

Awareness Regarding Occupational Hazards Among Dental Students in Buddha Institute of Dental Sciences and Hospital

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ABSTRACT

Introduction: Dental profession is susceptible to a number of occupational hazards. In recent years many occupational hazards still persist in modern dentistry. Dentists, as well as dental personnel and their patients, are constantly exposed to a number of specific occupational hazards. These cause the appearance of various ailments, specific to the profession, which developed and progress with years. In many cases occupational illness is a result of disease and its complex. **Aim & Objectives:** The aim of the study was to assess the awareness of occupational hazard among dental students in Buddha institute of dental sciences and hospital in Patna. To determine the demographic profile of dental students in Buddha institute of dental science and hospital. To assessing the awareness regarding occupational hazards among dental students. **Material & methods:** A cross-sectional questionnaire study was conducted among the dental students from Buddha institute of dental science and hospital. The sample size 240 dental students were selected. A close ended questionnaire was used to assess the awareness of occupational hazard among dental students. Chi-square tests are applied to find the association between the parameters and the level of significance. **Results:** A total 240 students participated in the present study. Majority of 173 were females students & 67 were male's students. A slight statistical significance was observed regarding awareness of vibration causing peripheral neuropathy which was more in males than females with a ($p= 0.048$.) Regarding infectious body fluid from percutaneous exposure incidents and sharp instrument as occupational hazards females were more aware than males with ($p= 0.048$.). **Conclusions:** The students have good awareness regarding occupational hazards in the present study. In this study, interns were more aware of occupational hazards than 3rd & 4th - year students. No statistically significant relation was found between awareness about occupational hazard with gender.

KEYWORDS: Occupational Hazards, Dentists, Awareness, Educational Level

INTRODUCTION

It is the most demanding profession that requires high degree of skill and competence. The operator results in low quality and productivity of work. In modern dental era many occupational hazards still persists. Ignorance of these potential hazards increases the chances of injury and consequent. Every occupation has its own hazards and risks. Occupational hazard is a risk to a person in his working environment. Besides the consequences like fatal accidents, minor to severe injuries, allergic and systemic effects which occur immediately, there are those that appear at a later period.¹ Dentists are usually exposed to a number of occupational hazards during their professional work. These cause the appearance of various ailments, specific to the profession, which develop and intensify with years. In many cases they result in diseases and disease complexes, some of which are regarded as occupational illnesses². Occupational hazards can be defined as a risk to a person usually arising out of employment. It can also refer to a work material, substance, process or situation that predisposes, or itself

causes accidents or disease, at a work place. Bernardino Ramazzini is referred to as father of occupational medicine³. According to the WHO the term "hazard" refers to 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 ergonomic and stress-related which affects individual.¹

Dentistry is a demanding profession involving a high degree of concentration and precision. Dentists require good visual acuity, hearing, depth perception, psychomotor skills, manual dexterity, and ability to maintain occupational postures over long periods. Diminution of these abilities may affect the practitioner's performance and productivity. Despite numerous advances in dentistry many occupational health problems still persist. Many dental professionals are at risk of occupational exposure with variety of hazardous chemicals. Being unaware of these potential hazards it makes environment more vulnerable. The ergonomics of the dental set-up is by a potential threat. Microbiological

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contamination and aerosol dissemination are generated by high-speed instrumentation and percutaneous exposures which remains a potential biological risk. Physical hazards include blunt or broken instruments, vibration, fire, noise, blue light, and heat. Uncooperative patients, over workload, the constant drive for work perfection contribute to psychosocial stress. Exposure to various naturally occurring synthetic chemicals are a potential hazard. It is of utmost importance that the dentist is aware of all the potential hazards in the work environment so that he can take the appropriate measures to protect himself, other dental staff and most importantly the patient. During clinical practices dentists are exposed to variety of work related hazards. Occupational hazards can be classified into five types: "physical, chemical, Biological, psychological and musculoskeletal disorders."³⁻⁶

The one primary objective of Ergonomics is - the prevention of work-related musculoskeletal disorders, or the symptoms that aggravate these disorders. In dentistry, working in bad condition, repetitive tasks - such as scaling, root planning, and uncomfortable physical postures leads to musculoskeletal disorders, stress, and loss of productivity.¹

The main objective of ergonomics is to achieve the best mutual adjustment of man and his work for the improvement of human's efficiency and wellbeing.⁴ The application of ergonomics has made a significant contribution in reducing industrial accidents and to overall health and efficiency of the workers.⁴

Aim: The aim of this study was to assess the Awareness regarding occupational hazard among dental students in Buddha institute of dental science and hospital, Patna.

Objectives: The objectives of this study were as follows:

- To determine the demographic profile of dental students in Buddha institute of dental science and hospital.
- To assessing the awareness regarding occupational hazards among dental students.

MATERIALS AND METHODS

A study group 240 dental students selected from Buddha institute of dental sciences and hospital. The study is descriptive, cross sectional survey. Inclusion criteria consisted of students present on the day of survey and willing to participate in the survey and exclusion criteria consisted of students not willing to participate in the survey. The proposed study was reviewed by the Ethical committee of Buddha institute of dental sciences. A survey was systematically scheduled to spread over a period of 1 month from 1st week of October to 2nd week of October. Duration for data collection from each student was 30 minutes.

Methods of collection of data: A structured close ended questionnaire has been designed to obtain information about awareness regarding occupational hazards among dental students. The self-administered questionnaire was

distributed among 3rd year, 4th year, BDS students & interns of Buddha institute of dental sciences and hospital. Through the questionnaire data on awareness of occupational hazards are collected. The questionnaire was distributed among dental students in the classroom and was collected in 30 minutes. There was no prior contact between researcher and students.

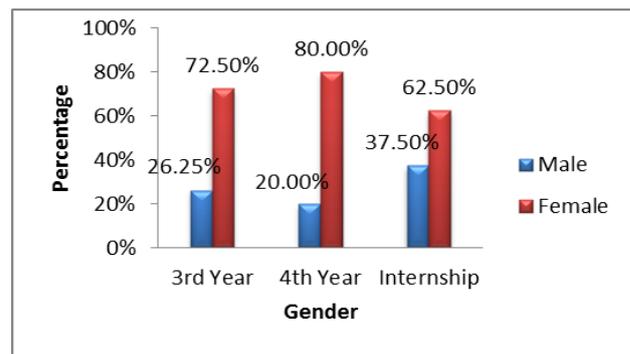
Statistical analysis: The data collected from the questionnaire was entered into the computer using excel format and was subject to statistical analysis using SPSS Software. Chi-square tests are applied to find the association between the parameters and the level of significance.

Categorical data was analyzed by chi square test.

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

RESULTS

A total 240 Dentists participated in the present study. Out of Whom 67 males (27.92%) students, 173 females (72.08%).(Graph1).



Graph 1: Distribution of Dentists according to Gender

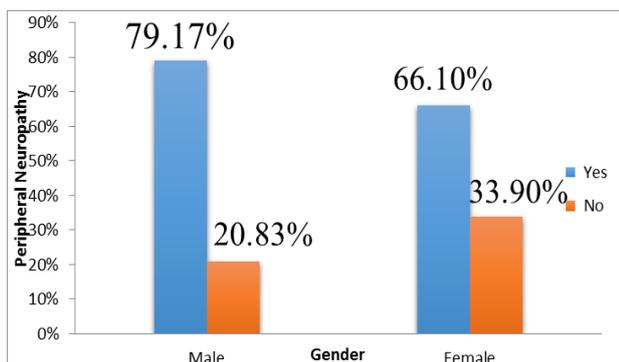
Majority of females 169 (95.48%) and males 66 (91.67%) were aware of occupational hazards. Majority of females 150(84.75%) & 52(72.22%) males are concerned about bio aerosols as an occupational hazard. Majority of females 132 (74.58%) 58 (80.56%) males were aware of toxicity from sterilization .Majority of females 235 (93.22%) 69 (95.83%) males were more aware of radiation exposure. Majority of females 156 (88.14%) and 65 males (90.28%) agreed that x-ray is a type of ionizing injury. Majority of 117 females (66.10%) and 55 males (76.39%) agreed on blue/UV light, non-ionizing radiation injury.

A statistical significant association was observed regarding the question, vibration causing peripheral neuropathy. Majority of males 57(79.17%) were aware, and 15(20.83%) were not, and among females, majority 117(66.10%) were aware, and 60 (33.90%) were not (P=0.048). Majority of 115 females (64.97%) 49 males (68.06%) were agreed that noise is inducing hear loss possible at dental setting. Majority of 100 females (61.02%) 50 males (69.44%) were more aware of an ergonomic effect. Majority of 140 females (79.10%) 62

males (86.11%) were more affect of musculoskeletal disorder. Majority of 159 females (89.83%) 60 males (83.33%) were more affect the dental practice. Majority of 152 females (85.88%) 60 males (83.33%) were more concern about prolong standing affect the health in dental settings. Majority of 147 females (83.05%) 63 males (87.50%) were agreed that debris cause eye injury. Majority of 143 female (80.79%) 59 males (81.94%) were more aware psychological risk. Majority of 147 females (83.05%) 57 males (79.17%) were agreed stress related to any financial status of procedure intricacy. Majority of 144 female (81.36%) 55 males (76.39%) were more aware of occupation safety. Majority of 152 females (85.88%) 50 males (69.44%) said that bacteria were involved in bio aerosols.

Majority of females 150 (84.75%) were aware than 53 males (73.61%) regarding infectious body fluid from percutaneous exposure incidents and sharp instrument as occupational hazards, and the result is found to be statistically significant. P value **0.048**. Majority of 154 female (87.01%) 52 males (72.22%) said that hepatitis B agent involved in infectious body fluid. Majority of 154 female (87.01%) 57 males (79.17%) were agreed that respiratory and other communicable diseases transmissible. Majority of 145 females (81.92%) 52 males (72.22%) were agreed that influenza agent is more involved in respiratory disorder. Majority of 149 females (84.18%) 59 males (81.94%) were more agreed that toxicity from dental material affect the health in dental settings .Majority of 152 females (85.88%) 58 males (80.56%) were more aware of toxicity from anesthetic gasses. Majority of 151 females (85.31%) and 55 males (76.39%) were more aware of toxicity from airborne particulates. Table 1

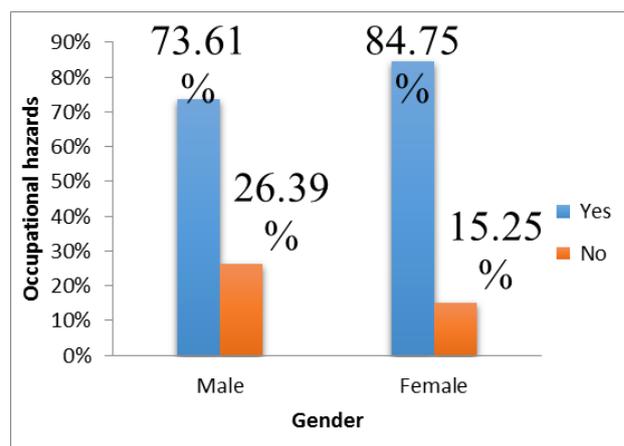
According to graph 2 a slight statistical significance was observed regarding awareness of vibration causing peripheral neuropathy which was more in males than females with a P value of 0.048.



Graph 2: Vibration causing peripheral neuropathy

In the graph 3 it was observed that females were more aware than males regarding infectious body fluid from percutaneous exposure incidents and sharp instrument as an occupational hazards with P value of 0.048. Out of sample 240, 82 (98%) 4th year students were more aware about the knowledge regarding occupational hazards. Among study group 240 sample 71 (85%) 4th year

students were agree that bioaresols as an occupational hazards.



Graph 3:- Infectious body fluid from percutaneous exposure incidents and sharp instrument.

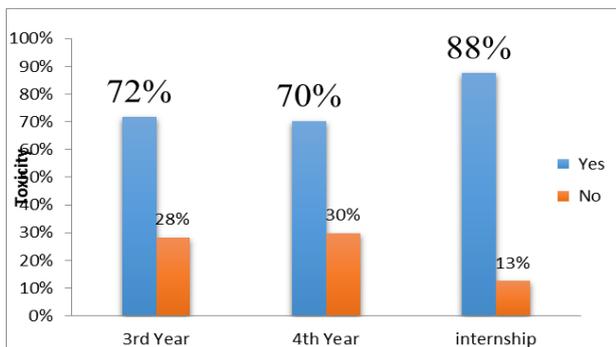
Majority of interns students 70 (88%) were more aware of toxicity from sterilization methods than 3rd and 4th year students. Majority of 3rd year (94%) were more aware of radiation exposure than 4th year and interns. Out of sample 240 76 (74%) 4th year students were agreed that x-ray is a type of ionizing injury. Among the study group interns students (74%) were more agreed that blue/ UV light is non ionizing radiation injury than 3rd year and final year students. Majority of interns 62(74%) students agreed that vibration cause peripheral neuropathy. Majority of interns students 62(78%) were more aware about hearing loss at dental settings than 3rd year and 4th year students. Out of sample 240 intern students 59(74%) were more aware about ergonomic effects than 3rd year and 4th year students.

Majority of 3rd year students 73 (86%) a were more affect of musculoskeletal disorder than 4th year and interns students. Majority of 3rd year 73(86%) were more affect the poor posture during dental practice. Among the study group of 240 sample 3rd year 73 (86%) were more affect the health in dental settings, due to prolonged standing than 4th year and interns students. Out of sample 240 4th year students 74 (88%) agreed that flying debris cause eye injury conjunctivitis. Majority of 4th year students 71(85%) were more aware psychological risk than interns and 3rd year. Majority of 3rd year 71(84%) students agreed that stress is related to financial status of procedural intricacy than 4th year & interns. Majority of 4th year 68 (81%) students were more aware about occupational safety among the study group. Among the study sample 4th year students 71(85%) were agreed that bacteria as agent involved in bioarosols. Majority of 3rd year students 72 (85%) were more agreed that infectious body fluid from percutaneous exposure incidents is occupational hazards. Among the study group majority of 4th year students 71 (85%) were agreed that hepatitis B is agent involved in infectious body fluid. Majority of 3rd year students 73 (86%) agreed that respiratory and other communicable diseases transmissible. Among study sample majority of 4th year students 72 (86%) agreed as

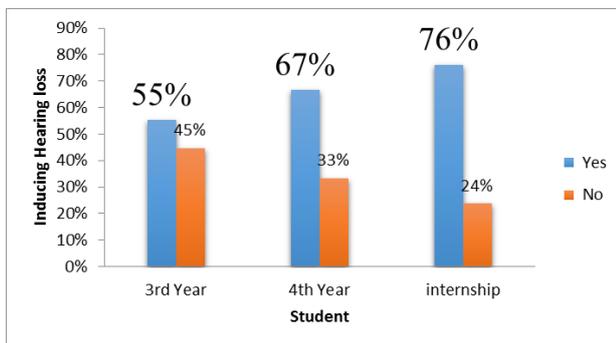
No	Question	Male		Female		p-value
		N	%	N	%	
1	Are you aware about the knowledge regarding occupational hazards?					
	1. Yes	66	91.67%	169	95.48%	0.2382
	2. No	6	8.33%	8	4.52%	
2	Are bioaerosols a occupational hazards?					
	1. Yes	52	72.22%	150	84.75%	0.4112
	2. No	20	27.78%	27	15.25%	
3	Are you aware of toxicity from sterilization methods ?					
	1. Yes	58	80.56%	132	74.58%	0.4112
	2. No	14	19.44%	45	25.42%	
4	Are you aware of any radiation exposure ?					
	1. Yes	69	95.83%	165	93.22%	0.5642
	2. No	3	4.17%	12	6.78%	
5	Is x-ray a type of ionizing injury ?					
	1. Yes	65	90.28%	156	88.14%	0.8252
	2. No	7	9.72%	21	11.86%	
6	Is Blue/UV light is non ionizing radiation injury?					
	1. Yes	55	76.39%	117	66.10%	0.1311
	2. No	17	23.61%	60	33.90%	
7	Does vibration causes peripheral neuropathy?					
	1. Yes	57	79.17%	117	66.10%	0.048
	2. No	15	20.83%	60	33.90%	
8	Is noise inducing hearing loss possible at dental settings ?					
	1. Yes	49	68.06%	115	64.97%	0.6617
	2. No	23	31.94%	62	35.03%	
9	Are you aware about ergonomic effect?					
	1. Yes	50	69.44%	108	61.02%	0.2464
	2. No	22	30.56%	69	38.98%	
10	Does musculoskeletal disorder affect the dental practice ?					
	1. Yes	62	86.11%	140	79.10%	0.217
	2. No	10	13.89%	37	20.90%	
11	Does poor posture affect the dental practice ?					
	1. Yes	60	83.33%	159	89.83%	0.1965
	2. No	12	16.67%	18	10.17%	
12	Does prolonged standing effect the health in dental settings?					
	1. Yes	60	83.33%	152	85.88%	0.6946
	2. No	12	16.67%	25	14.12%	
13	Does flying debris cause eye injury, conjunctivitis?					
	1. Yes	63	87.50%	147	83.05%	0.4455
	2. No	9	12.50%	30	16.95%	
14	Are you aware about psychological risk ?					
	1. Yes	59	81.94%	143	80.79%	1
	2. No	13	18.06%	34	19.21%	
15	Is stress related to any financial status of procedural intricacy?					
	1. Yes	57	79.17%	147	83.05%	0.4721
	2. No	15	20.83%	30	16.95%	
16	Are you aware about any occupational safety?					
	1. Yes	55	76.39%	144	81.36%	0.3867
	2. No	17	23.61%	33	18.64%	
17	Are these agents involved in bioaerosol ?					
	a. Bacteria	50	69.44%	152	85.88%	NA
	b. virus	19	26.39%	23	12.99%	
	c. fungi	0	0.00%	0	0.00%	
	d. prions	0	0.00%	0	0.00%	
	e. none	0	0.00%	1	0.56%	
	f. all	0	0.00%	0	0.00%	
	g. more than 1	3	4.17%	1	0.56%	
18	Is infectious body fluid from precutaneous exposure incidents and sharp instruments a occupational hazards ?					
	1. Yes	53	73.61%	150	84.75%	0.048
	2. No	19	26.39%	27	15.25%	
19	Are these agents involved in infectious body fluids?					
	a. Hepatitis B	52	72.22%	154	87.01%	NA
	b. Hepatitis C	16	22.22%	21	11.86%	
	c. Hepatitis D	0	0.00%	0	0.00%	
	d. HIV	0	0.00%	0	0.00%	
	e. None	0	0.00%	0	0.00%	
	f. All	4	5.56%	2	1.13%	
20	Are respiratory and other communicable diseases transmissible?					
	1. Yes	57	79.17%	154	87.01%	0.1243
	2. No	15	20.83%	23	12.99%	

Table 1: Distribution of study subjects according to awareness regarding a occupational hazards according to educational level.

Influenza as agent involved in respiratory disorder. Majority of 4th year students 75 (88%) agreed that toxicity from dental materials affect the health in dental settings. Majority of 4th year students 72 (86%) were more aware of toxicity than 3rd year and interns students out of sample 240. Among study group 240 majority of 4th year 72 (86%) were more aware of toxicity from airborne particulates than interns and 3rd year students 66 (78%) table 1. In the graph 4 it was observed that interns are more aware of toxicity from sterilization methods than 3rd year & 4th year students with P value 0.0164 which is highly significant. In graph 5 it was observed that interns are more aware of inducing hearing loss at dental settings than 3rd year & 4th year students with P value 0.0175 which is highly significant.



Graph 4: Toxicity from sterilization methods



Graph 5:- Inducing hearing loss at dental settings

DISCUSSION

The present study is a cross sectional study which was conducted in Buddha institute of dental science and hospital in Patna. The study sample consisted of 240 respondents, comprised of 3rd year, 4th year and House surgeons dental students. The study examined the awareness regarding occupational hazards among students.

In the present study 91.67 male 95.48 female students were aware about occupational hazards which show almost equal distribution between both genders regarding occupational hazards. In the present study 81.94% males were more aware about psychological risk than 80.79% females.

In the present study female were more aware about the occupational hazards resulting from sharp instruments and percutaneous exposure which is slightly statistical

significant with P value 0.048. Majority of students were aware that dental material effect the health which is in accordance with other study conducted by Pallavi Baghla et al. Majority of the interns were aware about toxicity from sterilization methods with P value = 0.0164; no other study has been conducted to support this results. A statistical significant relation was found between education qualification and awareness regarding induced hearing loss at dental setting with interns being most aware. P= (0.0175) In this study more than half (59.7%) of the respondents had musculoskeletal disorders.³

According to Marshall et al and similar studies, in previous study among Australian dentists population found that females experienced more symptoms of musculoskeletal disorder. Among Lithuanian dentists which was attributed to the lack of understanding of ergonomic principles, uncomfortable work environment and residual effect of treating seated patients which was a common practice in soviet union.^{3,8-12} In present study 69.44% male were more aware of ergonomic effect than 61.02% females. In the present study 87.01% females were observed more that hepatitis B are agents involved in infectious body fluids than males 72.22%. Among Turjanamaa et al it is observed that any kind of musculoskeletal problem is significantly lower than past survey among Danish Israel and Australian dentist were 50-60% of dentists reported musculoskeletal pain. In present study it is observed that 89.83% females affect more poor posture in dental practice than 83.33% males. Backache was commonest ailment found in the previous study. Out of 29.41% respondents used indirect vision while treating patients rest were more focus on neck and back.⁷ According to Leggat PA, it is observed that only 11% were used in dentistry is mercury in dental amalgam which poses a serious threat to dental as well as general population.¹² In present study 84.18% females were more aware of the toxicity from dental material affect the health in the dental setting, than 81.94% males.³ According to Rankin KV, some studies had demonstrated that starch particles combined with latex protein allergens become airborne, which are consequently inhaled or absorbed by skin.^{13,14,15} In the present study it was observed that females 85.31% were more aware about toxicity from airborne particulates, than males 76.39%. In the present study 85.88% females were more aware of toxicity from anesthetic gases than 80.56% males.

SUMMARY AND CONCLUSION

In this study interns were more aware about occupational hazards than 3rd & 4th year students. No statistical significant relation were found between awareness about occupational hazard with gender. In the present study female were more aware about the occupational hazards resulting from sharp instruments and percutaneous exposure. Majority of students were aware that dental material effect the health. Majority of the interns were aware about toxicity from sterilization methods.

It's not just enough to train the students on the various

procedures; but it is also equally important to inculcate the importance of following healthy practices. Dentists have to upgrade his existing knowledge by participating in continuing dental education. Universal precaution has to be taken while practicing to prevent occupational hazards. Dental clinic design has to be made with, sufficient lighting, ventilation, engineering control measure and equipped with appropriate personal protective. Sufficient knowledge and adequate information regarding occupational hazards and its prevention will contribute in providing quality care to patients without any doubt.

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