

# Prevalence of Neck and Lower Back Pain among Dentists from Three Dental Colleges in Patna City: A Questionnaire Study

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## Abstract

**Introduction:** In the practice of dentistry, stress, tension, and postural practices can contribute to neck and lower backache problems. Considering the importance of this problem, we considered it was necessary to investigate the prevalence and severity of these problems in this part of eastern India.

**Purpose:** To assess the prevalence, severity, and extent of lower back and neck pain among dentists of three dental colleges of Patna and to suggest/advice preventive measures.

**Materials and Methods:** 121 dentists from three dental colleges in Patna were surveyed to determine the prevalence of neck and lower back pain (73 males and 48 females). The dentists were interviewed with the help of a questionnaire.

**Result:** The data obtained and showed that (88) 72.80% of the dentists had suffered with the problem, sometimes during their practice of dentistry. 38.01% of dentists complained of the lumbar pain. 13.02% had pain in the cervical area, and 24.04% of the dentists had pain in both the areas. Only 39.54% of those complaining of a backache sought medical help. 57.85% of dentists opted exercise and yoga as treatment modalities to relieve the pain.

**Conclusion:** The neck and lower back pain is largely prevalent in dental practitioners though not of very severe degree. Preventive aerobic and relaxation exercises should be included in weekly activities of dentists to prevent recurrence of this problem.

**Key words:** Dentists, Exercise, Low back pain, Musculoskeletal disorder, Neck pain

## INTRODUCTION

The dentists are at high risk of neck and lower backache problems due to the limited work area with a limited scope of movement and narrow visual field associated with the oral cavity. These working restrictions frequently cause a clinician to assume stressful body positions to achieve good access and visibility inside the oral cavity. Furthermore, dental procedures are usually long; require much more concentration during work.<sup>1</sup> Dentist often

cannot avoid prolonged static postures. Even in optimal seated postures, more than one-half of the body's muscles are contracted statically, and there is little movement of the vertebral joints. This may result in damaging physiological changes (micro changes) that can lead to back, neck or shoulder pain or musculoskeletal disorders (MSDs) (macro changes)<sup>2</sup> in dentistry, overstrained and awkward postures, repetitiveness of different joint movements, use of high frequency vibration tools, and psychological stress have been identified as risk factors.<sup>3,4</sup> Studies have shown that dentists report more frequent musculoskeletal pain<sup>5,6</sup> particularly back and neck pain, has been found to be a major health problem for dental practitioners.<sup>7,8</sup> its exact causes are legion, and an exact diagnosis is often difficult.

It has been stated that the most common sites of pain among dentists are in the areas of the cervical and lumbar vertebrae.<sup>9-11</sup> It has been pointed out that common postural

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faults among dentists are craning and/or excessive bending and twisting of neck, bending forward from the waist, elevation of shoulders, and general bending or twisting of the back and neck.<sup>12</sup>

As preventive measure dentists should be taught relaxation techniques early in clinical training, and they should be taught correct working posture at chair side.

Recently, “Ergonomics” has become a popular term. The term has been used in most professions, but increasingly in the dental profession. It is a discipline that studies workers and their relationship to their occupational environment. This includes many different concepts such as how dentists position themselves and their patients, how they utilize equipment, how work areas are designed, and how all of these impact the health of dentists.<sup>2</sup>

It is very important to maintain an adequate work posture and that the instruments and furniture that the dentist is working with have adequate working characteristics.<sup>13</sup> Furthermore, they are exposed to biomechanical risk factors, which indicate that work forced postures, would imply more risk of soreness and presence of skeletal muscle lesions. These lesions could begin to appear at the beginning of their clinical practice as students, by acquiring inadequate postures and working habits that will accompany them for the rest of their professional life, acquiring an unhealthy lifestyle in their work environment.<sup>14</sup>

However, there is a lack of data regarding musculoskeletal pain among the Dentists in Bihar. Hence, the need was felt to conduct a study to check prevalence and risk factors associated with MSD among dentists.

This questionnaire study was taken to assess the prevalence, severity, and extent of lower back and neck pain among dentists from three dental colleges in Patna and propose some preventive measures.

## MATERIALS AND METHODS

A “pilot” study was conducted on 21 dentists from three dental colleges in Patna. The survey was conducted on the 15<sup>th</sup> and 16<sup>th</sup> July 2015; using printed questionnaire. Based on the data obtained from ‘pilot’ survey, modifications were made to make the main survey more reliable.

The main survey was a questionnaire study. The survey was conducted from 7<sup>th</sup> August 2015 to 28<sup>th</sup> August 2015 on a sample of 132 dentists out of which 52 were females and 80 were males.

The questionnaire used for the study consisted of 6 questions about general information and 14 questions about specific information on neck and lower back pain. The dentists were also enquired about any treatment modality opted.

The questionnaire was printed in the English language. All questions were the close ended type.

The dentists were selected from the following three dental colleges of Patna city:

1. Buddha Institute of Dental Sciences and Hospital
2. B. R. Ambedkar Dental College
3. Patna Dental College and Hospital.

The study protocol was reviewed and approved by Ethical Committee of the Institute.

The selection of these colleges and Dentists was dependent on the consent to participate in the study. During the survey, the majority of dentists were enthusiastic and had a positive attitude.

The questionnaire used to collect data for this study was based on similar studies published previously (2, 3, 5, 6). The study fully complied with the ethical standards for human research. The questionnaire included 20 questions pertaining to three domains, demographic and professional characteristics, general medical history, and history of MSD before and after joining the dental profession. These domains included questions pertaining to work setting characteristics and the effect of MSD on dentists’ daily work and non-work activities. MSD was defined as any unpleasant sensation in the musculoskeletal system of the body developed after joining the dentistry profession.

The questionnaire was sent self along with a reply paid envelope and an explanation of the purpose of the study to 132 dentists working in Dental colleges of Patna, inviting them to participate in the study. Respondents were assured of the confidentiality of their information. Dental professionals involved in direct patient contact for at least 10 h per week were eligible to participate. The participants had to complete the questionnaire. Incomplete questionnaires were rejected. 126 dentists replied and participated in the study. After checking, we excluded five questionnaires due to incomplete response. 121 questionnaires were complete and were used for analysis.

## RESULTS

- Figure 1 shows 73% of dentists complained of lower back and neck pain while 27% did not have lower back and neck pain

- Figure 2 shows 60% of males and 40% of females suffered with neck and lowered back
- Graph 1 shows 38% complained lumbar pain, 13% of cervical pain, 22% of both, and 27% were recorded as none
- Graph 2 shows 40% complained of mild pain in lower back and neck region, 31% of moderate nature, 2% of severe nature, 27% did not complained of any pain
- Table 1 shows 76.03% of dentists in 21-30 years age group reported of pain in lower back and neck region 20.67% in 31-40 years age group. Above 40 years were 3.30%
- Table 2 shows in 38.84% of dentists professional life was affected
- Table 3 shows 35.54% had consulted physician
- Table 3 shows 74.38% dentists had taken precautionary measures while 25.62% did not take any precautionary measure
- 57.85% of dentists opted exercise and yoga as treatment modalities to relieve the pain.

**Table 1: Prevalence of neck and lower back pain among various age groups of dentists**

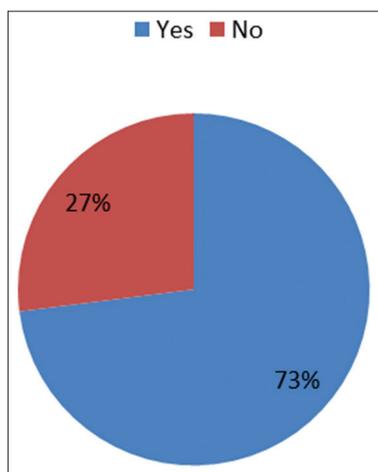
Age groups (years)	Number	Percentage
21-30	92	76.03
31-40	25	20.67
40	4	3.30
Total	121	110

**Table 2: Neck and lower back pain affecting professional life of dentist**

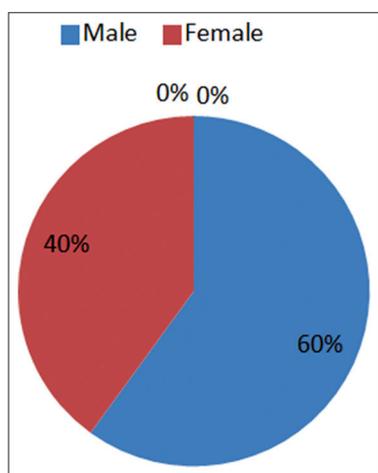
Areas	Professional Life		Sleep	
	Yes	No	Yes	No
Cervical	09	08	06	10
Lumbar	21	24	14	32
Both	17	09	14	12
None	-	33	-	33
Percentage	38.84	61.16	28.09	71.91

**Table 3: Dentist who have consulted or taken precautionary measure for lower back pain**

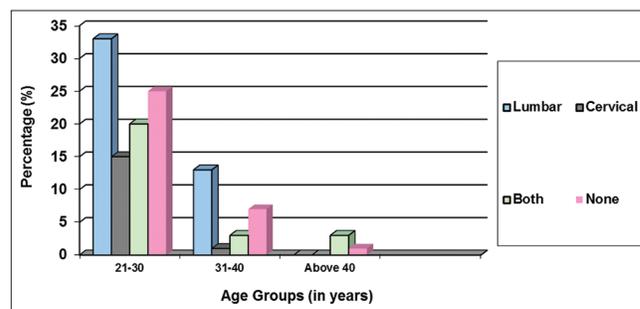
Areas	Precautionary		Consulted	
	Yes	No	Yes	No
Cervical	11	5	8	8
Lumbar	38	8	22	24
Both	20	6	13	13
None	21	12	-	33
Total (%)	90 (74.38)	31 (25.62)	43 (35.54)	78 (64.46)



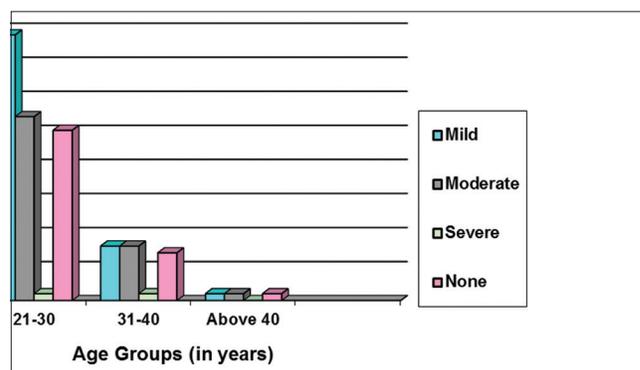
**Figure 1: 73% of dentists complained of lower back and neck pain while 27% did not have lower back and neck pain**



**Figure 2: 60% of males and 40% of females suffered with neck and lower back**



**Graph 1: Neck and lower back pain in relation to age groups**



**Graph 2: Relation between severity of lower back and neck pain with age groups**

Graph 1 shows: (1) 38.01% of dentists complained of lumbar pain and 13.02% complained of cervical pain, 21.84% complained of both (lumbar and cervical), and 27.20% did not complain, (2) 33 dentists had lumbar pain, 15 had cervical pain, 20 had both, and 25 did not have any pain in age group 21-30 years, (3) 13 dentists had lumbar pain, one had cervical pain, 3 had both, and 7 did not have any pain in age group 31-40 years, (4) 3 had both (cervical and lumbar pain) and 1 did not have any pain in age group above 40 years.

Graph 2 shows: (1) 39.88% dentists had mild lower back and neck pain, 30.98% had moderate pain, 1.88% had severe pain, and 27.20% did not complain of any pain, (2) 39 dentists had mild lower back and neck pain, 27 had moderate pain, 1 had severe, and 25 did not had any pain in age group 21-30 years, (3) 8 dentists had mild lower back and neck pain, 8 had moderate pain, 1 had severe pain, and 7 did not complained of any pain in age group 21-30 years, (4) 1 dentist had mild lower back and neck pain, 2 had moderate pain, and 1 did not complained of any pain in age group 21-30 years.

## DISCUSSION

MSD have become increasingly common worldwide during the past decades. It is a common cause of work-related disability among workers with substantial financial consequences due to workers' compensation and medical expenses.<sup>15</sup> In dentists, overstrained and awkward back postures for back pain, repetitiveness for neck and shoulder disorders, and psychosocial stressors for back, neck and shoulder complaints.<sup>14</sup> A slight hand neuropathy has also been reported caused by exposure to high frequency vibration tools.<sup>16</sup>

A cross-sectional study was carried out to assess the prevalence of pain and risk factor associated with the MSDs among the dental surgeons of three dental colleges in Patna.

The majority of the patients (73%) surveyed were found to be suffering from MSDS. Shaikh *et al.* also reported a high incidence (80%) of MSDS in their study in 30 dentists.<sup>16</sup> Among the MSDS, the incidence of low back pain (73.3%) was highest. Various other studies also suggest high incidence of MSDS among dentists.<sup>17,18</sup>

60% of males and 40% of females suffered with neck and lower back. These results are similar to the results of study done by Al Wazzan *et al.*, with findings - 58.24% males and 41.75% females suffered with neck and lowered back pain.<sup>1</sup>

The most common site for MSDS was lower back (38%), i.e., lumbar pain. 13% experienced cervical pain while 22% experienced pain in both regions. These results are again consistent with other studies where the most common area involved was lumbar region.<sup>19</sup> On the contrary, Leggat and Smith reported high incidence of cervical pain as compared to lumbar pain.<sup>17</sup>

The severity of pain encountered by dentists in our study varied from mild to severe. The majority of the dentist (40%) experienced mild pain which subsided with rest and 2% experienced severe pain. The severity of MSDS as found in our study was low as only 35.54% sought medical intervention, and only 38.84% reported that their professional life was affected. Khalid *et al.*, in their study, reported that only 37% of those suffering back and neck pain sought medical treatment and concluded that these symptoms among dental personnel are not severe enough to ask for medications.<sup>1</sup>

Most of the respondent in our study were a young practitioner (21-30 years). However, no correlation was found between age and severity or incidence of pain.

The majority of the dentist opted exercise and yoga as treatment modalities to relieve the pain and reported having used precautionary measures like periodic breaks, working in indirect vision.

## Recommendations

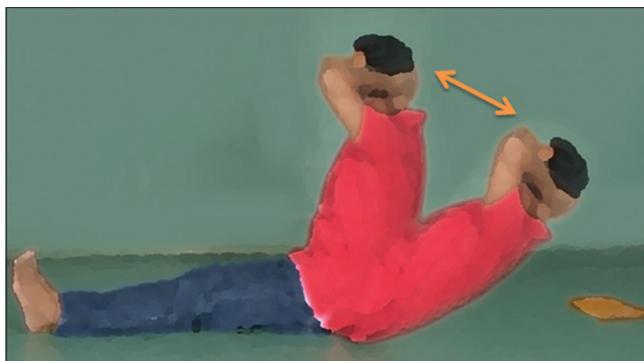
Within the limitations of this study, it might be concluded that neck and back pain among dental personnel of 3 dental colleges are not of a severe nature in Patna.

However, to minimize or even prevent such ailments, preventive aerobic and relaxation exercises should be included in the weekly activities of dental personnel. Such a practice would (1) help dental professionals avoid future physical limitations or handicaps, (2) help them remain productive for longer periods of time during their professional lives, and (3) also help to improve the quality of care during clinical procedures.

## Aerobic Exercises

Aerobic exercise has been reported to improve or prevent back pain. In general, exercise programs that facilitate weight loss, trunk strengthening, and the stretching of musculotendinous structures appear to be helpful in alleviating low back pain. A 30 min aerobic program three times a week is ideal for overall fitness.

Exercise to promote the strengthening of the muscles that support the spine (i.e., the oblique abdominal and spinal extensor muscles) should be considered (Figures 3 and 4).



**Figure 3: Trunk muscles exercise.** Lie in supine position with both hands behind back of your neck. Then up right yourself to a sitting position. Legs should be on the floor during the up righting movement. You can asked somebody to stabilize your legs. If you cannot reach the sitting position, you can do it half way, i.e., to 45°



**Figure 4: Trunk muscle exercise:** Lie in supine position AND, raise your legs up to 45° from the floor, without bending your knees, make a circular movement of 30 cm. In diameter 5 times clockwise and 5 times counter clockwise. Take rest for few seconds, and then repeat the exercise

An effective program may include a warm-up period, about 30 min of aerobic activity, isolated muscle group work (trunk muscle), and a cool-down period walking and/or water exercise are also recommended.

Dental professional may need to take a break from exercise if it aggravates back pain. It is recommended that dental professionals confirm with their doctor regarding which exercise should be used to relieve back pain, to stay fit, and prevent pain injuring oneself again. The presence of any leg pain or other evidence of nerve injury should serve as an indication to consult a physician before beginning exercise.

### Relaxation Exercises

Stress may produce a state of chronic muscle contraction that may decrease circulation increase the concentration of the toxic products (lactic acid and potassium ions) of muscle activity. These toxic products may in turn stimulate nerve endings to generate low back pain. Deep breathing and progressive muscle relaxation exercises may

serve to diminish this stress reaction. Below are some brief relaxation exercise that dentists and their auxiliary personnel may wish to employ any time during the day, break time, or in among patients.

Exercise 1: Performing a breathing exercise is one of the simplest ways to relax in any situation. Take 5-10 min to sit quietly and breathe deeply. Here is an example. Close your eyes and take a long, deep breath. Let it out very slowly. Now, take a second long, deep breath, as you let it out, feel yourself releasing the tensions in your mind and in your body. Just let yourself relax more and more, as you continue.

Exercise 2: Clench your hands. While keeping them clenched, pull your forearms tightly up against your upper arms and raise your shoulders against your neck. While keeping those muscles tense, tense all the neck, back, and leg muscles. While keeping all these tensed, shut your eyes fairly tight and take deep breath and hold it for 5 s. Then, let everything go all at once. Feel yourself letting your tensions.

## CONCLUSION

The present study was conducted on 121 dentists from three dental colleges in Patna to assess severity and area of the neck and lower back pain.

For dentists, neck and lower back pain is not a new problem, nearly most of the dentists have suffered from it sometimes during their practice of dentistry. Lower back pain is more prevalent than neck pain mainly due to faulty postural habits.

It can be concluded that neck and back pain among dentists is not of severe nature. The neck and lower back pain is largely prevalent in dental practitioners. That brings along with it a considerable amount of discomfort, lost working time, and economic loss. What we need is not preventing its incidence and recurrence by including preventive aerobic and relaxation exercises in weekly activities of dentists. This will help in improving the quality of work in their clinical practice.

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