

Assessment of Knowledge Regarding Ergonomics and Work-Related Musculoskeletal Disorders among Dental Professionals and Students – A Cross Sectional Study

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Abstract:-

Context: Dentists now a days are becoming more prone to musculoskeletal disorders. A well adapted design of the workplace is a basic requirement for maintaining musculoskeletal health that will in turn enhance work efficiency. **Aim:** The goal of the current study was to determine how many dental professionals and students were aware of ergonomics and the incidence of musculoskeletal problems. **Settings and Design:** The study was conducted over 3 months (January 2022-March 2022) in Andhra Pradesh. **Methods:** The present cross sectional survey was conducted on 264 dental students and professionals who were divided into four groups i.e., Group 1 (general practitioner), Group 2 (interns), Group 3 (specialist), and Group 4 (students). The questionnaire's major focus was on respondents' knowledge of ergonomics and MSDS. **Statistical Analysis:** The collected data was analyzed on the SPSS version 23.0 software. Chi square test was applied for statistical analysis.

Results: Twenty percent of the respondents were males 79 % were females. The majority of dentists work from 5–10 hours daily, while 86% of the undergraduate students work less than 5 hours daily. The Majority of dental practitioners and specialists work with an assistant, undergraduate students responded that they work without an assistant. **Conclusion:** The majority of dentists who replied appear to practise in settings that make musculoskeletal diseases worse. Increased preventive treatments were closely linked to an increase in symptoms of musculoskeletal problems.

Keywords:- Awareness, Ergonomics, Musculoskeletal disorders, Dentists.

I. INTRODUCTION

The term "ergonomics" comes from the Greek words "ergo" (work) and "nomos" (natural laws or systems), respectively. Therefore, the discipline of ergonomics is concerned with creating tools and processes that are as safe and effective as possible. (American Dental Association 2011).¹

Musculoskeletal disorder is the term that refers to the conditions that involve the nerves, tendons, muscles, and supporting structures of the body. When a specific job plays

the main causative factor, then the term becomes work - related musculoskeletal disorders (WMSDs).²

The creation and design of various tools that assist in easing MSD symptoms is related to ergonomics. Due to their prolonged operations, poor hand posture, and sitting position, dentists are also susceptible to MSDs. The unrestricted mobility of the hand is restricted when hand or rotational devices are frequently used in a small area of the oral cavity. The awkward position puts dental practitioners in danger. Dentists have pain in their joints and strain in their neck, shoulder, and back muscles. All of these things might result in backache, neck pain, shoulder pain, and headaches. Long-term one-position sitting contributes to the development of MSDs.³

The application of ergonomics in dentistry would enhance optimum access, discernibility, relief, and control in clinical practice. To ameliorate the dental profession's working conditions; the sit-down and four-handed dentistry perceptions have been implemented. Appropriate ergonomic design is essential to avoid repetitive strain injuries, which can progress to long-term disability over time.⁴

Research studies highlight a higher prevalence of work-related MSDs among dental professionals and dental students. The nature of their work might result in MSDs in many parts of the body depending on the location and the type of work they perform.⁵ The goal of the current study was to determine whether dental professionals and students were aware of ergonomics and the incidence of musculoskeletal problems.

II. METHODS

The study was conducted over 3 months (January 2022-March 2022) in Andhra Pradesh.

This questionnaire study was conducted among 264 dental professionals and students of different age groups (20-40 years). The study being a questionnaire -based survey received the approval of the Institutional Ethical Committee (IEC) clearance at Lenora institute of dental sciences (49/IEC/LIDS/PG/2022) where the study was initiated. The study group was divided into four groups i.e., Group 1 (general practitioner), Group 2 (interns), Group 3 (specialist), and Group 4 (students). The questionnaire mainly focused on the awareness of ergonomics and MSDs.

The questionnaire was divided into 4 sections; the first section included the demographic characteristics regarding gender, age, work duration, and type of clinic. The second section involved the implementation of ergonomics. The third dealt with the work conditions (such as working posture, working with or without an assistant) and the organization of the dentist's work (number of breaks and their purpose) and the last section was concerned with the MSDs and the prophylactic physical activities (type and effectiveness) . Some questions had multiple response options.

➤ Data Collection

The data collected were tabulated and analyzed on SPSS version 23.0 software (IBM, USA) The Chi square test is used for statistical analysis. Descriptive statistics were generated. p value <0.05 was considered statistically significant.

III. RESULTS

Twenty percent of the respondents were males 79 % were females [Table 1-3] .The patients' age ranged from 21 to 52 years with a mean and standard deviation of 27.5 ± 6.8 , and the majority of the respondents were below 30 years(89.4%) .The majority of dentists in the present study indicated that they prefer working in both sitting and standing position (54.9%). We found that 78.3% of students, 12.9% of interns, 5.8% of general dentists, and 2.9% of specialists think that ergonomics is useful . About 73.9% of students, 16% of interns, 6.4% of general dentists, and 3.7% of specialists had ideas about work-related risk factors. The majority of dental practitioners and specialists work with an assistant, undergraduate students responded that they work without an assistant. Majority of the respondents were working in the private sector. The majority of the respondents were having less than 5 years of clinical experience. Dentists working in government and private institutions were right handed (94.3%). The majority of dentists work from 5–10 hours daily, while 86% of the undergraduate students work less than 5 hours daily.

Table 1: Demographics: Total study subjects (n) – 264

		Frequency	Percent
Sex	Female	210	79.5
	male	54	20.5
Age	20-25	236	89.4
	26-30	23	8.7
	31-50	3	1.1
	36-40	2	0.8
Designation	General practitioner	15	5.7
	Intern	37	14.0
	Specialist	8	3.0
	student	204	77.3
Working Institution	Government	2	0.8
	Private	262	99.2
Years of Practice	>20 years	1	0.4
	≤5 years	246	93.2
	6-10 years	17	6.4
Handedness while working	Both	9	3.4
	Left handed	6	2.3
	Right handed	249	94.3

Table 2: Frequency distribution of responses of study subjects

		Frequency	Percent
Q1	Yes	174	65.9
Q2	Yes	185	70.1
Q3	Yes	240	90.9
Q4	Yes	188	71.2
Q5	Yes	201	76.1
Q6	Yes	227	86.0
Q7	Yes	247	93.6
Q8	Yes	185	70.1
Q9	Yes	171	64.8
Q10	Both	145	54.9
Q11	No	163	61.7
Q12	<5 Hours	172	65.2

Q13	1 –3 patients	158	59.8
Q14	Yes	222	84.1
Q15	Yes	186	70.5
Q16	Yes	168	63.6
Q17	Physical activities	124	47.0
Q18	sometimes	156	59.1
Q19	<5 years	230	87.1
Q20	Sometimes	131	49.6
Q21	<5 years	258	97.7
Q22	Never	166	62.9
Q23	<5 years	258	97.7
Q24	Sometimes	187	70.8
Q25	<5 years	227	86.0

Table 3: Designation based distribution of responses

		Designation					Total	p value
		General practitioner	Intern	Specialist	student			
Q1	No	Count	1	8	1	80	90	0.009 HS
		% within Q1	1.1%	8.9%	1.1%	88.9%		
	Yes	Count	14	29	7	124		
		% within Q1	8.0%	16.7%	4.0%	71.3%		
Q11	No	Count	1	24	1	137	163	0.00 HS
		% within Q11	0.6%	14.7%	0.6%	84.0%		
	Yes	Count	14	13	7	67		
		% within Q11	13.9%	12.9%	6.9%	66.3%		
Q12	<5 Hours	Count	2	21	1	148	172	0.00 HS
		% within Q12	1.2%	12.2%	0.6%	86.0%		
	>10 Hours	Count	2	1	1	4		
		% within Q12	25.0%	12.5%	12.5%	50.0%		
	5-10 Hours	Count	11	15	6	52		
		% within Q12	13.1%	17.9%	7.1%	61.9%		

Q13	>9 patients	Count	1	0	1	9	11	0.00 HS
		% within Q13	9.1%	0.0%	9.1%	81.8%	100.0%	
	1 –3 patients	Count	5	26	5	122	158	
		% within Q13	3.2%	16.5%	3.2%	77.2%	100.0%	
	4 –6 patients	Count	4	10	2	66	82	
		% within Q13	4.9%	12.2%	2.4%	80.5%	100.0%	
7 –9 patients	Count	5	1	0	7	13		
	% within Q13	38.5%	7.7%	0.0%	53.8%	100.0%		
Q17	Analgesics	Count	5	14	3	79	101	0.02 S
		% within Q17	5.0%	13.9%	3.0%	78.2%	100.0%	
	Physical activities	Count	8	17	5	94	124	
		% within Q17	6.5%	13.7%	4.0%	75.8%	100.0%	
	Physiotherapy	Count	1	6	0	31	38	
		% within Q17	2.6%	15.8%	0.0%	81.6%	100.0%	
	Steroids	Count	1	0	0	0	1	
		% within Q17	100.0%	0.0%	0.0%	0.0%	100.0%	
	sometime	Count	11	20	3	122	156	
		% within Q18	7.1%	12.8%	1.9%	78.2%	100.0%	
>10 years	Count	0	1	0	1	2		
	% within Q19	0.0%	50.0%	0.0%	50.0%	100.0%		
Q23	<5 years	Count	15	34	7	202	258	0.01 S
		% within Q23	5.8%	13.2%	2.7%	78.3%	100.0%	
	6-10 years	Count	0	3	1	2	6	
		% within Q23	0.0%	50.0%	16.7%	33.3%	100.0%	

HS – Highly significant at $p < 0.01$; S – Significant at $p < 0.05$
Statistical test applied: Chi square test; HS – Highly significant at $p < 0.01$;
S – Significant at $p < 0.05$.

IV. DISCUSSION

The demographic characteristics of the participants showed a noticeable difference in awareness, with female dentists appearing to be more aware of the importance of ergonomics. Interestingly both sexes appeared to agree that they were exhausted after a long day of clinical work and emphasised the value of implementing ergonomics in the dental environment, whether working in public or private facilities, in accordance with previous studies.

Even though younger and older dentists experienced the same symptoms equally, as was confirmed in the current investigation, Al Wazzan et al.⁶ hypothesised that the number of years of practise play a crucial role in the prevalence of MSDs. The current research confirms earlier findings⁷ by demonstrating that pain in the hands, wrists, hips, ankles and knees increased as practice years increased.

Most male and female dentists from various specialties preferred to work in both sitting and standing position.

which was similar to study done by Rundcrantz et al and Chaikumarn⁸ but few reported to be work in sitting posture.

According to Ratzon et al⁹, dentists who worked exclusively while seated experienced more severe low back pain than those who alternated between sitting and standing. Finding a position that allows him to always have the best access, visibility, comfort, and control is the major goal for any clinician.

The majority of male dental professionals (20.5%) and female dental professionals (79.5%) said they took brief breaks between patients. Only 41.7% of dentists, according to Chaikumarn⁷, took breaks of at least five minutes in between patients. Exercise was often used without preventative measures. All responders (100%) agreed that exercise could reduce MSDs. Walking and stretching exercises were the two physical activities that respondents engaged in the most frequently.

V. LIMITATIONS OF THE STUDY

The limitations of the study is small sample size. The participants of the study were restricted only to Andhra Pradesh and may not represent the true level of knowledge and awareness of dentists at the national level.

VI. CONCLUSION

The majority of dentists who responded appear to practice in environments that exacerbate musculoskeletal illnesses; the rise in preventative treatments was strongly correlated with the rise in symptoms of musculoskeletal disorders. It is advised that all dentists, regardless of their dental specialty, incorporate ergonomics into their daily practises. Additionally, to provide a comfortable working environment for all dental professionals, dental ergonomics should be taught to undergraduate students and carefully applied in the clinics.

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Conflicts of interest

There are no conflicts of interest.

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