

Prevalence of neck and back pain among dentists and dental auxiliaries in South-western Nigeria

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Summary

Dental health workers like other workers have occupation related health problems and hazards which include neck and low back pain. Previous studies have shown that the prevalence and location of pain may be influenced by posture and work habits and as well as demographic factors. The aim of this study was to determine the prevalence of neck and back problems among dentists and dental auxiliaries in private and government dental hospitals in south western Nigeria. Structured self administered questionnaire was sent to dentist and dental auxiliaries by randomly selecting 3 out of the 6 state capital from the southwestern Nigeria. Participants included those in private clinics, teaching hospitals and general hospitals. The questionnaire was composed of respondents biodata, questions about specific information on neck and back pain and routine practice posture while working at chairside. The total number of properly filled questionnaire was 210 with a male to female ratio of 1.04:1. Respondents included 147 dentists, 37 dental surgeon assistants (DSA), 14 dental therapists and 12 dental technologists. Prevalence of back and neck pain among the respondents was 88.1% and 81.9% respectively. Among the male respondents, the prevalence of back pain was 86.9% and 89.3% in female while for neck pain, the prevalence was 83.2% in male and 80.6% in female. Within the different professional groups, the prevalence of back pain was highest among the DSA(89.2%), closely followed by the dentists(88.4%), then therapists(85.7%) and least among the technologists(83.3%). For neck pain, the prevalence was highest among therapists followed by technologists, dentists and least among the DSA. More females missed work due to back and neck pain than males. There is therefore the need to address ergonomic issues and change the way dentistry is practiced.

Keywords: Back pain, neck pain, dentists, dental auxiliaries

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Résumé

Les employés des services de dentaire comme d'autres travailleurs ont des problèmes de santé et d'exposition du à l'occupation incluent le mal de dos et le mal du cou. Des études antérieures ont montrées que la prévalence et le site de la douleur peut être influence par la position et les habitudes au travail, et bien que les facteurs démographiques. Le but de cette étude était de détermine la prévalence du problème de mal du cou et du dos parmi les dentistes, les axillaires dans les hôpitaux dentaires prives et gouvernementaux au sud oust du Nigeria. Un questionnaire structure et administre librement aux dentistes et axillaires aux hasards dans 3 des six (6) hôpitaux dans la capital de l'état du sud ouest au Nigeria. Les participants inclus les cliniques privées, centre hospitalier universitaires et généraux. Le questionnaire était compose des données des participants, des questions spécifiques sur le mal du cou, du dos et la position routinière pendant le travail. Le nombre total des questionnaires bien remplis était de 210 avec une proportion de male: femelle de 1.04:1. Les participants inclus 147 dentistes, 37 chirurgiens dentaires assistant (CDA), 14 thérapeutistes dentaire et 12 techniciens dentaires. La prévalence de la douleur de cou et lombaire parmi les participants était de 88.1% et 81.9% respectivement. Parmi les participants males, la prévalence de la douleur lombaire était de 86.9% et 89.3% chez les femelles tandis que la douleur du cou avait une prévalence de 83.2% aux hommes et 80.6% aux femmes. Parmi les groupes professionnelles, la prévalence du mal de dos était le plus élevée parmi les assistants chirurgiens (89.2%), suivi des dentistes (88.4%), ensuite les thérapeutistes (85.7%) et le moindre les techniciens (83.3%). La prévalence de la douleur du cou était plus élevée parmi les thérapeutistes suivi des techniciens, dentistes et le moindre les assistant chirurgiens dentaires. Plus de femelles manquaient leur travail du aux douleurs de cou et lombaires que les males. Ainsi la nécessite d'adresser les issues ergonomiques et changer la façon donc le service dentaire est pratique.

Introduction

Musculoskeletal pain, particularly back pain, has been found to be a major health problem for dental personnel due to the limited work area and restricted vision associated with the oral cavity and bad posture

taken during patients' management [1]. Furthermore, dental procedures are usually long and require much more concentration during work (thereby predisposing to muscle fatigue) [1,2].

Dental health professionals like workers in other vocation have occupation related health problems and hazards. The well known hazards include neck and low back pain, allergies to latex and dental materials such as xylocaine and mercury, injury from needles and sharp instruments [2]. Various investigations have pointed out the common postural faults among dentists and dental auxiliaries among which are craning and/or excessive bending and twisting of the neck, bending forward from the waist, elevation of the shoulders and general bending or twisting of the back and neck [4,5].

Some investigations have shown that the prevalence and location of pain and other symptoms may be influenced by posture and work habits, as well as other demographic factors [1,2,3]. In a study conducted in Thailand [2], part-time Thai dentists were found to have a higher proportion of musculoskeletal problems than their full time counterparts. In a survey of Danish dentists, prevalence of lower back and neck/ shoulder pain over a one year period was reported as 50% and 65% respectively [6]. In a similar study [4] in Israel, it was observed that the prevalence of musculoskeletal symptoms in the lower back and the neck was 55% and 38.3% respectively.

Dental auxiliaries also experience back problems associated with their work. A survey of American hygienists in the state of Minnesota revealed that 68% reported musculoskeletal pain [7]. Another study demonstrated that both dentists and dental assistants experience back and neck discomfort which significantly increased with increase in work hour [8]. In 1989, Bassett concluded that despite the use of improved dental equipment, operating in a seated position using the four handed dentistry technique, and increasing frequency of exercise, the incidence of back problems has not decreased over the last 15 years [9]. As a preventive measure, Bassett recommended that dental students should be taught the correct working positions at chairside and relaxation techniques early in their clinical training.

Aims and objectives

The aim of this study was to determine the prevalence of neck and back problems among dentists and dental auxiliaries in private and government dental hospitals in South Western Nigeria and to develop some guidelines to reduce this dental occupational hazards.

Materials and methods

The survey was conducted by sending out structured questionnaire to dentists and dental auxiliaries in 3 state capitals from southwestern Nigeria. This was done by randomly selecting 3 out of the 6 states from the south western Nigeria. Participants included dentists and dental auxiliaries in private clinics, teaching hospitals as well as general hospitals. The self administered questionnaire was composed of questions about respondents bio-data (i.e gender, sex, weight), questions about specific information on neck and back pain, and routine posture while working at chairside, work frequency at chairside, frequency of absenteeism from work due to back/neck pain and appropriate treatment received. Informed consent was obtained from each respondent and confidentiality of the data was maintained. Ethical approval was obtained from the U.I/UCH ethical committee.

The data was collected, coded and entered into computer spreadsheet, before analysis using version 14.0 of SPSS software package. Continuous variables of age, height and weight were expressed as means and standard deviation. Pain prevalence was expressed as percentage, and strength of association between categorical variables was tested using the chi-square statistics for variables and p value was set at ≤ 0.05 .

Results

Three hundred questionnaire were distributed out of which two hundred and thirty two were returned. Twenty two questionnaires were however excluded from analysis because of inadequate information.

The total number of properly filled questionnaire was 210 with a male to female ratio of 1.04:1. The mean age of all respondents was 36 years \pm (S.D) 8.6 years. (figure 1). Figure 2 show that most (70%) of the respondents were dentists followed by dental surgeon assistants (17.6%) and the least are the technologists (5.7%)

Fig. 1:

prevalence of back pain was 86.9% male and 89.3% in female, while the prevalence of neck pain was 83.2% in male and 80.6% in female respondents.

Dental Surgeon Assistants (DSA) reported a prevalence of 89.2% and 78.4% for back and neck pains over a 12 month period, while dental therapists 85.7% reported back pain and all(100%) had neck pain over the same period. Technologists reported a prevalence of 83.3% for back pain and 91.7% for neck pain while back and neck pain prevalence was reported to be 88.4% and 80.3% respectively for dentists(Table 2). Weight did not have significant effect on prevalence of back and neck pain.

In Table 5, only one respondent work for less than 4 hours per day and he reported back and neck pains regularly. Among those who work for 5-8hours per day, the prevalence of back pain was 82.88% and 79.3% for neck pain. Respondents who work for 9-12 hours per day reported a prevalence of 97.7%

Fig. 2: Distribution of respondents profession by gender

Table 1: Frequency of back and neck pain according to gender

Sex	Back Pain					Neck Pain				
	Never	1-2ce/yr	3-4ce/yr	Regularly	Total	Never	1-2ce/yr	3-4ce/yr	Regularly	Total
Male	14	50	14	29	107	18	46	20	23	107
Female	11	49	17	26	103	20	50	18	19	103
Total	25	99	31	55	210	38	96	38	42	210

Table 2: Frequency of back and neck pain according to profession

Profession	Back Pain					Neck Pain				
	Never	1-2ce/yr	3-4ce/yr	Regularly	Total	Never	1-2ce/yr	3-4ce/yr	Regularly	Total
DSA	4	18	7	8	37	8	15	6	8	37
Therapist	2	4	2	6	14	-	6	3	5	14
Technologist	2	8	2	-	12	1	8	-	3	12
Dentist	17	69	20	41	147	29	63	29	26	147
Total	25	99	31	55	210	38	92	38	42	210

Table 3: The Relationship between Frequency of neck pain and weight of respondents Weight (Kg)

Neck Pain	40-50	51-60	61-70	71-80	81-90	91-100	>100	Total
Never	1	10	13	8	3	-	1	24
1-2times/yr	4	11	29	26	8	5	3	92
3-4times/yr	-	9	11	12	4	-	1	30
Regularly	2	14	9	9	4	1	-	52
Total	7	44	62	55	19	6	5	198

12 participants did not indicate their weight

In Table 1, the prevalence of back and neck pain among the respondents was 88.1% and 81.9% respectively. Among the male respondents, the

for back pain, 86.3% for neck pain while for respondents who work for more than 12hours per day, the prevalence of back pain was reported to be 100% and 90% for

neck pain. There is therefore an increase in the frequency of occurrence of back and neck pain as the number of working hours increases, even though the prevalence is higher in back than in neck pain.

(26.5%) respondents out of the 185 with back pain sought medical help. (Table 7).

Table 4: The relationship between frequency of back pain and weight of respondents Weight (in kg)

Back Pain	40-50	51-60	61-70	71-80	81-90	91-100	>100	Total
Never	-	7	9	6	2	-	-	24
1-2 times/yr	5	15	28	26	11	3	4	92
3-4 times/yr	-	7	9	11	2	1	-	30
Regularly	2	15	16	12	4	2	1	52
Total	7	44	62	55	19	6	5	198

$$X^2 = 24.9 \quad P = 0.406$$

Table 5: Frequency of back and neck pain according to the no of working hours per day

Working hrs	Back Pain					Neck Pain				
	Never	1-2ce/yr	3-4ce/yr	Regularly	Total	Never	1-2ce/yr	3-4ce/yr	Regularly	Total
<4	-	-	-	1	1	-	-	-	1	1
5-8	19	45	21	26	111	23	47	21	20	111
9-12	2	51	11	24	88	12	40	16	20	88
>12	-	4	2	4	10	1	5	1	3	10
Total	21	100	34	55	210	36	92	38	44	210

Table 6: The number of respondents who missed work due to neck and back problem

Missed work		Neck Pain	Back Pain
Yes	M	5	8
	F	8	12
No	M	102	100
	F	95	90
Total		210	210

Thirteen (12.6%) female respondents missed work due to back pain while only 7 (6.5%) males missed work due to back pain. (Table 6).

Out of the 172 with neck pain, thirty two (18.6%) respondents sought medical help due to neck pain out of which majority(62.5%) required analgesics while only one (3.1%) needed surgical intervention. Forty nine

Discussion

The nature of dental work requires flexion of the lumbar spine and subsequent loading on the intervertebral discs or extra tension in the spinous ligaments both of which can contribute to discomfort and pain. In this study, the mean age of 36years is in keeping with the fact that the average age-group among the working class is 20-40years, but this is lower than 43 years reported by Palliser and others [10].

The percentage distribution of the members of the dental team is as shown in figure 2 with dentist constituting 70%, DSA 17.6%, therapists 6.7% and technologists 5.7%. In a similar study by Al Wazzan *et al* [11], dentists constituted 44.6%, DSA 35.35%, technologist 14.2% and therapists 5.8%. In this study, dentists constitute the highest proportion among the respondents because Nigeria is a developing country

Table 7: Treatment modalities among respondents with back and neck pain.

Type of Pain	Treatment Received					Total
	Nothing	Analgesic	Physio	Analgesic plus Physio	Surgery	
Neck Pain	140	20	5	5	1	32
Back Pain	136	32	9	6	-	49

with only 4 dental schools, to one training school for DSA, therapists and dental technologists .

The proportion is such that to every 4 dental surgeon graduates from each school in a year, there will be just 1 DSA, 1 dental therapists and 1 dental technologist, and this may account for the disparity.

The prevalence of back and neck pain was 88.1% and 81.9% respectively among the respondents in this study. This is higher than 73.53% and 54.41% reported by Alwazzan *et al* [11] for back and neck pain respectively. The prevalence of back pain (88.1%) among respondents in this study was higher than that of neck pain (81.9%). AlWazzan *et al* [11] equally reported a higher prevalence of back pain than neck pain even though their own values were lower.

Back pain was more among the female respondents than in the male counterparts in this study while more male reported a higher prevalence of neck pain. However, Shrestha [12] in a study on work related complaints among dentists reported that gender did not have any relation with back and neck pain. Rundrantz *et al* [13] in their prospective study interviewed 311 dentists in 1987 and 359 in 1990 and discovered that the prevalence of musculoskeletal pain and discomfort had increased since 1987, even though as in 1987, female dentists had a higher prevalence of pain and discomfort in the neck and shoulders than their male colleagues in the 1990 study.

Among the dental team, the prevalence of back pain was highest among the DSA (89.2%) followed by dentists (88.4%), while neck pain was highest (100%) among dental therapist followed by dental technologists and least among the DSA. This is contrary to what AlWazzan [11] reported in their study where dentists had more back and neck pain than the other dental auxiliaries. Visser and Straker [8] also showed that dentists experienced significantly greater levels of lower back discomfort than dental assistants. The differences were attributed to the mental stresses and postural positions inherent in the dentists work, resulting in more strain on their spine while working. The comparative results of the present study were contrary to the findings about the work of the dental assistants. The nature of a dental assistants work was found to be less stressful with less strain on the spine. The dental assistant's work assignments allow for greater mobility than either the dentist or dental therapist. The dentist function is more constrained, while the greater mobility of the dental assistant allows frequent postural changes throughout the working day. This mobility helps to avoid prolong static loading of the spine. However,

since the results were subjective, one cannot really be too sure that what respondents reported was actually experienced.

It was found that weight had a minor effect on neck and back pain. The result also showed that increase in the daily working hours increased the prevalence of back and neck pain. This is similar to what Alexopoulos [14] reported that increased working hours was associated with elevated comorbidity such as back, neck, shoulder and wrist pain as the physical load on the spine is increased and there is lower job control.

Finally, of those who had neck pain (81.9%) and back pain (88.1%), only 7.6% missed work due to neck pain and 10.8% due to back pain. This is far less than 21.6% and 24.6% reported by AlWazzan [11]. In total, more females missed work due to musculoskeletal pain as against males. This is in agreement with what many authors [15,16] reported that women have greater prevalence of back pain and are more likely to miss work as a result. On the other hand, only 18.6% and 26.5% sought medical help for neck and back pain respectively. This is also higher than 16% reported by Shrestha [12] and far less than 70% reported by Bassett [9]. This indicates postural problems cause a minimal disruption of the working hours of dental professionals. The lowered figure of those who missed work due to back and neck pain reported in this study can be due to the culture of self medication which is being practiced in our own environment.

In conclusion, dental work often involve time spent in static uncomfortable positions which lead to musculoskeletal symptoms over the years in practice. There is therefore a critical need to address ergonomic issue in the educational system and to change the way dentistry is practiced to lower the risks of back and neck pain to dental practitioners.

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Received: 11/09/09

Accepted: 17/05/10