

PREVALENCE OF WORK RELATED MUSCULOSKELETAL DISORDERS OF WRIST AND HAND AMONG DENTAL PROFESSIONALS

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ABSTRACT

Introduction: Dentistry is the profession involving inconvenient postures and repetitive tasks of wrist and hand which makes them more prone to WRMSD of wrist and hand in comparison with other human service workers

Aim: The aim of the study is to identify the prevalence of work related musculoskeletal disorders of wrist and hand among dental professionals.

Materials and Methods: A total of 150 dental professionals were selected for the study. Five groups were consisting of 30 general dentist, 30 endodontist, 30 orthodontist, 30 dental assistants, and 30 oral and maxillofacial surgeons. Informed consent was taken. PRWHE was given and subjects were asked to mark a number in each item ranging from 0 to 10 and ranges of dominant hand and wrist were also taken.

Results: the response rate out of 150 was 139 (92.66%). The study also revealed that the total prevalence of work related musculoskeletal disorders according to PRWHE score as administered by the dental professionals was 58.99% and dental assistants had the highest mean of PRWHE Score i.e. 14.8

Conclusion: From the present study we conclude that work related musculoskeletal disorders of wrist and hand are present among dental professionals.

KEY WORD: WRMSD (Work Related Musculoskeletal Disorders), PRWHE (Patient Rated Wrist And Hand Evaluation Questionnaire).

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INTRODUCTION

US Department of labor defines " work related musculoskeletal disorders as injuries or disorders of muscles , nerves , tendons , joints , cartilage , and spinal disc associated with exposure to risk factors in work place ". WMSDs do not include disorders caused by slips, trips falls, and motor vehicle accidents [1].

Occupational health hazards are common in many sectors [2] and are on an increase but in comparison with other human service workers dental health workers typically report a higher incidence of work related musculoskeletal disorders [3].

A survey conducted by American dental association showed that 9.2 % of 2983

responding dentist had received diagnosis of upper extremity musculoskeletal disorders, 20% required surgery and 40% reduced their working hrs [4,5].

For the dentist it is difficult to avoid awkward position of wrist and hand during certain dental procedures [6].

Dental professionals work require small precise movements of fingers and hand [7], especially dentist use their thumb and middle finger in precision gripping. In addition to long work history of dental filling and root canal treatment as well as high body mass index seems to be associated with frequent finger symptoms that are perceived as being vibration [8].

One of the improper posture that the dentist has to take for wrist is wrist flexion and deviation in grasping and thumb hyperextension [9].

Therefore, the aim of the study is to identify the prevalence of work related musculoskeletal disorders of wrist and hand among dental professionals.

MATERIAL AND METHODS

Name and source of subjects: 150 dental professionals were selected. The study was conducted in Delhi, India.

Inclusion criteria

1. Minimum of one year of experience with a valid license and registration number [10].
2. Normal BMI ranging from 18.50 - 24.99 kg / m² [11].
3. Minimum 5 patients per day [12].
4. Below 40 yrs. of age [13,14].
5. Procedures for minimum of 2 hrs. Per day [15]

Exclusion criteria

1. Any diagnosed case of musculoskeletal system [16].
2. History of major accidental injuries in past one year affecting posture were also excluded [17].
3. Any diagnosed case of neurological, psychiatric disorders and upper limb congenital deformities, metabolic, dermatological disorders [13].
4. Involvement in upper limb sports.

MATERIALS USED

1. Patient rated wrist/hand evaluation questionnaire [18].
2. Weighing machine
3. Measuring tape
4. Universal goniometer [19].

OUTCOME MEASURES

1. Score of patient rated wrist/ hand evaluation questionnaire [18,20].
2. Range of motion of wrist and hand of dominant hand [21].

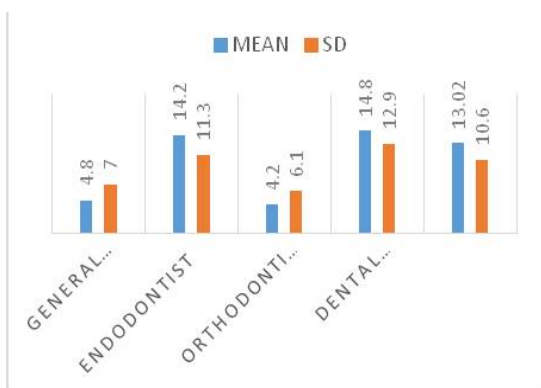
Procedure: A total of 150 dental professionals were selected for the study according to the inclusion criteria. Five groups were made. Group A consisted of 30 general dentist. Group. B consisted of 30 endodontist. Group C consisted of 30 orthodontist Group D consisted of 30 dental assistants and Group E consisted of 30 oral and maxillofacial surgeon's. The purpose of the study was to explain to the subjects and verbal description of whole procedure was also given. Study was further carried out after informed consent taken from the subjects followed by general assessment. Patient rated wrist /hand evaluation questionnaire was given and subjects were asked to mark a number in each item ranging from 0 to 10 describing their severity of pain in increasing order. Ranges of dominant hand and wrist were also taken .data was collected and documented in data collection form.

RESULTS

The total response rate for all groups was 139 (92.66%). The study revealed that the highest mean of PRWHE score was obtained by group D i.e. dental assistants followed by endodontist, followed by oral and maxillofacial surgeons, followed by general dentist and lastly by orthodontist.

The study also revealed that the total prevalence of WRMSD according to PRWHE score as administered by the dental professionals was 58.99% Furthermore the prevalence for general dentist was 42.8 %, endodontist was 71.4 %, orthodontist was 39.2%, dental assistant was 70 % and oral and maxillofacial surgeons was 72 %.

Graph 1: Showing the Mean and SD of PRWHE Score for different Dental Professionals.



As per analysis ranges of radial deviation for group A was 20.89(±5.28), group B 20.18(±3.4), group C 19.28(±3.9), Group D 19.50(±3.5), and group E 22.80 (±4.1) and f value was .035 which was significant.

As per analysis of data DIP flexion of index finger for group A was 83.21 (±12.9) , group B 86.79(±6.9) , group C was 88.57 (±7.5), group D was 88.50(±4.5), and group E was 89.20(±4.4) and f value was 2.586 which was significant.

As per analysis of data MCP extension of middle finger for group A was 31.9(±4.1), for group B 36.07(±4.9) group C was 35.54 (±3.9) group D 33.83(±4.08) and group E was 35(±4.5) and f value was 3.944 which was significant.

As per analysis of data CMC adduction of thumb for group A was 34.46(±4.9), group B was 30.36(±7.06), group was 32.6 (±7.7), group D was 28.6(±5.2), group E was 32.60(±7.23) and f value was 3.459 which was significant.

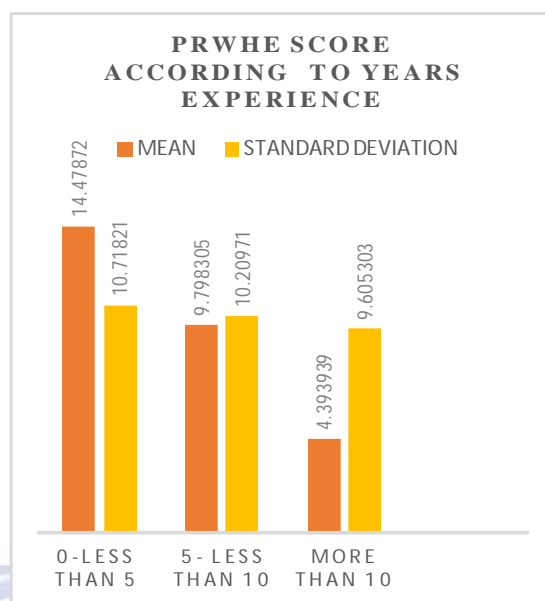
As per analysis of data CMC flexion of thumb for group A was 20.71(±5.2), group B 21.79(±5.8), group C 22.68(±5.6), group D was 25(±5.8) and group E was 27.2(±5.4) and f value was 5.7 which was significant.

As per analysis of data IP extension of thumb for group A was 13.93(±4.1), group B 12.68(±4.8), group C was 12.68(±4.40), group D was 10.53(±4.6), and group E was 11(±5.2) and f value was 2.497 which was significant.

Table 1: Showing the 139 Dental professionals were divided according to years of experience.

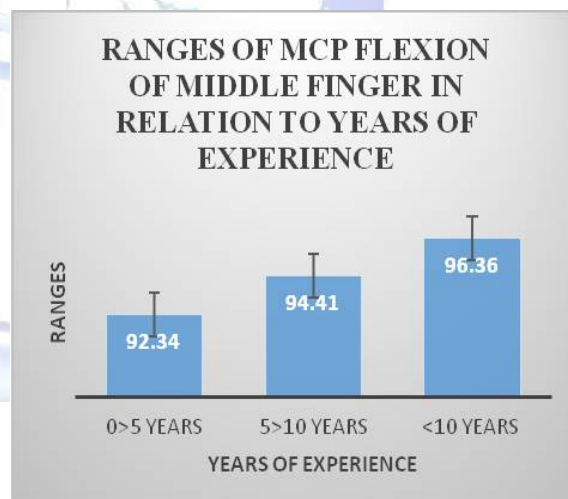
YEARS OF EXPERIENCE	GROUP	N	%
0 >5	A1	47	33.81
5 > 10	B1	59	42.44
< 10	C1	33	23.74

Graph 2: PRWHE Score according to years experience.



It was also seen that dental professionals with more years of experience had more mean for all ranges

Graph 3: Showing the Ranges of MCP Flexion of Middle finger in relation to years of experience.



Graph 4: Showing the Ranges of MCP Flexion of Index finger in relation to years of experience.

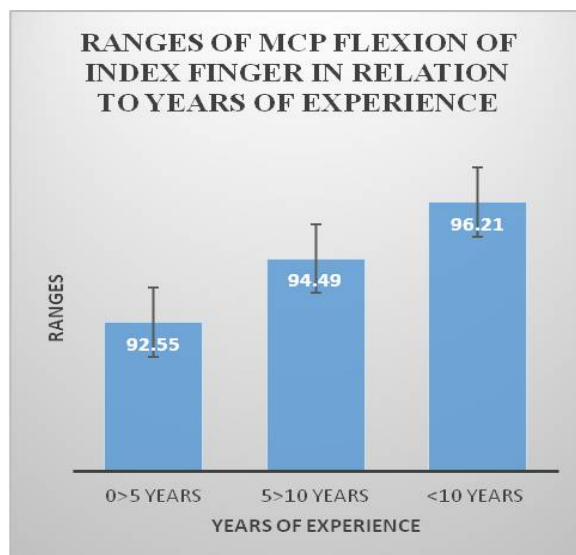


Table 2: Showing Description Of Activities For Dental Professionals.

GROUPS	YEARS OF EXPERIENCE	WORKING HOURS IN DAY	PROCEDURE TIMIMGS IN DAY	REST BREAKS IN A DAY
	MEAN	MEAN	MEAN	MEAN
GENERAL DENTIST	5.14	6.78	3.96	1.21
ENDODONTIST	5.46	7.67	4.03	1.32
ORTHODONTIST	7.07	7.28	3.94	1.28
DENTAL ASSISTANTS	8.9	7.43	3.66	1.23
ORAL SURGEONS	7.88	7.7	4.26	1.48

DISCUSSION

As per the present study analysis, it is found that the dental assistants were having the highest mean score of PRWHE followed by endodontist and oral and maxillofacial surgeons and then general dentist and orthodontist.

The result of our study are found to be consistent with a study of dental workers done by Valerie J. Rice et al. he reported that All three groups (dentists, DA / SA and DH / DAEF) reported back and upper extremity symptoms. However, DH / DAEF was at greatest risk for development of upper extremity symptoms. The study also revealed that, static, awkward positions of the wrist (flexion) and fingers (pinch), and repetitive wrist motions are implicated. Specific tasks, such as retraction and scaling, may emphasize these motions, resulting in localized fatigue and putting the practitioner at greater risk for injury. The study also explains that workers who like their work are more likely to report hand symptoms [22,23].

While conducting the study we also observed that the general dentist, endodontist, orthodontists and oral and maxillofacial surgeons managed the loads of patient according to their convenience but dental assistants have to do their work as designated by the dentist, which increases their load of patients and hence increases WRMSD.

According to our study total prevalence of work related musculoskeletal disorders according to PRWHE score as administered by the dental professionals was 58.99% Thus prevalence of oral and maxillofacial surgeons was found to be the highest i.e. 72 % among all dental professionals which may be due to some reasons such as the poor working posture i.e. the repetitive movements of hand and wrist,

ignorance of ways to maintain optimum posture, job stress, lack of fitness and competition among the colleagues [2,24].

From the present study we also found that dental professionals with less years of experience were having more PRWHE score and the dental professionals with more years of experience were having less PRWHE score.

The result of our study are found to be consistent with a study done by Tariq abduallah et al. a study done on musculoskeletal disorders among dentist in Saudi Arabia . The study revealed Frequency of pain and discomfort had tendency to decrease with age and with number of years in practice, because older dentist are with less loads of patient and younger dentist are mainly practicing general dentistry or enrolled in post graduate programme training that puts them under more pressure. He also found that older dentist have been taught to more frequently use various technologies and the dental mirror for directly inaccessible areas in the patient mouth [25].

Anna kierklo et al also found that young general practioners work very intensively in first years of practice often over 8 hours a day which causes early occurrence of musculoskeletal disorders, even within 3 years, possibly due to experiencing pain and muscle stiffness they start to keep fit and work less intensively, so this is why they do not experience pain in next few years [26].

From the present study we found that almost all dental professionals with more than 10 years of experience had hypermobile wrist and hand joints.

We also found that lack of improper rest breaks, lack of exercises, and improper working habits, and deficiency of knowledge of ergonomics

which can be one of the major factor for causing work related musculoskeletal disorders of hand and wrist

Hence it is seen that there is prevalence of wrist and hand related musculoskeletal disorders which may be prevented by improving lifestyle, educating them about correct postures as a part of under graduate dental education inculcating regular stretching strengthening and relaxing exercises regime regular breaks in between sessions²⁷ or using ergonomically designed dental instruments which will help to reduce the burden of static postures

Clinical relevance: To organize awareness programs for the prevention of various work related musculoskeletal disorders present among field of dentistry and also teaching them ergonomics and lifestyle and workstation modification.

Limitation of the study: Study included less variables and the study included limited number of subjects in each group

CONCLUSION

From the present study we conclude that total prevalence work related musculoskeletal disorders of wrist and hand was found to be 58.99 %.

Conflicts of interest: None

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