

ORIGINAL ARTICLE

Occupational health problems of dentists in United Arab Emirates.

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Abstract

Objectives: The aims of this study were to investigate the prevalence of some occupationally related health problems among dentists in United Arab Emirates.

Method: A cross-sectional study by using one-stage complex sampling technique using a self reported questionnaire distributed to all 844 dentists, working in three cities (Abu Dhabi, Dubai and Sharjah) in United Arab Emirates (UAE).

Results: Seven hundred and thirty three 733(87) dentists aged 22-70 years responded. The most common occupational health problems were musculoskeletal pain 497(68) and percutaneous injury 306(42). Around one fifth 135(18) of dentists had a history of contact dermatitis mostly caused by Latex gloves, 53% had eye problems, and 5% had hearing problems.

Conclusion: As exposure to potential infectious agents is of concern; continuing education in the avoidance of percutaneous injuries would be beneficial. Further studies are needed to identify causes of musculoskeletal pain and to identify the appropriate interventions to reduce its prevalence, as would similar measures to reduce exposure to agents which may produce contact dermatitis. The awareness of occupational health problems should be highlighted at all clinical and research symposia.

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Conflict of interest

The authors declare that they have no conflict of interest with respect to the submitted work.

Ethical statement

The authors confirm that this research has been conducted in full accordance with the World Medical Association Declaration of Helsinki. The current study was approved by the ethics committee of Ajman University of Science and Technology AUST, General Authority for Health Services for the Emirate of Abu Dhabi, Department of Health and Medical Services of government of Dubai, and Ministry of Health in UAE. Written consents were obtained from all participants in this study.

Introduction

Musculoskeletal system problems connected to occupational conditions are common among health care workers. The costs of these problems are substantial, both in terms of money and in terms of work time lost¹ it may result in lowered productivity due to missed work or in a career-ending injury. The musculoskeletal health of dental professionals has been the subject of numerous studies world-wide, and their focus has been on the pain experienced by the practitioner¹.

Clinical research has found that the primary occupation-related route of blood-borne pathogen transmission in dentistry is through percutaneous injury². Research indicates that dentists are at three times the general population's risk of contracting hepatitis B virus³. In a retrospective study⁴ of 310 dental practitioners who took part in the investigation, 56% of the respondents reported at least one inoculation injury within the last year. And in another study in Thailand⁵ based on self-report questionnaire distributed to 220 dentists, 50% of the respondents reported percutaneous injuries, mostly sustained from hypodermic needles (49%) and burs (20%).

When glove-wearing was first introduced into dentistry in the 1980's, many dentists wore gloves selectively for patients or procedures perceived as being 'high risk' for transmission of HIV or hepatitis⁶. Consequently, these dentists did not have their hands in more-or-less continuous contact with Natural Rubber Latex (NRL) gloves. The occurrence of hand dermatitis among personnel in all fields of dentistry has been found higher than in the general population⁷.

Allergy to latex, e.g. in rubber gloves, is an increasing problem in health care and especially in dental care⁸. The extraordinary increase in latex glove use in dentistry within the past decade is due to an increased awareness of blood infections (e.g. HIV and Hepatitis)⁹, consequently, the number of glove related diseases have considerably increased¹⁰. Health care workers who experience latex sensitivity have the potential of developing severe allergic reactions, which may limit their careers, as well as normal

daily activities. The risk of progression from skin rash, urticaria, to more serious reactions such as asthma, or anaphylaxis is unknown. Prolonged periods of contact with latex that are required for most dental procedures, could exacerbate the allergic reaction.

In Finland, according to the Finnish Register of Occupational Diseases (FROD), the occurrence of occupational diseases among dental personnel has increased threefold in the 1990s¹¹. While in Germany, skin diseases are the second most frequent occupational disease following musculoskeletal disorders, and most occupational dermatitis are cases of contact dermatitis¹².

This study was designed to investigate the prevalence and nature of occupational-related musculoskeletal pain, the prevalence and perceived cause of percutaneous injuries, the prevalence and perceived cause of contact dermatitis as well as the prevalence of sight and hearing disorders, and how demographic factors may influence these problems.

Methods

The current study was approved by the ethics committee of Ajman University of Science and Technology AUST, General Authority for Health Services for the Emirate of Abu Dhabi, Department of Health and Medical Services of government of Dubai, and Ministry of Health in UAE.

The questionnaire used in this study consists of 21 close-ended questions which consisted an information on the individual characteristics such as age, gender, marital status, number of years since graduation and number of hours worked per week. Furthermore, the questionnaires included information on the respondent's musculoskeletal complains in five anatomical regions of the body during the previous 7 days and the previous 12 months, percutaneous injuries during the previous 7 days and the previous 12 months, contact dermatitis, eye and hearing problems. A total of 844 dentists (GDP and specialists) working in three cities (Abu Dhabi, Dubai and Sharjah) in both sectors

(private and public) in UAE selected for inclusion in this study. At least one year of work experience in the current position was a criterion for eligibility to be included in the study.

The Clinics were selected from the membership register of Ministry of Health for emirates of Abu Dhabi, Dubai and Sharjah. This includes Dental clinics, Medical centers, polyclinics and hospitals. The purpose of the questionnaire and how they should be answered was explained, and whenever necessary further information was provided to the participant. The questionnaires were distributed by the researcher between July 2005 and February 2006. All the data entered into the Microsoft Excel, and then transferred into SPSS program. Data analyses were conducted by the use of SPSS windows version 11.0. The chi-square test was used where appropriate and the level of statistical significance was set at $P < 0.05$. Univariate and bivariate analysis were used when appropriate.

Results

This cross-sectional study examined the prevalence of, and some factors associated with, occupational health problems among dentists in United Arab Emirates. Questionnaires were completed by seven hundred and thirty-three 733 dentists from Abu Dhabi, Dubai and Sharjah from both sectors (public and private) with a total response rate of 87%. Missing data were excluded from the analysis. Of the 733 dentists 445(61%) were males, and 288(39%) were females, with an age range from 22-70 years (mean \pm SD = 38.1 \pm 10.3). Background data on age, number of years since graduation (or in clinical practice), and working hours per week been summarised in Table 1. Male dentist used to work for longer hours than female.

The prevalence of musculoskeletal problems, percutaneous injuries, contact dermatitis, eye and hearing problems of dentists have been summarised in Table 2. There were no significant differences between the prevalence of these occupational health problems by

sex, except the experience of musculoskeletal pain within the previous 12 months, and previous 7 days. Around 68% of the dentists reported having musculoskeletal pain in the past 12 months mainly due to back pain (49%), neck pain (33%), shoulder pain (25%) and hand/wrist pain as shown in table 3. There is a clear association between the presence of musculoskeletal pain in the past 12 months and the past 7 days, in relation to the gender of the respondents, specifically with neck, shoulder and hand/wrist pain. On the other hand, there were no significant associations between these problems and the age of the dentist, number of patients attended per day, and number of working hours per week (data not presented in the tables).

Few dentists (9%) reported at least one percutaneous injury during their dental practice in the previous week, however 42% of the dentists reported having at least one percutaneous injury during their dental practice in the previous months (Table 2) mainly by the hypodermic needle (16%). the instruments that caused the injuries are listed in Table 4, a highly significant association is shown between these injuries caused by child bite, endodontic file and being female dentists.

Around one fifth (18%) of the dentists had a history of contact dermatitis, as shown in table 2. There was a highly significant association between reporting contact dermatitis and being female. On the other hand, reporting contact dermatitis by the dentists were significantly associated with the number of year since.

As shown in table 2 more than half of the dentists reported having eye problems (53%). Eye problems included in order of frequency: short-sightedness (28%), long-sightedness (14%) and astigmatism (15%). Only 33 dentists (5%), twenty two males and eleven females, reported that they had hearing problems.

Discussion

To our knowledge, this is the first study to report on Occupational health problems (Musculoskeletal problems (MSP), Percutaneous injuries, Contact Dermatitis, Sight and

hearing problems) among dentists working in UAE. This cross sectional study examined the prevalence of, and some factors associated with occupational health problems in dentists in UAE by means of a self-administered questionnaire. Although the response rate for this study was good, one of the major limitations of this type of research is that what people report may differ from that which they actually do.

The results of this investigation are based on a questionnaire study in which the dentists were asked to note the occurrence of musculoskeletal pain over the past 12 and the previous 7 days. The questionnaire gave answers only with respect to the occurrence of symptoms and not to the frequency and intensity of pain.

Musculoskeletal pain, which is reported to level of 68% (in the past 12 months) in this study, appeared to be the major health problem for dentists in UAE. This percentage is comparatively lower than studies reported by Chowanadisai *et al.*⁵, Auguston *et al.*¹³ and higher than studies reported by Shugars *et al.*¹⁴ and Alexopoulos *et al.*¹⁵. While similar percentage was reported by Finsen *et al.*¹⁶ who also found that the prevalence of musculoskeletal pain in the past 12 months was 65%.

This study is in support of previous study⁵ that musculoskeletal health problems were the most common occupational health problems reported by dentists. The most frequent percentage of reported pain among UAE dentists was the occurrence of back pain in the last 12 months. The second most common anatomical region that was reported was the neck pain. This result supports the findings of similar previous studies in other countries like the findings of Alexopoulos *et al.*¹⁵ and Szymanska¹⁷ and others who suggested that pain were predominately localized in the back and in the neck.

The occurrence of back pain in the past 12 months was the highest and reported by almost half of the respondents, while the occurrence of pain in this region in the past 7 days was reported by nearly the third. It would be expected that the proportion of musculoskeletal symptoms in the five anatomical regions will diverge more or less identically in the past 12 months and in the past 7 days, and it did. The high level of back

pain could be attributed to the mental stresses and postural positions inherent in the dentist's work, resulting in more strain on their spine while working¹⁸. On the other hand, the substantial prevalence of pain in the neck and shoulders in this study could be associated with repetitive work performed with a flexed neck and elevated and abducted arms¹⁹.

Although the proportion of female dentists in the present study were less than males, they were significantly more likely than their male colleagues to report musculoskeletal pain; particularly the neck, shoulder and wrist pain. As the demand of dental tasks would be similar for both sexes, the increased prevalence of symptoms may reflect a greater willingness on the part of females to report the symptoms. Similar findings were reported elsewhere²⁰.

Working hours tend also to be longer among dentists than the standard working week hours of around 35 hours. In spite of long hours of working each day which is irrational from the point of view of ergonomics; according to this study; there was no relation between the number of working hours per week and having musculoskeletal symptoms in concordance with other studies^{21,22}. But, this is in contrast to the work of Al Wazzan *et al.*¹⁸ and Chohanadisai *et al.*⁵

Although on one extreme, one study⁵ indicates that the prevalence of musculoskeletal symptoms is negatively correlated with the years in practice, on the other extreme; other studies^{17,23} reported increase in prevalence of musculoskeletal symptoms with years in practice. Our study indicates that no significant association between reporting musculoskeletal symptoms and years in practice. A partial explanation for that is, may be those dentists with sever musculoskeletal symptoms had ceased working, though this could not be determined.

In a prospective study²³ of a 5-year follow-up, found that a relatively large number of individuals among the dental personnel had left their profession during the observation period. The leavers had a considerably higher prevalence of musculoskeletal symptoms

with a wide spread localization as early as at the beginning of the study and also after 5 years. The leaving of employment had resulted in a reduction in the prevalence rate of symptoms among the stayers; thus resulting in a dilution effect. The current study confirmed a comparatively lower prevalence of percutaneous injuries among practicing dentists in UAE.

In this study, the finding of (42%) of dentists reported having at least one percutaneous injury during their dental practice in the previous 12 months is lower than the prevalence of self-reported percutaneous injuries of dentists practicing in Scotland⁴ and in Thailand⁵. Dental practice within the UAE, where the prevalence of HIV/AIDS is among the world's lowest²⁴, appears to be associated with a very low risk of acquiring HIV infection by occupational exposure. However, the prevalence of percutaneous injuries indicates that they are a common hazard of dental practice and in view of the importance of other blood-borne viral infections, are a cause of concern.

The results of our study indicate that, syringe needles to be the primary source of percutaneous injuries in the dental environment corresponds with those of Chowanadisai and co-workers⁵. In general, there was no significant association between sustaining percutaneous injuries and being a male or female dentist. Same finding was reported in a prospective study in United States²⁵, while in a study conducted in Thailand⁵ showed that male dentists had a significantly higher prevalence of percutaneous injuries than female dentists.

The current study showed that female dentists experienced child bite injuries more than their male colleagues that were statistically significant. This might reflect the lower threshold on the part of female dentists to report the child bite injuries or that could be attributed to the fact that most mothers in United Arab Emirates prefer to take their children to female dentists; as a common sense in the minds of the parents that; they are better in management of their children than male dentists.

Our study is supporting the intuitive assumption that more years in practice is associated with less injuries (in past 12 months) sustained. This is in concordance with the conventional belief that experience leads to greater proficiency, and thus less injuries reported. Same finding has been obtained elsewhere²⁶.

Dental workers are an excellent group for studying the adverse reaction to latex gloves, as they may wear gloves for 8-10 hours daily, 5-6 days a week, giving them a much greater degree of exposure to latex than most other health care workers.

Contact dermatitis among dentists is an important occupational health issue. The (18%) working lifetime prevalence of hand dermatitis in this study was remarkably similar to a study reported from United States²⁷ among dental personnel. On the other hand, this finding is lower than (22-44%) from studies conducted in many countries^{5,9,28}.

Female dentists in the present study were statistically more likely to develop reaction to latex gloves, and this female preponderance has been noted in previous investigations^{28,29}. This is because women may have lower threshold for reporting an adverse reaction²⁹.

The present study shows just over half of dentists reported having eye problems. Similar finding has been obtained in Thailand⁵. Few studies have examined eye problems in dentists, although eye problems were common among the respondents in this study, most of these eye problems are commonly seen in the general community and were probably not occupationally related, but they may affect the work of dentists or be aggravated by their occupation⁵.

Few dentists in this study reported hearing problem, which is slightly higher than what is reported in Thailand⁵. This problem was associated mainly with old age dentists, and more years in practice. This low reported percentage of hearing problem could be related to the fact that noise levels of modern dental equipment have now fallen below 85dB (A), the widely used benchmark standard, below which risk of hearing loss is minimal³⁰.

Conclusion

The present study has indicated that some occupationally related health problems, especially musculoskeletal problems, percutaneous injuries and contact dermatitis were presents among dentists practicing in UAE. The prevalence of dentists, who reported percutaneous injuries in the previous 12 months, although low, is of particular concern; therefore, continuing education in the avoidance of percutaneous injuries would be beneficial. Further studies are needed to identify causes of musculoskeletal pain and to identify the appropriate interventions which would reduce its prevalence. Further continuing education and investigation of appropriate interventions to reduce exposure to agents which may produce contact dermatitis also needed.

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Table 1: Age, Number of years since graduation and working hours by sex.

	Male (n=445) (Mean ± SD)	Female (n=288) (Mean ± SD)
Age (years)	40.8±9.2	36.4±7.5
Number of years since graduation	16.7±9.2	13.5±8.1
Working hours per week (hours)	30.5±15.5	26.6±14.5

Table 2: Number (Percentage) of dentists who had some occupational health problems classified by sex.

Type of problem	Male n (%)	Female n (%)	Total n (%)
Musculoskeletal pain			
Past 12 months**	282 (63)	215 (75)	497 (68)
Past 7 days**	195 (44)	166 (58)	361 (49)
Percutaneous injury			
Past 12 months	179 (40)	127 (44)	306 (42)
Past 7 days	39 (9)	28 (10)	67 (9)
Contact Dermatitis**	63 (14)	72 (25)	135 (18)
Eye Problems	230 (52)	159 (55)	389 (53)
Hearing Problems	22 (5)	11 (4)	33 (5)

* $P < 0.05$ ** $P < 0.01$

Table 3: Prevalence of Musculoskeletal pain reported by sex.

1. Musculoskeletal pain in the past 12 months

Anatomical Region	Male n (%)	Female n (%)	Total n (%)
Back pain	211 (47)	148 (51)	359 (49)
Neck pain**	131 (29)	109 (38)	240 (33)
Shoulder pain**	94 (21)	91 (32)	185 (25)
Facial & Scalp muscle pain	6 (1)	6 (2)	12 (2)
Wrist/Hand pain**	35 (8)	44 (15)	79 (11)
Others	16 (4)	14 (5)	30 (4)

* $P < 0.05$ ** $P < 0.01$

2. Musculoskeletal pain in the past 7 days

Anatomical Region	Male n (%)	Female n (%)	Total n (%)
Back pain	136 (31)	102 (35)	238 (33)
Neck pain**	96 (22)	90 (31)	186 (2)
Shoulder pain**	68 (15)	86 (30)	154 (21)
Facial & Scalp muscle pain	6 (1)	3 (1)	9 (1)
Wrist/Hand pain**	31 (7)	34 (12)	65 (9)
Others	11 (3)	13 (5)	24 (3)

* $P < 0.05$ ** $P < 0.01$

Table 4: Prevalence of reported percutaneous injury during their dental practice in the previous 12 months by perceived causative instruments by sex (Some dentists were injured by more than one type of instrument).

Anatomical Region	Male <i>n</i> (%)	Female <i>n</i> (%)	Total <i>n</i> (%)
Hypodermic needle	67 (15)	50 (17)	117 (16)
Hand scaler (Sickle or Curette)	13 (3)	6 (2)	19 (3)
Bur	30 (7)	18 (6)	48 (7)
Endodontic file*	32 (7)	32 (11)	64 (9)
Wire*	34 (8)	12 (4)	46 (6)
Explorer	24 (5)	23 (8)	47 (6)
Exodontic elevator	19 (4)	9 (3)	28 (4)
Matrix band**	14 (3)	1 (1)	15 (2)
Child bite**	31 (7)	38 (13)	69 (9)
Others	5 (1)	3 (1)	8 (1)

* $P < 0.05$

** $P < 0.01$