



## Prevalence and Risk Factors of Backache Among Dental Auxiliaries: A Cross-sectional Study

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Received: 05 February 2025 / Revised: 19 May 2025 / Accepted: 25 May 2025 / Available Online: 20 June 2025

### ABSTRACT

**Objective:** Occupational health issues, particularly musculoskeletal disorders (MSDs), are prevalent worldwide. Dental auxiliaries are prone to backache due to prolonged static postures and repetitive movements, which affect their productivity and quality of life. The objective is to determine the prevalence of backache among dental auxiliaries in Islamabad and Rawalpindi and analyze the associated risk factors.

**Methods:** A cross-sectional study was conducted using a self-administered, validated questionnaire distributed among 80 dental auxiliaries in hospitals and private clinics. Out of these, 60 participants responded with complete details, hence n=60. The variables assessed included work posture, specialty, working hours, years in practice, and absenteeism due to pain. Data was analyzed using SPSS version 22, with chi-square tests applied to determine associations between back pain and independent variables.

**Results:** Out of 80 questionnaires distributed, 60 (75%) were completed. Among participants, 78.3% were males and 21.7% were females. The overall prevalence of back pain was 65%. Among affected participants, 58.3% reported bearable pain, 1.7% experienced severe pain, and 5% did not specify. The only factor significantly associated with back pain was specialty (endodontics/operative department,  $p = 0.04$ ). Other factors, including posture, years in practice, working hours, and exercise, did not show significant associations.

**Conclusion:** A high prevalence of back pain was observed among dental auxiliaries in Pakistan. Ergonomic interventions, targeted training, and workplace modifications are essential to mitigate occupational health risks.

**Keywords:** Backache; Dental auxiliaries; Risk factors; Musculoskeletal disorders; Occupational health

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**Citation:** Arif A *et al.*, Prevalence and Risk Factors of Backache Among Dental Auxiliaries: A Cross-sectional Study. *J Sci Technol Educ Art Med.* 2025;2(1):3-8

### Introduction

Musculoskeletal disorders (MSDs) represent a significant occupational health concern globally, particularly among healthcare professionals. Dental professionals, including

auxiliaries, are at a heightened risk of developing back pain due to the physically demanding nature of their work, which involves prolonged static postures, repetitive movements, and awkward body positions.<sup>1</sup> These occupational hazards contribute to chronic pain, work-related disability, and



diminished quality of life.<sup>2</sup>

The prevalence of MSDs among dental professionals varies worldwide. A study conducted in Malaysia reported that 34.1% of dental personnel experienced back pain<sup>3</sup> Similarly, in Yemen, 73% of dental professionals reported musculoskeletal discomfort, with back pain being the most affected area.<sup>4,5</sup> A study in the United Arab Emirates found that 61.4% of dental hygienists suffered from some form of musculoskeletal pain, with a significant percentage attributing it to improper ergonomic practices.<sup>4,6</sup> The risk factors for MSDs in dental settings include prolonged standing, non-neutral postures, excessive force exertion, and repetitive tasks.<sup>7</sup> Despite growing awareness of these occupational hazards, interventions to mitigate these risks remain inadequate in many regions.<sup>8</sup>

In Pakistan, there is limited research on the prevalence of back pain among dental auxiliaries. Most studies have focused on dentists rather than dental assistants, hygienists, or laboratory technicians. The lack of data on this subset of dental professionals highlights a significant gap in the literature. Understanding the burden of back pain among dental auxiliaries is crucial for developing targeted ergonomic interventions and improving occupational health policies.<sup>4</sup>

Furthermore, while previous research has extensively examined MSDs among dentists<sup>9,10</sup>, the experiences of dental auxiliaries have not been adequately explored. These professionals often perform physically demanding tasks such as assisting dentists in procedures, managing dental instruments, and handling laboratory work, all of which contribute to musculoskeletal strain.<sup>11</sup> Additionally, factors such as limited awareness about ergonomics, lack of preventive strategies, and insufficient workplace accommodations exacerbate the problem.<sup>2,12</sup>

This study aims to bridge this gap by assessing the prevalence and risk factors of back pain among dental auxiliaries in Pakistan. By identifying the occupational hazards specific to this group, we aim to provide recommendations for ergonomic improvements and workplace modifications to reduce musculoskeletal discomfort and enhance productivity in dental practice settings.<sup>13</sup>

## Materials and Methods

This study employed a cross-sectional, quantitative research design using a self-

administered questionnaire. The questionnaire was structured into three sections: demographic data, occupational risk factors, and pain assessment. The study was conducted over six months, from August 2023 to January 2024. The research was approved by the institutional ethical review board, ensuring adherence to ethical guidelines.

Convenience sampling was employed in this study. It is a non-probability method in which we select participants based on their accessibility and willingness to participate. While this approach offers advantages in terms of feasibility and resource efficiency, they are non-random and might not accurately represent the characteristics of the target population, and has a limited ability to generalize the findings to a broader population.

A total of 80 dental auxiliaries working in hospitals and private clinics in Islamabad and Rawalpindi were recruited. The sample included a mix of professionals such as dental assistants, hygienists, and laboratory technicians. Participants were approached directly and provided with detailed information about the study objectives and procedures before obtaining their informed consent. Out of the 80 questionnaires distributed, 60 were completed and returned, yielding a response rate of 75%. The male to female ratio is very high, which can be attributed to the fact that, in Pakistan, there are still very less females who pursue their careers as dental auxiliaries. The traditions and customs are gradually changing in this geographic area, but still, females often find fewer opportunities to work as compared to males. For this reason, we were unable to include an equal distribution of males and females.

The inclusion criteria required participants to be actively employed as dental auxiliaries for at least one year and to provide informed consent. There were no restrictions based on age or gender. Participants who did not fully complete the questionnaire or had pre-existing medical conditions unrelated to occupational factors were excluded.

To minimize bias, the questionnaire was validated through a pilot study involving ten dental auxiliaries to ensure clarity, reliability, and relevance. The final questionnaire incorporated necessary modifications based on expert feedback. The questionnaire included sections on demographics (age, gender, years in practice), work-related factors (posture, working hours, frequency of breaks, and exercise habits), and pain assessment (location, intensity,

relieving/aggravating factors, and absenteeism from work due to pain). All of these were correlated to their place of work, i.e., hospital set up or clinical set up, and in both, which specific specialty (specific field) they were working for. This was intended to probe, in depth, the knowledge regarding any effect of specific dental department workload, and its relation to the dental auxiliaries' health.

To ensure anonymity and confidentiality, participants were assigned unique identifiers instead of using personal information. Data was stored securely, accessible only to the research team, and used solely for academic purposes. The completed questionnaires were manually reviewed for completeness before data entry to mitigate errors.

Data was analyzed using SPSS version 22, employing descriptive statistics to summarize prevalence rates. Chi-square tests were used to examine associations between backache and independent variables such as specialty, working hours, and posture. A p-value of less than 0.05 was considered statistically significant. Missing data was handled through listwise deletion, ensuring that only fully completed responses were included in statistical analyses. This has the most immediate and obvious impact of reduced effective sample size, which in turn makes the sample size smaller and has ultimately a reduced statistical power. This also has the potential for underestimation or overestimation of the effects.

By ensuring thorough validation, maintaining participant anonymity, and applying appropriate statistical techniques, this study aimed to provide robust insights into the prevalence and risk factors associated with back pain among dental auxiliaries.

## Results

### Demographics and Work Characteristics

Among the 60 respondents, 47 (78.3%) were male and 13 (21.7%) were female. The majority of participants were within the age range of 30-45 years (56.7%), with 25% under 30 years and 18.3% above 45 years. The mean years of practice were  $7.8 \pm 3.4$  years, with a range of 2 to 18 years.

### Prevalence of Backache

The overall prevalence of backache among dental auxiliaries was 65% (n = 39). Among them, 35 (58.3%) reported bearable pain, 1 (1.7%) reported severe pain, and 3 (5.0%) did not specify pain severity. The remaining 21 (35%) participants reported no backache.

### Pain Distribution

The anatomical distribution of pain among respondents is shown in Table 1.

**Table 1: Anatomical distribution of pain among respondents**

Type of Pain	Frequency	Percentage (%)
Lower back pain	31	51.7%
Neck pain	18	30.0%
Shoulder pain	8	13.3%
Wrist pain	5	8.3%

### Association of Risk Factors with Backache

Statistical analysis using chi-square tests identified a significant association between specialty (endodontic/operative department) and backache (p = 0.04). Other factors, including work posture, years of experience, working hours, and frequency of breaks, did not show statistically significant relationships with back pain (p > 0.05) (Table 2).

**Table 2: Association between risk factors and backache**

Risk Factor	p-value	Interpretation
Type of Work	0.90	Not Significant
Specialty	0.04	Significant
Posture	0.70	Not Significant
Years in Practice	0.50	Not Significant
Working Hours	0.20	Not Significant
Frequency of Breaks	0.60	Not Significant
Exercise	0.20	Not Significant
Relieving Factors	0.80	Not Significant

### Work Absenteeism & Healthcare Seeking Behavior

Due to backache, 12 participants (20%) reported missing work, while 48 (80%) continued



working despite discomfort. Among those with back pain, 9 (15%) consulted a doctor, whereas 29 (48.3%) did not seek medical attention (Table 3). These findings emphasize the need for preventive

ergonomic interventions and improved workplace policies to address backache among dental auxiliaries.

**Table 3: Healthcare-Seeking behavior of participants**

Healthcare-Seeking Behavior	Frequency	Percentage (%)
Consulted a doctor	9	15.0%
Did not consult a doctor	29	48.3%
Total (with back pain)	38	63.3%

## Discussion

The present study found a 65% prevalence of backache among dental auxiliaries in Islamabad and Rawalpindi, with the most affected area being the lower back (51.7%). The only statistically significant factor associated with back pain was specialty, particularly among endodontic and operative department workers ( $p = 0.04$ ). Other factors such as work posture, years of practice, working hours, and exercise habits were not significantly related to backache. These findings highlight the urgent need for workplace interventions to address musculoskeletal health among dental auxiliaries.

The prevalence of back pain in this study aligns with findings from Malaysia (45%), Yemen (73%), and the United Arab Emirates (61.4%).<sup>6</sup> However, the higher prevalence in our study (65%) may be attributed to limited ergonomic awareness, lack of proper workplace modifications, and differences in work environments. The prevalence of backache (65%) observed in this study is consistent with international findings, including reports from the United Arab Emirates (61.4%) and Sweden (43%), indicating a widespread occupational health concern. Among musculoskeletal complaints, lower back pain (51.7%) emerged as the most common issue, specifically among dental auxiliaries, reflecting the physical demands and postural strain associated with dental practice. Notably, the specialty of endodontics/operative dentistry was the only area significantly associated with back pain ( $p = 0.04$ ), suggesting that certain dental procedures or working conditions may contribute more prominently to this issue. Furthermore, the occupational impact of back pain is underscored by the finding that 20% of affected individuals missed work, demonstrating the substantial burden of this condition on workforce productivity and well-being

within the dental profession.

**Specialty as a Risk Factor:** Our findings that endodontic and operative dental auxiliaries had a significantly higher prevalence of back pain are consistent with previous studies, which indicate that prolonged static postures, fine motor movements, and high visual demands in these specialties contribute to musculoskeletal strain.<sup>14</sup> The frequent bending and twisting motions required in these specialties increase spinal stress, leading to chronic discomfort.

**Lack of Association with Work Posture and Exercise:** Unlike prior research, which found strong links between work posture and musculoskeletal pain<sup>14</sup> our study did not observe a significant correlation. One possible explanation is self-reported bias, as participants may have underestimated or overestimated their postural habits. Additionally, the lack of standardized ergonomic training in the surveyed population may contribute to unrecognized poor posture.<sup>7</sup>

**Limited Healthcare-Seeking Behavior:** Only 15% of those with back pain sought medical consultation, compared to 53% in a study conducted in Lebanon<sup>14</sup>. This disparity might be due to low awareness of occupational health services and financial constraints limiting access to medical care among dental auxiliaries in Pakistan.

The study had a few limitations. Despite providing valuable insights, this study has certain limitations. The convenience sampling technique and small sample size ( $n = 60$ ) may limit the generalizability of findings and may introduce some level of bias in the study. Self-reported data can also introduce recall bias, potentially affecting accuracy. The drastic difference between the male-female ratio of the participants represents mainly the characteristics of the majority group, and the other group remains largely underrepresented. This can lead to a biased understanding of the overall population and limit the generalizability.



Additionally, the study did not incorporate pain intensity scales or longitudinal follow-up, which could have provided a more comprehensive understanding of back pain progression over time.

Nevertheless, this study is one of the few conducted in Pakistan focusing on dental auxiliaries, a group often overlooked in occupational health research. By identifying key risk factors and prevalence rates, it provides a foundation for future ergonomic interventions and policy recommendations in dental practice settings.

To enhance occupational health among dental auxiliaries, several key measures are recommended. First, the integration of ergonomic training programs into dental auxiliary curricula can equip professionals with essential knowledge on posture, equipment handling, and injury prevention. Second, workplace modifications such as adjustable seating, appropriate lighting, and supportive flooring should be implemented to create a more ergonomic and comfortable working environment. Additionally, encouraging regular stretching and exercise routines can help alleviate musculoskeletal stress and reduce the risk of chronic pain. Access to occupational health services should be promoted, alongside initiatives to raise awareness about preventive care and early intervention strategies. Lastly, to strengthen the evidence base and explore additional risk factors, larger, randomized studies are needed to validate current findings and inform future interventions.

## Conclusion

The high prevalence of backache (65%) among dental auxiliaries underscores a critical occupational health concern. Endodontic and operative specialties posed the highest risk, necessitating targeted ergonomic interventions. Addressing these issues through education, policy changes, and workplace modifications can significantly enhance productivity and reduce long-term disability among dental auxiliaries.

Future research should prioritize longitudinal studies and intervention-based approaches to develop more comprehensive and effective solutions for addressing this occupational health issue. Expanding the sample size to include a larger population will increase the statistical power of the findings and help minimize potential bias. Additionally, ensuring that the sample comprises an equal number of male and female participants will promote gender representation and enhance the generalizability of the results, allowing

for more accurate and inclusive conclusions across diverse populations.

## Acknowledgments

We highly acknowledge all the participating institutions and participants for their time.

## Author Contribution

AA and MQ conceived the study and designed the work. AA, RS and AA2 collected the data. MA and MS analyzed and interpreted the data and generated themes. All the authors contributed to the drafting and writing of the manuscript. AA, MA, RS, and MQ critically reviewed and revised the manuscript. All authors proofread the finalized manuscript.

## Data Availability Statement

All relevant data are within the manuscript. Additional data supporting this study are available from the corresponding author upon reasonable request.

## Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki and was approved by the institutional ethical board (Ref: (ANDC/RAC/34/06).

## Funding

The research did not receive funding from any profit / non-profit organization.

## Conflict of Interest

The authors have no conflicts of interest to declare.

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