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Assessing the Knowledge, Attitude and Practice on Dental Ergonomics among Physiotherapy Practitioners – A Cross Sectional Survey

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ABSTRACT

INTRODUCTION: The field of dental ergonomics encompasses much more than just mitigating musculoskeletal diseases at work. When ergonomics is used successfully, it guarantees high production, prevents diseases and injuries, and raises worker satisfaction. On the other hand, improper use might result in musculoskeletal diseases (MSDs) associated to the workplace. MATERIALS AND METHODS: A cross sectional survey was done among 250 Physiotherapy practitioners for a time period of 6 months through a 13 item self-administered questionnaire. The data were collected in person and was analysed to statistical methods. RESULTS: Only 28.67% of participants knew what physiotherapy dental ergonomics was, although 89% acknowledged knowing about body posture and productivity throughout the entire sample. It was shown that, in dentistry practise, 75.33% of respondents believed that good posture may avoid musculoskeletal illnesses, while 21.67% believed that it enhances one's physical appearance. Of them, 38% had a good attitude towards treating dentists, and 18.6% had treated dentists with multiple sclerosis in the past. CONCLUSION: The study concludes that physiotherapy practitioners had very less knowledge on physiotherapy dental ergonomics and showed a good positive attitude on treating the dentist population but seems to have very less encounters in their clinical practice.

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1. INTRODUCTION

Ergonomics is defined as the scientific discipline concerned with understanding of the interaction among humans and other elements of an organisation or system, and the profession that applies application, theory, data, and methods to design in order to optimise human well-being and overall system performance given by International Ergonomics Association (IEA)[1]. Because ergonomics recognises the limits and capacities of humans, it constantly aims to "fit the job to the man." Having appropriate working dental ergonomics is essential to maintaining job capacity, efficiency, and a high clinical level of care throughout a physiotherapy professional's career[2,3].

The field of dental ergonomics in dentistry covers a wide variety of topics, including the dynamics within the physiotherapy team, lighting, noise levels, and odours, as well as the software and equipment that is utilised. The treatment area has to be adaptable, including the patient chair, physiotherapy unit, operating light, dynamic and manual instruments, cabinets, and auxiliary equipment. In order to accommodate varying working practises, clinical procedures, and patient kinds, they must ensure appropriate working postures, enough illumination, and convenient access to necessary apparatus and materials[4-5].

The primary goal of life is to make money, yet most individuals don't know how to work in a healthy setting. Individuals labour to accumulate riches at the expense of their well-being[6].The majority of individuals have no idea what constitutes a healthy workplace. It has been noted that individuals who lack awareness of their rights to a healthy work environment may have health issues, including hearing impairments, which may even cause premature death. According to Takala's 2005 report, 2.2 million deaths per year are attributed to work-related accidents and illnesses[7].

School-age children experience an ergonomic problem when they develop low back pain from their school bags, which puts additional pressure on their L4 and L5 because the current recommendation for school bags is 10%. Inappropriate shoulder strap adjustments and the hip belt of the school bag also contribute to back pain[7]. Nursing has a higher frequency of backache than other professions because nurses are paid so little that they must work two jobs at a time to cover their expenditures. Medical care personnel also have the same ergonomic problems as a result of overwork[8].

Musculoskeletal disorders (MSDs) are currently responsible for 40% of occupational and job-related health expenses worldwide. Ergonomic treatments have proved effective in lowering the incidence of MSDs by more than 50%, particularly in occupations where workers are exposed to high levels of work risk factors[9]. According to a 2010 survey on dental ergonomics knowledge in Nigeria, just 2.1% of medical professionals were aware of dental ergonomics. The industrial sector in Malaysia is now heading in the right direction. Much work has been done globally to raise professional and community understanding of the value of dental ergonomics[10].

It's possible that poor ergonomic practises, ignorance, and unfavourable attitudes contribute to the high incidence of MSD. These inadequacies are linked in developing nations like India to a lack of attention on key ergonomic concepts throughout the training years. The majority of the knowledge acquired throughout undergraduate study is exclusive to operator chair roles[11-12].

There is a significant difference in the training, such as whether four-handed dentistry is practised while sitting or standing. The curriculum does not provide consistent recommendations for the same. There is a widespread lack of understanding and awareness of the numerous dental ergonomics ideas applicable to clinical dentistry practise as a result of this uncertainty in the undergraduate curriculum. Owing to the current COVID-19 epidemic, more people are using personal protection equipment, which may make the oral cavity less visible and accessibledentistry personnel may experience more MSD as a result of inadequate dental ergonomics training, accessibility issues, and poor visibility caused by PPE during clinical dentistry operations[13-15]. There is a need of assessing the knowledge attitude and practice methods of physiotherapy practitioners on physiotherapydental ergonomics to enhance the quality of life of physiotherapy professionals.

2. MATERIALS AND METHODS STUDY DESIGN AND SAMPLE

A cross sectional survey was conducted on physiotherapy practitioners for a period of 6 months duration. The study was conducted among the practitioners in Chennai city. The study obtained ethical approval from Institutional Ethical Committee Karpaga Vinayaga Institute of Physiotherapy Sciences. The sample size was estimated from the pilot study conducted before the start of the study to check for the feasibility and validity after which a total of 250 physiotherapy practitioners were enrolled in the study and the samples were collected through snowball sampling technique.

Questionnaire& Data Collection

A self-administered questionnaire in English was prepared, which had two parts. The first part consisted of information on demographics (age, sex, education) and years of clinical practice of the physiotherapy practitioners. The second part included a knowledge, attitude and practice questionnaire adapted from Sarfaz et al. It included the 13 items on knowledge, attitude and practice based on the physiotherapydental ergonomics which was given a Likert scale to measure the measurements. The questionnaire was validated and checked for inter and intra examiner reliability and cronbach’s alpha was estimated to be 0.87 with good agreement between them. Thus, the questionnaire was passes out to collect data from the study participants through interview method at their clinic venue in Chennai city by the trained examiners. A period of four months has been administered in collecting the data from the study participants and the collected data were subjected to statistical analysis.

STATISTICAL ANALYSIS

The collected data were entered into a Microsoft excel spread sheet 2010and were subjected to statistical analysis using SPSS software IBM USA version 21.0. Descriptive statistics was done to discriminate the demographic details and association between the factors and frequencies has been done by inferential statistics using a Chi square test with statistical significance p value less than or equal to 0.05.

3. RESULTS

The results of 250 study population states thatphysiotherapy practitioners (56.3%) were less than or equal to 28 years old. The mean age of the participants was 30.57. More than half of the respondents were female (57.1%), had a master's degree (47.4%), and had less than three years of clinical experience (61.9%). The majority of the respondents knew the meaning of "dental ergonomics" (87.7%), "health hazards" (93.4%), "benefits of ergonomic application" (83%), "popular operating posture that may cause MSD" (81.8%), "best posture of the dentist sitting" (90.8%), "the best level of the dentist shoulders and site of the elbow and upper arms" (92.8%), and best "site for forearms and operating fingers of the dentist" (89.4%).

Only 50% of the participants were familiar with the terms "orbit range around the patient's head" (62.2%) and "points on the body, including fingertips and feet, that come in contact with patients and objects for stable control and sightings of the operating points (60.5%)." Nearly two thirds of the participants were aware of "the degree of sight-line and light-line" (73%), "specifics for designing and equipping the treatment room" (58.2%), "human supports and material objects that account for body space, body parts' paths of motion, and instrument support location" (62.1%), "the benefits of an ergonomic head rest" (70.5%), "the ideal distance from the floor to the position" (65.3%), "moving, exercise, and stretch exercises between patient appointments" (66.7%), and "a comfortable environment, light, and temperature in the treatment.

The majority of respondents felt that: "dentists should alternate between sitting and standing between patient appointments" (76.7%); "various physiotherapy institutions should conduct continuing physiotherapy education" (87.5%); "should follow ergonomic principles in routine physiotherapy practise" (95.6%); and "physiotherapy chair and instruments play any role in following ergonomic principles in routine physiotherapy practise" (94.8%) (Table 2).

"Working in the upright position with the spine resting on the stool's back" (87.5%), "orienting the operating field to the elbow level of the working hand" (92.2%), "making an effort to maintain neutral posture while working" (85.2%), and "orienting the beam of light perpendicular to the observational direction" (87.4%) were the most common reported positions by the participants. "According to Table 3, the majority of practitioners (72.7%) do not utilise physiotherapy loupes for magnification

A greater likelihood of low or acceptable knowledge scores was seen in physiotherapy practitioners with fewer than 28 years of experience (OR: 0.57), recent graduates (OR: -0.47), and less than three years of clinical experience (OR: -0.53). The distribution of knowledge scores and sex did not significantly differ (OR: 0.3) (Table 4).

Over-28-year-old physiotherapy practitioners were much more likely to have favourable attitudes (OR: 0.6) and practises (OR: 0.54). Sex did not significantly affect the distribution of attitudes (OR: 1) or practise (OR: 0.7) scores. Regarding the attitude ratings, there was no discernible difference between practitioners who had master's and graduate degrees. Master's degree holders were more likely to employ best practises (OR: 1.92). Good practises were more likely to be used by practitioners with more than three years of clinical experience (OR: 1.72; 95% CI: 1.03 – 2.9) (Table 4).

4. DISCUSSION

Dental ergonomics is crucial to clinical physiotherapy practise, and practitioners must use it from the start of their careers. The lack of emphasis on dental ergonomics in dentistry curricula leads to a lack of understanding, attitudes, and practises during clinical work. In addition to these variables, earlier research indicates that physiotherapy healthcare practitioners had a high MSD prevalence[16].

Therefore, the purpose of our study was to assess the dental ergonomics knowledge, attitudes, and practises of private physiotherapy practitioners. According to our research, more than 75% of the physiotherapy professionals who took part in the survey were aware of the phrase "dental ergonomics" and the risks it poses to public health. However, just thirty percent were aware of the needs for ergonomic design in physical treatment settings. These outcomes lined up with the findings of investigations by Diaz-Caballero et al. and Garbin et al. In their regular work, less than 5% of physiotherapists use magnification devices like physiotherapy loupes[17-18].

Even while physiotherapists are aware of the advantages of assistive technology and appropriate ergonomic practises, they seldom use them in clinical settings. Similar to other studies, the majority of physiotherapists (41.1%) had fair understanding, and over one-half (75.2%) had positive opinions. Only one-fifth of them (21.9%) followed excellent practises, which was similar to a previous study on practitioners and students in physical therapy[19]. On the other hand, opposing results were also documented.

It is probable that younger physiotherapists shared the same undesirable habits, unfavourable attitudes, and fair to poor knowledge as those documented by Kalghatgi et al. Nevertheless, prior research on the relationship between age and dental and physiotherapy students' knowledge, attitudes, and practises did not find any evidence of a significant correlation[20]. Like prior research on physiotherapy students, no significant variations were found in knowledge, attitudes, or practises related gender. However, earlier

studies had different results. As in earlier research, specialised dentists exhibited markedly improved knowledge, attitudes, and practises. Even though the participants in this research had a positive attitude and a good deal of information about dental ergonomics, they nonetheless engaged in poor dental ergonomics practises in their everyday work routines, which is comparable to what Saraz et al. reported.

5. CONCLUSION

The study concludes that physiotherapy practitioners possessed positive attitudes and fair to good knowledge on physiotherapydental ergonomics. The integration of physiotherapyergonomic ideas into the physiotherapy curriculum is therefore imperative. Physiotherapy practitioners must participate in regular training programmes to enhance their knowledge, attitudes, and practises. They also need to undergo periodic, thorough musculoskeletal assessments regards to physiotherapydental ergonomics.

In this study, questionnaire covers every component of dental ergonomics that is necessary for therapeutic practise. The self-reported nature, social desirability bias, and absence of a suitable sample strategy are among the limitations.

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TABLES

TABLE 1. represents the distribution of knowledge of the physiotherapy practitioners towards dental ergonomics

QUESTIONS	YES %	TO SOME EXTENT %	NO %
Dental ergonomics means	2.3	22.2	75.5
Health hazards due to dental ergonomics	0.6	19.8	79.6
Benefits of dental ergonomics	7	33.2	59.8
Popular posture causing mucoskeletal disorder	8.2	37.3	54.5
Best posture for dentist in chair	3.2	23.3	73.5

Working style of dentist in operatory	5.2	28.3	66.5
Best site for foreaerm and fingers of dentist	9.6	40.8	49.6
Physical assessment of dentist	37	41.4	21.6
Position of head for working dentist	49.6	32.7	17.8
Headrest benefits	31.8	37.9	30.3
Ideal position from floor of working dentist	47.8	31.2	21
Any special parameters for dentist working in between patient appointment scheduling	29.4	37.6	32.9
Dentist ergonomics	33.2	32.9	33.8
Environment of working dentist	32.4	30	37.6

TABLE 2.represents the distribution of Attitude among physiotherapy practitioners towards dental ergonomics.

QUESTIONS	DEFINETLY NO %	NO %	NEUTRAL %	YES %	DEFINETLY YES %
Dental ergonomics is a part of physiotherapy practice	0	0	3.2	16.9	79.9
Is dental ergonomics compulsory for physiotherapy practitioners	0	0.3	4.1	23.9	71.7
Is dental chair important to know dental ergonomics	0	0	5.2	39.1	55.7
Do you recommend change of positions in between patient appointments	0.3	2.6	9.6	51.3	36.2
Do you think dental ergonomics education is important to physiotherapy practitioners	0.3	2.6	9.6	51.3	36.2

TABLE 3. Distribution of responses with respect practices of the dental practitioners towards ergonomics

QUESTIONS	NEVER %	RARELY %	OFTEN %	VERY OFTEN %	ALWAYS %
How frequently do you practice dental ergonomics	0.3	2.6	21.3	41.7	34.1
How frequently do you make dentist to perform ergonomic practice	0.6	12	42.9	34.7	9.9
How frequently do you recommend working style change in dental ergonomics	0.3	7.6	38.2	28.9	25.1
How frequently do you make dentist do neutral position	1.7	13.1	38.5	32.1	14.6
How frequently do you visit a dentist or encounter dentist for ergonomic therapy	1.5	11.1	37	27.7	22.7

TABLE 4.represents the association between Knowledge, attitude and practices with respect to demographic parameters.

		Knowledge			Attitude		Practice	
		Poor	Fair	Good	Negative	Positive	Bad	Good
	<28	56.2	75	35	58.8	46.1	52.6	37.3

Study participants AGE Group	>28	43.8	46.8	63.9	41.2	53.9	47.4	62.7
	P value	0.008			0.042		0.019	
	OR	-0.57			0.6		0.54	
Gender	Male	40	34.8	47.4	40	39.9	38.1	46.7
	Female	60	65.2	52.6	63.30	60.1	61.9	53.3
	P value	0.146			0.99		0.179	
	OR	0.30			1		0.7	
Literacy rate	Graduate	45.7	49.6	28.9	51.8	39.5	45.9	30.7
	Masters	54.3	50.4	71.1	48.2	60.5	54.1	69.3
	P value	0.005			0.048		0.018	
	OR	-0.47			1.64		1.92	
Clinical practice in years	0-3	57.1	57.4	38.1	55.3	50.8	54.9	41.3
	>3	42.9	42.6	61.9	44.7	49.2	45.1	58.7
	P value	0.006			0.47		0.038	
	OR	-0.53			1.2		1.72	