoking and previous attempts to quit smoking (n=32).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of starting smoking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;19 years</td>
<td>16</td>
<td>50.0</td>
</tr>
<tr>
<td>19+ years</td>
<td>16</td>
<td>50.5</td>
</tr>
<tr>
<td>Median; Range</td>
<td>18.5; 14-22 years</td>
<td></td>
</tr>
</tbody>
</table>

The table demonstrates that the median age of starting smoking among the smoker students accounted for 18.5 years, and it was found that one of the students started smoking as young as 14 years of age. Fortunately, it was found the great majorities of the smokers (78.1%) indicated that they smoke occasionally, and the rest (21.9%) are daily smokers. Moreover, it was noted that the overwhelming majority (91.7%) of the cigarette smokers are consuming less than ten cigarettes daily. On the other hand, it was realized that the number of students who think of quitting 15(46.9%) is lower than those who do not 17(53.1%). Generally, the results showed that out of the whole smokers, there were 10 smokers (31.5%) who tried to stop smoking before. However, only one student reported that her trial continued for more than one year.

Table 3:- Smoking status of the students according to their socio-demographic characteristics.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Smoking status</th>
<th>No</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>( \chi^2 )</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-19 years</td>
<td>7</td>
<td>39</td>
<td>84.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-21 years</td>
<td>11</td>
<td>114</td>
<td>91.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22-23 years</td>
<td>11</td>
<td>110</td>
<td>90.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-25 years</td>
<td>3</td>
<td>15</td>
<td>83.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic year</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(^{nd}) year</td>
<td>4</td>
<td>34</td>
<td>89.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3(^{rd}) year</td>
<td>8</td>
<td>63</td>
<td>88.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4(^{th}) year</td>
<td>4</td>
<td>43</td>
<td>91.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5(^{th}) year</td>
<td>7</td>
<td>74</td>
<td>91.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The table shows that the percentage of smokers was higher among older students (aged 24-25 years) if compared to younger age groups, therefore, it was realized that the percentage was higher among students in the 6th year if compared to those in lower academic year. Meanwhile, it was realized that the married students are more likely to be smokers (14.3%) than the singles (9.9%), however, this difference is statistically not significant \( p>0.05 \). In addition, it was noticed that the students who ranked their socio-economic class as being high were more likely to be smokers (13.2%) if compared to those in the middle class (9.4%). However, this difference is not statistically significant \( p>0.05 \).

Moreover, it was remarked that the students whom their fathers or mothers are highly educated i.e. have university qualifications are more likely to be smokers if compared to those whom fathers or mothers have a relatively lower education level. However, these differences are not statistically significant \( p>0.05 \).

<table>
<thead>
<tr>
<th>6th year</th>
<th>9</th>
<th>12.3%</th>
<th>64</th>
<th>87.7%</th>
</tr>
</thead>
</table>

**Marital status**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>( X^2 )</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>4</td>
<td>14.3%</td>
<td>24</td>
<td>85.7%</td>
</tr>
<tr>
<td>Single</td>
<td>28</td>
<td>9.9%</td>
<td>254</td>
<td>90.1%</td>
</tr>
</tbody>
</table>

**Socio-economic class**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>( X^2 )</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle</td>
<td>22</td>
<td>9.4%</td>
<td>212</td>
<td>90.6%</td>
</tr>
<tr>
<td>High</td>
<td>10</td>
<td>13.2%</td>
<td>66</td>
<td>86.8%</td>
</tr>
</tbody>
</table>

**Education level of the father**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>( X^2 )</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary or below</td>
<td>3</td>
<td>8.8%</td>
<td>31</td>
<td>91.2%</td>
</tr>
<tr>
<td>High school</td>
<td>2</td>
<td>3.7%</td>
<td>52</td>
<td>96.3%</td>
</tr>
<tr>
<td>University or above</td>
<td>27</td>
<td>12.2%</td>
<td>195</td>
<td>87.8%</td>
</tr>
</tbody>
</table>

**Education level of the mother**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>( X^2 )</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary or below</td>
<td>4</td>
<td>8.0%</td>
<td>46</td>
<td>92.0%</td>
</tr>
<tr>
<td>High school</td>
<td>4</td>
<td>5.3%</td>
<td>72</td>
<td>94.7%</td>
</tr>
<tr>
<td>University or above</td>
<td>24</td>
<td>13.0%</td>
<td>160</td>
<td>87.0%</td>
</tr>
</tbody>
</table>

The table illustrates that the frequency of smokers among students whom fathers are smokers (13%) is higher than those whom fathers are non-smokers (9%), however, this difference is not statistically significant. Meanwhile, it was observed that frequency was significantly \( p<0.05 \) higher among those whom mothers are smokers (29.2%), with a relative risk (RR=3.334; 95% CI= 1.612-6.905). On
the same line it was noted that the frequency of smokers was higher among students whom brothers or sisters are smokers (14.3%) if compared to those who aren’t (7.6%), however, it is not statistically significant (p>0.05).

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Smoking status of the students</th>
<th></th>
<th></th>
<th>X²</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>1 very low</td>
<td>0</td>
<td>.0%</td>
<td>2</td>
<td>.7%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>9.4%</td>
<td>5</td>
<td>1.8%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>53.1%</td>
<td>141</td>
<td>50.7%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>21.9%</td>
<td>94</td>
<td>33.8%</td>
<td></td>
</tr>
<tr>
<td>5 very high</td>
<td>5</td>
<td>15.6%</td>
<td>36</td>
<td>12.9%</td>
<td></td>
</tr>
</tbody>
</table>

The table describes the self-reported ranking of the students for their insight religious beliefs and their smoking status. It was found that slightly more than one-half of the smoker students (53.1%) expressed that their religious beliefs can be ranked as three out of five, which means almost intermediate level of belief. On the other hand, it was realized that 15.6% of the smokers expressed their religious beliefs as very high. Overall, it was remarked that the percentages were almost close between the smokers and non-smokers.

8. Discussion

Prevention of tobacco smoking amongst youths and young adult could limit deaths because of illness related to tobacco, (24) and assessment of the pattern of the problem is crucial for planning of preventive programs. The current study aimed at exploring the magnitude of smoking habits and its associated risk factors among female medical students at King Abdul Aziz University in the academic year 2009/2010. The results showed that 32(10.3%) of the respondents were currently smokers, this percentage is much lower than what was found among female medical students at Greece (35%), (25) Chile (26%),(26) Germany (22.1%),(4) Spain (22%),(27) Rawalpindi (23.3%),(28)

However, the prevalence of smokers among our female medical students was higher than their counterparts in Jordan (7%), (29)

These studies adopted the same tool of study, as is the case in our study, which is represented by a self-administered questionnaire. This tool inherits some limitations related to the tendency of some smokers to hide their smoking status especially among those who are belonging to health sectors, as they have insight perception that this habit is definitely against their profession. Therefore, it is assumed that the reported percentage of smokers is
lower than the real one. However, in a study conducted in Austria which overcame this limitation through assessing the smoking status among medical students through measurement of the exhaled Carbon Monoxide revealed that 12% were definitely current smokers, in addition to 10% who showed a borderline level of CO which indicate that they might be smokers.(8)

On the other hand a much lower percentage was recorded among medical students in Hong Kong, where it was found that only 7.2% ever smoked and 0.7% who were currently smokers.(30) Almost same percentage was reported among female medical students in Pakistan (1.7%).(31) This significantly lower percentage, according to the authors’ opinion, was attributed to notion that the great majority of the students had positive attitudes towards tobacco control. This explanation could partially be applied on our students where it was found that almost all nonsmokers strongly agree that smoking is harmful for health compared to only 68.8% of the smokers. This explanation is supported by what was found in Jordanian study, which revealed that smokers are less likely to believe that smoking is wrong. (29)

It is expected that the percentage of smokers increase with age due to addition of new smokers in an arte higher than those who quit. In Yemen, the percentage of smokers among medical students increased from 20% among those in the first year to 40% among fifth year students, (32). A substantially lower trend was observed among our students where it was found that the percentage increased by only 2% from the first (10.5%) to the 6th academic year (12.3%). This discrepancy in the increment rates could be attributed to the differences in the general perception of the community from which the students are belonging about smoking, as it is well known that smoking and chewing khat plant are popular among different sectors of the community.

The results showed that the frequency of smokers was higher among students whom parents are smokers, however, only mothers who are smokers showed statistically significant difference p<0.05.

9. Conclusion

The current study aimed to assess the prevalence of smoking among female medical students and to elaborate the factors potentiating its initiation. It found that the prevalence of smoking among them (10.3%) is considerably high if we are talking about future female medical physicians.

The smoking status of the mothers found to be the strongest influencing significant factor associated with smoking status of the students.

29.2% of smoking mothers have smoking daughters with a P value of 0.002.

10. Recommendations

From the findings of the current study, we strongly recommended the following:

1. To establish Anti-smoking health education programs targeting the female medical students throughout their college time until their graduation.

2. Health education campaigns targeting the community in general and females who are either the current or the future mothers in specific about the impact of their smoking status on increasing the likelihood of smoking habit of their children.

3. Health education messages in the mass media tailored for mothers should be initiated and supported from the health and social sectors.

11. References


