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A QUESTIONNAIRE-BASED RESEARCH ON THE KNOWLEDGE, ATTITUDE, AND PRACTICE OF ERGONOMICS AMONG PERIODONTOLOGY POSTGRADUATES IN INDIA

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ABSTRACT Ergonomics can be defined as 'an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely'. The successful application of ergonomics assures high productivity, avoidance of illnesses and injuries, and increased satisfaction among workers. Periodontal work covers most of the areas in the oral cavity including distal aspects of posterior teeth which are difficult to approach. It is important to prevent work related physical strain that ensures long term successful career. **Materials and methods:** A survey was conducted among 150 periodontology post graduates in India to assess their knowledge, attitude and practice of ergonomics. A structured closed questionnaire on knowledge, attitude and clinical practice were distributed among the periodontists through means of communication such as google forms through emails.**Results:** The data was collected, analysed and interpreted. The results suggested that the periodontal post graduates had adequate knowledge and attitude towards ergonomics, however the practical application was not as satisfactory.**Conclusion:**This survey concluded that the knowledge, attitude and practice of ergonomics among periodontal post graduates in India is better overall, but the practice needs some improvement.

KEYWORDS :

BACKGROUND:

Ergonomics originates from the Greek word “ergon” meaning work and “nomia” meaning laws – literally the “laws of work”. The definition of ergonomics is the applied science of designing and arranging the things people use so that the “people” and the “things” interact with the greatest degree of efficiency and safety.[1] The effects of poor ergonomics have been reported in the literature as far back as 1946, when a survey reported that 65 percent of dentists complained of back pain. Dental professionals are prone to musculoskeletal disorders and require special exercise and ergonomic interventions to maintain optimal health during the career. As dentists, we often assume static postures, which require more than 50 percent of the body's muscles to contract enabling the body to remain motionless. Such force, which results from sustaining a static posture, has been shown to be more taxing than dynamic, or moving, forces.[2] The risk of injury increases whenever work requires a person to perform tasks with body segments outside their neutral range in a deviated posture. Even after this development and the fabrication of ergonomic equipment, studies have found back, neck, shoulder or arm pain present in up to 81 percent of dentists.[3] Dental ergonomics is the adaptation of the dentist and his/her team, with respect to the physical and psychological capacity, for a healthy, safe and efficient functioning in their professional activity.[4] So this survey aimed to assess the knowledge, attitude and practice of ergonomics among periodontology post graduates in India.

MATERIALS AND METHODS:

This questionnaire-based survey was conducted among postgraduates in periodontics in India. Content validation and approval was done by four professors of different specialities. A total of 150 were approached for their participation in the survey. A 15-item close-ended questionnaire (Table 1) was sent out electronically via google forms to postgraduates of periodontology in India . The questionnaire began with obtaining demographic details of the postgraduates such as name, age, gender, and year of study. Following the demographic data, a set of close-ended questions were put forth pertaining to the subject. The survey questions were designed to obtain information on the Knowledge, attitude and practice of ergonomics.[5] After collecting the data from the students, statistical analysis was done, and results were obtained by using SPSS Version 16 software, and descriptive statistics were expressed as percentage of responds on selected variables. No inferential statistics was performed because our study is a descriptive type of study. Institutional ethical committee of Meenakshi Ammal dental college and hospital reviewed and discussed the study protocol and the ethical clearance was obtained.

Study design:

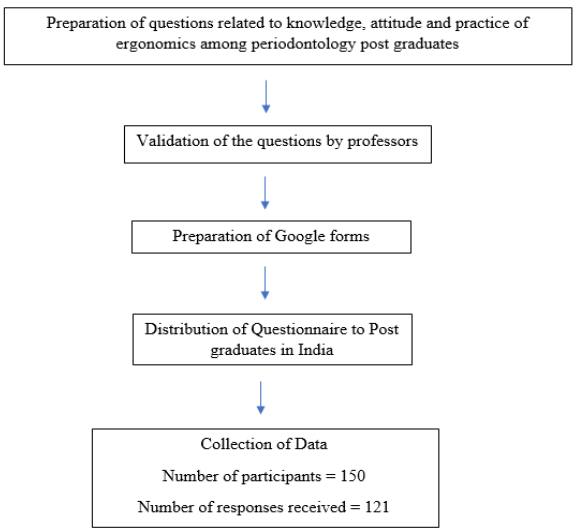

Table 1 – The questionnaire of the survey

1	Practice	How many clinical hours do you spend while working on a patient in a week	a) Less than 20 hours b) 20-40 hours c) 40-60 hours d) More than 60 hours
2	Practice	Do you work with an assistant when necessary?	a) Yes b) No
3	Knowledge	Are you aware of different operating procedures for different quadrants?	a) Yes b) No

4	Practice	Do you adjust the operator chair (or) patient's chair prior to the procedure for visibility, hip and lumbar support?	a) Yes b) No
5	Attitude	Do you think ergonomics play a major role in dentistry?	a) Yes b) No
6	Practice	Do you take breaks during lengthy procedures?	a) Yes b) No
7	Practice	Do you feel numbness in your fingers while performing a procedure?	a) Yes b) No
8	Practice	How often do you experience back pain (or) neck pain (or) shoulder pain post procedure?	1.a)Always 2.b) Sometimes 3.c) Never
4.9	5. Knowledge	6.Are you aware of stretching exercises that can be done in clinical hours?	a) Yes b) No
10	Attitude	Ergonomics must be a part of dental curriculum.	a) Agree b) disagree
11	Practice	How would you rate your overall ergonomics?	a) Good b) Average c) Poor

Google form:

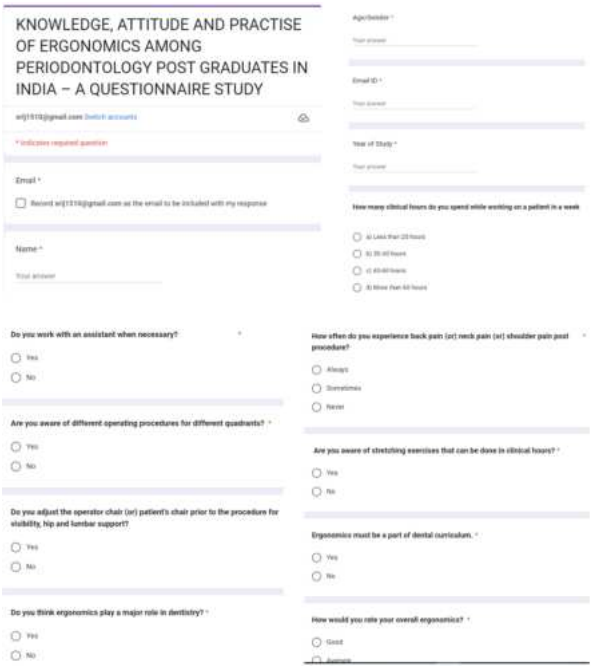

Fig 1- Google form showing the survey questionnaire

RESULTS:

A total of 121 of the 150 registered postgraduate students participated in the study, with an overall response rate of 80.6%. Table 2 shows the questionwise results of the study. The age distribution of participants was between 24 and 30 years. Survey responders answered questions on knowedge, attitude and practice of ergonomics in their clinical set up. Among the total sample which was studied, it was observed that 91.7% of the post graduates works with assistants when necessary. Only 49.6% of post graduates work with patients around 20 hours to 40 hours in a week. Also 99.2% reported that they are aware of different operating positions on different quadrants. 97.5% of the periodontology post graduates responded to the survey stated that ergonomics has an important role in dental practise.

Among 121 post graduates, 85 post-graduates reported that they have back pain or neck pain or shoulder pain sometimes. 52.1% of the periodontology post graduates are aware of stretching exercises that can be done during clinical hours.

Table 2 – Questionwise results of the survey

		N	%
How many clinical hours do you spend while working on a patient in a week?	< 20 hours	22	18.2%
	20-40 hours	60	49.6%
	40-60 hours	37	30.6%
	> 60 hours	2	1.7%
	Total	121	100.0%
Do you work with an assistant when necessary?	No	10	8.3%
	Yes	111	91.7%
	Total	121	100.0%
Are you aware of different operating positions for different quadrants?	No	1	0.8%
	Yes	120	99.2%
	Total	121	100.0%
Do you adjust the operator chair (or) patient's chair to the procedure for visibility, hip and lumbar support?	No	3	2.5%
	Yes	118	97.5%
	Total	121	100.0%
Do you think ergonomics play a major role in dentistry?	No	3	2.5%
	Yes	118	97.5%
	Total	121	100.0%
Do you take breaks during lengthy procedures?	No	51	42.1%
	Yes	70	57.9%
	Total	121	100.0%
Do you feel numbness in your fingers while performing a procedure?	No	47	38.8%
	Yes	74	61.2%
	Total	121	100.0%
How often do you experience back pain (or) neck pain (or) shoulder pain post procedure?	Never	3	2.5%
	Sometimes	85	70.2%
	Always	33	27.3%
	Total	121	100.0%
Are you aware of stretching exercises that can be done in clinical hours?	No	58	47.9%
	Yes	63	52.1%
	Total	121	100.0%
Ergonomics must be a part of dental curriculum.	Disagree	2	1.7%
	Agree	119	98.3%
	Total	121	100.0%
How would you rate your overall ergonomics?	Poor	9	7.4%
	Average	68	56.2%
	Good	44	36.4%
	Total	121	100.0%

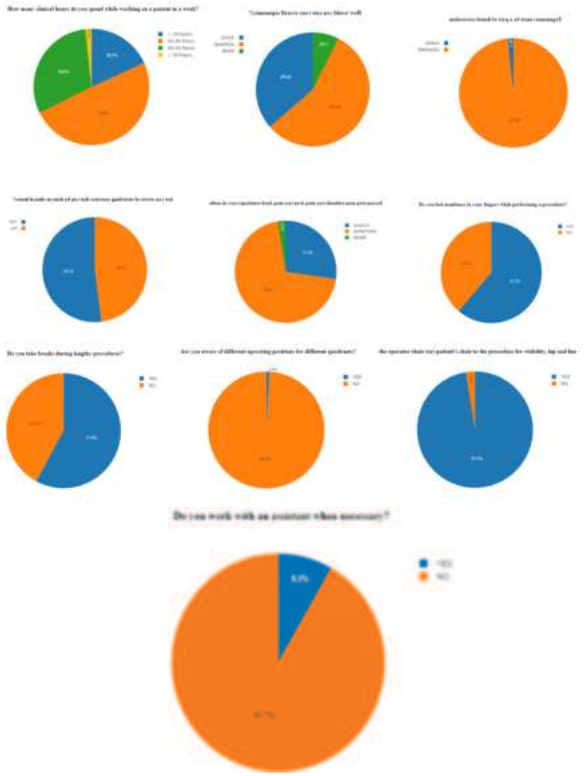

Fig 2: Pie charts showing responses of 121 respondents.

DISCUSSION:

Maintaining proper posture and form is crucial for dental professionals to ensure optimal health, function, and form. The majority of cases of musculoskeletal disorders (MSDs) are seen in dentists.[6] In 2002, Anton discovered that dental professionals experienced pain in their hands

and wrists (69.5%), neck (68.5%), upper back (67.4%), low back (56.8%), and shoulders (60%) areas. For dentists to be in better health, there needs to be greater knowledge of ergonomics. Maintaining a healthy practice requires the design of the work system to be founded on ergonomic principles with regard to body posture, body mobility, muscular strength, and body proportions.[7] Studies performed by Fish et al and Murphy et al suggest that taking micro breaks while working improve efficiency during dental procedures. Other methods of improving ergonomics and reducing MSDs include indirect mirror viewing, observing recommended practices for nutrition and regular exercise, proper lighting. Using loupes or microscopes has been shown to improve clinicians' working posture and reduce repetitive stress injuries related to ergonomically inefficient posture and practice.[8] The choice of loupes should take into account the physical and clinical requirements of the physician, as well as factors like most effective positioning, working distance, declination angle, and depth of field of the loupes. Workstations with poor construction have the biggest effect on the neck. One of the possible causes of this could be inadequate vision of the patient's oral cavity. In addition, bad posture in the neck can cause pain in the back. It was discovered in a 2018 study of ergonomic postures during typical that none of the operators had the optimal neck position.[9] Available research supports the idea that MSDs can be managed or alleviated effectively using a multifaceted approach that includes preventive education, postural and positioning strategies, proper selection and use of ergonomic equipment and frequent breaks with stretching and postural strengthening techniques. This represents a paradigm shift for daily dental practice.[10] It is important that dentistry incorporate these strategies into practice to facilitate balanced musculoskeletal health that will enable longer, healthier careers; increase productivity; provide safer workplaces and prevent MSDs.

CONCLUSION:

This survey concluded that the knowledge, attitude and practice of ergonomics among periodontal post graduates in India is better overall, but the practice needs some improvement. Adopting ergonomic equipment and working posture as well as ensuring a carefully organized operatory layout can help oral health professionals avoid MSDs that could potentially compromise career longevity

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