Self-reported occupational visual and hearing impairment among dental professionals in Nigeria

[1]Osazuwa-Peters N, [1]Azodo CC, [1]Ehizele AO, [2]Umanah AU, [3]Obuekwe ON

[1]Department of Periodontics, University of Benin Teaching Hospital, Benin City
[2]Department of Restorative Dentistry, University of Benin Teaching Hospital, Benin City
[3]Department of Oral and Maxillofacial Surgery, University of Benin, Benin City

Osazuwa-Peters N, Azodo CC, Ehizele AO, Umanah AU, Obuekwe ON
Self-reported occupational visual and hearing impairment among dental professionals in Nigeria. Tanz Dent J 2011, 17 (1):1-6.

Abstract

Objective: To determine the prevalence of occupational visual and hearing impairment among dental professionals in Edo State, Nigeria. **Materials and Methods:** A questionnaire based cross-sectional survey of dental surgeons, dental surgery assistants (DSA), dental therapists and dental technologists was conducted in four government owned dental centers in Edo state which included: University of Benin Teaching Hospital, Specialist Hospital, Benin City, Irrua specialist hospital and General hospital, Fugar. **Results:** The response rate was 78.1%. Majority (77.3%) of the respondents were dentists, others were dental nurses (10.7%), dental technologists (9.3%) and dental therapists (2.7%). The prevalence of hearing impairment was 4.0% while visual impairment was 12.0%. The prevalence of hearing impairment was higher among dental technologists, however this was not statistically significant (P>0.05).The regular use of safety practices among the dental professionals was low ranging from12.0% to 50.7%. **Conclusion:** Visual impairment was more common than hearing impairment among dental professionals. Noise level and hazards to the eyes in dental clinic should be evaluated by occupational health and safety advisors with a view of making useful recommendation to reduce their adverse impact on dental professionals. Further investigations using objective auditory and visual assessment tools are also recommended.

Keywords: Occupational health, visual impairment, hearing impairment, dental professionals, health hazards

Correspondence: Dr. C.C Azodo, Department of Periodontics, New Dental Complex, University of Benin Teaching Hospital, P.M.B. 1111 Ugbowo, Benin City, Edo State, Nigeria 300001, Email: clementazodo@yahoo.com, Phone: +2348034051699

Introduction

The eyes and ears are sense organs that are of great importance to the dental professionals which enable them to execute their duty with accuracy which meets patient's expectations (1). Screening of dental students during admission and pre-employment medical examination for dental professionals does not include visual and auditory assessment. However it appears that some occupational factors adversely affect these organs. One tenth (10%) of dental laboratory technicians in Norway were documented to have experienced sensory health problems (2). Hearing impairment inhibits team work which is necessary for optimal dental care delivery. Noise generated in dental clinic environment by high-speed air-turbine hand pieces, hand drills, compressor and generators is reasonably high enough to affect auditory functions of the workers (3,4). Report of tinnitus which is an early sign of hearing loss following ultrasonic use by both clinicians and patients exist in the literature (5). The noise levels in dental school environment and other forms of dental practice and laboratory is between 60 and 99 dB(A) (6,7). The noise level varies with the nature of equipment whether it is brand new or used; and also varies with different operations and location whether in the clinic or the laboratory (6,7). The noise levels during dental procedures result in an articulation index of 0.21 to 0.37, corresponding to understanding of about 18% to 48% of nonsense syllables and 52% to 90% of sentences (8). Hearing problems among dental personnel are not usually severe in nature but range from tinnitus to difficulty in speech discrimination with or without background noise level (9).

Good vision is important for quality clinical examination, diagnosis and treatment in dentistry where many clinical tasks requiring fine discrimination are performed. The delivery of perfect

aesthetic work like dentures, bridge, composite and tooth bleaching depends on optimal functioning eyes of a dental professional and emphasizes the unique visual demands on dentists (10,11). Visual impairment has adverse effects on the practice of dentistry (12). Poor illumination in work area, procedures using curing lights, or involving trimming are harmful to the eyes yet they exist in oral health care centers (13,14). The eyes are among the organs most frequently hurt in occupational injuries (15). Eye problem has been documented as a common occupational health problem among the Norwegian dental hygienists (16). Eye injuries in laboratories are among the most common injuries that occur in dental school environment (17). At the time of eye injuries 60% of affected individual are not wearing any eye protection (18). The random nature of many eye injuries, necessitate that all practitioners should maintain proper protective procedures (19). Regular eye protector wearing has been documented to reasonably reduce the prevalence of ocular injuries (20). However, the regular use of protective eye wear among dental personnel in Lagos University Teaching hospital, Nigeria is low (21). The adoption of protective eyewear was patchy and exposed dentists to unnecessary risk to eye injuries (22).

Few studies that evaluated visual functions of dental personnel showed diverse results, possibly because of difference in location of the studies. A study conducted in Scotland revealed that the eyesight of a group of dentists examined exceeded the generally accepted normal population values (23) while another study which examined the visual acuity of practicing dentists using a reduced Snellen chart imaged at 25 cm and 33 cm found that 27% failed the near vision test, having acuity of less than 6/9 at 25 cm, while 18% had acuity of less than 6/7.5 at 33 cm; 96 per cent of those who failed at 25 cm and 93.5 per cent of those who failed at 35 cm were 45 years of age or more (12). Working distance (operating distance) was found to be significantly greater in dentists over the age of 45 than in a group of undergraduate dental students (12). Literature has implicated mercury as a causative factor of visual impairment of dental professionals (24). Literature on visual and auditory impairment occupational problems research on oral health care workers is scanty. Assessment of visual and hearing impairment would be necessary to serve as a guide for development of precautionary measures. The objective of the study was, therefore, to determine the prevalence of visual and hearing impairment among dental professionals.

Materials and Methods

A questionnaire based cross sectional survey of dental surgeons, dental surgery assistants, dental therapists and dental technologists working in four government owned dental centers in Edo state was conducted over a 3 months period. The hospitals are tertiary and secondary health facilities and they include University of Benin Teaching Hospital, Specialist Hospital, Benin City, Irrua specialist hospital and General hospital Fugar. Data collected were demography, work experience, visual impairment, hearing impairment, use of ear plugs, use of protective eye goggles, illumination and hygiene practices related to amalgam spillage. Those on ototoxic drugs were excluded. Ethical approval for the survey was obtained from University of Benin Teaching Hospital ethics committee. Informed consent was obtained from the participant prior to the onset of the study. Data was analyzed using SPSS version 13.0. Test for significance was done with the chi square fisher exact test and significance was set at $P<0.05$.

Results

A total number of 75 dental professionals, with response rate of 78.1%, were included in the study. The female: male ratio was 1:1.3. The highest numbers of respondents were in the 26-30 years old age group (28.0%) and 36-40 years old age groups (24.0%). The highest number of females was in the 31-35 years old age group (Table 1).

Table 1: Age and sex distribution of the respondents

Age (years)	Male		Female		Total		P-Value
	n	%	n	%	n	%	
20-25	3	(33.3)	6	(66.7)	9	(12.0)	0.003
26-30	15	(71.4)	6	(28.6)	21	(28.0)	
31-35	5	(29.4)	12	(70.6)	17	(22.7)	
36-40	15	(83.3)	3	(16.7)	18	(24.0)	
41-45	3	(42.9)	4	(57.1)	7	(9.3)	
46-50	0	(0.0)	2	(100.0)	2	(2.7)	
>50	1	(100.0)	0	(0.0)	1	(1.3)	
Total	42	(56.0)	33	(44.0)	75	(100.0)	

Majority (77.3%) of the respondents were dentists, others were dental nurses/dental surgery assistant (DSA) (10.7%), dental technologists (9.3%) and dental therapists (2.7%) (Figure 1).

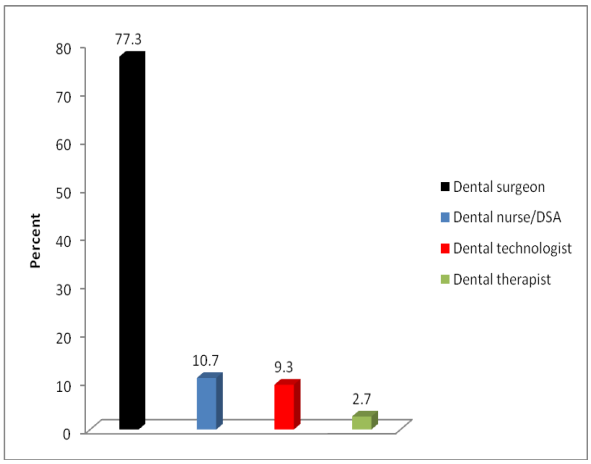

Figure 1: Professional status of the respondents

Prevalence of self reported hearing impairment was 4.0% (N=3) while 96.0% (N=72) had never had hearing impairment (Figure 2).

Although hearing impairment was not significantly associated with professional status, it was more common among dental technologists (P= 0.127) (Table 2).

Prevalence of self reported visual impairment was 12.0% (N=9). Visual impairment was not significantly associated with age, sex, professional status and years of experience (Table 3).

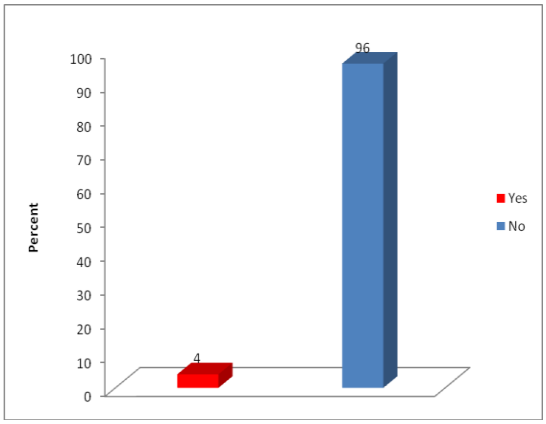

Figure 2: Prevalence of hearing impairment among the respondents

Table 2 Professional status and hearing impairment among the respondents

	Hearing impairment				
	Yes		No		P-Value
Professional status	**n**	**(%)**	**n**	**(%)**	
Dental surgeon	1	(1.7)	57	(98.3)	0.127
Other dental professional	2	(11.76)	15	(88.23)	
Total	3	(4.0)	72	(96.0)	

Table 3: Demographic characteristics and visual impairment among the respondents

Characteristics	Visual impairment				Total		P-Value
	Yes		No				
	n	(%)	n	(%)	n	(%)	
Age (years)							
20-25	1	(11.1)	8	(88.9)	9	(12.0)	0.900
26-30	3	(14.3)	18	(85.7)	21	(28.0)	
31-35	3	(17.6)	14	(82.4)	17	(22.7)	
36-40	1	(5.6)	17	(94.4)	18	(24.0)	
41-45	1	(14.3)	6	(85.7)	7	(9.3)	
46-50	0	(0.0)	2	(100.0)	2	(2.7)	
>50	0	(0.0)	1	(100.0)	1	(1.3)	
Gender							
Male	4	(9.5)	38	(90.5)	42	(56.0)	0.457
Female	5	(15.2)	28	(84.8)	33	(44.0)	
Professional status							
Dental surgeon	6	(10.3)	52	(89.7)	58	(77.3)	0.279
Dental nurse/DSA	1	(12.5)	7	(87.5)	8	(10.7)	
Dental therapist	1	(50.0)	1	(50.0)	2	(2.7)	
Dental technologist	1	(14.3)	6	(85.7)	7	(9.3)	
Years of experience							
<10	6	(11.5)	46	(88.5)	52	(69.3)	0.853
≥10	3	(13.0)	20	(87.0)	23	(22.7)	
Total	9	(12.0)	69	(92.0)	75	(100.0)	

Less than one-quarter (21.3%) of the respondents regularly wear protective eye goggle, 12.0% wear protective ear plugs, 46.7% work in well lit operating field and 50.7% adequately clean spilled amalgam on a regular basis (Table 4).

Table 4: Safety practices among the respondents

Protective measures	Regularly		Occasionally		Never		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Protective eye goggles	16	(21.3)	44	(58.7)	15	(20.0)	75	(100.0)
Protective ear plugs	9	(12.0)	7	(9.3)	59	(78.7)	75	(100.0)
Well lit operatory	35	(46.7)	33	(44.0)	7	(9.3)	75	(100.0)
Clean spilled amalgam	38	(50.7)	18	(24.0)	19	(25.3)	75	(100.0)

Discussion

Despite the importance of good eyesight and hearing in dental practice, dental professionals appear to have neglected the process of undergoing medical assessment of these sense organs. This may have also resulted in few research works on visual and hearing impairment in the literature which makes comparison with this present study difficult. The prevalence of self reported hearing impairment among the respondents in this study was 4.0%. This was comparable to the 3% hearing problems recorded among dentists working in 14 provinces of Southern Thailand (25) but differed from the 14.7% - 30.9% hearing problems documented in a survey of dental personnel working in Riyadh city, Saudi Arabia (9). Poor usage of protective ear plug in this study may have contributed to this prevalence. Although hearing impairment was not significantly associated with professional status, it was more common among the dental technologists which was similar to findings in previous literature where it was also found to be more common in dental technicians (9). It may be explained by the fact that the maximum noise level occurs in dental laboratories (6,7). Technicians and other personnel spending many hours in noisy dental laboratories without wearing ear protection increases the risk for hearing impairment (6). In this study, the prevalence of visual and auditory impairment was 16.0% which was comparable to 15% biannual

prevalence of eyesight/hearing problems among Swedish dental laboratory technicians (26).

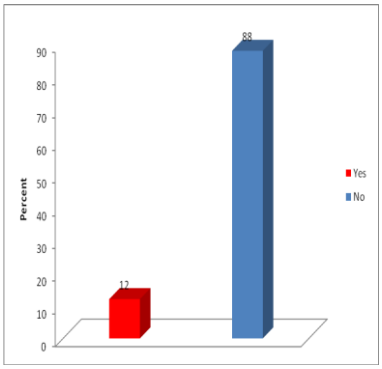

Figure 3: Prevalence of visual impairment among the respondents

A Southland dental practices survey showed a low prevalence of eye injuries (14). In this study, the prevalence of visual impairment among respondents is 12.0% which is comparable to 10% occupational eyes injuries documented by Porter et al. (27) 2 decades ago and 15% eye problems recorded among dentists working in 14 provinces of Southern Thailand (25). Poor adherence to preventive measures which include low usage of protective eye wear, working in poorly lit operatory and not giving adequate care to amalgam spills may have contributed to the fairly high prevalence of visual impairment recorded in this study (21,28). In this study, the prevalence of regular protective eye wear was 21.3% which is lower than 36.7% previously documented among dental personnel of Lagos University Teaching hospital, Nigeria (21). Previous studies have recorded differences in the prevalence of ocular injuries with professional status and gender (20, 21). In this study, there was no significant variation in visual impairment with sex, professional status and years of experience however, the prevalence of visual impairment appeared to be highest for dental therapist followed by dental technologist, dental nurse/DSA and finally dental surgeons. In this study, there was also no significant association between visual impairment and age among the respondents in this present study however the prevalence of visual impairment was highest for 31-35 years age group followed by 26-30 and 41-45 years age groups. This differed from findings of work-related eye injuries reported to the Norwegian Injury Surveillance System from a selection of emergency centres during the period 1990-2002, and on injuries reported by employers to the National Insurance Administration 1998-2001 which recorded the highest incidence among those 20 to 24 years of age (15). The prevalence recorded in this study has to be interpreted with care as all the data presented was self reported, however, the findings give a guide to the extent of the problem and could capture more than one level of oral health care.

Conclusion

Visual impairment was more common than hearing impairment among oral healthcare practitioners. Regular eye and ear examination of dental professionals by qualified personnel is deemed necessary. Noise level and hazards to the eyes and at dental clinic should be evaluated by occupational health and safety advisor with a view of making useful recommendation to reduce their adverse impact. Further investigation using objective auditory and visual assessment tool is also recommended.

References

1. Oboro HO, Azodo CC, Ehizele AO, Sede MA and Chukwumah NM. Perceived visual deterioration among a selected group of dental surgeons in Nigeria. Nig Med Pract 2011; 59:24-30.
2. Jacobsen N, Pettersen AH. Self-reported occupation-related health complaints among dental laboratory technicians. Quintessence Int 1993; 24:409-15.
3. Barek S, Adam O, Motsch JF. Large band spectral analysis and harmful risks of dental turbines. Clin Oral Investig 1999; 3:49-54.
4. Bali N, Acharya S, Anup N. An assessment of the effect of sound produced in a dental clinic on the hearing of dentists. Oral Health Prev Dent 2007; 5:187-91.
5. Coles RR, Hoare NW. Noise-induced hearing loss and the dentist. Br Dent J 1985; 159:209-218.
6. Setcos JC, Mahyuddin A. Noise levels encountered in dental clinical and laboratory practice. Int J Prosthodont 1998; 11:150-7.
7. SampaioFernandes JC, Carvalho AP, Gallas M, Vaz P, Matos PA. Noise levels in dental schools. Eur J Dent Educ 2006; 10:32-7.
8. Wilson CE, Vaidyanathan TK, Cinotti WR, Cohen SM, Wang SJ. Hearing-damage risk and communication interference in dental practice. J Dent Res 1990; 69:489-93.

9. Al Wazzan KA, Al Qahtani MQ, Al Shethri SE, Al Muhaimeed HS, Khan N. Hearing problems among dental personnel. J Pak Dent Assoc. 2005; 14:210-4.
10. Burton JF, Bridgman GF. Eyeglasses to maintain flexibility of vision for the older dentist: the Otago dental lookover. Quintessence Int. 1991; 22:879-82.
11. Chadwick RG. Factors influencing dental students to attend for eye examination. J Oral Rehabil 1999; 26:72-4.
12. Burton JF, Bridgman GF. Presbyopia and the dentist: the effect of age on clinical vision. Int Dent J 1990; 40:303-12.
13. Szymańska J. Work-related vision hazards in the dental office. Ann Agric Environ Med 2000; 7:1-4.
14. Bruzell Roll EM, Jacobsen N, Hensten-Pettersen A. Health hazards associated with curing light in the dental clinic. Clin Oral Investig 2004; 8:113-7.
15. Bull N, Høvding G, Riise T, Moen BE. Can work-related eye injuries be avoided? TidsskrNorLaegeforen. 2004; 124:2776-9.
16. Jacobsen N, Hensten-Pettersen A. Occupational health problems among dental hygienists. Community Dent Oral Epidemiol. 1995; 23:177-81.
17. McDonald RI, Walsh LJ, Savage NW. Analysis of workplace injuries in a dental school environment. Aust Dent J. 1997; 42:109-13.
18. Ramos MF. Prevention of work related injuries: a look at eye protection use and suggested prevention strategies. J Ophthalmic Nurs Technol. 1999; 18:117-9.
19. Stokes AN, Burton JF, Beale RR. Eye protection in dental practice. N Z Dent J. 1990; 86:14-5.
20. Al Wazzan KA, Almas K, Al Qahtani MQ, Al Shethri SE, Khan N. Prevalence of ocular injuries, conjunctivitis and use of eye protection among dental personnel in Riyadh, Saudi Arabia. Int Dent J. 2001; 51:89-94.
21. Ajayi YO, Ajayi EO. Prevalence of ocular injury and the use of protective eye wear among the dental personnel in a teaching hospital. Nig Q J Hosp Med. 2008; 18:83-6.
22. Chadwick RG, Alatsaris M, Ranka M. Eye care habits of dentists registered in the United Kingdom. Br Dent J. 2007; 203:E7.
23. Forgie AH, Gearie T, Pine CM, Pitts NB. Visual standards in a sample of dentists working within Scotland. Prim Dent Care. 2001; 8:124-7.
24. Canto-Pereira LHM,LagoM, Costa MF, Rodrigues AR, Saito C´A, Silveira LCL, Ventura DF. Visual impairment on dentists related to occupational mercury exposure. Environ ToxicolPharmacol 2005; 19: 517–522.
25. Chowanadisai S, Kukiattrakoon B, Yapong B, Kedjarune U, Leggat PA. Occupational health problems of dentists in southern Thailand. Int Dent J. 2000; 50:36-40.
26. Jacobsen N, Derand T, Hensten-Pettersen A. Profile of work-related health complaints among Swedish dental laboratory technicians. Community Dent Oral Epidemiol. 1996; 24:138-144.
27. Porter K, Scully C, Theyer Y, Porter S. Occupational injuries to dental personnel. J Dent 1990; 18, 258–262.
28. Otoh EC. Global use of dental amalgam: the African perspective. Nig Dent J 2008; 16:53-58.