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Musculoskeletal Neck and Back Pain Among Dental Healthcare Workers in Port Harcourt

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Abstract: This study aimed to determine the prevalence and risk factors of the neck and back pain among students and staff of the Dental centre, University of Port Harcourt Teaching Hospital (UPTH). This study was conducted among one hundred subjects, comprising of ten consultants, eight residents, fourteen house officers, forty-three dental students, fifteen dental surgery assistants, four therapists and six technologists. Evaluation of the subjects with self-administered questionnaires was done, which comprised subjects' biodata, posture during work, rest period at work, exercise during rest and location of pain. Pain severity was assessed using the Visual Analogue Scale (VAS) (0 -10) pain scores. Fifty-eight percent of the participants were female, with male to female ratio of 1:1.34 and mean age was 30.23±8.49years. Seventy-six percent (76%) had experienced back pain with neck pain predominating in 38.2% followed by upper back pain (31.6%). There was no statistical difference between the percentage of males (76.2%) and females (75.9%) that have experienced musculoskeletal pain. According to the cadre of the respondents; 100% of residents, 90% of consultants, 86.7% of DSA and 83.3% of dental technologist have experienced musculoskeletal pain in their practice. Only 14.5% of the respondents had missed practice due to pain. Majority (49.0%) compromised their posture while working and only 9% do any form of exercise during rest period. There is a high prevalence of neck and back pain among dental professionals in this study. Years of practice, number of patients seen per day and posture plays a vital role. Hence, a review of the practice of dentistry is needed.
Keywords: Neck and Back Pain, Dental healthcare workers, Musculoskeletal.

INTRODUCTION

The musculoskeletal disorder is one of the occupational hazards among dental personnel [1]. It is characterised by the presence of discomfort, disability or persistent pain in the joints, muscles and tendons [2]. The aetiology of musculoskeletal neck and back pain is repeated movements and prolonged awkward or forced body postures [1, 2]. The high risk of neck and back pain in dentistry has been attributed to the limited work area with restriction of movement, bad posture and the narrow visual field associated with the oral cavity [1-3]. Moreover, dental procedures are usually lengthy and require much precision.

The global prevalence of musculoskeletal pain among dental health workers ranged between 44.9% to 80% [3]. Generally back pain was found to be more prevalent in females while neck pain was more in males [2-5]. Moreso, more females missed work due to musculoskeletal pain compared to males [5].

A systematic review by Hayes *et al*., [6] reported a prevalence between 64% to 93% among dentist with the most commonly cited regions of musculoskeletal pain being the back (36.3–60.1%) and neck (19.8–85%). A study done in South Africa [7] among dentist reported an extremely high prevalence of musculoskeletal disorder. In the study, the prevalence of lower back pain was 99.1%, followed by 98.2% in the neck and shoulder. Seventy-seven percent of dentists complained of back pain in the south-east of Nigeria as reported by Udoye and Aguwa [8] in 2007. Furthermore, in the south-west of Nigeria, 88.1% of dentist had back pain while 81.9% had neck pain [5].

Dental surgery assistants (DSA) have been reported to complain of back pain more than dentists [5]. However, Al Wassan *et al*., [9] found that dentists had relatively more neck and back pain as compared to dental auxiliary staff. A study by Rising *et al*., [10] investigated the body distribution and severity of musculoskeletal pain among dental students and reported an incidence of between 46%-71%.

Furthermore, final year dental students have been reported to have musculoskeletal pain due to poor posture [11].

Dentists and dental auxiliaries are exposed to numerous occupational hazards [5-10]. Occupational hazard like musculoskeletal back and neck pain can result in early retirement. Hence, assessment of professional hazards among dental workers is an essential aspect of the dental profession. However, there is a paucity of literature on the prevalence of musculoskeletal disorders among dental health care-workers and dental students in south-south of Nigeria. Therefore, this study aimed to determine the prevalence and risk factors of neck and back pain among dental health care workers and dental students at the University of Port Harcourt Teaching Hospital (UPTH).

MATERIALS AND METHODS

This study is a descriptive cross-sectional study done among dental health workers and clinical dental students at the University of Port Harcourt Teaching Hospital, Rivers State. A self-administered questionnaire was used to obtain information on socio-demographics, routine posture while working at the dental chairside, questions about musculoskeletal pain and coping methods. Pain severity was assessed using the Visual Analogue Scale (VAS) (0 -10) pain scores.

Participants included dentists, dental auxiliaries and clinical dental students in UPTH. Informed consent was obtained from each respondent and confidentiality of data was maintained. Ethical approval was obtained from the UPTH Research Ethics Committee.

The Statistical Package for Social Sciences version 20.0 (IBM SPSS statistics, Armonk New York) was used for data analysis. The strength of association between categorical variables was tested using Chi-square and p-value was set at ≤ 0.05.

RESULTS

One hundred participants were recruited for this study. Fifty-eight percent of the respondents were female, with a male to female ratio of 1:1.34 and mean age of 30.23±8.49years. Most (63.0%) of the respondents were within 21 to 30 years age group while the least (5.0%) age group were those less than 20 years of age. The majority (43.0%) of the respondents were dental students followed by DSA (15.0%) as shown in Table-1.

Seventy-six percent (76%) had experienced musculoskeletal pain, and 60.5% (46/76) of those with pain were within 21-30 years age group as shown in Figure-1.

Most (47.0%) of the respondents bend at the chairside while working and 45% have a rest period at work. Only 14.5% of the respondents have missed work due to neck and back pain. Also, only 9% do any form of exercise during rest hour (Table-2).

There was no statistical difference between the percentage of males (76.2%) and females (75.9%) that have experienced musculoskeletal pain. According to the cadre of the respondents; 100% of residents, 90% of consultants, 86.7% of DSA and 83.3% of dental technologist have experienced musculoskeletal pain in their practice. The least (65.1%) was among the students. Also, those in the dental profession for more than ten years had more pain when compared to those below ten years of dental practice (Table-2).

The majority (85.1%) of those that bend while attending to their patients had pain compared to 62.5% and 76.2% that experienced pain among those that sit or stand respectively without bending at the chairside. Also, the percentage of those that had pain was found to be higher among; those that attend to more than three patients per day, those that work without an assistant and those that do not exercise during the rest period (Table 2).

Neck pain (38.2%) predominates among the respondents followed by upper back pain (31.6%). The consultants and students experienced neck pain more than the other cadres. However, residents, dental technologist and house officers suffered lower back pain while DSA and dental therapist had more of upper back pain than the other members of the dental profession (Figure-2).

While neck pain(40.6%) and lower back pain(37.5%) predominates among the males; upper back pain(38.6%)and neck pain(36.4%) was more common among the females. Neck pain (40.0%) predominates among those that sit and those that bend while working. Upper back pain(37.5%) was experienced more among those that stand while lower back pain (32.5%) predominates among those that bend at dental chairside as shown in Table-3.

Most (55.3%) of the participants experienced moderate pain with a mean VAS score of 4.6±1.5. Also,38.2% of the respondent do nothing to relieve their musculoskeletal while 31.6% rest to achieve relieve as shown in Figure-3.

Table-1: Sociodemographic distribution

		Frequency	%
Age group	<20	5	5.0%
	21-30	63	63.0%
	31-40	16	16.0%
	41-50	16	16.0%
Gender	Male	42	42.0%
	Female	58	58.0%
	Student	43	43.0%
Cadre	DSA	15	15.0%
	Dental Therapist	4	4.0%
	Dental Technologist	6	6.0%
	House Officers	14	14.0%
	Resident	8	8.0%
	Consultant	10	10.0%
Years of practice	<5 years	69	69.0%
	6-10 years	8	8.0%
	11-15 years	10	10.0%
	16-20 years	9	9.0%
	>20 years	4	4.0%
	Total	**100**	**100.0%**

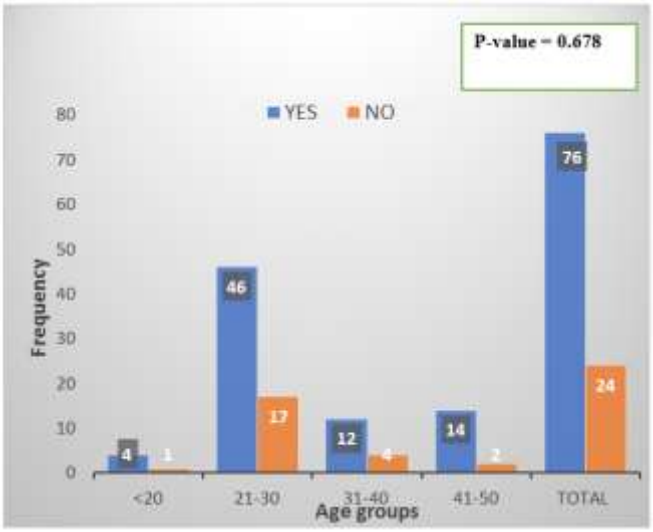

Fig-1: The frequency of musculoskeletal pain among the respondents

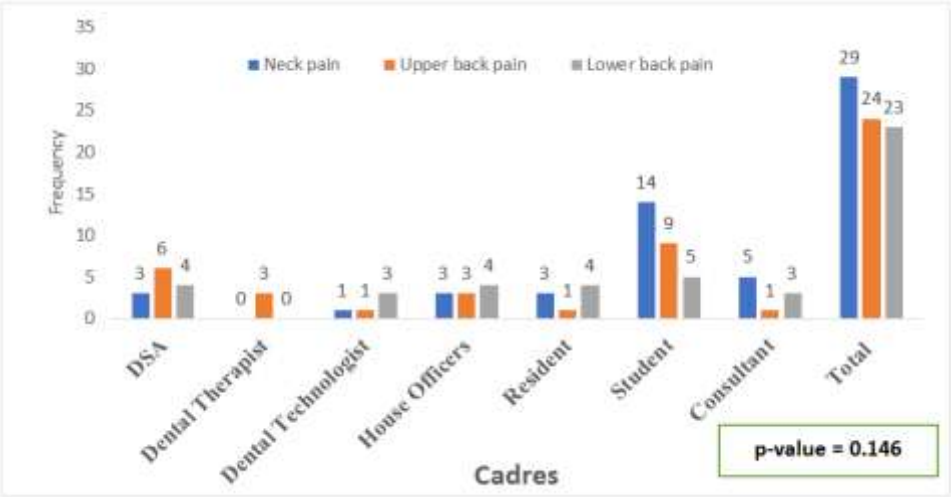

Fig-2: Location of pain among the different cadres

Table-2: Frequency of musculoskeletal pain and respondents' characteristics

Respondents' variables		Presence of pain						
		Yes		No		Total		
		N	%	N	%	N	%	P-value
Gender	Male	32	76.2%	10	23.8%	42	42.0%	0.970
	Female	44	75.9%	14	24.1%	58	58.0%	
Years of practice	<5 years	49	71.0%	20	29.0%	69	69.0%	
	6-10 years	6	75.0%	2	25.0%	8	8.0%	0.295
	11-15 years	10	100.0%	0	0.0%	10	10.0%	
	>15	11	84.6%	2	15.4%	13	13.0%	
Cadre	DSA	13	86.7%	2	13.3%	15	15.0%	
	Dental therapist	3	75.0%	1	25.0%	4	4.0%	0.263
	Dental technologist	5	83.3%	1	16.7%	6	6.0%	
	House officers	10	71.4%	4	28.6%	14	14.0%	
	Resident	8	100.0%	0	0.0%	8	8.0%	
	Student	28	65.1%	15	34.9%	43	43.0%	
	Consultant	9	90.0%	1	10.0%	10	10.0%	
Posture at chairside	Bend while sitting or standing	40	85.1%	7	14.9%	47	47.0%	0.148
	Sit without bending	20	62.5%	12	37.5%	32	32.0%	
	Stand without bending	16	76.2%	5	23.8%	21	21.0%	
Number of patients seen per day	1-3	35	71.4%	14	28.6%	49	49.0%	
	4-6	25	80.6%	6	19.4%	31	31.0%	0.576
	>6	16	80.0%	4	20.0%	20	20.0%	
Do you have an assistant?	Yes	52	75.4%	17	24.6%	69	69.0%	0.824
	No	24	77.4%	7	22.6%	31	31.0%	
Rest period at work	Yes	35	77.8%	10	22.2%	45	45.0%	0.707
	No	41	74.5%	14	25.5%	55	55.0%	
Exercise during rest	Yes	6	66.7%	3	33.3%	9	9.0%	0.492
	No	70	76.9%	21	23.1%	91	91.0%	
	Total	**76**	**76.0%**	**24**	**24.0%**	**100**	**100.0%**	

Table-3: Location of pain according to gender and posture at chairside

		Location of pain						P-value
		Neck		Upper Back		Lower Back		
		N	%	N	%	N	%	
Gender	Male	13	40.6%	7	21.9%	12	37.5%	0.260
	Female	16	36.4%	17	38.6%	11	25.0%	
Posture at chairside	Bending while sitting or standing	16	40.0%	11	27.5%	13	32.5%	
	Sitting without bending	8	40.0%	7	35.0%	5	25.0%	0.964
	Standing without bending	5	31.3%	6	37.5%	5	31.3%	
	Total	**29**	**38.2%**	**24**	**31.6%**	**23**	**30.3%**	

DISCUSSION

The prevalence of musculoskeletal disorders (MSD) in the dental professions has been well established, and can have detrimental effects on the industry, including lower productivity and early retirement. This study shows that the prevalence of musculoskeletal pain among dental personnel in south-south of Nigeria was about 76.0%. This finding is comparable to that of the south-east (71.0%) [8] and south west(88.1%) [5] of Nigeria, and some less developed countries such as South Africa(99.1%) [7] and Nepal(80.0%) [12]. In contrast to all this, the prevalence of musculoskeletal pain among middle-income countries such as Thailand, Malaysia and Hong kong ranged between 43.0% to 50.0% [3]. Moreso, a lesser prevalence of 28.0% was reported in Finland [13]. The similarities and differences between countries have been attributed to the level of economic development, the standard of living, population characteristics and assessment methods [3].

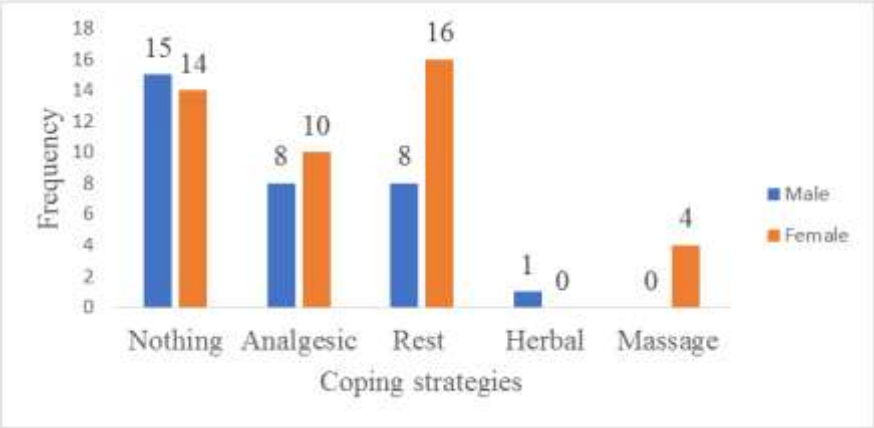

Fig-3: Methods of coping with musculoskeletal pain among the respondents

The difference in the prevalence of pain among the different age groups and gender were not statistically significant in this study. This is consistent with previous studies [3, 9, 12, 14] in which there was no association between back pain and age or gender. Dental professionals irrespective of age groups and gender were assumed to have similar compromised chairside posture [3]. However, Leggat *et al*., [15] reported that backpain was more common among younger Australian dentists. This was attributed to work inexperience and inadequate knowledge in dental procedures among the younger dentists.

A previous study [5] in the south west of Nigeria reported a higher prevalence of back pain among DSA (89.2%) closely followed by dentists (88.4%) and least among dental technologists (83.3%). In this study, dentists (residents and consultants) have a higher prevalence (95.0%) of pain compared to 86.7% among DSA and 83.3% among dental technologists. Our findings are consistent with that of Al Wassan *et al.*, [9] where dentists were observed to have experienced more pain than the other dental auxiliaries. With the relatively high prevalence of musculoskeletal pain among all dental professionals, it appears the knowledge of ergonomic hazards does not affect postural positions in dental practice among dental professionals in Nigeria.

Furthermore, this study shows that those with compromised chairside posture have a higher frequency (85.1%) of musculoskeletal pain and those that sit or stand without bending their neck also have a considerable high rate of pain, 62.5% and 76.2% respectively. It is reasonable to assume that proper chair side positioning and health safety procedures are not being followed by dental health workers. Though poor working conditions, unavailability of adjustable dental units and instruments, and a long time spent in static uncomfortable positions over the years of practice [5] may have contributed immensely to the high prevalence of musculoskeletal pain. This observation of the impact of working positions and conditions on body posture is consistent with other previous studies [3, 5, 13, 14].

As regards location of musculoskeletal pain among respondents in this study. Most of the participants had neck pain (38.2%) followed by 31.6% with upper back pain while 30.3% experienced lower back pain. This is lower than 81.9% for neck pain and 88.1% for back pain reported by Abiodun-Solanke *et al.*, [5]. Back pain was more among the females than the males who reported a higher prevalence of neck pain. This is similar to the results of previous studies [5,9]. However gender has been reported to have no association with back or neck pain [12]. The high prevalence of lower back pain among dental technnologist in this study was consistent with earlier studies [3] and this has been attributed to continous repetitive motion of trimming dental prostheses for several hours [3,16].

Most of the studies on musculoskeletal pain in the dental profession have focused on dentists and few on dental auxiliaries. There has been paucity in the number of studies that reports the prevalence among dental students. In this study, 65.1% of the clinical dental students have experienced pain in their neck (50.0%), upper back (32.1%) and lower back (17.9%). This is similar to the findings of Ng *et al*., [17]. They found that the odds of experiencing pain was higher among those not wearing loupes during clinical work and those having no prior experience in the field [17]. The higher prevalence in the neck and upper back suggests that dental students resort to bending of their upper extremities more often and they have improper posture at the chairside while performing their procedure.

Limitation of the study

There is possibility of overestimation of symptoms due to the reliance on self-reported data in this study. Also, causal inferences cannot be evaluated from this study due to its cross-sectional nature. The role of body mass index, specialty and types of chair

used by the respondents on musculoskeletal pain was not determined.

CONCLUSION

Within the limitations of this study, there is a high prevalence of neck and back pain in this study. The symptoms occurred more among dentists followed by DSA and least among clinical dental students. Prevalence rate increases with years of practice, number of patients seen per day and among those with compromised posture at chair side while performing dental procedures. Most of the respondents do nothing to alleviate the pain experienced in their practice. As preventive measure, dental personnel should be taught relaxation techniques early in clinical training, and they should be taught correct working posture at chair side.

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