



## **A SURVEY ASSESSING THE PREVALENCE OF NECK PAIN AMONG DENTAL PROFESSIONALS: EFFECT OF SPECIALITY, PRACTICE DURATION AND PHYSICAL ACTIVITY PERFORMED.**

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### **Abstract:**

#### **Background:**

Dental Professionals are extremely prone to musculoskeletal disorders mainly due to their working position and long hours of practice. Neck pain is the most frequent type of pain encountered by dentists worldwide.

#### **Aim:**

This survey tries to assess the prevalence of neck pain among dental professionals, identify the speciality of dentistry which is affected the most along with the effect of duration of practice and regular physical activity.

Setting and Design: Questionnaire-based survey.

#### **Methodology:**

An observational study was then conducted among 400 dental practitioners in the state of Tamil Nadu and 372 participants responded.

#### **Results and Conclusion:**

About 63.8% of participants were suffering from neck pain and/or stiffness. Neck pain is the most common occupation –related ailment among dentists. Regular physical activity with intermittent relaxation during practice may play a crucial role in preventing neck discomfort among dentist.

**Keywords:** Neck pain, Practice duration, Physical activity, Neck Disability Index, Dentist.

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## **INTRODUCTION:**

Dentistry is a physically and mentally demanding profession (1). Prevalence of musculoskeletal disorders is more common among dental surgeon. Among these MSDs neck and low back pain are more common. Long working hours can cause muscle fatigue and it increases the risk of low back and neck pain in dentists (1). It has been reported that 87.5 percent of practitioners suffer from some form of musculoskeletal discomfort since healthcare professionals spend most of their workdays in static, uncomfortable positions (2).

The second most common musculoskeletal disorder in dentistry is neck pain. The cervical spine is regularly rotated and flexed forward when performing dentistry, which requires extreme accuracy. As a consequence of this, The neck area experiences a significant static load. Neck pain, tension neck syndrome, muscle imbalance, or cervical instability can be caused by prolonged static load and repetitive movements. Neck stiffness is characterised by pain, soreness, and rigidity. Although it is temporary, it may indicate excessive or inappropriate use of the neck. Incorrect posture can strain the muscles and ligaments supporting the neck and result in injury over time causing neck pain. Since the oral cavity is narrow, dentists have a limited field of vision and limited range of motion, which causes pain in their neck and back (3).

Although a backache or a stiff neck once in a while usually doesn't require medical attention, the cumulative physiological damage that arises from neglecting persistent pain and discomfort might create an accident or a handicap that can end a career. Since these difficulties not only affect the general health and productivity but also the performance efficiency of a dental professional, they should be addressed with utmost

concern. Although various studies have been conducted on prevalence, incidence and risk factors associated with neck pain in dentists (4), there is a knowledge gap in focusing on different specialties of dentistry that may contribute to musculoskeletal pain. Hence the current study focuses on prevalence of neck pain among dental practitioners, effect of speciality, practice duration and physical activity performed.

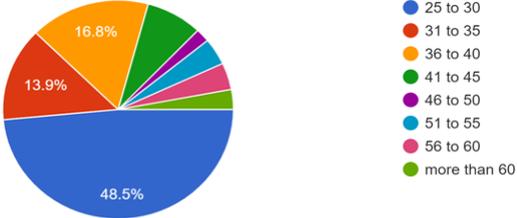
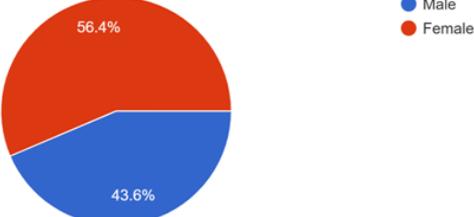
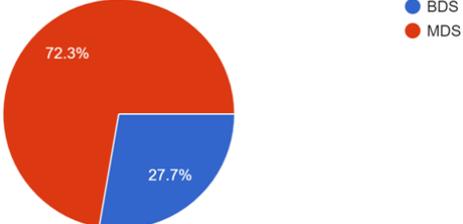
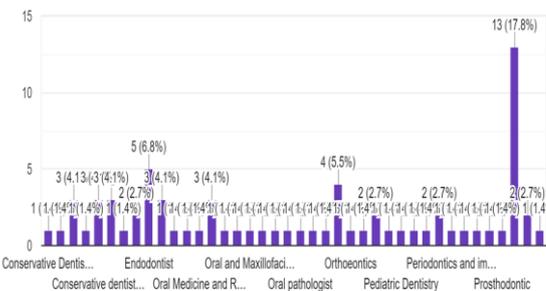
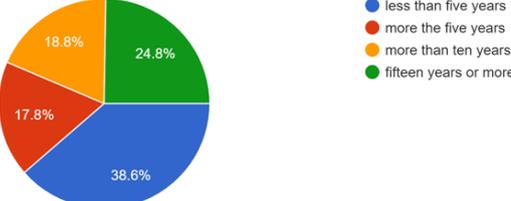
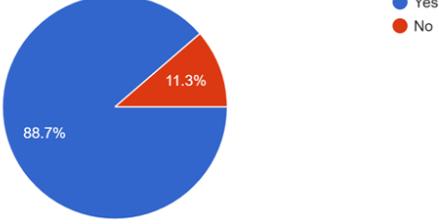
## **METHODOLOGY**

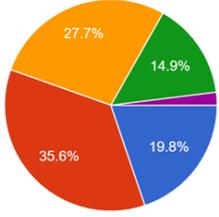
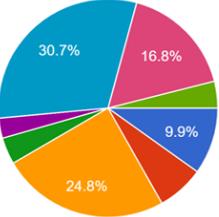
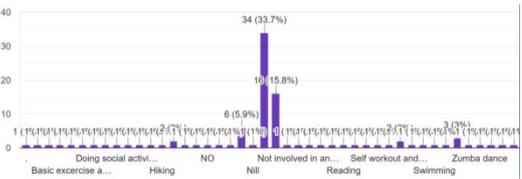
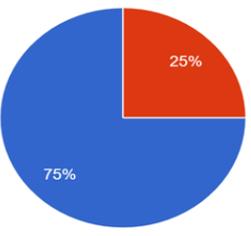
Study design: The survey questionnaire was drafted and validated by 10 professional experts in each field, who were chosen based on highest frequency of procedures performed. The drafts were collected by the end of the first week and Content Validity Index was calculated. Those questions with content validity less than 0.75 were replaced with new questions based on the suggestions provided by the experts. The modified final drafts were once again sent to the experts seeking approval and upon approval, was then distributed among registered dental practitioners.

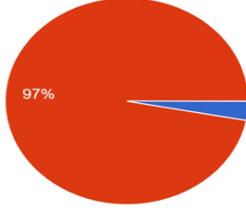
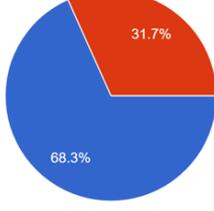
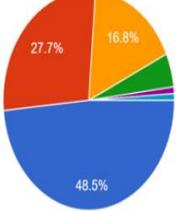
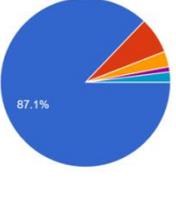
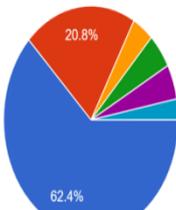
A total of 372 of the 400 questionnaires sent as Google Forms were completed and returned within a month. All participants' privacy was protected at all times during the research. Dental professionals who have retired from clinical practise as well as dentists without a valid certificate for practise were excluded.

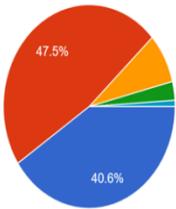
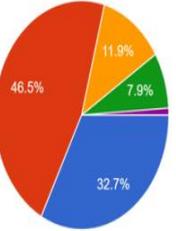
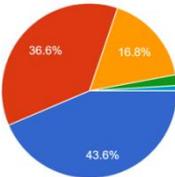
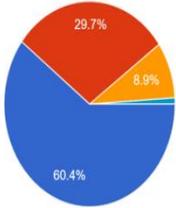
The data was collected using a questionnaire that includes demographic data, years of practice, hours of practice, any physical activity been practiced, posture of practice, pain/stiffness in neck region, intensity of pain and other characteristics of neck pain that restricts regular activities. Qualitative characteristics were displayed using bar/pie charts and percentages. Descriptive statistics were used to represent the total score.

TABLE: QUESTIONNAIRE AND CHOICES & RESPONSES

Questionnaire	Choices/Responses n(%)	Pie / bar diagram
Age	25 to 30 - 48.5 31 to 35 – 13.9 36 to 40 – 16.8 41 to 45 46 to 50 51 to 55 56 to 60 More than 60	
Gender	Male - 44 Female – 56	
Qualification	BDS - 28 MDS – 72	
If MDS, please mention speciality	conservative dentistry - 6.8 Periodontics - 2.7 Prosthodontics - 17.8 Orthodontics – 5.5 Pedodontics – 2.7 Oral and maxillofacial surgery - 1 Other non clinical – 1	
Year of clinical experience	< 5 years – 38.6 > 5 years – 17.8 > 10 years – 18.8 15 years or more -24.8	
Are you currently practicing dentistry	Yes - 88.7 No – 11.3	

<p>Hours of practice per day</p> <p>Mention the physical activity that you are involved in atleast 3 days or more in a week</p>	<p>1 to 3 hours – 19.8 4 to 5 hours – 36.6 6 to 8 hours – 27.7 8 to 10 hours – 14.9 More than 10 hours</p> <p>yoga – 9.9 gym Self workout – 24.8 Sports Swimming Walking or jogging - 30.7 None Others</p>	 <ul style="list-style-type: none"> <li>● 1 to 3 hours</li> <li>● 4 to 5 hours</li> <li>● 6 to 8 hours</li> <li>● 8 to 10 hours</li> <li>● more than 10 hours</li> </ul>
<p>Kindly mention if you are involved in any other activity other than those mentioned</p>	<p>zumba dance - 3 not involved any physical activity - 34</p>	 <ul style="list-style-type: none"> <li>● Yoga</li> <li>● gym</li> <li>● self workout</li> <li>● sports</li> <li>● swimming</li> <li>● walking or jogging</li> <li>● None</li> <li>● others</li> </ul>
<p>Approximate duration of physical activity performed</p>	<p>around 30 minutes – 62.4 Around 1 hour - 27 More than 1 hour - 10</p>	 <ul style="list-style-type: none"> <li>● around 30 minutes</li> <li>● around 1 hour</li> <li>● more than 1 hour</li> </ul>
<p>Common posture of practice</p>	<p>Sitting -75 Standing – 25</p>	 <ul style="list-style-type: none"> <li>● sitting</li> <li>● standing</li> </ul>
<p>Any history of trauma or surgery in the head and neck region</p>	<p>Yes No – 97</p>	<p>34 (33.7%) 10 (15.8%) 8 (5.9%) 3 (3%)</p>
<p>Have you experienced neck stiffness or pain</p>	<p>Yes – 63.8 No – 31.7</p>	<p>62.4%</p>
<p>Neck pain intensity</p>	<p>75%</p>	<p>75%</p>

<p>personal care ( washing, dressing etc.,)</p>	<p>I have no neck pain at the moment-48.5                      pain is very mild at the moment -27.7                      pain is moderate at the moment – 16.8                      pain is fairly severe at the moment                      pain is very severe at the moment                      pain is the worst imaginable now</p> <p>I can look after myself normally without causing extra neck pain                      I can look after myself normally, but it causes extra neck pain - 87                      It is painful to look after myself, and I am slow and careful                      I need some help but manage most of my personal care                      I need help every day in most aspects of self-care                      I do not get dressed, I stay in bed</p> <p>I can lift heavy weights without causing extra neck pain – 62.4                      I can lift heavy weights, but it gives me extra neck pain – 20.8                      Neck pain prevents me from lifting heavy weights off the floor but can manage if items are conveniently positioned, i.e., on a table                      Neck pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned                      I can lift only very light weights                      I cannot lift or carry anything at all</p> <p>I can read as much as I want with no neck pain- 40.6                      I can read as much as I want with slight neck pain – 47.5                      I can read as much as I want with moderate neck pain</p>	 <p>● yes ● no</p>  <p>● Yes ● No</p>  <p>● I have no pain at the moment. ● the pain is very mild at the moment. ● the pain is moderate at the moment. ● the pain is fairly severe at the moment. ● the pain is very severe at the moment. ● the pain is the worst imaginable at the moment.</p>  <p>● I can look after myself normally without causing extra pain. ● I can look after myself normally but it causes extra pain. ● It is painful to look after myself and I am slow and careful. ● I need some help but manage most of my personal care. ● I need help every day in most aspects... ● I do not get dressed, I stay in bed</p>  <p>● I can lift heavy weights without extra pain. ● I can lift heavy weights but it gives extra pain. ● Pain prevents me from lifting heavy weights off the floor, but can manage i... ● Pain prevents me from lifting heavy weights, but I can manage light to me... ● I can lift very light weights. ● I cannot lift or carry anything at all.</p>
<p>Lifting</p>		
<p>Reading</p>		

<p>Headaches</p>	<p>I cannot read as much as I want because of moderate neck pain I cannot read as much as I want because of severe neck pain I cannot read at all</p> <p>I have no headaches at all- 32.7 I have slight headaches that come infrequently – 46.5 I have moderate headaches that come infrequently – 11.9 I have moderate headaches that come frequently – 7.9 I have severe headaches that come frequently I have headaches almost all the time</p>	 <ul style="list-style-type: none"> <li>● I can read as much as I want with no pain in my neck.</li> <li>● I can read as much as I want with slight pain in my neck.</li> <li>● I can read as much as I want with moderate pain.</li> <li>● I can't read as much as I want because of moderate pain in my neck</li> <li>● I can hardly read at all because of sev...</li> <li>● I cannot read at all</li> </ul>
<p>Concentration</p>	<p>I can concentrate fully without difficulty – 43.6 I can concentrate fully with slight difficulty – 36.6 I have a fair degree of difficulty concentrating – 16.8 I have a lot of difficulty concentrating I have a great deal of difficulty concentrating I cannot concentrate at all</p>	 <ul style="list-style-type: none"> <li>● I have no headaches at all.</li> <li>● I have slight headaches which come infrequently.</li> <li>● I have slight headaches which come frequently.</li> <li>● I have moderate headaches which come infrequently.</li> <li>● I have severe headaches which come frequently.</li> <li>● I have headaches almost all the time.</li> </ul>
<p>Work</p>	<p>I can do as much work as I want -60.4 I can only do my usual work, but no more -29.7 I can do most of my usual work, but no more – 8.7 I cannot do my usual work I can hardly do any work at all</p>	 <ul style="list-style-type: none"> <li>● I can concentrate fully when I want with no difficulty.</li> <li>● I can concentrate fully when I want with slight difficulty.</li> <li>● I have a fair degree of difficulty in concentrating when I want to.</li> <li>● I have a lot of difficulty in concentrating when I want to.</li> <li>● I have a great deal of difficulty in conc...</li> <li>● I cannot concentrate at all.</li> </ul>
<p>Driving</p>	<p>I cannot do any work at all</p> <p>I can drive as long as I want without neck pain – 67.3 I can drive as long as I want with only slight neck pain - 19.8 I can drive as long as I want with moderate neck pain I cannot drive as long as I want because of moderate neck pain</p>	 <ul style="list-style-type: none"> <li>● I can do as much work as I want to.</li> <li>● can only do my usual work, but no more.</li> <li>● can do most of my usual work, but no more.</li> <li>● cannot do my usual work.</li> <li>● I can hardly do any work at all.</li> <li>● can't do any work at all.</li> </ul>

<p style="text-align: center;"><b>Recreation</b></p> <p>Are you suffering from musculoskeletal pain in any other part of the body other than neck? If so kindly mention</p>	<p>I can hardly drive at all because of severe neck pain I cannot drive my car at all because of neck pain</p> <p>I have no trouble sleeping- 52.5 My sleep is slightly disturbed for less than 1 hour -34.7 My sleep is mildly disturbed for up to 1-2 hours -11.9 My sleep is moderately disturbed for up to 2-3 hours My sleep is greatly disturbed for up to 3-5 hours My sleep is completely disturbed for up to 5-7 hours</p> <p>I am able to engage in all my recreational activities with no neck pain at all -71.3 I am able to engage in all my recreational activities with some neck pain – 21.8 I am able to engage in most, but not all of my recreational activities because of the pain in my neck I am able to engage in a few of my recreational activities because of the pain in my neck I can hardly do recreational activities due to neck pain I cannot do any recreational activities due to neck pain</p> <p>Lower back pain -11 Shoulder pain - 5 Knee pain -1</p>	<p><b>Driving Data:</b></p> <ul style="list-style-type: none"> <li>I drive my car without any neck pain: 67.3%</li> <li>I can drive my car as long as I want with slight pain in my neck: 19.8%</li> <li>I can drive my car as long as I want with moderate pain in my neck: 11.9%</li> <li>I can't drive my car as long as I want because of moderate pain in my neck: 2.0%</li> <li>I can hardly drive my car at all because of severe pain in my neck: 0.8%</li> <li>I can't drive my car at all: 8.2%</li> </ul> <p><b>Sleeping Data:</b></p> <ul style="list-style-type: none"> <li>I have no trouble sleeping: 52.5%</li> <li>My sleep is slightly disturbed (less than 1 hr. sleepless): 34.7%</li> <li>My sleep is moderately disturbed (1-2 hrs. sleepless): 11.9%</li> <li>My sleep is moderately disturbed (2-3 hrs. sleepless): 2.0%</li> <li>My sleep is greatly disturbed (3-4 hrs. sleepless): 0.8%</li> <li>My sleep is completely disturbed (5-7...): 1.1%</li> </ul> <p><b>Recreation Data:</b></p> <ul style="list-style-type: none"> <li>I am able to engage in all my recreation activities with no neck pain at all: 71.3%</li> <li>I am able to engage in all my recreation activities, with some pain in my neck: 21.8%</li> <li>I am able to engage in most, but not all of my usual recreation activities because of the pain in my neck: 2.0%</li> <li>I am able to engage in a few of my usual recreation activities because of pain in my neck: 2.0%</li> <li>I can hardly do any recreation activities because of the pain in my neck: 2.0%</li> <li>I can't do any recreation activities at all: 2.0%</li> </ul> <p><b>Musculoskeletal Pain Data:</b></p> <table border="1"> <thead> <tr> <th>Pain Location</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Lower back pain</td> <td>28</td> <td>33.9%</td> </tr> <tr> <td>Shoulder and l...</td> <td>4</td> <td>5.6%</td> </tr> <tr> <td>Other locations</td> <td>2</td> <td>2.8%</td> </tr> </tbody> </table>	Pain Location	Count	Percentage	Lower back pain	28	33.9%	Shoulder and l...	4	5.6%	Other locations	2	2.8%
Pain Location	Count	Percentage												
Lower back pain	28	33.9%												
Shoulder and l...	4	5.6%												
Other locations	2	2.8%												

## **RESULTS**

**Demographic Characteristics.** Among the 372 dentists 44 % were male and 56% were female. 48% of participants were between 25-30, 13.9% were between 31-35, 16.8% were between 36- 40. Among them 27% were bachelor of dental surgeons and 72% were master of dental surgeons. Out of 372 dentist 38.6% of them practicing less than 5 years, 17.8% of them practicing more than 5 years, 18.8% of them more than 10 years, 24.8% of them practicing 15 years or more. Of them 35.6% were practicing 4 to 5 hours per day, 27.7% were practicing 6 to 8 hours per day, 19.8% were practicing 1 to 3 hours per day, 14.9% were practicing 8 to 10 hours per day.

Among the 372 dentists, approximately 82% involved in physical activities, while others do not. And 62.4% doing physical activities around 30 minutes, 27% doing around 1 hour, 10.6% doing more than 1 hour. The results show that dentists who acknowledged feeling pain did not exercise as much as dentists who acknowledged feeling no pain.

**Pain-Related Characteristics:** Only 31% of the 372 dentists who participated in the survey denied experiencing any pain, while 68.3% acknowledged feeling neck pain or stiffness as a result of their work. Out of those dentists who admitted to experiencing pain other than neck are lumbar zone / lower back pain 11 %, shoulders 5%, and knees 1%.

**Neck Disability Index:** To measure the degree of neck pain in dentists, the Neck Disability Index was used in this study. Table 1 shows a results for the 10 questions related to neck pain intensity. The findings indicated minimal levels of pain to severity.

**Factors Affecting Pain:** There was no statistically significant difference between the frequency of discomfort and the gender of the dentists. Dentists who stated they were in pain are older than dentists who stated they were not. 40% of dentists who reported discomfort were over the age of 35.

## **DISCUSSION**

Dentistry is a very demanding profession in terms of physical and psychomotor skills. Any profession when being practised in static position for long periods of time tend to induce occupation induced musculoskeletal disorders which is more frequent with the dental profession with practitioners commonly experiencing soreness in neck and back muscles.

Neck pain is the second most frequent musculoskeletal disorder experience by dentist following back pain (5). The dentist usually flexes

the spine forward with slight rotation when working on a patient. When this position is held for extended periods of time, it produces extreme static stresses in the neck region. These stresses combined with repetitive movements performed in dentistry produces a variety of neck conditions ranging from mild pain, tightness to cervical instability and neck muscle imbalance (6).

In addition, oral cavity is a small area with a narrow visual field that restricts freedom of movement and leads to a fixed neck position which ultimately leads to pain (7). Physical factors like sluggish life and physical inactivity along with psychosocial factors like demanding work and inadequate rest periods can also contribute to increased risk of neck pain (8).

The findings also revealed that 68.3% of dentists experiencing neck discomfort were aware of ergonomic postures. Utilizing an ergonomic posture when doing clinical tasks in a dental office reduces the chance of pain. The likelihood of pain is reduced by altering work posture, changing positions during clinical practice, stretching after clinical practice, handling instruments within hand reach without making strenuous movements, performing torsions or cervical flexions to improve vision when working in the oral cavity.

Studies have shown that in China, about 83.8% dentist suffer from neck pain (9-10). In contrast, our study reports that around 63.8% of practicing dentist reported neck pain or tightness. This may be attributed to the fact that around 62.4% of dentist seem to involve themselves in some form of physical activity for more than 30 minutes a day. Of this category another thing to note is that, more than 30% are performing yoga everyday and another 17% seem to involve in some form of self workout. A previous study (11) that was conducted in the same part of the country in 2015 reported that only 9.6% of dentist practicing yoga and in the following 8 years the number of dental professionals practicing yoga has drastically increased to 30%. It is important to note that increase in yoga practice among dentists might be a reason for decline in the incidence of neck pain.

Koneru and Tanikonda et al (12) compared the prevalence of musculoskeletal pain among dentist practicing yoga with those practicing other physical activities like walking and those with no physical activity. The results showed that only 10.5% of dentist practicing yoga reported musculoskeletal pain, as opposed to 21.7% practicing other physical activity, and 45.6% reporting no physical activity, respectively. These finding suggest that any involvement in some form of physical activity is

crucial for dentist to escape from musculoskeletal pain or disorders.

In this study, the neck disability index was used as it can provide professional information on how occupation related neck issues can affect a person's ability to manage everyday life (13). Out of 372, 40 participants had neck disability scores above 22% which indicates significant disability in daily life. All of these 40 participants either did not involve in any physical activity or performed self workout for 30 minutes. Therefore physical activity performed (yoga or gym or swimming etc.) for more than 30 minutes seem to play a crucial role in preventing neck pain among dental professionals. Another interesting finding from the study is that of these 40 participants with significant disability, 20 participants were general practitioners followed by 8 prosthodontists making the speciality more vulnerable to neck pain. All of these 40 participants reported a practice duration for about 5 hours a day.

## CONCLUSION

Neck pain is the most prevalent type of occupational health hazard affecting the dental fraternity. Field of dentistry (speciality) was unrelated to development of neck pain as general practitioners were most affected. However, participants with significant neck disability reported a clinical practice duration of more than 5 hours a day. Strict adherence to ergonomic postures, along with regular physical activity for more than 30 minutes must be recommended to all dentists.

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