Prevalence of Musculoskeletal Disorders Risk among Dentist: A Study in Northern India

Singh LP*

Department of Industrial and production Engineering, Dr. B. R. Ambedkar NIT, India

*Corresponding author: Lakhwinder Pal Singh**,** Department of Industrial and production Engineering, Dr. B. R. Ambedkar NIT, Jalandhar 144011, India, Email: singhl@nitj.ac.in

Abstract

Present study is focused to assess the musculoskeletal disorders (MSDs) risk and work posture of dentists in clinic and hospital of Northern India. Seven different jobs performed by 50 different dentists of clinic and hospital were investigated with the help of RULA method. The results revealed that In L.H.S 54% dentist were under low risk, 30% dentists under medium risk and 16% were under high risk. Further Chi-Square χ^2 analysis was performed to check the dependability of MSDs on various demographic and operational parameters. The analysis revealed that RULA was found dependent on type of task performed by dentists, although, the MSDs were found independent of age, BMI. The study concluded that there is no association between LHS RULA score and job performed by dentists and similarly there is no association between RHS RULA score and job performed by dentists.

Keywords: Dentists; Musculoskeletal Diseases; Ergonomics

Introduction

Dentistry is a demanding profession regarding concentration and precision. Most dentists today work in the sitting position treating the patient in the supine position. Because their work area (the mouth of the patient) is narrow, performance of dental treatment results in a very inflexible work posture. Studies have shown that dentists have a high frequency of musculoskeletal disorders. There are large numbers of studies relating to musculoskeletal complaints among dental surgeons in the Western literature but none has been conducted in North region.

The working environment has a major role in the development of many musculoskeletal problems, although most of these disorders can be avoided orat least reduced with more attention to ergonomics.[1–6] In particular, dental professionals often assume positions that are uncomfortable and asymmetric, keeping the head forward and rotated to the side with the arms held out from the body. This attitude, if held for prolonged periods each day, tends to overstress muscles and joints, especially those of the neck, back and shoulder, causing symptoms such as headache, neck and shoulder pain, and backache.

Ergonomics is a systematic approach to study the relationship between the individuals, their tools and the

work environment. While studying ergonomic considerations for dentists, it is observed that they suffer from musculoskeletal disorders (back pain) due to repetitive and awkward or stressful motions during their operation. This paper involves the literature survey on ergonomic design of dentist chair and associated studies in dentistry [1-7].

The prevalence of upper-extremity musculoskeletal disorders, such as tendinitis, is elevated among dental practitioners. An important risk factor for these disorders is forceful pinching; however, the pinch forces and instrument forces during scaling are unknown. Musculoskeletal disorders (MSDs) are common among dental care workers as indicated in many studies. Over a third of Finnish dentists have experienced at least one diagnosed musculoskeletal disease, which is above the average in the whole population [8-12].

Scope and Objective of the Study

The objective of study was to find out the prevalence and distribution of musculoskeletal symptoms among dentists in Northern India. Furthermore, to find possible correlations between these symptoms and working position and actions. A Questionnaire about Musculoskeletal symptoms in different parts of the body was completed by 50 dentists.

Materials and Methods

The present cross- sectional study included randomly selected 50 dentists engaged in clinic and hospital, located in a Northern state of India. Oral consent was obtained from these subjects. A comprehensive questionnaire was formulated to assess the information regarding various parameters. The questionnaire included demographic descriptors, the nature of job/process, related low back pain, the duration of the job, working hours, shifts and over times. The questionnaire was presented and validated on a few subjects to know the trend in the quality of life of the dentists and then a standard questionnaire was constructed and applied to the full sample. The various operations were observed in which treatment was done.

Statistical Analysis

The relationships between musculoskeletal disorders and work practices, treatment, and physical activity were assessed by chi-square test. Values of $p < 0.05$ were considered statistically significant. The obtained results were processed using Microsoft Access and Microsoft

Excel on the lower extremities are harmful from the point of view of ergonomics and work organization among the dentists studied. This type of work generally affects the health of the dentists employed and limits their effectiveness.

RULA (Rapid Upper Limbs Assessment Tools)

McAtamney and Corlett [13] developed the rapid upper limbs assessment (RULA) tool for application in the health care and other services industries, RULA uses a similar approach as REBA, Where posture, force, movement, or action, repetition are assessed. It is thus a means to assess posture for the risk of WMSDs [14-20]. The tools consider critical areas of a job and for each task it assesses the posture factors by assigning a score to each region. The data obtained through assessment of the task is then entered in a scoring sheet which gives a RULA score along with the level of risk for each task, urgency with which action should be taken (Table1). Various criteria can also be used to select postures to analyze and the use of time sampling can also be utilized. RULA is analysis posture of neck & upper limb loading. It is sedentary, seated tasks. Final risk assessment score (combines arm/wrist risk with neck, trunk, leg risk.). Final score magnitude (b/w 1&7). Overall injury risk due to musculoskeletal loading.

The present study aimed to do ergonomic risk assessment of dentists working in clinic and hospitals of a North Indian state using RULA tool and analyzing distribution method depend upon six steps. Firstly observe the task and record the video select snapshots after every 10 seconds. Then select postures worst and most frequently adopted for assessment. Score the postures. Process the scores. Determine final scores. Confirm action level

RULA Score Sheet	
Risk score	Risk Level
1 or 2	Negligible
3 or 4	Low
5 or 6	Medium
7 or Above	High

Table 1: RULA Decision sheet.

Results and Discussion

Process Wise (Treatment) Distribution of RULA Score

The study was conducted on 50 dentist doctors engaged in various processes in one of the hospital and
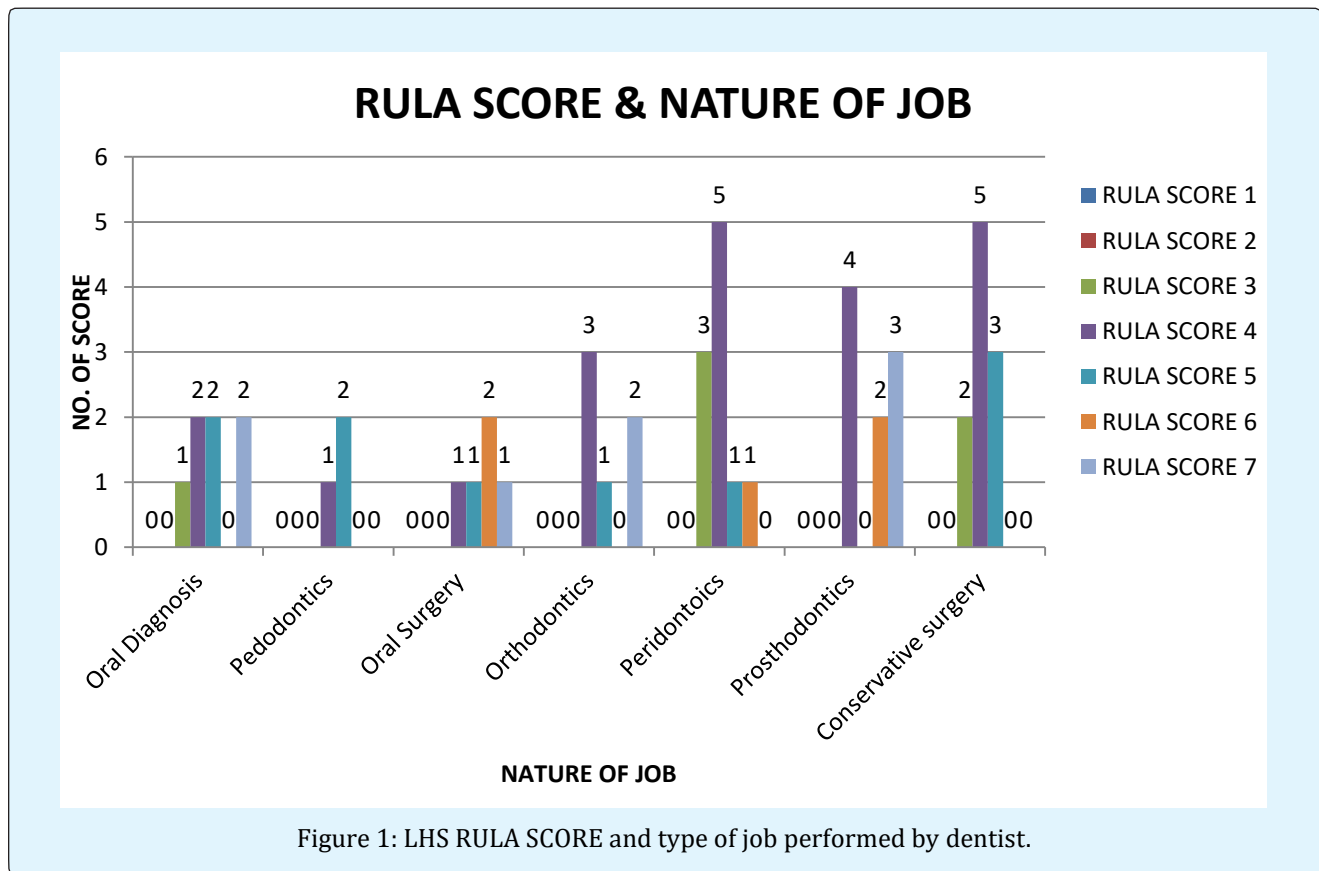
various clinic situated in north India. The RULA score of 50 awkward postures of these 50 dentist doctors were calculated for analyzing the level of risk of MSDs. Some of the doctors working 8 hrs but some of dentist working more than 8 hrs, such a long working hours might have increased the risk for musculoskeletal disorders.

After analyzing the 50 left hand side postures of 50 dentists. On the basis of RULA score it can be shown that the postures having action level1-2 i.e. posture is acceptable is zero, (54 %) of postures having action level 3-4 so they require further investigation, (30%) of postures having action level 5 -6 so in this type of postures investigations and changes are required soon whereas (16%) postures are related with action level 7 so investigations and changes are required immediately. The results regarding LHS RULA score and type of job performed by the dentist are shown by Table 2 and Figure 1.

Type of job	Number of cases having RULA Score						
	1	2	3	4	5	6	7
Oral Diagnosis	0	0	1	2	2	0	2
Pedodontics	0	0	0	1	2	0	0
Oral Surgery	0	0	0	1	1	2	1
Orthodontics	0	0	0	3	1	0	2
Periodontics	0	0	3	5	1	1	0
Prosthodontics	0	0	0	4	0	2	3
Conservative surgery	0	0	2	5	3	0	0
Total	0	0	6	21	10	5	8
Percentage %	0%		27=54%		15=30%		8=16%

Table 2: LHS RULA SCORE and type of job performed by the dentist.

Figure 1: LHS RULA SCORE and type of job performed by dentist.

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Conclusion

According to findings of present research it can be concluded that

- The postures adopted by dentists scored between 3-7 and none of the posture was found acceptable according to RULA Method.
- The posture adopted is categorized as having high to very high level of MSD risk. Therefore, dentists are working at very high risk of musculoskeletal disorders; hence the ergonomically interventions are required in these sections.

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