

Assessment of Awareness and Prevention of Occupational Health Hazards in Dental Professionals in Two Major Dentistry Hospitals in Upper Egypt.

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Abstract

Background: dentists and other dental professionals are constantly exposed to number of specific occupational hazards. **Aim of the study:** In this survey different occupational health hazards present in two major dental hospitals (Minia University Dentistry Hospital and Al-Azhar University Dentistry Hospital) were assessed, and interpreted to detect level of awareness and best preventive measures. **Subjects and methods:** The study begin at June 2010 up to December 2010, a total number of 200 dental professionals responded to a self-administrated questionnaire, which include a questions in personal demographic data, occupational position, duration of work, structured questions to assess the level of awareness to occupational hazards and practice of safety and preventive measures. The study assesses physical, chemical, biological and psychological hazards. **Results:** the results of survey showed that house officers and final two years students constitute 23% and 32% respectively. With less than one year duration in work, and this can explain a higher incidence of risks in this group. Also the survey showed a significant number of respondents are following the safety measures and they are aware of all the potentials risks in the work place. The survey also showed a significant risks either physical, chemical or stressors to all dental professionals. **Conclusion and Recommendations:** despite the numerous advancement, many occupational health hazards still exist in present dental professionals. To help assure a safe work environment in dental hospitals, the hazards awareness and prevention of legal risks should be made known to all dental professionals. It is therefore recommended that regular workshop and seminars for continued dental medical education for all dental staff and dental clinic design has to be madewith sufficint light, ventilation and equipped with appropriate personal protective measures.

Key words: Occupational health hazards, Dental professionals, Dentestery Hospitals and Awareness of risks.

Introduction

The occupational health hazards found among dentists and other clinical dental workers are similar worldwide and include a wide range of risks⁽¹⁾. The source of these hazards is the work environment which can include physical, chemical, biological, mechanical, and social aspects⁽¹⁾.

Dental professionals are constantly exposed to a number of specific occupational hazards and being unaware of the potential hazards in the work environment makes them more vulnerable to injury⁽¹⁾. In many cases, these exposures result in diseases, which are regarded as occupational illnesses⁽²⁾. These range from toxicity from

chemicals routinely used in dentistry and threat of cross-infection in the dental clinic⁽³⁾. Such hazards cause the appearance of various diseases that are specific to the profession and that develop and intensify over the years⁽¹⁾. Awareness of these occupational hazards and implementation of preventive strategies can provide a safe dental environment for all concerned workers⁽⁴⁾. Such hazards includes; physical factors (lights, noise, vibration, heat and trauma), chemical factors (latex monomer, sterilization, aerosols and radiology liquids), biological factor (exposure to microbial aerosols which are aggravated by high speed rotatory hand pieces) and psychological factors as stressful hazards

(working long hours at a high level of concentration, working in a sedentary state and working with anxious patients)^(8,9,10). Several studies have shown that dentists report more frequent and worse health problems than other high risk medical professionals^(11,12).

Although identification of risks to dental healthcare workers has been explored in several industrialized nations, a very little data is available from developing countries^(13,14).

Subjects and methods

The study was conducted at Minia University Dentistry Hospital (MUDH) and Al-Azhar University Dentistry Hospital (AUDH), Assiut branch, at June 2010 up to December 2010. A total number of 207 dental professionals agreed to participate in the current study (104 dental professionals in MUDH and 103 dental professionals in AUDH). The study population consists of dentists, faculty staff and their assistants, residents, house officers, nurses, and final two years students who attend clinics and dental laboratory.

Data was obtained through a self-administrated questionnaire, which includes questions in personal information like age, gender, occupational position, duration of work. The questionnaire also contain structured questions in order to assess the level of awareness to occupational health hazards, seminar and scientific meeting attendance, possession of health insurance policy, practice of safety measures and preventive measures undertaken and occupational health hazards experienced while in practice. The questionnaire in this study concentrated mainly on the symptoms and effects of physical, chemical, biological

and psychological hazards. Musculo-skeletal disorders were excluded from this study as we are investigating this point in another thesis in our department stressing on this point⁽¹⁵⁾.

The participants were informed to answer all points, any questionnaire with these incomplete items or hesitated replay were excluded from the study, therefore the final study population were 120 in MUDH and 90 in AUDH. A written informed consent was obtained from all the participants and ethical approval was obtained from the institutional ethical committee for conducting this study.

Data collected, pooled out of the questionnaire and were analyzed using Statistical Package for Social Science (SPSS) for Windows Version 20. Descriptive methods as mean, standard deviation (SD), frequency distribution and cross tabulation. Significant tests as Chi-square (χ^2) test was used. A P-value of 0.05 was considered the limit below which the difference of the values would be statistically significant.

Results

The results of this study showed that the house officers under training and final two years students constitute the main categories representing (33%) and (32%) respectively as shown in table (1) and fig. (1). Duration of work and experience were less than one year and their mean age in the early half of the 3rd decade, as shown in table (1) and table (2). It is a quite clear that these facts will be reflected in some high figures of risks and hazards related to this group as sharp instrument , injury following the safety measures and application of preventive measures as shown in table (3).

Table (1): Demographic data and occupational categories of dental professionals in MUDH and AUDH, June 2010 up to December 2010.

| Categories | MUDH (n=120) | | | | | AUDH (n=70) | | | | | Total | |
|--------------------|--------------|-------------|---------------------|-----------|-----------|-------------|-------------|---------------------|-----------|-----------|------------|------------|
| | No. | % | Age Mean ± SD | Sex | | No. | % | Age Mean ± SD | Sex | | No. | % |
| | | | | Male | Female | | | | Male | Female | | |
| Faculty staff | 12 | 9.6 | 39 ± | 9 | 3 | 0 | 7.7 | 30 ± | 4 | 1 | 17 | 8.0 |
| Assistant lecturer | 22 | 17.6 | 34.4 | 16 | 6 | 9 | 12 | 30.0 | 6 | 3 | 31 | 10.0 |
| Residents | 12 | 9.6 | 26 ± | 9 | 3 | 10 | 13.3 | 26 ± | 8 | 2 | 22 | 11 |
| House officer | 26 | 20.8 | 22 ± | 16 | 10 | 20 | 27.7 | 18 ± | 12 | 8 | 46 | 23 |
| Nurses | 12 | 9.6 | 26 ± | 3 | 9 | 8 | 10.7 | 27 ± | 2 | 6 | 20 | 10 |
| Students | 41 | 32.8 | 18 ± | 23 | 18 | 23 | 29.1 | 17 ± | 12 | 11 | 61 | 32 |
| | | | 20 ± | | | | | 20 ± | | | | |
| | | | 17 ± | | | | | 17 ± | | | | |
| | | | 22 ± | | | | | 22 ± | | | | |
| | | | 22 ± | | | | | 22 ± | | | | |
| | | | 17 ± | | | | | 17 ± | | | | |
| Total | 120 | 62.0 | | 76 | 49 | 70 | 37.0 | | 44 | 31 | 200 | 100 |

Fig. (1): The different occupational categories of dental professionals in total (MUDH and AUDH) dental professionals, June 2010 up to December 2010.

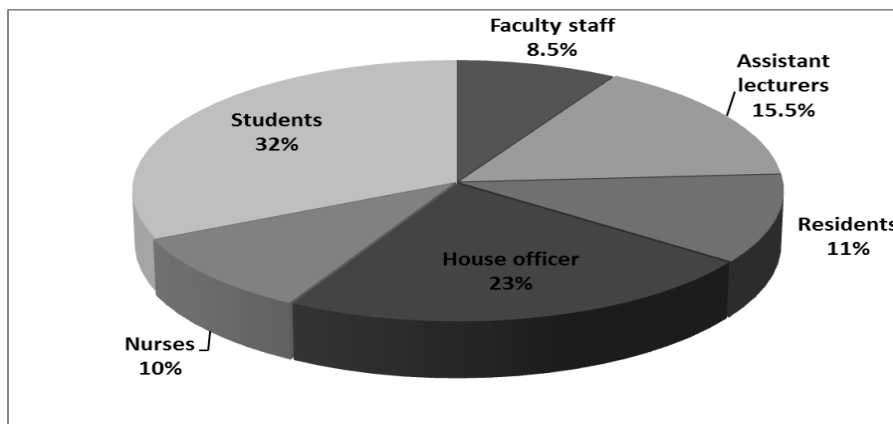


Table (2): Duration of occupation of dental professionals in MUDH and AUDH, June 2010 up to December 2010.

| Duration of occupation | MUDH (n=120) | | | | AUDH (n=70) | | | | Total | |
|------------------------|--------------|------|--------|------|-------------|------|--------|------|-------|------|
| | Male | | Female | | Male | | Female | | No. | % |
| | No. | % | No. | % | No. | % | No. | % | | |
| < 1 year | 33 | 43.8 | 19 | 38.8 | 21 | 47.7 | 16 | 51.7 | 49 | 44.0 |
| 1 - 5 years | 12 | 10.7 | 8 | 17.3 | 7 | 10.9 | 0 | 17.1 | 32 | 16 |
| > 5 - 10 years | 8 | 10.7 | 8 | 17.3 | 7 | 10.9 | 0 | 17.1 | 28 | 14 |
| > 10 - 15 years | 11 | 14.0 | 0 | 0.0 | 0 | 0.0 | 3 | 4.7 | 24 | 12 |

| | | | | | | | | | | |
|--------------|----|------|----|------|----|------|----|------|-----|------|
| > 10 years | 12 | 10.8 | 9 | 18.4 | 4 | 9.1 | 2 | 6.0 | 27 | 13.0 |
| Total | 76 | 60.8 | 49 | 39.2 | 44 | 58.6 | 31 | 41.4 | 200 | 100 |

Fig. (3): Preventive, safety measures and personal awareness of dental professionals in MUDH and AUDH, June 2010 up to December 2010.

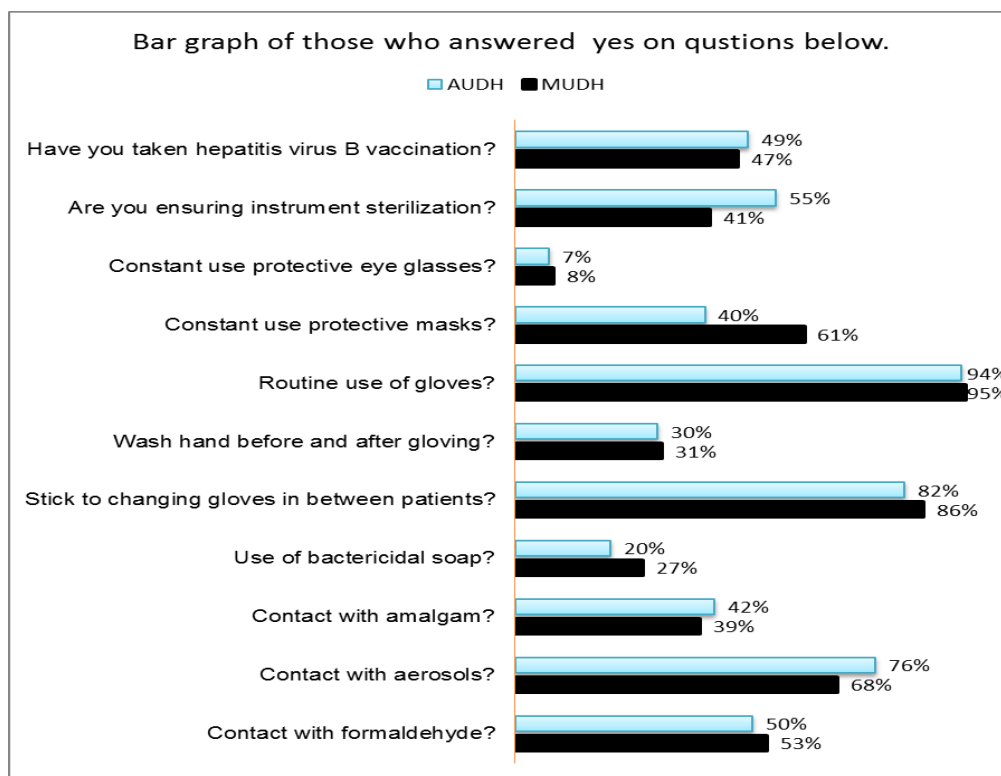


Table (4): Occupational complaint and level of awareness of dental professionals in MUDH and AUDH, June 2010 up to December 2010.

| Hazards | MUDH (120) | AUDH (70) | Total (200) | *P -value |
|--|---------------|--------------|----------------|-----------|
| | No. (%) | No. (%) | No. (%) | |
| Physical hazards: | | | | |
| - Eye complaint / troubles. | 01 (0.8) | 31 (44.3) | 32 (16.1) | < 0.05 |
| - Ear complaint / troubles. | 42 (35.0) | 26 (37.1) | 68 (34.0) | < 0.05 |
| - Allergy to latex / others. | 10 (8.3) | 6 (8.6) | 16 (8.0) | < 0.05 |
| - Sharp instrument injury. | 21 (17.5) | 10 (14.3) | 31 (15.5) | < 0.05 |
| Chemical hazards: | | | | |
| - Amalgam contact. | 16 (13.3) | 11 (15.7) | 27 (13.5) | < 0.05 |
| - Formaldehyde contact. | 12 (10.0) | 7 (10.0) | 19 (9.5) | < 0.05 |
| Psychological hazards (stress): | | | | |
| - Patient related stressors. | 00 (0.0) | 37 (52.9) | 37 (18.5) | < 0.05 |
| - Dentist related stressors. | 47 (39.2) | 28 (40.0) | 75 (37.5) | < 0.05 |
| - Economic related stressors. | 01 (0.8) | 31 (44.3) | 32 (16.1) | < 0.05 |
| Biological hazards: Awareness. | | | | |
| - Awareness of Respiratory infection. | 31 (25.8) | 20 (28.6) | 51 (25.5) | < 0.05 |
| - Awareness of HIV. | 20 (16.7) | 21 (30.0) | 41 (20.5) | < 0.05 |
| - Awareness of HBV. | 39 (32.5) | 20 (28.6) | 59 (29.5) | < 0.05 |
| - Awareness of HCV. | 41 (34.2) | 36 (51.4) | 77 (38.5) | < 0.05 |

*= by test Chi-square (χ^2) test.

Discussion

A wide variety of work place risks are known to exist in dental professionals; these risks arise out of employment, work materials, substances and work processes⁽¹¹⁾.

Dental personnel are exposed to various occupational health hazards like stress, allergic reactions, higher noise levels, percutaneous exposure incidents and radiation⁽¹²⁾. This is in accordance to previous studies where occupational hazards such as interactions with patients, physical strain and financial pressure negatively related to psychological wellbeing of dental professionals^(13,14). A part from this, dental environment is also associated with a significant risk of exposure to various microorganisms. Infectious agents may be present in blood or saliva, as a consequence of bacteremia or viremia associated with systemic infections⁽¹⁵⁾.

In this study, all previously mentioned points and hazards were carefully assessed, analyzed and interpretation of all data collected in self-administrated questionnaire. The results of this study revealed a definite incidence of hazards as eye complaints (21%), ear troubles (32%), allergy to latex (8%), sharp injuries (18%), allergy to amalgam contact (13.5%) and formaldehyde inhalation (9.5%), also significant incidence of stressful situations either duo to contact with anxious patients (26%) or working long hours at a high level of concentration (37.5%) or financial pressure (21%). In addition, the level of awareness of the different dental professional to the risk of transmission of blood borne diseases and bacterial pathogenesis showed a very good percentage of awareness as shown in table (3).

The occupational categories showed a (32%) to be final two years students and 23% to be house officers and those with duration of work for < 1 year and this can easily explain important items of the results like exposures to injury and risk of blood borne infections and the level of awareness to the possible occupational health hazards. Previous studies showed a more or less similar results especially in the developing countries like Nigeria^(11,16).

Formaldehyde is one of the chemical agents routinely used in the clinical set up mainly for disinfection of operative area. Liquid and vapor forms of formaldehyde may cause severe abdominal pain, nausea, vomiting and eye irritation⁽¹⁷⁾. The clinical symptoms of latex allergies include: urticaria, conjunctivitis accompanied by lacrimation and swelling of eyelids, mucous rhinitis, bronchial asthma and anaphylactic shock⁽¹⁸⁾. The latex sensitization rate in dental students was (8%), which is higher than the general population.

Few dentists in south Thailand reported hearing problems⁽¹⁹⁾. Nonetheless some dentists may still be at risk particularly when older and non standardized equipments are used⁽²⁰⁾. Dental laboratory machine, dental hand piece, ultrasonic scalers, amalgamators, high speed evacuation devices and other items produce sound at different levels. As reported in many studies conducted among dentists and dental auxiliaries, (16.6%) of subjects reported of tinnitus, (30%) had difficulty in speech discrimination and (30.8%) had speech difficulty in a background noise^(20,21). The results of this study showed the presences of hearing trouble and tinnitus in (32.6%) and (32.9%) of the surveyed dental professionals in MUDH and AUDH respectively as shown in table (3).

Reports of a study carried out in Washington reveals that 66.9% of the percutaneous injuries are sustained by dentists and most of the injuries (90%) occurred during administration of local anesthesia, recapping a needle and performing surgical procedures^(22,23). This study showed the incidence of sharp instruments injury to be 16.8% and 20% in MUDH and AUDH respectively as shown in table (3).

The emergence of blood-borne pathogens like HIV, HBV and HCV has urged dentists to adopt a number of precautions that have become generally accepted^(24,25). A dentist can become infected either directly or indirectly, i.e by a cut or wound, needle stick injury, aerosols of saliva, gingival fluid and natural organic dust particles⁽²⁶⁾. The awareness of different categories of

dental professionals in the current study showed a percentage of (20%) and (28%) with HIV, (31.2%) and (33.3%) with HBV, (32.8%) and (48%) with HCV in MUDH and AUDH respectively as shown in table (3).

A strict time schedule, coping with anxious patients or painful treatments are frequently referred to as major stressors, procedures connected with anaesthetization of patients, overcoming of pain and fear, unanticipated emergency situations in which a patient's life is in danger, or procedures with hesitant prognosis. It was found that the most commonly reported stressors were treating difficult children (22%), constant time pressure (48%) and maintaining high levels of concentration (43%)^(21,22). Similarly in this study the commonly reported stress in the respondents were patient related in (46%) and dentist related in (37.2%) and economic stress was only in (41%). Coping with difficult or uncooperative patients, over workload, constant drive for technical perfection, underuse of skills, low self-esteem and challenging environment are important factors contributing to stress among dentist. Dunlap and Stewart in their survey on 3,000 dentists found that (38%) were frequently worried or anxious, (34%) of the respondents felt physically or emotionally exhausted, and (26%) said they always or frequently had headaches or backaches⁽²³⁾.

Recommendations

We must assure a safe work environment in dental hospitals the hazards awareness and prevention of legal risks should be made known to all dental professionals. Despite the numerous advancement, many occupational health hazards still exist in present dental professionals. It is therefore recommended that regular workshop and seminars for continued dental education for all clinical dental staff. Dental clinic design has to be made with sufficient lighting, ventilation, engineering control measure and equipped with appropriate personal protective measures.

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