ORIGINAL ARTICLE

Awareness Regarding Occupational Hazards and its Prevention among Dentist in Twin Cities of Pakistan

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ABSTRACT

Aims: The main purpose of this study is to assess the different occupational hazards faced by the dental professionals and important precautionary measures undertaken in twin cities of Pakistan.

Material and method: A cross sectional questionnaire based study was conducted among the dental professionals in twin cities of Pakistan. The targeted sample size was 150-200 individuals. The survey gathered information regarding age, designation, demographic details and knowledge related to physical, chemical, psychosocial hazards and the preventive measures taken in clinics.

Results: Most common hazards faced by dental practitioners are of Musculoskeletal pain and fatigue. However, Personal protective equipment and instrument sterilization were declared as most effective means of infection control

Conclusion: Awareness regarding various occupational hazards among the dentists in twin cities of Pakistan is good among specialists compared to house officers and students which requires a need to spread awareness among students and house officers so that they can identify and avoid these problems. **Keywords:** Occupational hazards, preventive measures, twin cities of Pakistan.

INTRODUCTION

The word "hazard" can be explained as an inherent property of an agent, or a situation having the potential to cause adverse effects when an organism, system or population is exposed to ergonomics and stress related conditions that can affect an individual¹. Occupational hazards include all the risks which are faced as a consequence of the working environment of a certain job².

The father of occupational medicine, Bernardino Ramazzini, emphasized the role of occupation in dynamics of health and disease back in the 18th century³.

In the clinical environment, dentists are exposed to a number of occupational hazards⁴.

Some of these hazards include musculoskeletal disorders, allergic reactions, sharp instrument injuries, radiation exposure and infectious diseases².

Poor posture in the clinical setting leads to various problems such as pain in neck, shoulder, back and sometimes in the wrist. Allergies from latex gloves, disinfectants and mercury have also been observed. Sharp instrument injuries are one of the most common injuries occurring in the dental practice⁴.

These injuries can result from simple hand instruments to rotary instruments and also from needles if proper method of re-capping is not used⁵.

Radiation exposure is also a major hazard faced by healthcare professionals. Harmful rays can eventually lead to various life threatening diseases such as cancers⁶. Pathological microorganisms such HBV, HCV, HIV, Mycobacterium tuberculosis which can be transmitted via saliva, blood or respiratory secretions are also a cause of concern and are major hazardous infectious agents⁷. Diseases from these agents can prove to be fatal and an understanding of the healthcare professional's knowledge needs to be known⁸.

Thus this study was conducted to determine the knowledge regarding various occupational hazards and

their preventive measures among the dentists in the twin cities of Pakistan.

MATERIALS AND METHODS

A cross sectional questionnaire -based survey was conducted among 250 dentist who are working in twin cities of Pakistan.

Dentists were contacted by either email or phone and a questionnaire was given.

The purpose was to record awareness regarding types of occupational hazards encountered and status of measures used for their prevention. The study was conducted after obtaining clearance from Institutional Ethics Committee of Foundation University Islamabad. The study was conducted for duration of 6 months.

Inclusion criteria was the dentists in twin cities of Pakistan and exclusion criteria was not significant.

The software used for statistical analysis was SPSS version 21.

RESULTS

A total of 200 dental professionals participated in the study (n=200), where 70 (35.0%) were males and 130 (65.0%) females with mean age of 24.6±5.8 years (Age range 18-45). There were 104 (52.5%) students in the study group while remaining 95 (47.5%) were working as house officers/general dentists/specialists as shown in table 1. Gender distribution in terms of professional status is illustrated.

Majority of the participants [192 (96.0%)] declared to be aware of occupational hazards associated with their profession. Fatigue was reported to be the most common problem faced during dental procedures by 142 (71.0%) participants, followed by 136 (68.0%) participants mentioning long working hours affects general health, 116 (58.0%) stress, 116 (58.0%) anxiety during procedure and 61 (30.5%) reported problem of lack of social life.

Musculoskeletal pain was reported by 181 (90.5%) participants to be the most common physical hazard, followed by sharp instrument injury 164 (82.0%), allergic reaction 96 (48.0%) and eye injury 86 (43.0%). Most of the participants 195 (97.5%) agreed that poor posture causes musculoskeletal problems in dental practice, while 150 (75%) agreed that scaling arousal causes eye irritation/conjunctivitis. Around 193 (96.5%) participants declared that needle stick injury is avoidable while remaining felt contrary. Hepatitis was reported by 193 (96.5%) participants to be transmissible via needle stick injury, herpes by 34 (17.0%), influenza by 16 (8.0%) and HIV by 131 (65.5%) participants. Out of 200, 172 (86.0%), 12 (6.0%), 73 (36.5%), 126 (63.0%) and 60 (30.0%) participants reported that latex gloves, barrier films, disinfectants, mercury, x-ray chemical and masks can cause allergic reaction in dental settings respectively. Majority of the participants 181/200 (90.5%) were aware of radiation exposure risks, while on the other hand, only 92 (46.0%) participants were aware of toxicity from sterilization techniques. 37 (18.5%) participants declared that x-ray films should be held in patient's mouth while taking a radiograph.

In respect of infection control measures to be followed in clinic, 94.5% participants give emphasis to ensure instrument sterilization, use of protective eye wear (83.0%), use of face mask (86.5%), change gloves between patients (89.0%), wash hands between patients (87.0%) and wear protective apron (71.0%). 98.5% participants thought that maintaining correct posture can prevent occurrence of musculoskeletal problems related to dental practice, similarly, less working hours (38.5%), frequent breaks (62.5%) and visiting physical therapist (44.5%) could also prevent such problems. Most of the participants (98.5%) agreed that vaccination should be done against hepatitis B infection for self-protection. In terms of radiation exposure prevention, 80.5% participants suggested to stand behind suitable barrier, 62.0% felt that wearing radiation exposure detection could be helpful, 38.5% said that gloves should be worn and 38.5% responded that suitable distance should be maintained to prevent radiation exposure during dental practice. Single handed scoop technique of needle recapping was reported by 86.0% of the participants while remaining 14.0% reported double handed technique. With respect to preventive measures that can be adopted to prevent hepatitis C, participants reported that vaccination (25.5%), double masks/glove (88.5%), single handed scoop technique (63.5%), and throwing away used sharp needles (84.0%) to be most effective preventive technique, while 3.0% thought that there is no need to adopt any preventive measures.

Regarding problems faced during dental practice, females more commonly reported fatigue (p<0.001) and lack of social life (p=0.018) as a problem as compared to males. Similarly, among physical health hazards associated with dental practice, females more frequently reported musculoskeletal pain (p=0.028), eye injury (p<0.001), sharp instrument injury (p=0.014), allergic reactions (p=0.001) as potential physical health hazards as compared to males. A greater number of females reported poor posture to be associated with musculoskeletal problems (p=0.033), and scaling aerosol to be associated with conjunctivitis (p=0.026) as compared to males. More females than males thought that x-ray chemical can cause allergic reaction (p=0.010). Similarly, greater number of females reported instrument sterilization (p=0.041), use of protective eye wear (p=0.005), use of face mask (p=0.048) and changing gloves between patients (p=0.042) to be an effective infection control measure as compared to males. More females than males agreed that less working hours (p=0.001) can be effective in preventing musculoskeletal problems due to dental practice.

While comparing the professional status with various factors, it was found that specialists were more likely to think that musculoskeletal physical hazard is associated with dental practice as compared to house officers and students (p=0.046). Specialists more frequently reported that latex gloves can cause allergic reactions as compared to house officers and students (p<0.001). Similarly, specialists were more likely to be aware of hazards associated with radiation exposure as compared to house officers and students (p=0.013). Significantly greater number of specialists agreed that x-ray film is to be held in patients mouth while taking radiograph as compared to house officers and students (p=0.006). Similarly, more number of specialists reported that single-handed scoop method rather than double handed technique of re-capping should be used to avoid physical hazard (p=0.003).

Sr. No.	Characteristics	Frequency (Percentage) n(%)		
1	Age (mean±SD)	24.6±5.8 years		
2	Age range	18-45 years		
3	Gender			
	Male	70 (35.0%)		
	Female	130 (65.0%)		
4	Professional status			
	Student	104 (52.0%)		
	House officer	64 (32.0%)		
	Specialists	32 (16.0%)		

Table 1: Demographic characteristics of study population (n=200)

Table 2: Overall summary of responses to dental practice occupational hazard questionnaire and gender wise comparison

	Variables	Overall	Gender		Р
	Vallables		Males	Females	value
1	Aware about occupational hazards				0.364
	Yes	192 (96.0%)	66 (34.4%)	126 (65.6%)	
	No	8 (4.0%)	4 (50.0%)	4 (50.0%)	
2	Problems that can be faced during dental practice				
	Long working hours can affect general health	136 (68.0%)	44 (62.9%)	92 (70.8%)	0.253
	Stressed because of work	116 (58.0%)	38 (54.3%)	78 (60.0%)	0.435
	Nervousness and anxiety during work	117 (58.5%)	40 (57.1%)	77 (59.2%)	0.775
	Fatigue	142 (71.0%)	37 (52.9%)	105 (80.8%)	<0.001
	Lack of social life	61 (30.5%)	14 (20.0%)	47 (36.2%)	0.018

3	Physical bazard that be faced during dental practice				
3	Museuloskolotal pain	191 (00 5%)	50 (94 2%)	122 (02 8%)	0.028
		101 (30.376) 96 (42.09/)	15(04.376)	722(93.070)	10.020
	Cyennin structure ant inium.	00 (43.0%)	15 (21.4%)	71 (34.0%)	<0.001
	Sharp instrument injury	164 (82.0%)	51 (72.9%)	113 (86.9%)	0.014
	Allergic reaction	96 (48.0%)	22 (31.4%)	74 (56.9%)	0.001
4	Poor posture can cause musculoskeletal problems				
	Yes	195 (75.0%)	66 (94.3%)	129 (99.2%)	0.033
	No	5 (2.5%)	4 (5.7%)	1 (0.8%)	
5	Scaling aerosol can cause eye irritation or conjunctivitis				
	Yes				
	No	150 (75.0%)	46 (65.7%)	104 (80.0%)	0.026
		50 (25.0%)	24 (34.3%)	26 (20.0%)	
6	Needle stick injury is avoidable				
Ŭ		183 (01 5%)	61 (87 1%)	122 (03.8%)	0 105
	No	17 (8 5%)	Q (12 Q%)	8 (6 2%)	0.105
7	Disasses that can be transmitted by a sharp injury	17 (0.570)	3 (12.370)	0 (0.2 /0)	
'	Diseases that can be transmitted by a sharp injury	102 (00 50()	66 (04 28()	107 (07 70/)	0.011
		193 (90.5%)	66 (94.3%)	127 (97.7%)	0.211
	Herpes	34 (17.0%)	13 (18.6%)	21 (16.2%)	0.664
	Influenza	16 (8.0%)	9 (12.9%)	7 (5.4%)	0.063
	HIV	131 (65.5%)	39 (55.7%)	92 (70.8%)	0.033
8	Equipment that can cause an allergic reaction in dental setting				
	Latex gloves	172 (86.0%)	60 (85.7%)	112 (86.2%)	0.932
	Barrier films	12 (6.0%)	2 (2.9%)	10 (7.7%)	0.170
	Disinfectant	73 (36.5%)	21 (30.0%)	52 (40.0%)	0.161
	Mercury	126 (63.0%)	40 (57 1%)	86 (66 2%)	0.206
	X-ray chemical	60 (30 0%)	13 (18 6%)	47 (36 2%)	0.010
	Masks/cotton dauze	23 (11 5%)	7 (10.0%)	16 (12 3%)	0.626
٩	Awareness about toxicity from sterilization techniques	20 (11.070)	1 (10.070)	10 (12.070)	0.020
9		00 (46 00()	22 (47 40/)	ED (4E E0()	
	nes Na	92(40.0%)	33 (47.1%)	39(43.3%)	0.010
10		106 (34.0%)	37 (32.9%)	71 (34.0%)	0.012
10	Awareness about radiation exposure	101 (00 50)		101 (00 101)	
	Yes	181 (90.5%)	60 (85.7%)	121 (93.1%)	0.090
	No	19 (9.5%)	10 (14.3%)	9 (6.9%)	
11	X-ray film should be held in patient's mouth while taking a radiograph				
	Yes	37 (18.5%)	16 (22.9%)	21 (16.2%)	
	No	163 (81.5%)	54 (77.1%)	109 (83.8%)	0.244
12	Infection control measures that should be followed in the clinic				
	Ensure instrument sterilization	189 (94.5%)	63 (90.0%)	126 (96.9%)	0.041
	Use of protective eve wear	166 (83.0%)	51 (72.9%)	115 (88.5%)	0.005
	Use of face mask	173 (86 5%)	56 (80.0%)	117 (90.0%)	0.048
	Change gloves between patients	178 (89 0%)	58 (82 9%)	120 (92.3%)	0.042
	Wash hands with antihacterial soan	174 (87.0%)	58 (82 0%)	116 (89 2%)	0.201
	Wear protective aprop	1/2 (71.0%)	46 (65 7%)	96 (73.8%)	0.201
12	Musculoskalatal disorders can be provented by:	142 (11.070)	40 (00.170)	30 (10.070)	0.221
15	Correct poeture	107 (09 59/)	60 (08 69/)	129 (09 59/)	0.051
		137 (30.3%)	16 (22.0%)	120 (30.3%)	0.951
	Less working hours	11 (30.5%)	10 (22.9%)		0.001
		125 (62.5%)	39 (55.7%)	00 (00.∠%)	0.140
	visiting a physical therapist	89 (44.5%)	26 (37.1%)	ხპ (48.5%)	0.124
14	Vaccination against Hepatitis B should be done	107 (00 57)		100 (00 57)	
	Yes	197 (98.5%)	69 (98.6%)	128 (98.5%)	0.951
	No	3 (1.5%)	1 (1.4%)	2 (1.5%)	
15	Radiation protection measures that should be followed in dental clinic				
	Standing behind suitable barrier	161 (80.5%)	55 (78.6%)	106 (81.5%)	0.613
	Wearing radiation exposure detection device	124 (62.0%)	43 (61.4%)	81 (62.3%)	0.903
	Wearing gloves	77 (38.5%)	24 (34.3%)	53 (40.8%)	0.369
	Maintaining a suitable distance	135 (67.5%)	51 (72.9%)	84 (64.6%)	0.235
16	Method of re-capping that should be used for re-capping a needle	, <i>, , , , , , , , , , , , , , , , , , </i>	, <u>,</u>	· · · · ·	
	Single handed scoop technique				
	Double handed scoop technique	172 (86.0%)	58 (82 9%)	114 (87 7%)	0.347
		28 (14 0%)	12 (17 1%)	16 (12 3%)	0.011
17	Preventive measures that should be taken to avoid Hopatitic C	20 (17.0/0)	12 (11.170)	10 (12.0/0)	
	infortion				
	Measingtian		20 (20 60()	24 (22 00()	0.465
		51 (25.5%)	20 (28.6%)	31 (23.8%)	0.405
	Double gloves/masks/gowns	1// (88.5%)	60 (85.7%)	117 (90.0%)	0.365
	No extra measures required	6 (3.0%)	1 (1.4%)	5 (3.8%)	0.339
	Single handed scoop technique	127 (63.5%)	42 (60.0%)	85 (65.4%)	0.451
	Throw away used sharp needles in special containers	168 (84.0%)	54 (77.1%)	114 (87.7%)	0.052

DISCUSSION

The present study is a cross sectional study which was conducted in Foundation university college of dentistry, Islamabad. Three other dental colleges took part in it which are Army Medical College, Margalla Institute of Health Sciences and Islamabad Medical and Dental College. The study sample consisted of 200 respondents, comprising of 104 undergraduate students and 95 post graduate faculty including the house surgeons/general dentists/specialists. The study assessed different occupational hazards faced by dentists and precautionary measures undertaken in twin cities of Pakistan.

Majority of the participants [192 (96.0%)] declared to be aware of occupational hazards associated with their profession $^{9}\,$

Fatigue was reported to be the most common problem faced during dental procedures by 142 (71.0%) participants, followed by 136 (68.0%) participants mentioning long working hours affects general health, 116 (58.0%) stress, 116 (58.0%) anxiety during procedure and 61 (30.5%) reported problem of lack of social life.¹⁰

Regarding problems faced during dental practice, females more commonly reported fatigue (p<0.001) and lack of social life (p=0.018) as a problem as compared to males.¹¹

Similarly, among physical health hazards associated with dental practice, females more frequently reported musculoskeletal pain (p=0.028), eye injury (p<0.001), sharp instrument injury (p=0.014), allergic reactions (p=0.001) as potential physical health hazards as compared to males.¹²

A greater number of females reported poor posture to be associated with musculoskeletal problems (p=0.033), and scaling aerosol to be associated with conjunctivitis (p=0.026) as compared to males. More females than males thought that x-ray chemical can cause allergic reaction (p=0.010). Similarly, greater number of females reported instrument sterilization (p=0.041), use of protective eye wear (p=0.005), use of face mask (p=0.048) and changing gloves between patients (p=0.042) to be an effective infection control measure as compared to males. More females than males agreed that less working hours (p=0.001) can be effective in preventing musculoskeletal problems due to dental practice¹³.

In respect of infection control measures to be followed in clinic, 94.5% participants give emphasis to ensure instrument sterilization, use of protective eye wear (83.0%), use of face mask (86.5%), change gloves between patients (89.0%), wash hands between patients (87.0%) and wear protective apron (71.0%). 98.5% participants thought that maintaining correct posture can prevent occurrence of musculoskeletal problems related to dental practice, similarly, less working hours (38.5%), frequent breaks (62.5%) and visiting physical therapist (44.5%) could also prevent such problems¹⁴.

Most of the participants (98.5%) agreed that vaccination should be done against hepatitis B infection for self-protection. In terms of radiation exposure prevention, 80.5% participants suggested to stand behind suitable barrier, 62.0% felt that wearing radiation exposure detection could be helpful, 38.5% said that gloves should be worn and 38.5% responded that suitable distance should be maintained to prevent radiation exposure during dental practice¹⁵.

CONCLUSION

After carrying out this study we can conclude that awareness regarding various occupational hazards among the dentists in twin cities of Pakistan is fairly high. Musculoskeletal pain and fatigue were most common among the hazards faced by dental practitioners. Personal protective equipment and instrument sterilization were declared as most effective means of infection control. Among the participants of the study, specialists were more aware about the hazards faced by dentists and had more knowledge on how to avoid such hazards as compared to house officers and students. There is a need to spread awareness among students and house officers so that they can identify and avoid these problems as much as possible.

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