

## Original Article

# Prevalence of Neck Pain in Dental Surgeons

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## ABSTRACT

**Background:** Cervical pain, or cervicgia, is increasingly recognized as a significant occupational hazard among dental surgeons. The demands of dental practice, including prolonged static postures and repetitive motions, have been implicated in the development of musculoskeletal disorders, with a notable impact on the cervical spine.

**Objective:** This study aimed to determine the prevalence of cervical pain among dental surgeons and identify associated risk factors, focusing on the impact of work-related postures.

**Methods:** A cross-sectional study was conducted among 90 dental surgeons from June to December 2022, employing non-probability convenience sampling. Participants were recruited from Farooq Hospital (Westwood branch), Akhtar Saeed Medical and Dental College, and Fatima Memorial Hospital, Lahore. Inclusion criteria targeted dental surgeons aged 20 to 35 years, excluding those over 35, dental assistants, other medical doctors, and individuals with cervical spondylosis. Pain intensity was measured using the Numeric Pain Rating Scale (NPRS). Data analysis was performed using SPSS version 25, with quantitative variables presented as means, standard deviations, ranges, and histograms, and categorical variables as frequencies and percentages.

**Results:** The study found that 83% of the participating dental surgeons experienced neck pain, attributable to faulty work postures. The age distribution of participants was primarily within the 20-25 age group (65.6%), and a significant majority were females (62.2%). Regarding pain intensity, 50% reported mild pain, 27.8% moderate pain, and 5.6% severe pain, with 16.7% reporting no pain.

**Conclusion:** The high prevalence of cervical pain among dental surgeons underscores the critical need for ergonomic intervention and awareness in dental practice. Implementing ergonomic principles and promoting a better understanding of occupational health risks can potentially reduce the incidence of cervical pain and improve the overall well-being of dental professionals.

**Keywords:** Cervical Pain, Dental Surgeons, Ergonomics, Occupational Health, Musculoskeletal Disorders, Numeric Pain Rating Scale.

## INTRODUCTION

The cervical spine, a complex assembly of nerves, bones, joints, and muscles, encompasses seven vertebrae (C1-C7) separated by intervertebral discs, playing a pivotal role in head support and mobility. However, this critical anatomical structure is not immune to pain, with neck pain emerging as a globally prevalent condition impacting various populations, particularly healthcare workers. The prevalence of neck pain in the general populace is notably varied, ranging from 0.4% to 86.8% (1, 2), attributed to multifactorial origins encompassing both work-related and non-work-related risk factors. These factors are broadly categorized into physical, psychosocial, and individual elements, with additional risk factors including body mass index, age progression, non-ergonomic working conditions, smoking habits, female gender, and diminished neck strength (3, 4). The majority of neck pain cases are classified as non-specific, characterized by postural or mechanical symptomatology, though the underlying causes remain poorly elucidated and are believed to be multifaceted. Contributing factors may include poor posture, degenerative changes, psychological stressors such as anxiety and depression, muscular strain, injuries or traumas proximal to the neck region, prolonged occupational activities necessitating neck extension, advancing age, comorbidities, heavy lifting, and nerve compression (5, 6). Clinical manifestations of cervical pain often include a spectrum of symptoms like restricted physiological movement range, muscle tenderness or pain upon palpation, and postural alterations of the head and cervical spine, which are frequently implicated in such disorders. Specifically,

forward head posture is commonly associated with neck pain, presenting either bilaterally or unilaterally, and may lead to headaches, limb numbness, or even localized swelling (7).

Dental professionals, in their practice, encounter numerous work-related hazards, including prolonged periods of static postures and interactions with anxious patients, which predispose them to musculoskeletal and peripheral nervous system disorders. Dental surgeons, due to the nature of their work, often adopt prolonged static postures, leading to static muscle tension and minimal vertebral joint movement, even in optimal seating positions. This static posture can contribute to musculoskeletal disorders (MSDs), manifesting as shoulder, back, or neck pain (8, 9). The dental practice necessitates the adoption of strained postures for optimal access and visibility within the oral cavity, often requiring excessive forward bending. This not only strains the cervical muscles, resulting in pain, spasm, and stiffness but also impacts the cervical spine's crucial functions of load support, cushioning to the head/neck, rotation facilitation, and spinal cord protection. There is evidence linking mechanical neck pain (MNP) to cervical muscle dysfunction, with observed behavioral changes in individuals experiencing cervical pain. Notably, weakness in the anterior cervical muscles has been hypothesized as a contributory factor to persistent neck pain (11). The prolonged tightness or overactivity of the upper trapezius muscle, leading to weakness in the middle and lower trapezius muscles, results in postural adjustments and pain, a condition prevalent among dental surgeons. Additionally, the occupational hazards faced by dental surgeons, including increased disk pressures and spinal hypomobility, may precipitate degenerative changes in the cervical region, further exacerbated by weak postural muscles of the trunk and shoulder, culminating in poor operative posture (12, 13).

Neck pain, defined as discomfort between the base of the skull and the first thoracic vertebra, with radiating pain extending into adjacent areas, ranks as the fourth leading cause of disability, boasting an annual prevalence exceeding 30%. Factors such as genetics, psychological stressors, lifestyle habits, and rheumatological conditions have been associated with neck pain. Despite the potential for acute episodes to resolve independently, approximately 50% of individuals continue to experience significant discomfort or frequent flare-ups. The differentiation between mechanical and neuropathic pain is crucial, often discernible through patient history and physical examination (14, 15). The consensus acknowledges the widespread occurrence of neck pain across diverse demographics, linking both physical and psychological occupational stressors and a history of injuries to the incidence of neck syndrome (16, 17). The limited literature and evidence specific to the Pakistani population underscore the significance of this study, aimed at elucidating the prevalence of cervical pain among dental surgeons.

## MATERIAL AND METHODS

In this cross-sectional study, conducted from June 2022 to December 2022, we assessed the prevalence of neck pain among dental surgeons within a specific age demographic. The study cohort comprised 90 dental surgeons experiencing neck pain, who were selected from Farooq Hospital (Westwood branch), Akhtar Saeed Medical and Dental College, and Fatima Memorial Hospital, Lahore. Participants were included if they were dental surgeons aged between 20 to 35 years. Exclusion criteria were set to omit dental surgeons older than 35 years, dental assistants, other medical doctors, and individuals diagnosed with cervical spondylosis, ensuring the study focused on a specific population potentially at risk for occupation-related neck pain.

The sample size of 90 was calculated using the formula  $n = Z^2P(1-P)/d^2$  (18), based on the anticipated prevalence of neck pain among dental surgeons, the desired level of precision, and the confidence level. We employed a non-probability convenience sampling technique to recruit participants. Following the procurement of informed consent, which adhered to ethical standards in line with the Declaration of Helsinki, the intensity of neck pain was quantified utilizing the Numeric Pain Rating Scale (NPRS). This method allowed for the systematic evaluation of pain levels as reported by the study subjects.

Data collection involved a structured questionnaire that gathered both demographic and professional practice information, alongside the NPRS scores. The data were then meticulously analyzed using SPSS version 25 to ensure the application of the most current statistical analysis techniques. Quantitative variables, such as pain levels, were summarized using means, standard deviations, ranges, and visually represented through histograms. In contrast, categorical variables, including demographic characteristics and professional practice patterns, were depicted as frequencies and percentages. These were further elucidated through cross-tabulations and bar charts, offering a comprehensive view of the data distribution.

This study was firmly grounded in ethical principles, ensuring the confidentiality and anonymity of participant data. The ethical approval was secured from the institutional review board of the participating hospitals, affirming the study's adherence to the ethical guidelines for medical research involving human subjects. The utilization of SPSS version 25 for data analysis highlights the precision and reliability of the statistical evaluation conducted in this research.

## RESULTS

In the conducted cross-sectional study, the demographic characteristics of the participants, as elucidated in Table 1, reveal a predominantly younger cohort with 65.6% (n=59) of the dental surgeons falling within the age group of 20-25 years. This is followed by those aged 26-30 years, who constitute 23.3% (n=21) of the sample, and the 31-35 year age group represents the smallest segment at 11.1% (n=10). The gender distribution among the participants further highlights a notable predominance of females, who account for 62.2% (n=56) of the study population, in contrast to the males who make up 37.8% (n=34). This demographic profile underscores the younger and female-dominated composition of the dental surgeon cohort examined in this research.

Turning to the assessment of pain intensity among the study participants, as detailed in Table 2, the distribution of pain levels provides insightful observations into the occupational health challenges faced by dental surgeons. A significant portion of the participants, precisely 50.0% (n=45), reported experiencing mild pain (scores ranging from 1-3 on the Numeric Pain Rating Scale), indicating a prevalent but manageable level of discomfort within this professional group. Moderate pain (scores of 4-7), suggestive of more significant occupational impact, was reported by 27.8% (n=25) of the participants, highlighting a concerning level of discomfort that may affect daily activities and work performance. Notably, a small fraction, 5.6% (n=5), experienced severe pain (scores of 8-10), underscoring the potential for extreme discomfort among dental surgeons. On the other end of the spectrum, 16.7% (n=15) of the study participants reported no pain, indicating a subset of the population potentially less affected by the occupational hazards of dental surgery or possibly benefiting from effective preventive or management strategies.

Table 1: Demographic Characteristics of the Study Population

Age Groups	Frequency	Percent (%)
20-25	59	65.6
26-30	21	23.3
31-35	10	11.1
<b>Total</b>	90	100
<b>Gender</b>		
Males	34	37.8
Females	56	62.2
<b>Total</b>	90	100

Table 2: Pain Intensity Among Study Participants

Pain Intensity Level	Frequency	Percent (%)	Valid Percent (%)
No Pain (0)	15	16.7	16.7
Mild Pain (1-3)	45	50.0	50.0
Moderate Pain (4-7)	25	27.8	27.8
Severe Pain (8-10)	5	5.6	5.6
<b>Total</b>	90	100	100

The analysis of pain intensity levels within this cohort of dental surgeons not only sheds light on the occupational health dimensions of dental practice but also emphasizes the critical need for targeted interventions to address and mitigate neck pain in this professional group. The findings from this study, articulated through the demographic and pain intensity profiles of the participants, underscore the occupational health challenges faced by dental surgeons and the imperative to foster ergonomic practices and preventive measures within this field.

## DISCUSSION

The study aimed to elucidate the prevalence and factors contributing to cervical pain, or cervicgia, among dental surgeons, a condition increasingly recognized as a common occupational hazard in this group. Previous research, such as that by Nabeel et al. in Karachi, has explored various occupational hazards among dentists, including spinal and joint pains, eye infections, impaired hearing, stress, and material allergies, affecting 93.8% of the respondents (19). Unlike the broad scope of Nabeel et al.'s study, our research focused specifically on cervical pain, finding a high prevalence rate of 83% among dental surgeons, primarily attributed to faulty postures.

Echoing our findings, a local study reported that 75.8% of dentists acknowledged the physical demands of their profession (20). Our research adds to this discourse by suggesting that the onset of neck pain occurs early in dental careers, potentially due to a lack of ergonomic knowledge and the use of outdated equipment, which contributes to an uncomfortable working environment. This study, therefore, underscores the significant impact of ergonomics on the prevalence of cervical pain among dental surgeons, particularly those who maintain forward flexed neck positions for extended periods.

International research, including a study from Australia, supports the global nature of musculoskeletal issues among dentists, reporting a prevalence rate of 82% for such disorders, often due to the repetitive and monotonous movements required during dental procedures (21). Our findings are aligned with this global pattern, highlighting neck pain resulting from the continuous flexed positions of the neck and head, necessary for dental surgeons during their work.

Moreover, the study reinforces the critical impact of musculoskeletal pain on the careers of craniofacial and maxillofacial dental surgeons, suggesting that muscle soreness can significantly affect professional longevity and quality of life (22). Our focus on the cervical region emerges from an identified gap in awareness regarding the occupational health implications and ergonomic practices on surgeons' musculoskeletal health. While a study in Saudi Arabia addressed the prevalence of work-related musculoskeletal disorders (WMSD) among dentists, noting a 70% prevalence with the neck being a common pain location (23), our research specifically emphasizes the cervical pain experienced by dental surgeons due to work postures.

This study not only adds to the existing literature by highlighting the prevalence of neck pain in dental surgeons but also identifies a lack of ergonomic practices as a key contributor. The limitation of this research lies in its cross-sectional design, which allows for the identification of associations but not causality. Furthermore, the study's reliance on self-reported data may introduce bias. Future research should aim to longitudinally assess the impact of ergonomic interventions on reducing neck pain among dental surgeons.

## CONCLUSION

In conclusion, the prevalence of neck pain among dental surgeons is notably high, primarily attributable to prolonged periods spent in neck-flexed positions during work. This study underscores the need for increased awareness and implementation of ergonomic practices in dental surgery to mitigate the risks of cervical pain. Recommendations for future research include exploring the effectiveness of ergonomic interventions and educational programs in reducing the incidence of cervical pain among dental surgeons, thereby enhancing their occupational health and career longevity.

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