

# Knowledge, Attitude and Practices about Posture Ergonomics among Dental Surgeons of Punjab Dental Hospital (PDH)

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## ABSTRACT

**Background:** Dentistry is skilful profession which demands high visual and precise working positions. The aim of present study was to assess the basic knowledge, attitude and practices about posture ergonomics by dental practitioners of Punjab Dental Hospital.

**Methods:** This Cross-sectional study was conducted from October 2017 to December 2017. Data obtained was analysed by chi-square test (SPSS).

**Result:** For 28% of dental practitioners major fatigue causing factor was patient overload and most fatigue causing procedure was RCT (46%). 70% of dental practitioners are suffering from musculoskeletal disorders. The most common cause of not following ergonomics is lack of conventional training regarding ergonomics and malfunctioning dental units.

**Conclusion:** Major problem regarding not following posture ergonomics among dental practitioners of PDH is lack of training regarding ergonomics and malfunctioning dental unit with insufficient auxiliary staff. Ergonomics should be taught as a part of

**Keywords:** Ergonomics, posture, attitude, practices

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## INTRODUCTION

Posture ergonomics are neutral postures where the body is aligned and balanced, either sitting or standing, placing minimal stress on body and keeping joints aligned.<sup>1</sup> Dentistry is skilful profession requiring high visual and precise working positions which may lead to uncomfortable posture during daily dental work<sup>2-4</sup>. The dental literature indicates both dental surgeons and dental hygienists are exposed to occupational risk factors that often lead to musculoskeletal disorders<sup>5</sup>.

Musculoskeletal disorder (MSD) is a condition where parts of musculoskeletal system e.g., muscles, tendons and nerves gets injured over time<sup>6,7,8</sup>. MSD occur when too much stress is exerted or the part of body is overused repeatedly. Work activities that are frequent with awkward postures cause MSD that may be painful at work or rest. Most common factors leading to MSD are<sup>9-12</sup>

- Fixed positions
- Excessive use of muscle
- Tight grips
- Repetitive movements
- Positioning challenges
- Equipment limitation/confined space)

The aim of this study was to evaluate the factors which may lead to failure of practicing posture ergonomics among dental surgeons of Punjab Dental hospital (PDH).

## METHODOLOGY

A cross-sectional study was conducted from October-December 2017 among 200 dental practitioners of Punjab Dental hospital, Lahore. The study criteria consisted of work experience of at least 8 months and onwards including the medical conditions such as migraine, back ache, hypertension, diabetes and congenital MSDs.

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The study was conducted on the basis of author's designed questionnaire about knowledge, attitude and practices about posture ergonomics among dental surgeons of Punjab Dental hospital. The questionnaire consisted of 23 questions with mostly objective type questions for ease of operation and less time consumption. The questionnaire had three sections.

1<sup>st</sup> section concerned demographic factors such as age, sex, body height and weight, current working department and right handed or left handed person.

2<sup>nd</sup> section was related to knowledge about ergonomics like conventional training of using operating stool, hip and trunk angle, side-effects of static working position and knowledge about clockwise working positions.

3<sup>rd</sup> section was related to attitude and practice of the dental surgeons towards ergonomics. More detailed questions about positioning, number of rest breaks taken during work, pain in musculoskeletal system and its duration, fatigue causing procedures and factors and some close-ended questions on reasons for not following the posture ergonomics were included. Some questions were allowed for multiple responses. Out of 200 randomly selected dentists, to whom the designed questionnaire was distributed, each of them participated and responded with filled questionnaire. Data obtained was analyzed by chi-square test using SPSS.

## RESULTS

A total of 200 dental practitioners at Punjab Dental Hospital participated in the study. The demographic data of the dental practitioners who participated in the study is given below in (Table 1). Four questions regarding knowledge about ergonomics response rate was 100%. Out of 200, 94 dentists had knowledge about conventional training regarding the use of operating stool while 106 had no idea about it. Hip and trunk angle for ideal operator position is an important factor to know during daily dental work. So the question relating this was asked for which 134 dentists responded "yes" and 66 responded "no". Prolonged static

working position is the major factor that could lead to MSD. When question about static working position was asked, 182 responded "yes" and 18 responded "no". Out of 200 dentists, 150 had knowledge about basic clockwise working positions in dentistry while 50 had no knowledge about it.

For questions regarding practicing the knowledge about posture ergonomics, 5 questions were asked. Out of 200, 82 prefer sitting position, 46 prefer standing position and 72 maintain their position according to procedure. The conventional training for right chair positioning is a basic knowledge for the dentist and for the total of 200 dentists, 32 had their knowledge through self-learning, 22 from books, 146 from their respective institute.

Multiple choice questions about fatigue causing factors were asked. Out of 200, for 54 it was patient overload, for 50 it was inadequate equipments, for 10 noise pollution, for 46 prolonged procedures and 38 chose multiple factors. Another question relating the procedures more liable in causing fatigue was asked. According to data collection, for 92 out of 200 dentists, major fatigue causing procedure was RCT. Other responses are mentioned in Table 2.

Table 1: Demographic characteristics of Dental Surgeons

Demographics	n	%age
<b>Gender</b>		
Male	92	46
Female	108	54
<b>Medical problems</b>		
Yes	70	35
No	130	65
<b>Right or left handedness</b>		
Right handed	194	97
Left handed	6	3

Table 2 Different fatigue causing procedures reported by dental surgeons

Procedures	n	%age
Scaling	16	8
RCT	92	46
Prosthetics	22	11
Impaction & extraction	26	13
Major oral surgeries	36	18
Orthodontic bonding	8	4

Table 3: Report of time duration for the dentists experiencing MSD

Time duration	No. of Dentists Responding
Less than 6 months	88
6 months	2
1 year	8
More than 1 year	42
Did not have MSD	60

Two questions were asked about MSD in questionnaire. Out of 200 dentists, 140 have experienced MSD during daily dental work in their lives while 50 haven't and 10 rarely does. Time duration of MSD for the dentists was assessed, to make an idea about the impact the dentists have, for not following the posture ergonomics in their daily dental work. Four options were made with the responses given in (Table 3). When the question about taking the rest breaks during daily dental work was asked, 156 answered yes while 44 said no. A set of close ended questions were asked about the reasons for not following

posture ergonomics. Responses are recorded in the (Table 4). An assessment of fatigue causing factors and fatigue causing procedures affecting posture ergonomics among dental practitioners was evaluated by data analysis and listed in the Table 2 & 5.

Table 4: Reporting of reasons for not following posture ergonomics by dental surgeons

Procedures	Yes	No
Lack of training regarding ergonomics	144(72%)	56(28%)
Malfunctioning dental units and lack of instruments	158(79%)	42(21%)
Work overload	136(68%)	64(32%)
Stress	116(58%)	84(42%)
Individual behaviour of the dentist	130(69%)	62(31%)
Lack of sufficient auxillary staff	138(69%)	62(31%)
Patient comfort	80(40%)	120(60%)
Individual habit of performing procedure in direct vision	158(79%)	42(21%)

Table 5: Fatigue causing factors reported by dental surgeons

Factors	n	%age
Patient overload	56	28
Inadequate equipments	50	25
Noise pollution	10	5
Prolonged procedures	46	23
Multiple factors (from above)	38	19

## DISCUSSION

The aim of this study was to evaluate the factors which may lead to failure of practicing posture ergonomics among dental surgeons of Punjab Dental hospital (PDH). A cross-sectional study was conducted from October-December 2017 among 200 dental practitioners of Punjab Dental hospital, Lahore. The study was conducted on the basis of author's designed questionnaire about knowledge, attitude and practices about posture ergonomics among dental surgeons of Punjab Dental hospital. The questionnaire consisted of 23 questions with mostly objective type questions for ease of operation and less time consumption.

According to the data collected, major fatigue causing factor was patient overload and most fatigue causing procedures were RCT and major oral surgeries. In relation to sitting position, for dental practitioner as part of his working environment, one variable was assessed i.e., type of stool, either saddle or flat. As a result of assessment, 78% of the dentist reported that they use flat stool while 22% use saddle type. There is a significant association b/w presence of lower back pain and sitting position using comfortable working stool. This means that the dental practitioner who use uncomfortable working stool were more liable of having back pain as uncomfortable stool doesn't allow one to follow posture ergonomics<sup>13-16</sup>. According to the data collected, major reasons of not following posture ergonomics were lack of training regarding ergonomics and malfunctioning of dental units & lack of instruments.

A study was conducted in all Malaysian schools in April 2002 about work-related MSD. 560 students participated in the study. 93% of clinical year students reported symptoms of work-related MSD<sup>17</sup>. Neck and lower back reported to have highest prevalence of MSD. The

presence of MSD during practice suggests that ergonomics should be taught as a subject in regular curriculum as ergonomics lessen the health risks associated with daily dental work.

There was another study about ergonomics aspect of dentist's operating postures. The study showed that the posture attained by a dentist in beginning is balanced but changes to unbalanced postures gradually during the work therefore leading to MSD<sup>18</sup>. The study emphasizes on correct inclination between different body parts of dentist. Many dentists do not know ergonomics even theoretically. So ergonomics should be added to undergraduate courses.

Another project was done to analyze the link between muscle activity and ergonomics by using specially designed chair and conventional chair. The dentists of Midlands and University of Birmingham participated. The study suggests that use of the chair that makes easy to practice ergonomics during daily dental work can reduce MSD in the dental practitioners<sup>19-20</sup>.

## CONCLUSION

Overall the study shows that major problem regarding not following posture ergonomics among dental practitioners of PDH is lack of training regarding ergonomics and malfunctioning dental unit with insufficient auxiliary staff. Our suggestion is daily institutional interventions should be taken to improve and follow ergonomics. Ergonomics should be taught as a part of dental curriculum to reduce the risk of fatigue leading to MSDs.

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