Dentists' perceptions of occupational hazards and preventive measures in East Jerusalem

I.A. Al-Khatib,[1] M. Ishtayeh,[1] H. Barghouty[1] and B. Akkawi[1]

إدراك أطباء الأسنان للمخاطر المهنية وللتدابير الوقائية في القدس الشرقية

عصام أحمد الخطيب، ماهر اشتيه، حنين البرغوثي، بسام عكاوي

الخلاصة: يتعرَّض أطباء الأسنان، مثل غيرهم من المهنيِّين الصحيِّين، لأنواع مختلفة من مشكلات الصحة المهنية، إضافةً إلى المشكلات الخاصة بمهنتهم. وقد تـمَّت في إطار هذه الدراسة مقابلة عينة موزعة عشوائياً من 40 طبيب أسنان (42.2٪) ممن يعملون في القدس الشرقية. واستُخدم استبيان لاستطلاع مدى إدراكهم للمخاطر المهنية. وبيَّنت الدراسة أن معظم المشاركين في الاستبيان يدركون المخاطر البيولوجية: حيث ذكر 38٪ منهم فيروس التهاب الكبد «بي»، وذكر 13٪ منهم فيروس العَوَز المناعي البشري (الإيدز). واشتملت مصادر الكرب المدركة على العوامل التي تتوافق مع المعطيات الدولية، مثل العلاقة مع المرضى، والإجهاد الجسماني، والضغوط الاقتصادية، إضافةً إلى بعض العوامل الخاصة بثقافة الفلسطينيِّين مثل العلاقة مع سائر أطباء الأسنان، والسياسة الضريبية التي تطبِّقها سلطات الاحتلال الإسرائيلي عند التعامل مع أطباء الأسنان العرب في القدس الشرقية. ولم يُذكر الاعتماد على المواد الكيميائية كمصدر محتمل للخطر.

ABSTRACT Dentists, like other health professionals, are exposed to various occupational health problems, with specific ones of their own. A randomly distributed sample of 40 (42.2%) dentists working in East Jerusalem was interviewed. A questionnaire was used to detect their perception of occupational hazards. Most respondents were aware of biological hazards: 38% specifically mentioned hepatitis B virus and 13% human immunodeficiency virus. Perceived sources of stress included factors that coincided with international data, such as relationships with patients, physical strain and economic pressure, but also some specific to the Palestinian culture such as relationships with other dentists and Israeli occupation tax policy when dealing with the Arab dentists in East Jerusalem. Chemical dependency was not mentioned as a potential hazard.

Perception des risques professionnels par les dentistes et mesures préventives à Jérusalem-Est

RÉSUMÉ Les dentistes, comme d'autres professionnels de la santé, sont exposés à différents types de problèmes de santé au travail, ainsi qu'à des problèmes spécifiques à leur profession. Un échantillon aléatoire de 40 dentistes (42,2 %) travaillant à Jérusalem-Est a été interrogé. Un questionnaire a été utilisé pour identifier leur perception des risques professionnels. La plupart des répondants étaient conscients des risques biologiques : 38 % ont mentionné spécifiquement le virus de l'hépatite B et 13 % le virus de l'immunodéficience humaine. Les sources de stress perçues comprenaient des facteurs coïncidant avec des données internationales, tels que la relation avec les patients, la tension physique et la pression économique, mais aussi certains facteurs spécifiques à la culture palestinienne tels que la relation avec d'autres dentistes, la politique fiscale liée à l'occupation israélienne qui est appliquée aux dentistes arabes installés à Jérusalem-Est. La chimiodépendance n'était pas mentionnée comme risque potentiel.

[1]*Institute of Community and Public Health, Birzeit University, West Bank, Palestine (Correspondence to I.A. Al-Khatib: ikhatib@birzeit.edu).*
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Introduction

Occupational ill health and diseases are known to occur, but few people have the knowledge and skill to prevent them. Accidents and diseases in the workplace have generally been seen as part and parcel of everyday life, bad luck, carelessness and no one's fault, particularly not the owners of the work place when a worker is affected [*1*].

Prevention of hazardous conditions in the workplace is central to the practice of occupational health as a profession. Occupational health and dental waste management can and should be considered an integral part of the broader delivery of public health services [*2*].

In Palestine, as in most developing countries, there is difficulty in obtaining accurate estimates of the frequency of occupational health diseases. Several factors are involved:

- Many problems do not come to the attention of health professionals and employers and are therefore not included in data collection systems.
- Many occupational medical problems that do come to the attention of physicians and employers are not recognized as work-related.
- Some medical problems recognized by health professionals or employers as work-related are not reported because the association with work is equivocal and because reporting requirements are not strict.
- Many occupational medical problems are preventable; their very persistence implies that some individual or group is legally and economically responsible for creating or perpetuating them [*3*].

However, where the availability of medical care for the general public is often limited, the major part of occupational health is concerned with the ordinary diseases that workers get at home and bring to work. Nevertheless, there is considerable economic interest in providing occupational health services, both from the employer's point of view and that of the nation: the healthier the work force and the less time lost in sickness absence, the better because there will be greater productivity and prosperity [*1*].

Dentistry is considered by the practitioners and most of the public as being extremely hazardous [*4,5*]. The hazards can be classified as:

- Psychological hazards: stress is the most common psychological condition that occurs in the dental profession. Some studies indicate that dentists perceive their profession as more stressful than other occupations [*6–8*]. One of the main causes of this could be the negative picture created by the media of dentistry as a profession filled with dangers [*8*].
- Physical hazards: these include chemical dependency [*7*] and musculoskeletal problems that have a direct relation to practising dentistry, such as postural practices that may increase the risk of twisting and contorting the body, varicose veins, etc. [*9*].
- Infectious hazards: needles and other sharp objects, spatter and aerosols can be sources of viral infections such as fatal infections of hepatitis B and acquired immunodeficiency syndrome (AIDS) [*10,11*]. Bacterial infections are also a potential risk. The major areas of concern are syphilis and tuberculosis [*12*].
- Allergic reactions: latex gloves are responsible for most of the allergic skin reactions, but dental materials, solvents, lubricating oils, detergents and X-ray

processing chemicals may also induce an allergic skin reaction [*13*].

- Mercury health hazard: it is known that high exposure to mercury vapour can cause biological and neurological damage [*14*]. The use of sealed amalgam capsules with reduced mercury level, water irrigation and high suction, good ventilation and proper collection and discarding of amalgam have greatly reduced the mercury hazard [*3,15*].
- Anaesthetic gases in the dental office: this is a specific hazard for those who use nitrous oxide gas regularly over an extended period of time [*16,17*].
- Ionizing radiation: the use of X-ray machines in the dental office exposes dentists to ionizing radiation [*15,17*].
- Non-ionizing radiation: this has recently become a concern since the introduction of composites and other resins, in addition to the introduction of lasers in dentistry, which has added another potential hazard to eye and other tissues that may be directly exposed [*15*].

Concerning prevention, the international literature focuses mostly on infection control and proper handling of potentially infected materials, owing to the high profile of dentistry regarding transmission of infection. Barrier techniques include gloves, masks, protective eye wear, high power suction and good ventilation to reduce aerosols and vapour dangers [*18,19*]. Hypoallergenic non-latex gloves are proposed to deal with latex allergy. Lead aprons, periodic maintenance of the X-ray machine and radiation level sensors prevent radiation hazards [*13,17*].

The aim of this study was to identify dentists' perceptions of occupational hazards and preventive measures in East Jerusalem and to determine whether preventive techniques are employed.

Methods

Data were collected by interviewing a sample composed of 40 (42%) dentists out of 95 working in East Jerusalem in January 2000. The dentists were asked to participate in the study during a gathering at the East Jerusalem centre of the Palestinian Dental Association. The 84 dentists present were given the questionnaire. They were asked to respond according to their opinion and understanding of the occupational hazards they faced in their practice in an orderly fashion and according to their perception of importance. No list of hazards was given. Participants were asked to respond in the same way concerning the preventive methods they used.

The questionnaires were collected after 1 week; 49 dentists responded, a response rate of 58.3%. Nine questionnaires were rejected owing to unclear answers.

At a later stage, the respondents were visited and asked to explain certain answers, either to give more details or to justify them. For example, some referred to stress without explaining the reasons or mentioned biological hazards without giving specific pathogens. Others mentioned patients or other dentists as being a cause of stress and were asked for specific reasons; many mentioned the Israeli occupation as a source of economic stress and were asked to explain. The data were then analysed and the results classified into 3 main groups: stress, biological hazards and physical hazards.

Results

Table 1 summarizes all hazards and the number of respondents who mentioned each. Most of the dentists (95%) identified infection, including hepatitis B and human

Table 1 **Occupational hazards reported by dentists in East Jerusalem**

Occupational hazard	Respondents No.	%
Stress	40	100
Patient related	24	60
Dentist related	14	35
Economic	32	80
Biological hazards	38	95
Hepatitis B virus	15	38
HIV	5	13
Nonspecific	23	58
Physical hazards	21	53
Musculoskeletal	20	50
Eye/ear injury	8	20
Radiation hazard (X-ray)	2	5
Allergic reactions	3	8

HIV = human immunodeficiency virus.

Table 2 **Preventive measures against occupational hazards reported by dentists in East Jerusalem**

Preventive measure	Respondents No.	%
Barrier techniques	40	100
Hepatitis B vaccine	15	38
Adherence to ethical conduct in practice	27	68
Full medical history of patients	18	45
Engaging in sports activities	12	30

immunodeficiency virus (HIV), as a major hazard; no other infections were mentioned specifically. Half of the respondents identified musculoskeletal problems as a physical hazard. The most frequently mentioned were backache, neck ache and varicose veins.

Stress was identified as a major hazard by all the respondents. The main sources included dealing with patients who had other conditions, especially heart disease; dealing with pregnant women; and dentist–dentist relations. Taxes, lack of patient knowledge and absence of rules and regulations for the dental profession were also mentioned.

Two sources of stress related to economic factors were mentioned: the increasing number of graduate dentists that enter the profession each year and the very severe tax policy applied in East Jerusalem.

Preventive actions taken were identical for almost all of the dentists. Table 2 summarizes all preventive measures cited. All of them mentioned sterilization and barrier techniques, including gloves, masks and eye wear, as being of great importance. No mention was made of the rubber dam or regular testing of the unit's water supply.

About half the dentists in our study considered taking a very thorough clinical history of the patient as a step towards preventing occupational hazards. Having a high moral and ethical attitude in practising the profession was also considered very important by 68% of the respondents.

Sports activities were mentioned as a way of handling stressful working conditions and dealing with musculoskeletal pain resulting from the practice of dentistry.

Discussion

All the respondents identified stress as the major occupational hazard, which coincides with the international data indicating that dentists perceive their profession as highly stressful [*6–8*], but they also included factors (some related to the Israeli occupation) that are specific to Palestinian culture, such as ways of resolving disputes between dentists, and between dentists and patients without resorting to Israeli associations and laws and how to deal with the tax policy of the Israeli occupation.

Patient-related stress, according to the respondents' opinions, was associated with dealing with patients who had a medical history of other conditions and the possibility of the patient deliberately or unintentionally concealing their health status.

Stress associated with dentist–dentist relations, according to the respondents' perceptions, derived from unethical competition among dentists and defamation by other dentists. These concerns may be in part the result of the political situation and the years of occupation that have prevented organizational, legal and regulatory actions concerning professional issues among the Palestinian dentists in East Jerusalem. The Jerusalem branch of the Jordanian Dental Association has been operating since 1952, before the Israeli occupation, but during the occupation it has lacked executive authority. This led to a situation where cases of unethical competition among dentists occurred, including non-compliance with the fee schedule which was laid down and approved as the sole reference for pricing by the Jerusalem branch of the association, and other conduct that resulted in the deterioration of dentist–dentist relations [*20*].

Other factors that contributed to these concerns were the limited dental awareness of patients in addition to some deep-rooted wrong beliefs that may also have been shared by some dentists. These included refusal to treat pregnant women and certain tribal ways of solving disputes in traditional Palestinian society, e.g. certain elderly people who are heads of well known families or large tribes may be the judges in disputes: despite their lack of knowledge on scientific issues, their rulings must be obeyed. This tended to augment the stress of Palestinian dentists when dealing with patients.

The increasing number of graduates that enter the profession each year in an area as confined as East Jerusalem leads to fierce competition and economic instability among dentists. In addition, the Israeli authorities apply in East Jerusalem a tax policy that includes almost daily tax raids on the Arabic sector by tax department officials, who do a very thorough inspection of the accounts. Any discrepancy in the papers entails fines and legislative actions that cost the dentist a great deal of time and money. This was mentioned as a further source of economic stress [*21*]

The dentists were well aware of the biological hazards, especially the most dangerous ones (HIV and hepatitis B virus). This can be attributed to the great deal of publicity given to cross contamination via blood-borne pathogens in dentistry in the past few years. Respondents mentioned HIV less than hepatitis B virus, probably because of the widely held belief by the Palestinian public that HIV usually affects people with deviant practices that are alien to the conservative nature of Palestinian society. Numerous surveys and studies have shown that the incidence of hepatitis B developing after needle-stick injuries from HBs Ag(+) patients is approximately 20% compared with an estimate of 0.4% following similar exposure to HIV [*19,22,23*]. Infections from other microorganisms such as Epstein–Barr virus, cytomegalovirus, herpes simplex or cold viruses are not mentioned specifically. This may be because they are rare or they cause mild infections that dentists do not consider significant.

Musculoskeletal complaints were common. These are usually a result of wrong postural practices, especially among dentists who do not use the "4-handed dentistry technique" in which patients are treated while in a supine position and the dentist is seated with back support [*24*].

Allergic reactions did not seem to be perceived as an important hazard.

Only 2 dentists mentioned ionizing radiation as a hazard because most of the responding dentists did not perform X-ray

examinations in their practices, preferring to refer their patients to a specialized X-ray centre in East Jerusalem.

Chemical dependency was not mentioned as a potential hazard; we believe that this was probably due to the conservative nature of Palestinian society, where alcohol and drug addiction are looked on as unacceptable behaviours. It is also likely that even if there were cases, they would not be mentioned.

Concerning preventive measures, all of the dentists mentioned barrier techniques: wearing protective clothing was standard procedure for all the respondents. This is in agreement with the results of a study conducted in Saudi Arabia in which only 2%–4% of dental professionals never wore gloves when treating patients [*25*]. The situation is almost the same in Canada: in 1994 it was found that 91.8% of dentists in Ontario, always wore gloves, 74.8% always wore masks and 83.6% always wore eye protection [*26*]. A study conducted by Morris et al. showed that about 90% of dentists in Kuwait wore gloves, 75% wore masks and 52% wore eyeglasses [*27*]. In a New Zealand study, 42.0% of dentists wore gloves, 64.8% wore masks and 66.4% wore eye protection [*28*].

Other barriers such as the rubber dam were not widely used by the respondents in our study since nobody mentioned it.

Following ethical codes of conduct in practising dentistry was mentioned to be of great importance to decrease stress from dentist–dentist relationships. Taking the full medical history of the patient was justified to take special precautions for special cases, or to get authorization from the patient's physician to treat certain patients and even to refuse to treat certain cases or defer treatment, especially for pregnant women. This was thought to decrease stress from dealing with "compromised" patients.

Conclusions and recommendations

There is no doubt that the potential occupational health hazards in dentistry are great. Reckless practice can have devastating health effects on both dentists and patients. But obviously, adequate awareness exists among dentists about most of these hazards, and the compliance of dentists to at least the major preventive techniques has diminished these hazards. This is reflected in the fact that there are no apparent large-scale adverse effects among dentists in East Jerusalem, and by the absence of studies that demonstrate the prevalence of these effects (excluding stress and muscular symptoms).

The Palestinian situation is similar to the international one with a greater emphasis on the biological hazards. Specific psychological concerns related to the characteristics of the Palestinian community were expressed.

We recommend promoting events that could improve interpersonal relations between dentists in East Jerusalem, e.g. group sports activities, parties, dinners, etc. Good social relationships could markedly reduce stress from poor dentist–dentist relationships.

Local dental committees could set up support groups that would work in 2 directions. They would deal with disputes arising between dentists and patients, and also professional disputes between dentists. The other direction would be educational: constantly updating dentists on occupational health issues to keep them aware and interested, and to direct efforts towards improving public awareness, and correcting erroneous beliefs about dentistry. This could be done through the local media or with the cooperation of local associations.

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Compendium of activities of the WHO Collaborating Centres in Occupational Health. Network of Collaborating Centres work plan 2001–2005 – 15 task forces

Collaborating Centres are occupational health institutes or departments affiliated with WHO that are making a substantive contribution to the implementation of the Global strategy on occupational health for all with a wide range of activities. The 2001–2005 work plan of the Network of the WHO Collaborating Centres in Occupational Health was developed over the period 2000–2001. The work plan incorporates the commitments of WHO headquarters, the Regional Offices, the WHO Collaborating Centres in Occupational Health, and the affiliated NGOs, for the implementation of the Global Strategy. At the sixth Network Meeting in February 2003 in Brazil, progress reports for projects were delivered by each Centre represented and new goals were set. The current version of the *Compendium of activities of the WHO Collaborating Centres in Occupational Health* is based on those updates. However, as this is a rapidly evolving process, updates will be published periodically in hard copy and continually on this website. Further information on the Global strategy on occupational health for all is available at: http://www.who.int/occupational_health/en/