

# MUSCULOSKELETAL DISORDERS AMONG DENTISTS AND DENTAL STUDENTS

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## ABSTRACT

*Work-related musculoskeletal disorders (MSD) have been a longstanding problem among dental practitioners and are known to affect their daily life. The present study was aimed to determine the frequency of musculoskeletal disorders among dental students and dentists at the Institute of Dentistry CMH Lahore Medical College, and the relationship of MSD with their quality of life and dental work. A self-reporting questionnaire was responded by 108 dental students (from first, third and fourth year) and 42 dentists (house officers and faculty members). The questionnaire included questions regarding demographics, past musculoskeletal pain (MSP), the site, frequency and intensity of MSP, effects of MSP on the respondents' daily activities and whether they perceived their work in dental clinics as the cause of their pain. Data was analyzed using SPSS version 20. Respondents included 109 females and 41 males. The mean age of the respondents was 22 years (SD  $\pm$ 3.05). Majority of the respondents worked 16-30 hours per week. Musculoskeletal pain was reported by 74% dentists and 51% dental students ( $p=0.011$ ). The most common complaint was lower back (43%) followed by neck (32%) and shoulder (28%). Medical treatment was sought by 41% of the respondents and 13% took sick leave. Daily activities were affected in 27% of the respondents with MSD. Quality of life was significantly more affected in dentists, and 64% of respondents perceived work in the dental clinic as the cause of their MSD.*

**Key Words:** Musculoskeletal disorder, musculoskeletal pain, dentists, dental students, dental work.

## INTRODUCTION

Musculoskeletal disorder is defined as any disorder of the muscles, tendons, peripheral nerves or vascular system not directly resulting from an acute or instantaneous event (e.g. slip or fall). This is considered to be work related when the work environment and the performance of work contribute significantly to the causation of this multifactorial disease.<sup>1</sup>

According to World Health Organization about 58% of the world's population over the age of 10 years spend one third of their time at work and about

30-50% of the workers are exposed to significant physical occupational hazards.<sup>2</sup>

Musculoskeletal disorders have been a longstanding problem among dental professionals. In a 1946 study, Biller found that 65% of dentists reported complaints of back pain.<sup>3</sup> Since then, other studies have shown prevalence of musculoskeletal pain in various sites such as back (41-79%)<sup>4,5</sup> and neck (42-59%).<sup>5,6</sup>

These musculoskeletal disorders have an adverse effect on the quality of life and work of many practitioners. It is reported that dentists may take between 1 to 72 days of sick leave per year as a result of their MSD.<sup>7</sup> It also interferes with their daily activities, and many (25-38%) have to seek medical treatment for their disability.<sup>7,8</sup>

Research has found that dental students (46-78%) are also subject to experiencing MSD in numerous parts of the body, including neck and shoulder area, mid and lower back, and both right and left arms and hands.<sup>9,10</sup> Third year dental students most frequently report musculoskeletal pain.<sup>9</sup>

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In Pakistan, MSD was found to be prevalent in 47% of dental practitioners in a study conducted in Khyber Pakhtunkhwa, with lower back (58%), neck (38%) and shoulders (30%) being the most common sites.<sup>11</sup> The aim of the present study was to determine the frequency of musculoskeletal disorders among dental students and practitioners; its effect on their quality of life and their work, and their perception of the relation between their musculoskeletal disorder and dental work. Our research will provide baseline data for further studies on musculoskeletal disorders among dental practitioners in Pakistan as well as help in identifying risk factors which will help in the prevention and management of MSD.

## METHODOLOGY

This cross sectional descriptive study was conducted in October 2014 at the Institute of Dentistry, CMH Lahore Medical College. A questionnaire was designed and piloted on 10 students and faculty members to assess any difficulties that may arise in filling of the questionnaire.

The definition of musculoskeletal pain and disorder was given at the start of the questionnaire to help respondents in understanding the term better. The questionnaire consisted of four parts, the first dealing with demographics of the respondents and whether or not the respondents had ever experienced past musculoskeletal pain. All further questions were perception-based. The second part of the questionnaire dealt with identifying the site of musculoskeletal pain and describing the intensity (mild/moderate/severe) and frequency (rarely/occasionally/often/always) with which the respondents experienced it. The third part was concerned with the effect of MSP on the respondents' daily life, while the last part contained questions on whether they perceived their work in the dental clinic as a cause of their pain.

The questionnaire was distributed to 156 BDS students (first, third, and final year) and 70 practising dentists (house officers and teaching staff) at the dental college. First year students do not work in the clinics and were included for comparison with other groups. The respondents' willingness to fill out the form was considered as consent to take part in the survey.

TABLE 1: DEMOGRAPHICS

Designation	No.	Gender (%)		% with MS Pain
		Male	Female	
Dental Students				
1st year	27	26	74	44
3rd year	41	27	73	56
4th year	40	18	82	50
Total	108	23	77	51
Dentists				
Faculty	16	31	69	56
H.O.s	26	42	58	85
Total	42	38	62	74
Total Participants	150	27	73	57

TABLE 2: SITE, INTENSITY AND FREQUENCY

Site	No.	Intensity (%)			Frequency (%)			
		Mild	Moderate	Severe	Rarely	Occasionally	Often	Always
Lower back	64	42	55	3	27	50	3	0
Mid back	42	52	43	5	26	55	19	0
Upper back	34	38	47	15	41	32	21	6
Neck	48	46	48	6	40	40	19	2
Shoulders	42	48	38	14	38	31	26	5
Upper arm	27	59	33	7	67	30	4	0
Fore arm	18	61	33	6	56	38	6	0
Wrist	26	54	39	8	54	31	12	4
Hand	23	74	13	13	65	26	9	0
Other	9	33	67	0	22	33	44	0

TABLE 3: MUSCULOSKELETAL PAIN

Designation	No.	Gender (%)		Effect on Daily Activities (%)	Medical Treatment (%)	Sick Leave (%)	
		Male	Female				
Dental Students	1st year	12	25	75	42	25	17
	3rd year	23	26	74	22	35	9
	4th year	20	20	80	25	35	10
	Total	55	24	76	27	33	7
Dentists	Faculty	9	22	78	11	22	0
	H.O.s	22	36	64	32	68	23
	Total	31	32	68	26	45	16
Total Participants	86	27	73	27	41	13	

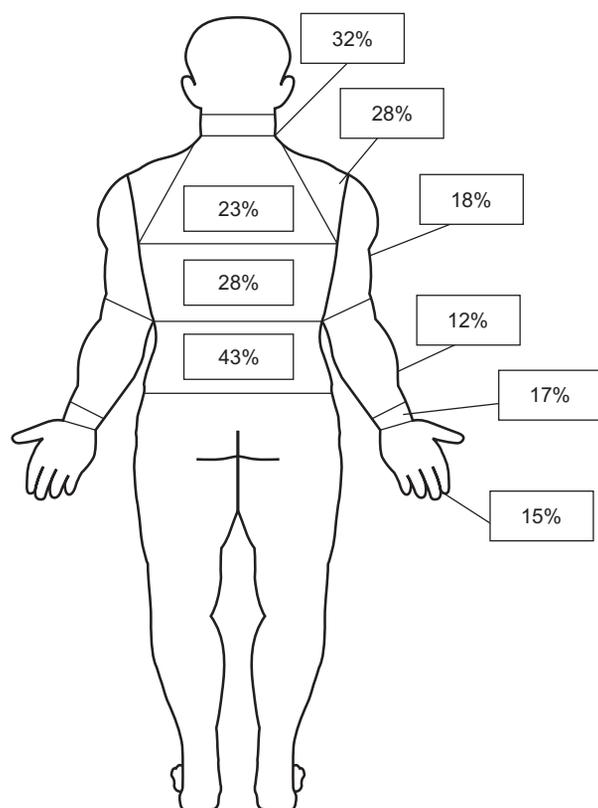


Fig 1: Sites affected by MSP (n=86).

Data was analyzed using SPSS version 20. Frequencies were calculated for the categorical variables. Results were compared between the groups using Pearson's chi square test. The level of statistical significance was set at  $p < 0.05$ .

## RESULTS

Two hundred and twenty six questionnaires were distributed out of which 150 were returned after completion (response rate=66%). There were 109 (72.7%) females and 41 (27.3%) males. The age of the respondents ranged from 18 to 35 with a mean of 22 years (SD  $\pm 3.05$ ). There were 108 (72%) dental students and 42

(28%) dentists (Table 1). Majority of the respondents worked 16-30 hours per week, however all of the first year students worked for less than 5 hours a week. Significantly more dentists worked 16-30 hours per week (81%) than dental students (32%,  $p < 0.001$ ).

Out of the 150 respondents, 86 (57.3%) reported some form of musculoskeletal pain in the past. There was no significant difference in the frequency of MSP between males (56.1%) and females (57.8%,  $p = 0.851$ ). The frequency of musculoskeletal pain was significantly higher in dentists (73.8%) than in dental students (50.9%,  $p = 0.011$ ). MSP was reported most frequently by house officers (85%, Table 1). The intensity of pain in this study was generally mild to moderate, and the frequency of pain varied between rarely and often (Table 2).

The most frequently affected site of musculoskeletal pain was lower back (42.6%) followed by neck (32%) and shoulder (28%, Fig 1). Significantly more dentists (57.1%) experienced lower back pain compared to dental students (37%,  $p = 0.025$ ). Dentists apparently had higher frequency of neck pain (40.5%) compared to dental students (29%), but the difference was not statistically significant ( $p = 0.165$ ).

Among the respondents who experienced MSP (n=86), sick leave was taken by 12.8% and medical treatment was sought by 40.7% (Table 3). Significantly more dentists (54.8%) took medical treatment for their musculoskeletal disorder than dental students (32.7%,  $p = 0.045$ ). Medical treatments received included painkillers, muscle relaxants and physiotherapy. Daily activities were affected in 26.7% of the respondents with the MSD (n=86).

Work in the dental clinic was perceived as the cause of their MSP by 64% (n=86). Out of the dental students (n=55), 56% believed dental work was a cause for their musculoskeletal disorder, all of whom were third and final year students. Significantly more dentists (77%)

considered dental work as the cause of their musculoskeletal disorder ( $p=0.051$ ). Factors perceived as responsible for their pain were work posture, number of hours working in the clinic, type of clinical procedure being performed and overall health of the practitioner.

## DISCUSSION

Research has shown that morbidity due to musculoskeletal disorders seems to be high, with reports of medical care seeking and absenteeism being common among practising dentists.<sup>11</sup> In our study we found that the frequency of musculoskeletal pain was significantly higher in dentists (74%) than in dental students (51%,  $p=0.011$ ). The overall percentage of musculoskeletal pain in dentists is comparable to that reported in Spain (79.8%), 4 Australia (87.2%)<sup>7</sup> and Greece (62%).<sup>12</sup> The higher frequency of MSD in dentists compared to dental students may be attributed to the significantly longer working hours of dentists ( $p < 0.001$ ). Additionally, work in the dental clinic was also perceived as a cause of their MSD significantly more frequently by dentists (77%) than dental students (56%,  $p=0.051$ ).

Medical treatment was sought by 40.7% of dental practitioners in our study, and these results are consistent with other reports.<sup>7,12,13</sup> Significantly more dentists (55%) than dental students (33%,  $p=0.045$ ) sought medical treatment which is consistent with the higher frequency of MSD reported by dentists than dental students (74% vs. 59%). It is possible that medical treatment is sought more often by dentists than dental students due to greater awareness among dentists or negligence on the part of dental students towards their health. Only 16% dentists and 11% dental students took sick leave though the results were not significant ( $p=0.486$ ). Sick leave is perhaps avoided among dental students because of strict attendance policies in colleges and among dentists due to fear of loss of income from salary cuts.<sup>13</sup> Musculoskeletal disorders affected daily activities and quality of life equally in both dentists (26%) and dental students (27%,  $p=0.883$ ) with respondents complaining of difficulty in performing household chores, difficulty in lying down and getting out of bed, and constantly feeling tired because of the pain.

The frequency of musculoskeletal pain experienced by dental students in our study (51%) was consistent with results from the United States (46%)<sup>9,13</sup>, but less than the results reported in Colombia (80%).<sup>14</sup> Amongst dental students, highest frequency of musculoskeletal pain was reported by third year students (56%). The results were similar to other studies where third year students have been identified as most likely to experience musculoskeletal pain because they are just starting clinical work and may not yet be cognizant of the ergonomic principles related to dental work.<sup>9,13,14</sup>

Lower back pain was the most common area to be affected (43%), and similar results are seen in studies in United States (44%)<sup>13</sup>, Spain (41%)<sup>4</sup> and Greece (46%).<sup>12</sup> The occurrence of neck pain was 32% which is similar to results reported in Greece (30%)<sup>12,15</sup> and Khyber Pakhtunkhwa (38%)<sup>13</sup>, but were lower than in studies conducted in Saudi Arabia (54.4%)<sup>8</sup>, Nepal (59%)<sup>5</sup> and Australia (58%).<sup>7</sup> Shoulder pain (28%) was consistent with previous data collected in Spain (24.3%)<sup>4</sup>, United States (31%)<sup>13</sup> and Khyber Pakhtunkhwa (29.6%).<sup>11</sup> With regards to the high occurrence of pain in lower back, neck and shoulder areas, a study conducted on dentists in Sweden accredited the pain to a high load on the trapezius muscles bilaterally along with prolonged forward bending of the back and neck.<sup>16</sup>

This study was limited to only one institute and reports cross-sectional data. Further research should study longitudinal data on a cohort of dental students entering dental practice, and investigate their awareness of ergonomic principles pertaining to dental work. The different work postures adopted by dental students and dentists and their effects on musculoskeletal pain should be studied, and MSD may be related to the quality and quantity of dental work and to the management strategies employed.

## CONCLUSION AND RECOMMENDATIONS

Musculoskeletal disorders were reported by 57% of the respondents in our study of which 74% were dentists and 51% were dental students. Frequently affected sites included lower back, neck and shoulders. Majority of respondents perceived work in the dental clinic as the cause of their MSD.

Musculoskeletal pain affected quality of life equally in both dentists and dental students however medical treatment for it was sought more often by dentists. Although such management strategies are being employed, symptoms have been reported to reappear if work patterns are not improved.<sup>17</sup> Thus, by minimizing identified risk factors associated with dental work, it is possible to prevent MSD from developing in the first place. Due emphasis to correct work posture should be given by implementing it into the curriculum as soon as students begin work in the dental clinics, and should be continuously revised throughout the practitioners' careers.

Prolonged working hours and particular clinical procedures require dentists to maintain static positions which may result in excessive load on the muscles and ligaments.<sup>18</sup> Frequent breaks during clinical procedures, in between successive patients, and regularly after 2-3 hours have been suggested to counter the strains that develop in different areas of the body.<sup>4</sup>

Lastly, every effort should be made by both dentists and dental students to maintain good overall health to maximize their work efficiency and ensure a long and successful clinical career.

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## CONTRIBUTION BY AUTHORS

- |                                |   |
|--------------------------------|---|
| <b>1 Syeda Batool Abbas:</b>   | Title selected, article writing.            |
| <b>2 Samir Riaz Qazi:</b>      | Data collection also helped in methodology. |
| <b>3 Sundus Iftikhar:</b>      | Helped in results compiling.                |
| <b>4 Muhammad Usman Iqbal:</b> | Proof reading & took part in discussion     |