



Knowledge and Behaviour of Physicians and Surgeons Regarding Shisha Smoking

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Authors' contributions

This work was carried out in collaboration between all authors. Author AK designed the study, wrote the protocol and supervised data collection. Author MM managed the literature searches and wrote the drafts of the manuscript. Author NH participated in the literature searches and the data analyses. Authors ZAN and BS managed data collection, entry into SPSS and analyses. Author NR supervised the whole study including data analyses and guided the development of the questionnaire.

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ABSTRACT

Background: The aim of the study was to determine the prevalence, knowledge, attitude and practices of shisha (waterpipe) smoking among physicians and surgeons in five main cities of Pakistan. Shisha smoking is becoming more popular in Pakistan, and as medical doctors (both physicians and surgeons) serve as role models for healthy behavior, they can greatly influence shisha use in public by the example they set, and by the education that they provide to their patients.

Objective: To investigate and compare the knowledge, attitudes, and practices of shisha smoking among physicians and surgeons in Pakistan.

Materials and Methods: A cross-sectional study was done in five major public medical universities of Pakistan. A self-administered questionnaire was used with some modification.

Results: Out of 1000 distributed questionnaires, 786 doctors responded of which 51.4% were physicians and 48.6% were surgeons. Even though the vast majority (99%) of doctors agreed that

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shisha smoking is detrimental to health, almost 20% of surgeons and 13% of physicians reported using shisha daily. More physicians than surgeons had never used shisha, and more physicians were willing to quit, with the difference achieving statistical significance. The knowledge about shisha smoking was not uniform amongst the doctors, with physicians demonstrating significantly more knowledge as outlined in three areas (smoking causing increased risk of Sudden Infant Death Syndrome [SIDS], lung and heart disease). More physicians than surgeons agreed that doctors who use shisha are less likely to advise people against it; they also agreed that doctors should get training on cessation techniques. The majority of participants agreed that doctors are role models for patients. More physicians thought that smoking should be banned in public places and that tobacco sale to children and adolescents should also be banned. More surgeons than physicians agreed that shisha use is socially more acceptable than cigarette smoking. It was also noted that for the majority of doctors, there is no workplace policy in place regarding smoking.

Conclusion: Social and recreational use of shisha is widespread among both physicians and surgeons (slightly higher among surgeons), despite being acknowledged by the majority as a health hazard. This is of concern as doctors are role models for patients, and doctors who smoke shisha raise public skepticism. Keeping in mind the health complications of this social practice, appropriate counter measures should be taken.

Keywords: Shisha; tobacco products; physicians; surgeons; doctors.

1. INTRODUCTION

The tobacco epidemic receives striking attention around the world. It is estimated that up to 10 million people will die annually by the year 2030 due to tobacco-related causes [1]. The prevalence of tobacco intake in Pakistan is high, reaching upto 33% among middle aged males [2]. While most of the research has focused on cigarettes, the increasing popularity of shisha has received much less attention. Shisha smoking has become fashionable and is widely used in the Arab world [3-5], and even in Europe and the United States [4,6]. Shisha, or the water-pipe, also known as narghile, hookah, and hubble-bubble in different countries and cultures, is a form of tobacco intake in which the smoke passes through water before inhalation. It's origin from one historical account suggested that it was invented in India by a physician Hakim Abul Fath during the reign of Emperor Akbar as a less harmful method of tobacco use [7].

Even though several health hazards have been associated with water pipe smoking, the population at large has not yet fully understood the associated risks [4,6]. There exists a common belief in the general population that shisha smoking is less harmful than cigarette smoking, in particular because the water "filters" the smoke [8]. Shisha has a softer image with people, which can be attributed to its fruity flavours, making it more comfortable for females and younger individuals [9]. Another factor adding to the popularity of shisha smoking is its social acceptability as compared to cigarettes, and its portrayal as a symbol of modernization of

our cultural heritage [4]. Research however has proved that firstly, shisha is smoked over coal adding additional harmful toxins to the smoke, and the smoke inhaled is up to 200 times more in a single session as compared to cigarette smoke [10]. There is also a link to second-hand smoking due to its high social acceptance [11]. Shisha smoke contains carbon monoxide, nicotine, tar and heavy metals in equal amounts to cigarettes and thus, shisha smoking increases the risk of bronchogenic carcinoma as well as oral and bladder cancers [10]. A meta-analysis study also revealed that shisha smoking is significantly associated with lung cancer, respiratory illness, low birth-weight and periodontal disease [12]. Moreover, shisha smoke increases heart rate, decreases pulmonary function and is associated with markers of atherosclerosis, as well as an increased risk of coronary heart disease [13]. The smoke from shisha, besides other toxic elements, contains hundreds of potentially dangerous heavy metals like, arsenic, cobalt, chromium and lead [14].

Shisha smoking has become popular in Pakistan, is now a regular feature at restaurants, cafes and other public places, has developed social acceptability, and may surpass cigarette smoking in terms of addiction [11]. Previous research exploring trends in shisha smoking in Pakistan have mostly focused on the southern city of Karachi [15]. One study cited 22.7% of medical students at six medical and dental schools in Karachi as active shisha smokers [16]. Another study conducted on medical practitioners revealed that 29.5% have used shisha at some point in their life, and there was a significant lack

of knowledge regarding the hazards of shisha smoking [17]. A survey conducted on medical house-officers in Karachi showed that 32% of all male doctors are regular smokers [18]. In 2005, the WHO advisory panel on shisha smoking pioneered in putting forth a set of recommendations to help countries to plan strategies against this practice [19]. It was strongly recommended that shisha should be subjected to the same regulations as cigarette and other tobacco products. Unfortunately, Pakistan failed to implement any of those recommendations [20]. As such, there is no data on the prevalence of shisha use among the general population in Pakistan, so there is an information gap in this area. Most of the studies have concentrated on university students or doctors.

It is very important to evaluate the knowledge, attitude and practices of doctors regarding shisha use, so that areas can be identified which need to be targeted for educating them. Doctors are role models in society, and can play a crucial part in clearing misconceptions about shisha use, as well as in facilitating prevention and cessation of use among the community. We conducted this survey in five major cities of Pakistan to assess the knowledge, attitude and practices of medical doctors regarding the use of shisha, in order to ascertain areas where tangible steps can be taken towards reducing shisha use in the community.

2. METHODS

This cross-sectional study was carried out in 2015 amongst physicians and surgeons working in five hospitals in four major metropolitan cities of Pakistan: Karachi, Lahore, Islamabad and Quetta. The hospitals where the study was conducted were: Civil Hospital and Jinnah Post-graduate Medical Centre in Karachi, Mayo Hospital in Lahore, Pakistan Institute of Medical Sciences in Islamabad, and Sandeman Provincial Hospital in Quetta. These cities are also provincial capitals while Islamabad is the federal capital of Pakistan. Convenience sampling of medical doctors from the five hospitals was done. All doctors who had started or completed their postgraduate training were included so that their line of practice (Medicine or Surgery) was already established. Exclusion criteria included doctors who had not yet entered into a post-graduation training program. A self-administered questionnaire was developed after studying the current literature. The validity of the questionnaire was checked by pre-testing the

original questionnaire on ten medical practitioners and then applying the same with modifications. The results obtained were comparable, thus comparing the validity of the modified version [17]. The study was approved by the Ethics Committee of the Chest Health and Education Society, which is a registered society of Pakistan with more than 400 chest physicians from all over the country. It has its own research unit to facilitate research work in Pulmonary Medicine.

The information on individual doctors was kept confidential. Informed consent was obtained from all participants prior to voluntary participation. The questionnaire was administered at the doctors' workplace, where they were given 20 minutes to fill out the questionnaire. The investigators of the study were responsible for administering and collecting questionnaires from each class. The questionnaire had 41 items in total, and the questionnaire was divided into three parts. The first part inquired about socio-demographic data, age at initiation of smoking, and the frequency of shisha use for smoking. The remainder of the questionnaire focused on the knowledge, attitude and practices of doctors regarding shisha smoking and associated hazards, and the respondents were asked whether they "agree, were unsure, or disagree" with the different statements used. The knowledge section included questions related to the morbidity associated with shisha use, including its link with an increased risk of pulmonary and cardiac disease, as well as increased risk of neonatal death and SIDS with maternal shisha use. The attitude section had questions regarding doctors being role models for patients, and their role in helping patients quit smoking, as well as questions asking if smoking should be banned in public places, the enforcement of bans on the advertisement of tobacco products and the sale of tobacco products to adolescents. It also inquired if shisha smoking is socially more acceptable than cigarette smoking. The practice section had questions on smoke-free policies at the workplace, and the use of self-help materials, counselling, medications and traditional remedies to help patients quit smoking. The different parts of the questionnaire are outlined in detail in the tables in the "Results" section.

2.1 Statistical Analysis

The sample size was calculated using the formula for calculating the sample of a prevalence study, taking the prevalence as 50%,

degree of error as 5%, and confidence interval as 95%. The sample size was inflated to 20%, taking into consideration wastage and non-response. Nominal variables such as gender and position were presented as frequencies and percentages. The Chi-square test was used to establish if significant associations existed between physicians and surgeons and the study variables. A p-value of < 0.05 was considered statistically significant. The results were analysed on SPSS version 21.

3. RESULTS

Out of 1000 distributed performas, 786 doctors responded with a response rate of 78.6%. Of these respondents, 404 were surgeons and 382 were physicians. Gender distribution is summarized in Fig. 1.

It was noted that 81.7% of surgeons and 82.7% of physicians worked in the public sector, whereas 18.3% of surgeons and 17.3% of

physicians worked in the private sector (p-value=0.703).

The age distribution is summarized in Table 1.

Shisha smoking was reported in 33% of surgeons and 24% of physicians, and the difference was not statistically significant difference (p= 0.078). There was no statistically significant difference between doctors in the age at which they started smoking, the number of cigarettes smoked per day, the duration of shisha use, or if they had tried quitting for a week. However, more physicians than surgeons had never used shisha (p<0.001), and more physicians were willing to quit, with the difference achieving statistical significance (p = 0.002).

Details of smoking behaviour are shown in Table 2 and Table 3 and future plans of smoking cessation are shown in Table 4. "Occasionally" was defined as smoking shisha socially and with friends in shisha cafes and restaurants.

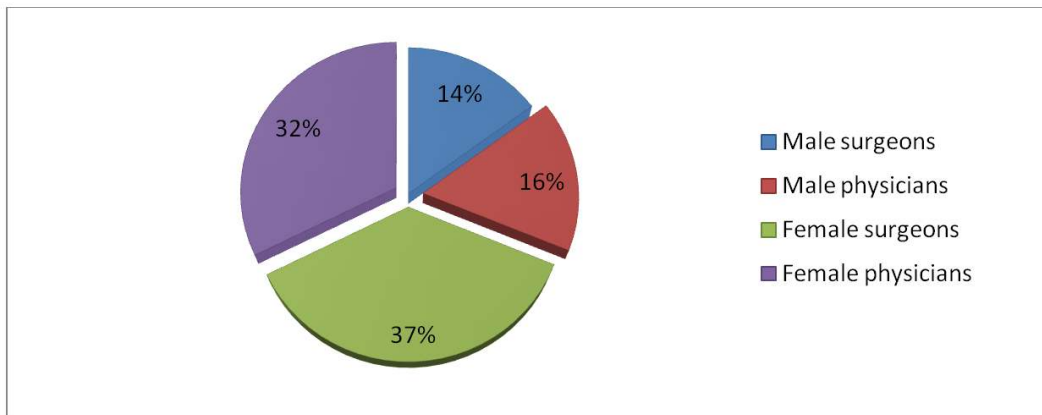


Fig. 1. Gender distribution of study participants

Table 1. Age distribution of participants (Total: 786)

	Surgeons n (n%)	Physicians n (n%)	P value
Age 20-30 yrs	220 (27.9%)	125 (15.9%)	<0.001
Age 31-40 yrs	86 (10.9%)	155 (19.7%)	
Age 41-50 yrs	70 (8.9%)	52 (6.6%)	
Age > 50 yrs	25 (3.1%)	53 (6.7%)	

Table 2. Smoking practices in doctors

Smoking behaviour	Surgeons n (n%)	Physicians n (n%)	P value
1 Never smoked shisha	182 (46.7%)	231 (61.1%)	<0.001
2 Quit smoking totally	18 (4.6%)	24 (6.3%)	
4 Smoke both shisha and cigarettes occasionally	86 (22.0%)	63 (16.6%)	
5 Smoke only shisha occasionally	28 (7.2%)	12 (3.2%)	
6 Smoke shisha daily	76 (19.5%)	48 (12.7%)	
Total	390 (100%)	378 (100%)	

The results of the questions asked to assess the participants' knowledge regarding the hazards of shisha smoking are shown in Table 5. Overall, the knowledge regarding shisha smoking was not uniform amongst the doctors, with physicians demonstrating significantly more knowledge as outlined in three areas (smoking causing increased risk of SIDS, lung and heart disease). Overall, 99% of medical practitioners agreed that shisha smoking is detrimental for health ($p=0.687$).

The results of assessment of doctors' perception and practices towards shisha smoking are shown in Table 6 and 7, respectively. More physicians than surgeons agreed that health professionals who use shisha are less likely to advise people against it, that they should get training on cessation techniques ($p=0.000$ and 0.006 , respectively). More physicians thought that smoking should be banned in public places ($p=0.004$), and that tobacco sales to children and

adolescents should be banned ($p=0.000$). More surgeons than physicians agreed that shisha use is socially more acceptable than cigarette smoking ($p=0.005$). The majority of doctors endorsed taking steps to decrease the prevalence of smoking. This included measures such as doctors routinely asking their patients about their smoking habits, and routinely advising their smoking patients to quit smoking, with surgeons being in the majority ($p=0.001$ and $p=0.003$, respectively). There was no smoke-free policy in force at the work place for the majority of doctors (49.5%), and even if such a policy did exist, it was not enforced for the majority (53.2%). The majority of doctors used counselling rather than medications to help their patients stop smoking (77.0%). For the majority, self-help material and traditional remedies were not available to help patients stop smoking (71.6% and 82.4%, respectively). Statistically significant results of the parameters with difference in knowledge are displayed in Fig. 2.

Table 3. Number of hours of shisha smoked per day

Number of hours of shisha smoked per day		Surgeons (n) (n%)	Physicians n (n%)	P value
1	Less than one hour	50 (67.6%)	25 (71.5%)	0.026
2	More than two hours	24 (32.4%)	10 (28.5%)	
		74 (100%)	35 (100%)	

Table 4. Intention to quit shisha (and tobacco) smoking

Intention to quit smoking		Surgeons n (n%)	Physicians n (n%)	P value
1	Not ready to quit within next six months	100 (54.6%)	53 (46.9%)	0.002
2	Thinking about quitting within six months	61 (33.3%)	28 (24.8%)	
3	Ready to quit now	22 (12.0%)	32 (28.3%)	
	Total	183 (100%)	113 (100%)	

Table 5. The knowledge of doctors regarding the health hazards of shisha smoking

Knowledge parameter		Response	Surgeons (n) (n%)	Physicians (n) (n%)	P – value
1	Shisha smoking is harmful for health	Agree	399 (99.0%)	380 (99.2%)	0.687
		Unsure	4 (1.0%)	2 (0.5%)	
		Disagree	0	0	
2	Neonatal death is associated with passive shisha exposure	Agree	269 (66.6%)	284 (74.3%)	0.059
		Unsure	109 (27.0%)	79 (20.7%)	
		Disagree	26 (6.4%)	19 (5.0%)	
3	Maternal shisha use during pregnancy increases the risk of Sudden Infant Death Syndrome (SIDS)	Agree	285 (70.5%)	309 (80.9%)	0.003
		Unsure	109 (27.0%)	67 (17.5%)	
		Disagree	10 (2.5%)	6 (1.6%)	
4	Passive shisha smoking increases the risk of lung disease	Agree	272 (67.3%)	310 (81.2%)	<0.001
		Unsure	108 (26.7%)	68 (17.8%)	
		Disagree	22 (5.4%)	4 (1.0%)	
5	Passive shisha smoking increases the risk of heart disease	Agree	260 (64.4%)	299 (78.3%)	<0.001
		Unsure	116 (28.7%)	69 (18.1%)	
		Disagree	28 (6.9%)	14 (3.7%)	
6	Paternal shisha smoking increases the risk of pneumonia in children	Agree	297 (73.5%)	307 (80.4%)	0.075
		Unsure	85 (21.0%)	60 (15.7%)	
		Disagree	22 (5.4%)	15 (3.9%)	

Table 6. Attitude of doctors towards different aspects of shisha smoking

	Attitude parameter	Response	Surgeons (n) (n%)	Physicians (n) (n%)	P - value
1	Doctors serve as role models for their patients and the public	Agree	364 (90.1%)	352 (92.1%)	0.180
		Unsure	22 (5.4%)	22 (5.8%)	
		Disagree	18 (4.5%)	8 (2.1%)	
2	Doctors should set a good example by not smoking shisha	Agree	364 (90.1%)	363 (95.0%)	0.031
		Unsure	28 (6.9%)	14 (3.7%)	
		Disagree	12 (3.0%)	5 (1.3%)	
3	Patients' chances of quitting shisha are increased if a doctor advises them to quit	Agree	326 (80.7%)	324 (84.8%)	0.023
		Unsure	54 (13.4%)	50 (13.1%)	
		Disagree	24 (5.9%)	8 (2.1%)	
4	Doctors who are smoke shisha are less likely to advise people against it	Agree	258 (63.9%)	287 (75.1%)	<0.001
		Unsure	80 (19.8%)	66 (17.3%)	
		Disagree	66 (16.3%)	29 (7.6%)	
5	Doctors should get special training on smoking cessation techniques	Agree	344 (85.1%)	352 (92.1%)	0.006
		Unsure	38 (9.4%)	16 (4.2%)	
		Disagree	22 (5.4%)	14 (3.7%)	
6	Health professionals should speak to community groups about shisha use	Agree	362 (89.6%)	353 (92.4%)	0.118
		Unsure	32 (7.9%)	17 (4.5%)	
		Disagree	10 (2.5%)	12 (3.1%)	
7	Smoking in enclosed public places should be prohibited	Agree	344 (85.1%)	354 (92.7%)	0.004
		Unsure	36 (8.9%)	16 (4.2%)	
		Disagree	24 (5.9%)	12 (3.1%)	
8	Tobacco sales to children and adolescents should be banned	Agree	354 (87.6%)	370 (96.9%)	<0.001
		Unsure	28 (6.9%)	6 (1.6%)	
		Disagree	22 (5.4%)	6 (1.6%)	
9	Doctors should routinely ask about their patients about their smoking habits	Agree	364 (90.1%)	360 (94.2%)	0.001
		Unsure	16 (4.0%)	18 (4.7%)	
		Disagree	24 (5.9%)	4 (1.0%)	
10	Doctors should routinely advise their patients to quit smoking.	Agree	360 (89.1%)	356 (93.2%)	0.003
		Unsure	22 (5.4%)	22 (5.8%)	
		Disagree	22 (5.4%)	4 (1.0%)	
11	Health warnings on cigarette packages should be in big print	Agree	330 (81.7%)	335 (87.7%)	0.041
		Unsure	40 (9.9%)	21 (5.5%)	
		Disagree	34 (8.4%)	26 (6.8%)	
12	Sports sponsorships by the tobacco industry should be banned	Agree	312 (77.2%)	315 (82.5%)	0.155
		Unsure	70 (17.3%)	48 (12.6%)	
		Disagree	22 (5.4%)	19 (5.0%)	
13	There should be a complete ban on the advertisement of tobacco products	Agree	316 (78.2%)	327 (85.6%)	0.014
		Unsure	68 (16.8%)	47 (12.3%)	
		Disagree	20 (5.0%)	8 (2.1%)	
14	Hospitals and health care centres should be smoke-free areas	Agree	374 (92.6%)	362 (94.8%)	0.276
		Unsure	20 (5.0%)	15 (3.9%)	
		Disagree	10 (2.5%)	4 (1.0%)	
15	The price of tobacco products should be increased sharply	Agree	294 (72.8%)	294 (77.0%)	0.004
		Unsure	50 (12.4%)	59 (15.4%)	
		Disagree	60 (14.9%)	29 (7.6%)	
16	Doctors should routinely advise patients who smoke to avoid smoking around children	Agree	360 (89.1%)	353 (92.4%)	0.132
		Unsure	32 (7.9%)	17 (4.5%)	
		Disagree	12 (3.0%)	12 (3.1%)	
17	Do you think shisha use is less harmful than cigarette smoking?	Agree	84 (20.8%)	87 (22.8%)	0.778
		Unsure	133 (32.9%)	120 (31.4%)	
		Disagree	187 (46.3%)	175 (45.8%)	
18	Do you think that shisha use is socially more acceptable than cigarette smoking?	Agree	120 (29.7%)	94 (24.6%)	0.005
		Unsure	143 (35.4%)	111 (29.1%)	
		Disagree	141 (34.9%)	177 (46.3%)	

Table 7. Doctors’ practices regarding the health hazards of shisha smoking

Practice parameter	Response	Surgeons (n)	Physicians (n) (n%)	P - value
1 What sort of smoke-free policy is in place at your workplace?	No policy	205 (50.7%)	184 (48.2%)	0.619
	Smoking room available	92 (22.8%)	85 (22.3%)	
	No smoking allowed	107 (26.5%)	113 (29.6%)	
2 Is the smoke-free policy enforced?	Yes	141 (35.1%)	138 (36.2%)	0.049
	No	209 (52.0%)	208 (54.5%)	
	Don't know	52 (12.9%)	36 (9.4%)	
3 Are traditional remedies available to help your patients stop smoking?	yes	74 (18.3%)	56(14.7%)	0.144
	no	324 (80.2%)	324 (84.8%)	
	unsure	6 (1.5%)	2 (0.5%)	
4 Is self-help material available to help your patients stop smoking?	yes	117 (29.0%)	106 (27.7%)	0.706
	no	287 (71.0%)	276 (72.3%)	
5 Are medicines available to help your patients?	yes	299 (74.0%)	282 (73.8%)	0.952
	no	105 (26.0%)	100 (26.2%)	
6 Do you use self-help material to help your patients stop smoking?	yes	115 (28.5%)	97 (25.4%)	0.332
	no	289 (71.5%)	285 (74.6%)	
7 Do you use counselling to help your patients stop smoking?	yes	315 (78%)	290 (75.9%)	0.494
	no	89 (22.0%)	92 (24.1%)	
8 Do you use medications to help your patients stop smoking?	Yes	134 (33.2%)	135 (35.3%)	0.272
	no	270 (66.8%)	247 (64.1%)	
9 How well-prepared do you feel you are when counselling patients on how to stop cigarette smoking?	Very well prepared	53 (13.1%)	42 (11.0%)	0.387
	Somewhat well-prepared	235 (58.2%)	235 (61.5%)	
	Not at all prepared	116 (28.7%)	105 (27.5%)	
10 Have you received any formal training in smoking cessation techniques with your patients?	Yes	82 (20.3%)	64 (16.8%)	0.202
	no	322 (79.7%)	318 (83.2%)	
11 Have you received any training in specialized programmes?	Yes	60 (14.9%)	67 (17.5%)	0.306
	No	344 (85.1%)	315 (82.5%)	
12 Have you received any training in conferences, symposia, workshops?	Yes	107 (26.5%)	121 (31.7%)	0.109
	no	297 (73.5%)	261 (68.3%)	

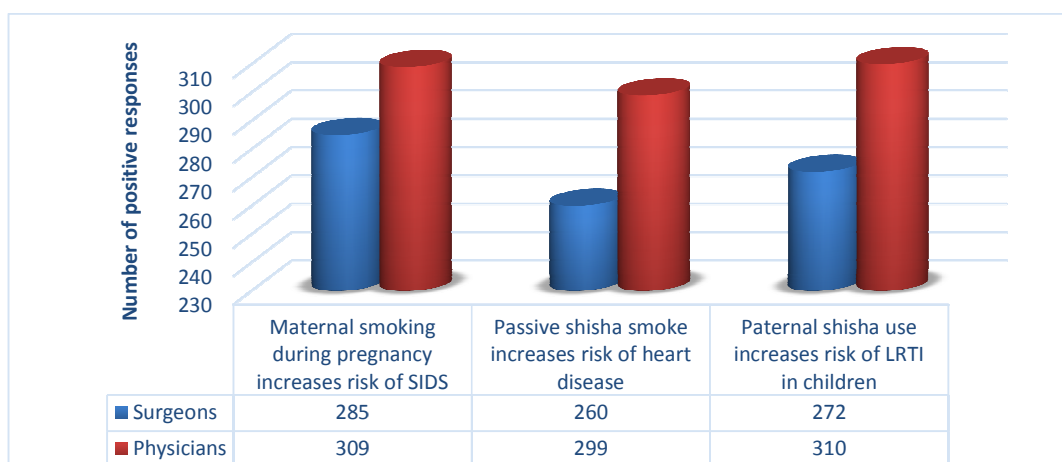


Fig. 2. Statistically significant results of the parameters with difference in knowledge

4. DISCUSSION

This study was done to investigate the knowledge, attitude and practices of shisha smoking among doctors in our society. A previous study was done in Karachi to investigate shisha use among doctors [17], but this is the first of its kind which has been done across five major metropolitan cities. Moreover, this is the first time that the attitude of physicians and surgeons towards shisha smoking has been compared in Pakistan. In the Karachi study [17], 5.2% of doctors admitted to using shisha daily, whereas our study showed that 15.7% of all doctors smoke shisha daily, with the number being higher amongst surgeons ($p < 0.001$). In a study conducted on Iranian physicians, 4.3% used shisha regularly [21], whilst a Bahrain study showed it to be 4% [22]. Amongst the study participants, there was a higher number of female doctors (70%), which may reflect their willingness to participate in the study, and may also be due to social norms due to which females choose shisha smoking over cigarette smoking [23]. Of those who smoke shisha, 54.6% of surgeons and 46.9% of physicians said that they were not ready to quit in the next six months ($p=0.002$). This was a better result than a study conducted on Americans with Middle Eastern ethnicity, where 73% of shisha smokers reported no intention to quit smoking [24]. In a similar study conducted in India, it was seen that 66.7% of participants had no intention to quit [25]. About 75% of those surveyed were age 40 or under, which may reflect the willingness of younger doctors to participate in the survey.

One reason for the higher prevalence of shisha use among surgeons maybe the higher stress level among surgeons as shown by a German study [26]. Surgeons work long hours, deal regularly with life-and-death situations with their patients, and make substantial personal sacrifices to practice in their field [27]. Distress among surgeons can have serious manifestations, including anxiety, depression, alcoholism, substance abuse, and suicide [27]. This increases level of work stress may also translate into more addictive behaviour as mentioned above, including tobacco use. It was also noted that the majority of the surgeon participants were in the age group 20-30 years, and the majority of physician participants were in the 30-40 year age group. It may be that surgeons start smoking shisha earlier due to higher work stress during surgical post-graduate training. The majority of doctors (71.6%) had

started smoking shisha at age 25 or less. In a previous study done on medical students at a university in Karachi, the majority were of the opinion that shisha cafes play an important role in promoting shisha smoking [28]. Similar results were observed in a study conducted on customers of shisha cafes in Egypt [29]. As the younger age group tends to visit these cafes and be more influenced by peers, this may be the reason that we found such a high prevalence of shisha smoking among the doctors surveyed. Shisha smoking is accepted by the youth as a safe recreational activity, due to lack of government policies, misperceptions about its safety and ignorance of general population and health care professionals [11]. In Pakistan, the most common reason for the initiation of shisha smoking was curiosity, followed by pleasure-seeking behaviour, peer pressure, boredom and stress [30]. These factors most likely extend to doctors' attitudes and practices regarding shisha smoking, as these are the reasons they start smoking as medical students.

Our studies showed a wide difference among the knowledge of physicians and surgeons regarding the smoking of shisha, with physicians demonstrating significantly more knowledge as outlined in three areas (smoking causing increased risk of SIDS, lung and heart disease). Overall, 99% of doctors agreed that shisha smoking is detrimental for health. One reason could be due to a lack of awareness and deficiency in the post-graduate surgery academic curriculum about this serious, non-communicable and preventable cause of morbidity and mortality [31]. Generally, physicians read more about the deleterious effects of smoking on cardiovascular and lung health. Even then a high number was not aware of the association of neonatal death, SIDS and lung disease with shisha smoking. With such disappointing overall levels of awareness about the well-known adverse effects of shisha smoking, it would be unreasonable to expect the doctors to be aware of studies which have shown that new toxins are added to the dangerous shisha smoke when smoking flavoured tobacco over coals, and the amount of shisha smoke inhaled exceeds that of one cigarette smoke by 200 times [32]. As compared to a single cigarette, shisha smoke contains even higher levels of metals such as arsenic, lead and nickel, 36 times more tar, and 15 times more carbon monoxide and nicotine [33]. It has been documented that shisha smoking exposes a smoker to a variety of diseases, such as lung, bladder and oral cancers [34]. Shisha smoking

increases the risk of transmitting tuberculosis, viruses such as herpes or hepatitis, and other illnesses [33,35,36].

The majority of respondents agreed that doctors serve as "role models" for their patients and that they should set up good examples by not smoking. Many people support the idea that health professionals ought to be positive health role models. It is important that smoking in the medical profession declines in future years, so that physicians can remain at the forefront of anti-smoking programs and lead the way as public health exemplars in the 21st century [37]. Doctors incur a certain responsibility as exemplars for patients with regard to healthy behaviour, as well as the public image they inadvertently portray outside of the work environment. Continued tobacco usage by health care workers undermines the message to smokers that quitting is important, and as early as 1976 it was suggested that physicians could best persuade patients to quit if they themselves did not smoke [37]. The main reason is that smoking is unhealthy for doctors, not because smokers are bad health professionals. Health authorities, health institutions, hospitals and medical schools should set out clear regulations about smoking behaviour when acting as a health professional and provide an architecture that discourages smoking (designated areas some distance away) [38]. In fact, the first epidemiological studies delineating the adverse health effects of smoking were actually conducted in a cohort of British physicians by Doll and Hill in 1954.

More physicians than surgeons agreed that doctors who smoke shisha are less likely to advise patients against it, and that they should receive training on cessation techniques, and advise their patients about quitting. This is because physicians probably spend more time than surgeons talking to patients in the wards and in clinics, so they are more likely to talk to patients about quitting. More physicians also agreed that smoking in enclosed public places should be prohibited and that tobacco sales to children and adolescents should be banned. This may be that physicians have more awareness of the dangers of second hand smoking due to their academic curricula. The majority of doctors also agreed that there should be a complete ban on the advertisement of tobacco products, and that hospitals and health-care facilities should be smoke-free zones. Second-hand smoke is not only hazardous for the patrons of public places,

but also for the staff working there, which has become a major occupational hazard [39]. In 2002, the Ministry of Health in Pakistan laid down an ordinance whereby public smoking was banned completely [40]. Sadly, the implementation of these laws has not been enforced properly, and people continue to endanger themselves and others by smoking shisha for recreation. Smoking cessation group sessions should be conducted in the community where health care professionals can focus on this growing problem and encourage people to control it before it destroys their medical, financial, social and emotional well-being.

The majority of the respondents endorsed that there is no sort of smoke-free policy at the workplace, and even if it does exist, it is not enforced. Moreover, self-help groups and traditional materials to stop smoking are not available for patients. The majority of all doctors have not received formal training in smoking cessation counselling. Scientists and policy makers need to understand that they function in an environment that is heavily influenced by covert tobacco industry efforts to subvert the normal decision-making processes [41]. Smoke-free legislation is associated with substantial reductions in preterm births and hospital attendance for asthma. Together with the health benefits in adults, this study provides strong support for WHO recommendations to create smoke-free environments [42]. Therefore, there should be legislative bans on smoking, and anti-shisha smoking campaigns should be initiated at the national level.

One of the limitations of the study is that convenience sampling was used, so the respondents may not be representative of all the doctors in the country. Moreover, there were more doctors working/training in the public sector due to the universities chosen for the study, and again, may not be representative of all of the population of doctors in the country, as several work in private clinics and hospitals as well. This may add to the bias in the study. A strength of the study is the large sample size, and the administration of the questionnaire in four different cities which added to the diversification of the respondents. It is the first study of its kind exploring the differences in the knowledge, attitude and practices of physicians and surgeons towards shisha smoking.

As shisha smoking is a modified traditional and cultural activity, discouraging its use is more

challenging than discouraging cigarette smoking [17]. Doctors also serve as role models for healthy behaviour, and the example they set in public is essential. Despite this argument, tobacco use has become an ingrained habit in a significant fraction of doctors [43]. Smoking represents a key issue in the medical profession, as physicians and surgeons can play a leading role not only in curbing tobacco usage in the community but in the development of overall public health policy as well. Medical professionals are on the front line of primary health care, and research has shown that medical interventions could be more effective if doctors would make a greater effort in attempting to convince their patients to quit smoking [43]. The curriculum in medical colleges should be revised to impart knowledge regarding the harmful effects of tobacco used in different forms. The academic curriculum for surgical post-graduate doctors probably merits more attention. It should also be emphasized to doctors that they have a responsibility towards society as they are role models. Other methods of restricting shisha smoking should also be implemented strictly, including increasing taxes and banning shisha cafes. The public and private health authorities should work to disseminate smoking cessation literature via the media and social media, and self-help groups in the community should be developed. The issues of the misconceptions about the hazards of shisha smoking should be addressed, and public health policies to curb the spread of this already flourishing practice should be implemented.

5. CONCLUSION

Our results revealed a high prevalence of shisha smoking among doctors, especially as it is considered to be a trendy social habit. It also showed that the knowledge and attitude of physicians was slightly better compared to that of surgeons. The general public looks up to doctors, and it is their duty to educate patients towards a healthy life-style, especially as they have more knowledge and awareness regarding the harmfulness of shisha smoking. The government should play a major role to provide information about the dangers of smoking the water-pipe, and legislation to curb smoking should be enforced as a public health measure.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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