PREVALENCE, KNOWLEDGE, ATTITUDE AND PRACTICE OF SHISHA SMOKING AMONG MEDICAL AND DENTAL STUDENTS OF KARACHI, PAKISTAN

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ABSTRACT

Objectives: To determine the prevalence of shisha smokers among medical and dental students of Karachi and assess their knowledge, attitude and practice regarding shisha, and the effect of discipline (medical/dental) and year of professional education with their responses.

Study design: Cross sectional, observational study.

Subjects and Methods: One thousand two hundred and four students from the six medical/dental colleges of Karachi participated in the study. The present study was conducted during April and May of the year 2007. The questionnaire consisted of personal questions like gender, field of study, name, and year of study; smoking habits, frequency and place of smoking, attitude and knowledge about diseases developed due to shisha smoking. Chi-square test was used to find relationship between independent variables i.e. field of study (medical/ dental), and year of study (1st, 2nd, 3rd, 4th and final year) with response variables.

Results: The mean age of the participants was 20.2±1.6 years. Two hundred and seventy three students (22.7%) indicated that they smoke shisha. One hundred and nineteen of the male students (41.2%) and 154 female students (16.8%) indicated positively for shisha smoking. Dental students showed 13% higher prevalence of shisha smoking than medical students ($p<0.0001$). Eighty percent of respondents selected either restaurants or 'shisha bar' for the place of smoking. Sixty four percent of the respondents were influenced by their friends to adopt this habit. Eighty one percent of the respondents admitted that shisha smoking was harmful. Twenty eight percent of the respondents believed an association between shisha smoking and cancer, and about a quarter related it with heart diseases. Thirty eight percent of the shisha smokers were also involved in cigarette smoking.

Conclusions: High prevalence of shisha smoking was observed among medical and dental students. However, most of them had adopted this habit as leisure and for socialization. The awareness about the health hazards due to shisha smoking is needed as an intervention to extricate them from this habit.

Key Words: Shisha, smoking, medical, dental, students, tobacco consumption

INTRODUCTION

Smoking in any form is a known health hazard being responsible for cardiovascular diseases, lung cancer, chronic bronchitis, and respiratory diseases[1-6]. However, the hazards due to the consumption of tobacco with methods other than cigarette did not get much attention. 'Shisha', (Figure 1) also known as 'Hubble-bubble', 'hookah', 'goza' or 'narghile', is one of the other ways of tobacco consumption. This habit, which was traditionally confined to older men in the Indian sub-continent and Arab countries, is now spreading to other groups. There is a misguided opinion of this being not as dangerous as cigarette smoking, because of the purported filtering effect of water through which the smoke passes before it is inhaled. Shisha is flourishing in restaurants and coffee shops in Middle Eastern Countries[7]. Young educated community including women is commonly using this method of smoking[8].

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Figure 1: The Shisha device.

Shisha is a device using water pipe to smoke *Jurak or moasela,* a dark colored paste, produced in Indian sub-continent by mixing tobacco, pulpy fruit (e.g. banana) and molasses. This mixture is burned by an electric device or more commonly by charcoal. Jurak smoke has a pleasant, fruity odor. Fifteen minutes smoking of Juruk would provide approximately the same amount of tobacco smoke as one cigarette[9]. Global Youth Tobacco Survey (GYTS) reported that 10% of youths of 13-15 years of age of five Arab countries were using tobacco products other than cigarettes; most likely shisha[10]. Rice[11] indicated that 26.6% of Arab Americans smoke shisha.

Health hazards of shisha smoking are discussed in different studies. Sajid[12] showed that hazard of carbon monoxide in shisha smoking was as high as with cigarette smoking. Sukumar[13] found that the shisha smoking was associated with increased level of cadmium in hair and nails of both men and women of rural areas. Sulaiman[14] showed that total ambulatory activity of exposed-to-shisha-smoke pregnant rates was 21.1%, lower than that of matched control. Hence prenatal exposure to shisha smoke lowers the response of offspring to novel environment stimuli. Literature also indicates that shisha smoker is exposed to include interference with oxidation, damage to genetic compounds, increased risk of developing malignancies, infectious diseases, damage to fetus and newborn[15,16]. Therefore, shisha is a serious health hazard.

In Pakistan, the information regarding shisha smoking is scarce and that is a hindrance in effective intervention. Only few studies were conducted to determine general smoking pattern to the selected areas and specific population groups[17-20]. Therefore, to know a knowledgeable base related to shisha smokers is an important factor for the tobacco control scientists in Pakistan. It is not only important to know the health hazards of shisha smoking for prevention and treatment efforts, it is also essential to know the prevalence and social pressure on its user. Furthermore, few studies are conducted in Pakistan for prevalence of smoking habits among medical students[21-24]. But, none of them explicitly discussed the shisha smoking among this group of the population. This study, which was the first of its kind, as per authors' knowledge, was conducted to assess the knowledge, attitude and practice among medical and dental students of Karachi educational institutions.

The objectives of the study were to find the prevalence of shisha smokers among medical and dental students of Karachi and assess their knowledge, attitude and practice regarding shisha. The secondary objectives of the studywere to determine the effect of type of students (medical/dental) and year of professional education with other responses.

SUBJECTS AND METHODS

The present study was conducted during April and May of the year 2007. The number of medical and dental colleges, both in private and government sectors, in Karachi was 20 in 2007. Out of these 20 colleges, seven were conveniently chosen for the study. The permission from those medical/dental colleges was requested through proper channel. The Ethical Review Board of the investigators' institution has given the permission to conduct this study. One medical college refused to participate in the study. Three colleges were teaching medicine (Dow Medical College, Sindh Medical College and Aga Khan University) and 2 colleges were teaching dentistry (Dr. Ishrat-ul-Ibad Khan Institute of Oral Health Sciences and Fatimah Jinnah Dental College). One college had both medical and dental students (Karachi Medical and Dental College).

The study design was cross-sectional, based on self-administered questionnaire. One thousand two hundred and four students from the six medical/dental colleges participated in the study. The pre-tested questionnaires were distributed by the investigators during the class lecture. No student refused to return the questionnaire. The questionnaire consisted of personal questions like; gender, field of study (medical/dental), name of college and year of study; smoking habits (shisha, cigarette, pipe and cigar), frequency and place of smoking, attitude and knowledge about diseases developed due to shisha smoking.

The responses were entered into the computer using SPSS

program (ver. 10.0). Chi-square test was used to find relationship between independent variables; field of study (medical/ dental), and year of study (1st, 2nd, 3rd, 4th and final year) with response variables.

RESULTS

One thousand two hundred and four medical and dental students participated in this study. Nine hundred and seventy four students (80.9%) were from medical colleges and 230 students (19.1%) were from 3 dental colleges. Forty two percent respondents were from Dow Medical College, followed by 23.5% from Sindh Medical College and 15.8% from Karachi Medical and Dental College.

The participants from government institutions were 82.1%. The mean age of the participants was 20.2±1.6 years (R: 16-26 years). Female students constituted 75.8% of the total sample. Thirty-five percent respondents were studying in the first year of their medical/dental degree, which was followed by 3rd year students of 23.9% (Figure 2).

Two hundred seventy three students (22.7%) indicated that they smoke shisha. One hundred nineteen of the male students (41.2%) and 154 female students (16.8%) indicated positively for shisha smoking. The difference was statistically significant (p<0.001). About one-third (32.8%) of the respondents started smoking shisha at the age of 17-18 years.

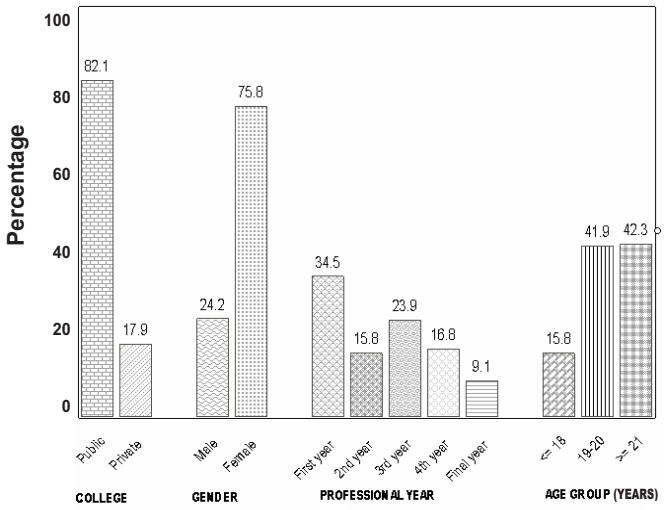

Figure 2: Percentage of respondents categorized by type of colleges, gender, professional year and age groups.

Table I shows the practice of smoking with students' type (medical/dental) and professional year of studies. Dental students showed 13% higher prevalence of shisha smoking than medical students (p<0.0001). There was a significant

Table I: Relationship of practice of shisha smoking with students' type and professional years

Question	Students			Professional Year						Total
	Medical	Dental	p-value	1st Year	2nd Year	3rd Year	4th Year	Final Year	p-value	
Do you smoke shisha	196 (20.2)	77 (33.5)	<0.001	100 (24.2)	45 (25.5)	63 (21.9)	44 (21.8)	18 (16.5)	0.414	273(22.7)
Age when started shisha smoking										
<14	23.1	17.3		21.5	19.6	22.0	15.9	35.3		55 (21.2)
15-16	12.6	13.3	0.058	18.3	10.9	11.9	6.8	5.9	<0.0001	33 (12.7)
17-18	28.6	42.7		45.2	43.5	22.0	20.5	5.9		85 (32.8)
19-20	23.6	24.0		10.8	23.9	35.6	38.6	17.6		62 (23.9)
>20	12.1	2.7		4.3	2.2	8.5	18.2	35.3		24 (9.3)
How often do you smoke?										
Daily	21.7	18.2		23.4	12.8	29.3	11.9	7.6		53 (20.5)
Weekly	11.1	23.4	0.054	14.9	19.1	8.6	21.4	5.9	0.448	38 (14.7)
Monthly	27.8	29.9		26.6	27.7	25.9	35.7	29.4		73 (28.3)
Others	39.4	28.6		35.1	40.1	36.2	31.0	47.1		94 (36.4)
Average duration of one session										
15 minutes	29.1	23.7		31.9	32.6	18.2	30.2	17.6		70 (27.8)
16-30 minutes	18.3	18.4		13.2	17.4	25.5	16.3	29.4		46 (18.3)
31-45 minutes	18.9	14.5	0.561	15.4	19.6	21.8	16.3	11.8	0.550	44 (17.5)
40-60 minutes	17.7	19.7		17.6	13.0	20.0	25.6	11.8		46 (18.3)
> 60 minutes	16.0	23.7		22.0	17.4	14.5	11.6	29.4		46 (18.3)
where do you smoke mostly?										
Restaurant	35.6	27.6		32.6	38.3	22.8	39.5	41.2		85 (33.2)
Shisha Bar	46.7	50.0		42.4	42.6	61.4	44.2	52.9		122 (47.7)
Home	11.1	17.1	0.425	15.2	12.8)	10.5	14.0	5.9	0.470	33 (12.9
Others	6.7	5.3		9.8	6.4	5.3	2.3	0.0		16 (6.3)

Table II: Relationship of knowledge and reasons of shisha smoking with students' field of study and year

Question	Students percentage			Professional Year						Total
	Medical	Dental	p-value	1st Year	2nd Year	3rd Year	4th Year	Final Year	p-value	
Who influenced you for shisha smoking?										
Friends	58.7	76.6	0.006	65.0	62.5	52.4	75.0	72.2	0.159	174 (63.7)
Fashion	27.6	22.1	0.354	21.0	25.0	39.7	22.7	16.7	0.075	71 (26.0)
Family Members	11.2	13.0	0.684	11.0	8.3	12.7	9.1	27.8	0.247	32 (11.7)
Media	5.1	6.5	0.650	10.0	2.1	1.6	2.3	11.1	0.066	15 (5.5)
Believe shisha smoking harmful	83.8	70.9	<0.0001	79.5	79.6	80.4	83.7	87.9	0.390	714 (81.2)
Harmful effect associated with shisha smoking										
Lung Diseases	62.4	60.4	0.576	59.5	72.6	60.1	55.4	70.6	0.001	747 (62.0)
Cancer	20.8	28.7	0.840	22.7	27.9	29.5	29.7	43.1	0.001	339 (28.2)
Heart Diseases	23.4	26.5	0.320	18.1	23.7	24.7	25.7	42.2	<0.0001	289 (24.0)
Eczema	8.2	12.6	0.037	8.9	6.3	5.9	13.4	14.7	0.007	109 (9.1)
None	6.5	13.9	<0.0001	7.7	10.0	10.1	5.4	3.7	0.116	95 (7.9)
Disease that can be caused by shisha smoking										
Tuberculosis	28.3	36.1	0.021	27.0	39.5	30.9	23.3	33.0	0.005	359 (29.8)
Herpes	9.1	22.2	<0.0001	6.0	10.0	12.8	19.3	18.3	<0.0001	140 (11.6)
Hepatitis	16.3	26.5	<0.0001	18.6	20.0	19.1	16.3	15.6	0.816	220 (18.3)
None	7.8	11.3	0.086	8.4	8.4	11.5	5.0	7.3	0.151	102 (8.5)
Try to quit shisha smoking?	12.6	26.9	0.004	20.8	8.7	12.9	21.7	16.7	0.313	45 (16.8)
Symptom during shisha smoking										
Headache	22.4	45.5	<0.0001	6.0	9.5	7.6	5.4	5.5	0.445	79 (28.9)
Dizziness	23.0	36.4	0.024	6.0	5.8	5.2	7.9	6.4	0.807	73 (26.7)
Blurred Vision	10.2	15.6	0.214	3.4	2.6	3.5	1.5	0.9	0.439	32 (11.7)
Cough	26.0	24.7	0.819	7.0	5.8	5.6	5.0	6.4	0.871	70 (25.6)
Palpitation	9.2	14.3	0.218	1.7	3.2	3.5	3.0	0.9	0.420	29 (10.6)
None	32.7	31.2	0.813	8.7	7.4	7.3	8.4	4.6	0.685	88 (32.2)
Recommend shisha to other people	32.3	38.5	0.229	33.5	36.8	38.8	26.3	28.9	0.406	152 (62.6)

relationship between age-group of starting of shisha smoking and professional year (p<0.0001). Majority of final year students started shisha smoking either before 14 years of age or after 20 years, which was in opposite trend compared to the first to the third year's students. Majority of the students did not smoke shisha 'daily' or 'weekly'. More than one-fourth (27.8%) of the respondents indicated that they smoke for not more than 15 minutes in each session. There was no significant relationship between duration of smoking with students' field or professional year (p>0.05). Eighty percent of respondents chose either restaurants or 'shisha bars' for shisha smoking. There was no significant difference of smoking place with students' field or professional years (p>0.05).

Table II states the knowledge and reasons of shisha smoking with students' type and professional years. Sixty four percent of respondents indicated that they were influenced by friends to adopt this habit. Dental students were influenced more by the friends than the medical students to acquire this habit (p=0.006). Other than this, the remaining influencing factors, like: fashion, family members and media did not show any significant effect on student type and professional years (p>0.05). Eighty one percent of the respondents admitted that shisha smoking was harmful. Medical students indicated significantly higher percentage than the dental students for the negative effects of shisha smoking (p<0.0001). Second and final years' students showed significantly higher percentages than other students for indicating relationship between shisha smoking and lung diseases (p=0.001). Twenty eight percent of respondents indicated that there is an association between shisha smoking and cancer, and about a quarter related it with the heart diseases. Final year students indicated significantly higher percentage than other students (p<0.001) for relating these diseases with shisha smoking. The students of 2nd year indicated significantly lower percentage for shisha smoking as a risk factor for tuberculosis than 4th year students(p = 0.005). Dental students showed significantly higher percentage than medical students of indicating the relationship of these diseases with shisha smoking (p<0.05). About 17% of the respondents mentioned that they had tried to quit this habit. The percentage of dental students who tried to quit this habit was almost double the medical students (p = 0.004). Twenty five to twenty nine percent of the shisha smokers experienced headache, dizziness and coughing during the smoking session.

Table III: Relationship of shisha smoking with other smoking habits

Question	Students percentage			Percentage distribution of Professional Year						Total
	Medical	Dental	p-value	1st Year	2nd Year	3rd Year	4th Year	Final Year	p-value	
Tobacco use in any other form										
Cigarette	35.7	42.9	0.273	43.0	25.0	36.5	45.5	27.8	0.171	103 (37.7)
Pipe	6.6	13.0	0.089	10.0	4.2	9.5	4.5	16.7	0.407	23 (8.4)
Cigar	7.1	20.8	0.001	14.0	6.3	11.1	6.8	16.7	0.492	30 (11.0)
Other	5.6	6.5	0.780	6.0	0.0	11.1	2.3	11.1	0.089	16 (5.9)
what do you smoke more?										
Cigarette	37.6	42.2	0.532	45.5	32.3	32.7	47.1	21.4	0.238	80 (39.0)
Shisha	62.4	57.8		54.5	67.7	67.3	52.9	78.6		125 (61.0)
More harmful than cigarette smoking	32.5	28.9	0.577	32.0	27.7	27.4	37.2	38.9)	0.751	84 (31.5)

Significantly higher percentage of dental students suffered headache and dizziness than the medical students ($p<0.05$). Eleven percent of the respondents admitted that they encountered blurred vision and palpitation during shisha smoking. About 63% of the smokers indicated that they would recommend other people for shisha smoking. There was no significant difference of this response either among medical and dental students or professional year.

Table III states the shisha smoking along with cigarette smoking. Thirty eight percent of the shisha smokers were also involved in cigarette smoking. Pipe, cigar and other form of tobacco smoking were practiced by 8.4%, 11% and 5.9% of the shisha smokers, respectively. Sixty two percent shisha smokers prefer shisha over cigarette. Sixty nine percent of shisha smokers indicated that shisha is not as harmful as cigarette. There was no significant difference among students' type or professional year regarding this response.

DISCUSSION

Due to scarcity of data which could describe different aspects of this potentially major health problem in Pakistan, this study presents information regarding the prevalence, knowledge and practice of shisha smoking among medical and dental students in Pakistan. The prevalence of shisha smoking and the relationship of knowledge, attitude and practice with field of study (dental/medical) and year of study among university students in Karachi were studied. The significance of the study lies in relatively high proportion of this highly respected group of students indulged in shisha smoking.

The total prevalence of shisha smoking was about 23%, with 41.2% male and 16.8% female. These figures showed similar prevalence as the other studies reported from Middle Eastern countries. A study in Syrian university students showed the prevalence of ever smokers of shisha was 45.3%, with males and females percentage was 62.6% and 29.8%, respectively[7]. A study at Beirut University students showed prevalence of 32.4% for current shisha smokers[25]. Another study from Beirut university students [26] showed shisha smoking at 43%. The present results indicate a noteworthy increase in shisha smoking among the well educated youths of Pakistan. Previously this practice was mainly concentrated among lower middle class population of Pakistan[20,27], until recent past. As cigarette smoking is more predominant among the male population of Pakistan[28], shisha smoking also showed higher prevalence of two and a half time among male than female students. Furthermore, the percentage of female smokers in this study was almost two and half times more than the prevalence of smoking indicated among females of Pakistan in the National Health Survey[28].

Significantly higher prevalence of shisha smoking among dental students could be due to more free time available to those students.

Eighty-eight percent of respondents of this study indicated of initiating the shisha smoking before 20 years of age. Syrian students showed some what higher mean age[7] than the students of current study. Daily smokers among the shisha smokers in this study were 20.5%. This figure was marked higher than the university students of Syria, where this prevalence rate was about 5 to 6%[7,29]. However, more than one-third of the smokers were not regular smokers. It shows that a large number of smokers smoke shisha occasionally. This result agrees with the figure of Syrian students; where most of them smoke shisha occasionally[7]. This opinion is further strengthened with the other result of this study, which showed that more than one-third of reported smokers spent less than 30 minutes during one session of smoking. The initiation age, frequency or intensity of smoking was insignificant

among the type of professional students (medical/dental) or year of studies. Therefore, the practice among the students was the same, irrespective of education type or year of studies. Maziak et al[7] also showed that year of study (first year vs. advanced) and field of study (Health, Science and Art) do not have any significant effect in the prevalence of shisha smoking.

Eight out of the ten smokers, smoke shisha at the restaurant or shisha bar, without any significant difference among field of studies (medical/dental) or year of studies. About ninety percent of the respondents of this study claimed that they had initiated the shisha smoking due to the influence of friends or social pressure of the fashion. This percentage is close to a Syrian study[29] where they found that 80% of student shisha smokers initiated this habit with friends. All these results indicate that shisha smoking among this group of population is mostly for socialization without getting any regular smoking habits. These outcomes are similar to the Syrian university students, as Maziak et al.[7] mentioned that the seasonal pattern of narghile smoking related to outdoor leisure time and socialization with peers emphasizes the predominance of the social pattern of this smoking method. Even though we have found a high prevalence of shisha smoking in this study, majority of the respondents (81%) knew that shisha is harmful for the health. However, most of them could not relate it to cancer, heart disease, eczema, tuberculosis, herpes or hepatitis. Lung diseases were the only health hazard which was indicated by 62% of the respondents. Afsar et al.[29] also showed that 47.7% of Syrian students have related the shisha smoking with respiratory diseases. More than quarter of smokers experienced headache, dizziness and cough during shisha smoking. It is worth observing that even though most of the shisha smokers were not habitual and adopted this habit occasionally, many of them reported such health related problems. Nevertheless, with all these negative effects they have experienced, and the health hazards knowledge about the of shisha smoking, two out of three smokers indicated to recommend shisha to the other people.

More than one third of shisha smokers (37.7%) also smoke cigarette. However, 69% of them thought that cigarette is more harmful than shisha smoking. This figure of shisha smokers who also smoke cigarette is almost the same as reported by Maziak et al[7] (37.6%) in Syrian students.

The Government of Pakistan Ordinance of 'Prohibition of Smoking in Enclosed Places and Protection of Non-smokers Health, 2002'[30] promulgates that no person shall smoke or use tobacco in any place of public work or use, includes: restaurants, eating houses, hotel lounges and places which are visited by general public. It also says that any person, who contravenes the provisions, shall be punished by fines. All the cafes and restaurants that are providing shisha smoking services to their customers are clearly violating the above Presidential Ordinance.

This study timely provides insight of the prevalence and KAP of the use of this habit among the much respected professional group of students. This smoking habit is rapidly increasing in Pakistan as a fashion and a way of socialization among well-off and upper middle class of young generation. Therefore, shisha smoking has different social, temporal and spatial patterns than cigarette smoking. These factors indicate further in-depth investigation for a conceptual model that includes those variables which are considered as tobacco addiction and dependence. Clinical and social interventions should be organized keeping in mind the distinction between toxic and addictive behavior of shisha smoking compared to cigarette smoking. The curriculum in medical and dental colleges should include the health hazards knowledge of shisha smoking. Further epidemiological and clinical studies are needed to grasp the health hazards and social effects of this newly developed way of socialization in Pakistani society.

CONCLUSIONS

High prevalence (23.7%) of shisha smoking was observed among medical and dental students. Two and a half times more females were indulged in this habit as compared to the national data of female smokers. More than 80% of shisha smokers used shisha bar or restaurants for smoking. About 85% of respondents started this habit due to fashion and friends. Awareness of the health hazards is needed as an intervention to extricate them from this habit.

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Authorship Entitlement

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