



Awareness and Knowledge of General Dental Practitioners in Tamil Nadu towards Management of Temporomandibular Disorder: A Questionnaire-based Survey

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: The term “Temporomandibular disorders” (TMDs) refers to a broad range of problems, such as discomfort in the jaw muscles and Temporomandibular joint (TMJ) restrictions on the motions of the mandible, and intraarticular functional abnormalities, such as locking of the Jaw. A significant population of general dentists find the diagnosis of Temporomandibular disorders challenging and often complex. It aims to find out how general Practitioners and specialists in India perceive the difficulties in managing a patient with Temporomandibular disorders. This study will assist in determining if general practitioners or Temporomandibular disorders experts need further training in the diagnosis and management of Temporomandibular disorders.

Materials and Methods: An electronic survey was carried out where in all the participants were sent mail giving description about the study as well as the survey link. 17 closed end questions were asked in the questionnaire. Then the survey data was then analyzed using statistical packages for social sciences (SPSS 18.0 VERSION IBM USA)

Results: The results 114(89%) of the 128 research participants were dentists in active practice, with an average age of 24.80 ± 1.63 years and a range of 22 to 31 years. Sixty-seven percent of the participants were female. Patients with TMD were treated by 72.7% of the study's participating practitioners, while 26.6% of participants decided to send the patient to another dentist or educational facility.

Conclusion: The results imply that General dentists practicing in Tamil Nadu, differ from one another in their approach to the diagnosis and management of Temporomandibular disorders. A vast majority of them treated patients with Temporomandibular disorders using occlusal splint therapy anticipating relief. Therefore, to provide dental professionals confidence in treating Temporomandibular disorders, a valid, repeatable patient-centered procedure has to be developed. It would be more advantageous to include instruction on Temporomandibular disorders diagnosis in the undergraduate curriculum.

Keywords: Temporomandibular disorders; orofacial pain; treatment.

1. INTRODUCTION

The term “temporomandibular disorders” (TMDs) refers to a broad range of problems, such as discomfort in the jaw muscles and Temporomandibular joint (TMJ) restrictions on the motions of the mandible, and intraarticular functional abnormalities, such as locking of the Jaw [1]. According to several epidemiological investigations, TMD and Orofacial pain (OFP) disorders are very prevalent in the general population [2,3]. Emotional strain, occlusal interferences, tooth loss, dysfunction of the masticatory muscles, and internal and external alterations in the anatomy of the Temporomandibular joint (TMJ) have been postulated to be the causative factors for Temporomandibular disorders” TMD [4].

The treatment of Orofacial pain and problems affecting the masticatory and related musculature are becoming increasingly associated with dentists [5]. According to statistics, TMDs are estimated to account for the most prevalent OFPs with musculoskeletal origins, affecting 28–86% of the population [6]. Dental practitioners thought to use the best available scientific data, their previous clinical experience, and the

patient's treatment requirements and preferences to choose the best treatment plan [7]. Although TMD is one of the most well-known controversial and debated dental subjects, fundamental science and clinical researchers have made some progress in approaching it better.

A large proportion of practicing dentists are only partially aware of TMD diagnosis and therapy due to a variety of misconceptions that exist in dental education and clinical practice. The patient's history, previous medical records, the results of the clinical examination, and, if necessary, TMJ imaging, are the main sources of information used to diagnose TMD [8]. Concerning the treatment plan of patients with TMDs, it has been recommended that a reversible course of therapy be followed initially. This is frequently the case since the history of TMD indicates a tendency to improve or disappear over time. And conservative techniques have proven to be more successful in many instances than many invasive therapies in relieving symptoms [9].

A significant population of general dentists find the diagnosis of TMDs challenging and often complex. The diagnosis and treatment are

influenced by the dental professionals' experience, education, and attitude. The goal of the current study is to determine the General dental practitioner's (GDP) level of awareness and understanding of TMD diagnosis and treatment. It also aims to find out how general Practitioners and specialists in India perceive the difficulties in managing a patient with TMDs. This study will assist in determining if general practitioners or TMD experts need further training in the diagnosis and management of TMD.

2. MATERIALS AND METHODS

2.1 Study Setting and Study Area

For six months, from June 2022 to December 2023, a cross-sectional study was conducted among practicing general dentists in Chengalpattu district, Tamil Nadu.

2.2 Inclusion Criteria

1. The survey took into account 200 DCI-registered general dentists practicing in and around Chengalpattu district, Tamil Nadu.
2. Graduated general dental practitioners regardless of the dental school of origin, gender, graduation year, or program content.

2.3 Exclusion Criteria

1. Postgraduates.
2. TMD specialists were not allowed to participate in the study.

2.4 Sample Size Estimation

For a study of a similar kind carried out in India, the sample size was determined using the sample size formula for qualitative data [6].

$$n=4 pq/L^2$$

Where, p=Proportion of GPD having good knowledge=44.64% L=Allowable error =20% of p=20x44.64/100 =8.928 n=4x44.64x(100-44.64) 8.9282 =124.01 n=125 patients needed in the study

2.5 Questionnaire Framing and Validation

The questionnaire is framed in English language as 17 items and was pre and post tested for inter

and intra examiner reliability using Cohn's Kappa statistics in which the results showed a good agreement between the reliable factors with kappa value 0.92.

2.6 Data Collection

The General dental practitioners were given access to a specially designed web survey using Google Forms which included seventeen questions. The questionnaire was prepared using a study by Aldridge RHS et al [10] as a reference. Six questions concerned behavior, six about treatment methods, two about cause, and three about demographic information (age, gender, and designation). The survey evaluated respondents' awareness and understanding of TMD, including its etiology, diagnosis, and course of therapy.

2.7 Statistical Analysis

The collected data were entered into Microsoft Excel spread sheet and was subjected to statistical analysis using SPSS Software Version 18.0 IBM USA in which descriptive and inferential statistics to check for the association between the factors using Chi square test with p value kept as less than or equal to 0.05 as statistical significant difference.

3. RESULTS

Out of 128 participants in the study, 114 (89.1%) were practicing dentists with a mean age of 24.80±1.63 years, with a range of 22 to 31 years. Among the participants, the majority consisted of Female (61.7%). The general practitioners mentioned that almost 71.1% of TMD patients were treated in their clinics. Practitioners varied greatly in the diagnostic method they used, the way they approached each patient, the location of referral, and the treatment option they preferred. Physical examination was the most frequently employed method of diagnosis (20.3%).

72.7% of the practitioners who participated in the study treated the patients with TMD and 26.6% of the participants chose to refer them to another dentist or educational institution. Maxillofacial surgeons were the most often recommended specialists for patient referrals, according to 101 general practitioners (78.9%). 75 candidates in the study (58.6%) picked the standard occlusal splint therapy as their treatment of choice. In answer to the splint-related questions, 122

respondents (95.3%) recommended splints as the most popular form of therapy.

The most often utilized splint types were soft stabilization appliances (46.9%) and hard stabilization appliances (19.50%). Among the 128 participants, 87(68%) of them used a semi-adjustable articulator to fabricate the occlusal splints.

No matter what kind of splint was employed, each patient's need should determine the occlusal relationship in which the splint was fabricated (40.6%).On the day of the insertion of the splint, 89 (69.5%) practitioners had done

occlusal modifications. Additionally, according to 63 members (49.20%), individual patient needs determine the duration that the splint should be used. 48 dentists (37.5%) believed that a weekly follow-up was necessary for the patients treated using splint therapy and 47 dentists admitted that individual patient needs determine the follow-up protocol (Table 1).

According to the responses to the queries on causes and effects, 93 GDPs (72.7%) believed that the etiology of TMD was multi-factorial, and 124 GDPs (96.4%) thought that multidisciplinary medical and dental therapy was required (Table 1).

Table 1. Represents the distribution of study population based on Age, Gender and Dental Practice by using descriptive statistics

Demographic data				
Sno	Parameter	Options	Frequency	Percentage
1	Age (years)	21-23	117	91.4
		24-27	9	7.0
		28-31	2	1.6
2	Gender	Male	49	38.3
		Female	79	61.7
3	Are you practicing dentistry?	Yes	114	89.1
		No	14	10.2

Descriptive statistics was performed

Table 2. Represents the distribution of study population and association based on the behavior in treating TMD patients using chi square test

The following are behavior-related questions of dentist towards TMD patients					
SNO	Questions	Options	Frequency	Percentage	SIG
1	Are TMD patients being treated at your clinic?	Yes	91	71.1	0.055
		No	37	28.9	
2	What procedures do you use to diagnose these patients?	Medical history	9	7.0	0.003
		Physical examination	26	20.3	
		Imaging studies	5	3.9	
		Study models	1	0.8	
3	What is your approach toward these patients?	Offer treatment	93	72.7	0.048
		Refer to an academic institution	27	21.1	
		Refer to another dentist	7	5.5	
4	If you do not treat these patients, what specialty do you refer them to?	Prosthodontics	11	8.6	0.056
		Orthodontics	15	11.7	
		Neurology	0	0	
		Maxillofacial surgeon	101	78.9	
5	If you do treat these patients, what treatments do you offer them?	Counseling	12	9.4	0.054
		Thermotherapy	8	6.3	
		Physiotherapy	32	25.0	
		Occlusal splint therapy	75	58.6	
6	Is the treatment provided by you beneficial to the patients?	Yes	122	95.3	0.000
		No	5	3.9	

Chi-square test was applied with p value less than or equal to 0.05 is considered statistically significant difference

Table 3. Represents the distribution and association between the choice of treatment suggested by the dentist towards TMD patients using a chi square test

Considering that splints are the most common choice of treatment for TMD					
SNO	Questions	Options	Frequency	Percentage	SIG
1	What kind of splint do you employ?	Anterior bite appliances	27	21.1	0.063
		Posterior bite appliances	13	10.2	
		Hard stabilization appliances with chewing surfaces	25	19.5	
		Soft stabilization appliances	60	46.9	
2	Do you use semi-adjustable articulators?	Yes	87	68.0	0.052
		No	40	31.3	
3	In what occlusal relationship do you fabricate the splint?	Centric relation (CR)	44	34.4	0.342
		Depending on the individual case	52	40.6	
		Maximum habitual intercuspation (MHI)	29	22.7	
4	Do you adjust the occlusal surface of the splint at the time of fitting?	Yes	89	69.5	0.045
		No	38	29.7	
5	What are your instructions regarding the curation of splint use?	Daytime	25	19.5	0.067
		All the time	24	18.8	
		Depending on the individual patient	63	49.2	
		Nocturnal	15	11.7	
6	How often do the patients return to the office for follow-up?	Weekly	48	37.5	0.456
		Monthly	33	25.8	
		Depending on the individual patient	47	36.7	

Chi-square test was applied with p value less than or equal to 0.05 is considered statistically significant difference

Table 4. Represents the distribution of study population and association between on the cause effect relationship between factors by using chi square test

Furthermore, two questions about the cause/effect relationship were included					
SNO	Questions	Options	Frequency	Percentage	SIG
1	What do you attribute the TMD etiology to?	Multifactorial	93	72.7	0.034
		Occlusion factors	17	13.3	
		Para function	7	5.5	
		Stress	4	3.1	
		Trauma	6	4.7	
2	Do you believe in multidisciplinary medical and dental treatment?	Yes	124	96.9	0.000
		No	4	3.1	

Chisquare test was applied with p value less than or equal to 0.05 is considered statistically significant difference

4. DISCUSSION

A dentist must be proficient in both the diagnosis and treatment of oral disorders to practice successfully. The diagnosis and treatment of TMDs and OFPs are also under the scope of general dentists [10].

TMDs are usually considered a controversial and debated dental subject. It is evident from the existing literature that most practitioners consider TMDs as a single entity rather than contemplating the numerous factors involved. Unfortunately, a significant number of clinical dentists have failed in precise diagnosis and efficient treatment planning owing to the existing

misconceptions and misjudgments regarding TMDs.

In this study, 26.6% of the practicing dentists elected to refer the TMD patients to another dentist or an academic institution whereas 72.7% of GDPs had a good number of TMD patients treated at the clinic. Therefore, it stands to reason that the more a dentist evaluates and treats patients, the more competent and confident they become.

In the current survey, around 20.3% of GDPs made diagnoses based only on physical examinations, whereas 63% of practitioners employed combination procedures. This is in line with a survey conducted by Aldrique RHS et al. [10] Numerous researchers have addressed the prevalence of evidence-based clinical diagnostic techniques over cutting-edge technology techniques [6,11].

The European Academy of Craniomandibular Disorders Council also recommends a basic preliminary examination to rule out the existence of TMD and an assessment using oral, maxillofacial, and general histories together with supplementary imaging investigations to establish a workable diagnosis. This aids in distinguishing between medical disorders of the head and neck and neurological and mental disorders, as well as in determining the existence of psychosocial variables [12].

5.5% of the survey's practitioners admitted they referred the patients to a different dentist, and 21.1% suggested that the patients would be sent to an academic institution. The most often recommended specialists were maxillofacial surgeons (78.9%), prosthodontists (8.6%), orthodontics (11.7%), and neurologists (0%). It demonstrates that GDPs who took part in the trial had little knowledge of the recommended methodology and referral. Maxillofacial surgeons might be substituted for TMD and OFP experts in this section, even though they don't have clinical expertise in TMD (8). According to the results 20% males and 45% females having knowledge on TMD, when age group is considered knowledge on TMD is higher among 21-23 years of age since they were directly related to academics in which TMD problems were addressed in detail.

In the current study, the most often provided treatment technique by GDPs was occlusal splint

therapy (58.60%), followed by counseling (9.40%). According to a 2013 survey, 76% of GDPs treated patients with TMD, 97.6% provided mouth guard or splints, 85.9% used self-care, 84.6% prescribed over-the counter drugs, and 63.6% performed occlusal adjustment [2].

Splints are a more passive and patient-centered approach that has been endorsed by international committees. Like any pain treatment, splint therapy is frequently a great example of a potent placebo for traumatic mental disorders. Many GDPs believed that the length of time splints must be used and the frequency of follow-up visits depended on each patient's needs. There is limited evidence on this subject, and it is valid given that various conditions may heal at different times [2].

Dental schools were able to identify pain in the orofacial area by using a more comprehensive approach and not restricting their understanding to pain that is solely related to intraoral structures [10].

The findings of this study are consistent with a study by Aldrique RHS et al, which found that while 21.1% of GDPs sent their patients to another dentist or academic institution owing to a lack of expertise and training, 72.7% of GDPs were competent enough to treat patients at their dental clinic.

However, comparable research carried out in other regions of the world revealed that GDPs were unsure about the diagnosis and treatment of TMDs. Additionally, they emphasized the need for TMD continuing education as well as for the development and reinforcement of undergraduate dentistry course curricula [6]. These investigations have all been contrasted and listed in [Table 2].

Most GDPs believed that there were several contributing factors to the etiology of TMD and that interdisciplinary medical and dental care was required. But to create a protocol, it is imperative to connect the constant stream of discoveries with dental education, taking into account how specifically these results might be applied in clinical settings.

5. CONCLUSION(S)

The results imply that General dentists practicing in Tamil Nadu, India differ from one another in

their approach to the diagnosis and management of TMDs. A vast majority of them treated patients with TMDs using occlusal splint therapy anticipating relief. However, from the study, it was evident that there are lots of misconceptions concerning both diagnosing and managing patients presenting with TMDs or Orofacial pain. Therefore, to provide dental professionals confidence in treating TMD, a valid, repeatable patient-centered procedure has to be developed. It would be more advantageous to include instruction on TMD diagnosis in the undergraduate curriculum.

6. STRENGTH AND LIMITATION(S)

The study was restricted to undergraduates who had never received any TMD management instruction. The study's questions ought to be connected to the practitioners' degree of training, experience, and education.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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