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Original Article

Dentistry Section

Awareness and Knowledge of General Dental Practitioners in Central India Towards Management of Patients with Temporomandibular Disorder: A Questionnaire-based Survey

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ABSTRACT

Introduction: Temporomandibular Disorders (TMDs) accounts for common Orofacial Pain (OFP) arising from musculoskeletal origins, affecting almost 80% of the overall population. The multifactorial nature of the disease makes it difficult to diagnose and treat and is challenging to a considerable number of General Dental Practitioners (GDPs). They're increasingly approached by patients for advice on TMD, but little is understood about how this disorder is addressed with in primary health care.

Aim: To assess the awareness and knowledge regarding management of TMDs among GDPs in Central India.

Materials and Methods: The cross-sectional study was conducted at Central India, Nagpur, Maharashtra, India from 20th June 2020 to 12th December 2020, including 200 general dental practitioners, who were registered under the Dental Council of India. A questionnaire consisting of 17 questions with reference to TMDs was designed and the questionnaire was circulated through a web designed program. The responses were collected, and data were analysed descriptively using Statistical Package for the Social Sciences (SPSS) statistics for windows version 24.0.

Results: The mean age of the participants in the study was 24.80±1.63 years. Predominantly, participants were 164 females (82%). Among all the participants, about 181 (90.50%) of GDP's were practicing Dentistry. The study findings suggest that the overall general practicing dentists encounter TMD cases and 162 (81%) of GDP's treat patient at their clinic. A 76% of GDPs acknowledged the causative factor for TMD to be multifactorial and physical examination (88.50%) as the diagnostic tool. Most of the general practitioners around 126 (63%) preferred referring the patient to the specialist, maxillofacial surgeon. Among the practitioners who were confident in treating TMD, occlusal splint was the treatment of choice for 198 (96%) of the GDPs.

Conclusion: Many GDPs lack standard protocol knowledge, felt insecure in TMD diagnosis, therapy decisions and treatment. There is a requirement for better quality evidence on which TMD diagnosis and treatment, including the event of a valid, reproducible patient-centered outcome measure to enable dental practitioners to feel confident in managing TMD. It is essential to train GDPs to identify individuals with TMDs through professional courses and training. It would be highly beneficial to educate the undergraduates regarding the diagnosis of TMDs in their curriculum.

Keywords: Diagnosis, Multifactorial, Occlusal therapy, Orofacial pain, Splints

INTRODUCTION

Temporomandibular Disorders (TMDs) is an umbrella term for various conditions including jaw muscle and Temporomandibular Joint (TMJ) pain, limitations of mandible movements and intra-articular functional disturbances, like TMJ sounds and locking of the jaw [1]. One epidemiological study has shown that TMD and OFP conditions are common within the general population [2]. Emotional tension, occlusal interferences, teeth loss, masticatory muscular dysfunction, internal and external changes in TMJ structure and therefore the various associations of those factors' attribute toward the TMD aetiology [2].

Dentists are increasingly liable for the popularity and management of OFP and TMD of the TMJ region, and disorders of the muscles of mastication and associated musculature [3]. Current data indicate that TMDs compute for the most common OFPs of musculoskeletal origin, affecting 28-86% of the population [4]. To determinate appropriate treatment strategies, GDPs should combine the patient's treatment needs and preferences with the best available scientific evidence, in conjunction with their clinical expertise [5]. Though TMD is most commonly recognised controversial topics in dentistry, both basic science and clinical researchers have currently reached some degree of consensus [6]. However, because of various misconceptions within dental education and clinical practice, TMD diagnosis and management have not yet embraced by much of clinical dentistry. The diagnosis of TMD is based on data obtained from the medical record of patient, clinical examination and TMJ imaging findings if needed [7]. In order to assess analogous orthopaedic, rheumatological, neurological, and psychosocial disorders, standard medical diagnostics may also be employed [8]. It has been suggested that the initial treatment should be conservative and reversible. This is often because history of TMD suggests the tendency to enhance or resolve over time, and conservative modalities are minimum as effective in providing symptomatic relief as several invasive treatments [9]. The diagnosis of TMDs can frequently be difficult and presents a challenge to significant number of practitioners. The knowledge, attitude and years of training of the dental practitioners affect the diagnosis and management.

The present study focuses on assessing the extent of awareness and knowledge regarding TMDs diagnosis, treatment among GDPs and also to seek information on how the GDP or specialist views these TMD issues in Central India. This study will help to determine if there is need for TMD specialists or the GDP's to be trained by continuing education in TMD.

MATERIALS AND METHODS

This cross-sectional study was carried out in Central India, Nagpur, Maharashtra from 20th June 2020 to 12th December 2020 for duration of six months. The research protocol was approved by the Institutional Ethics Committee with ethical clearance number (SDKS/PG/STRG/Pros1).

Inclusion criteria: A total of 200 GDP across Central India; registered under the Dental Council of India, were considered in the survey. Graduated GDPs independent of dental school of origin, gender, graduation year and curriculum content were included within the study.

Exclusion criteria: Postgraduates, TMD Specialists were excluded from the study.

Sample size calculation: The sample size was calculated using sample size formula for qualitative data for similar type of study conducted in India [4].

$$n=\frac{4\,pq}{L^2}$$

Where, p=Proportion of GPD having good knowledge=44.64%

L=Allowable error

$$=20\%\text{ of }p=\frac{20\times44.64}{100}$$

$$=8.928$$

$$n=\frac{4\times44.64\times(100-44.64)}{8.928^2}$$

$$=124.01$$

n=125 patients needed in the study

Questionnaire Survey

A specially created web designed survey in Google forms was circulated among the GDPs, and the responses were recorded. This questionnaire survey consisted of 17 questions. The questionnaire was prepared considering study conducted by Aldrigue RHS et al., (2016) [8].

- Three questions were related to the demographic data (age, gender and designation);
- Six behaviour related questions,
- Six questions related to treatment modalities and
- Two questions related to cause

The questionnaire assessed awareness, knowledge of TMD including diagnosis, treatment and aetiology [Annexure-1].

Next, the questionnaires about TMD management were randomly distributed to be answered on an anonymous basis and the responses were collected. The results of the survey were tabulated in Google Sheets.

STATISTICAL ANALYSIS

Data were analysed descriptively using Statistical Package for the Social Sciences (SPSS) statistics for windows version 24.0.

RESULTS

The results of this survey revealed that mean age of the participants in the study was 24.80±1.63 (age range 22-31 years). Predominantly, participants were 164 females (82%). Among all the participants, about 181 (90.50%) of GDP's were practicing Dentistry. A 162 (81%) of GDP's treated TMD patients at their clinic. The diagnostic technique employed, approach toward each patient, place of referral, and treatment alternatives were significantly different among practitioners. Physical examination was more frequently used for diagnosis by 177 (88.50%) practitioners. Most practitioners 146 (i.e., 73%) offer the treatment. For 126 (63%) of the general practitioners, maxillofacial surgeons were the most frequently specialists preferred for referring patient. Splinting treatment modality was usual given 71 (35.50%), subsequently by counselling 65 (32.50%). The responses to the splint-related questions indicated that 198 (96%) of GDP's suggested splint as the most common treatment modality.

Soft stabilisation appliance 72 (36.0%) and hard stabilisation appliance 69 (34.50%) was the type of splint most commonly used. During splint fabrication, 65 (32.50%) did not employ semi-adjustable articulators. Despite the type of splint used, they were fabricated in maximum habitual intercuspation by or centric relation by 85 (42.50 %) of GDPs depending on individual patient. Total 162 (81%) of GDP's performed occlusal adjustments at the time of fitting. Furthermore, 81 (40.50%) and 83 (41.50%) of GDPs believed that the duration of splint use and frequency of follow-up, respectively, should be patient dependent [Table/Fig-1].

The responses to the cause/effect related questions indicated that 152 (76%) of GDP's considered the aetiology of TMD to be multifactorial and 192 (96%) considered multidisciplinary medical and dental treatment to be necessary [Table/Fig-1].

Sr. No.	Questions	Answers	Number of responses	Results
Demographic data				
D1	Age (years)	22-24	89	44.50%
		25-27	100	50%
		28-31	11	5.50%
D2	Gender	Male	36	18 %
		Female	164	82%
D3	Are you practicing dentistry?	Yes	181	90.5%
		No	19	9.5%
The following behaviour related questions were included				
B1	Does the TMD patients are treated at your clinic?	Yes	162	81%
		No	38	19%
B2	What procedures do you use to diagnose these patients?	Medical history	0	0%
		Physical examination	177	88.5%
		Imaging studies	0	0%
		Study models	0	0%
		Combination of these	23	11.5%
B3	What is your approach toward these patients?	Offer treatment	146	73%
		Refer to an academic institution	19	9.50%
		Refer to another dentist	35	17.50%
B4	If you do not treat these patients, what specialty do you refer them to?	Prosthodontics	38	19%
		Orthodontics	30	15%
		Neurology	06	3%
		Maxillofacial surgeon	126	63%
B5	If you do treat these patients, what treatments do you offer them?	Counselling	65	32.50%
		Thermotherapy	14	7%
		Physiotherapy	50	25%
		Occlusal splinting	71	35.50%
B6	Is the treatment provided by you is beneficial to the patients?	Yes	198	96%
		No	02	4%
Considering that splints are the most common choice of treatment for TMD, the following questions were included				
S1	What kind of splint do you employ?	Anterior bite appliances	19	9.50%
		Posterior bite appliances	40	20%
		Hard stabilisation appliances with chewing surfaces	69	34.50%
		Soft stabilisation appliances	72	36%
S2	Do you use semi-adjustable articulators?	Yes	135	67.5%
		No	65	32.5%

S3	In what occlusal relationship do you fabricate the splint?	Centric relation (CR)	85	42.50%
		Depending on individual case	82	41%
		Maximum habitual intercuspation (MHI)	33	16.50%
S4	Do you adjust the occlusal surface of the splint at the time of fitting?	Yes	162	81%
		No	38	19%
S5	What are your instructions regarding the duration of splint use?	Daytime	38	19%
		All the time	42	21%
		Depending on individual patient	81	40.50%
		Nocturnal	39	19.50%
S6	How often do the patients return to the office for follow-up?	Weekly	49	24.50%
		Monthly	68	34%
		Depending on individual patient	83	41.50%
Furthermore, two questions about the cause/effect relationship were included				
C-E1	What do you attribute the TMD aetiology to?	Multifactorial	152	76%
		Occlusion factors	17	8.50%
		Para function	15	7.50%
		Stress	11	5.50%
		Trauma	05	2.50%
C-E2	Do you believe in multidisciplinary medical and dental treatment?	Yes	192	96%
		No	08	4%

[Table/Fig-1]: Summary of the results to the questionnaire.

DISCUSSION

Successful dentistry requires dentist practitioner to be efficient in the diagnosis and treatment of diseases in the mouth. General Dentists are also accountable for the identification and management of OFP and TMDs [8].

TMD are considered known controversial topics in dentistry. When considering TMD, it appears practitioners identify it as single factor instead of multiple. However, due to relatively misconceptions, diagnosis and treatment outlook for TMD have failed and subsequently endorse by much of the clinical dentistry [8].

In this study, 81% GDP's had good clinical routine TMD patients and treated them at the clinic, while 19% dentist deferred treatment, felt insecure and lacked confidence. Thus, one can speculate that more the dentist examines and gives treatment the more confident and skilled the practitioner gets.

About 88.5% of the GDP's in the present study diagnosed patient by using physical examination, while 11.5% practitioners used combination procedure to diagnose. This is in accordance with survey of the management done by patients with TMDs by Aldrigue RHS et al., [8]. The Prevalence of evidence-based clinical diagnosis methods against advanced technological methods has been discussed extensively in many studies [4,7,10,11].

The Council of the European Academy of Craniomandibular Disorders also suggests an initial simple examination to identify the presence of a TMD and an evaluation to determine a working diagnosis through general, maxillofacial, and oral histories and supporting imaging studies. This helps in differentiation related to head and neck medical disturbances and neurological and psychiatric conditions and in identifying the presence of psychosocial factors [12].

A 17.50% of the practitioner in the survey referred TMD patients to another dentist and 9.50% to academic institution. Most commonly referred specialists were 63% maxillofacial surgeon followed by 19% to prosthodontics, 15% to orthodontics and 3% to neurology. It shows that GDPs participated in the study were not much aware of the standard protocol and referral [12]. Although maxillofacial surgery isn't a treatment solution for TMD, these professionals could also be considered as substitutes for TMD and OFP specialists in this part [8].

Most common treatment modality offered by GDPs in the present study was splinting (35.50%), followed by counselling (32.50%). A survey conducted in 2013 mentioned that 76% of GDPs managed TMD patients, 97.6% offered splints or mouth guards, 85.9% utilised self care, 84.6% prescribed over-the-counter medications and 63.6% did occlusal adjustment [13].

International councils recommended splints as a patient-centered and more passive modality. Splint therapy, was like every treatment for pain, is often an excellent example of a strong placebo for TMD. While the illusive use of placebos must be regarded as unethical, professionals treating patients with pain must be caution of this phenomenon. To gain advantage of its vast possibilities. Duration of splint use and number of follow up were considered to be patient dependent by many GDPs. Evidence on this subject is restricted, and valid so, because each condition may have different healing periods [13].

Dental educational institutions got to recognise pain within the orofacial region from a broader perspective, without limiting their knowledge only there to caused by the intraoral structures. Furthermore, they should be aware that pain is indeed a health issue that should be addressed by the GDP [8].

The results of this study are similar to a study conducted by Aldrigue RHS et al., [8] wherein 81% GDP's are confident in treating patients at their own dental clinic and while 19% GDP's referred to another dentist or academic institution due to lack of knowledge and training. But this was in contrast to similar studies conducted in other parts of the world stating that GDP's felt insecure regarding TMD diagnosis and management. They also emphasised for developing and strengthening undergraduate dental course curriculum and continuing education in TMD [4,14-20]. All these studies have been compared and enlisted in [Table/Fig-2].

S. No.	Name of author and year	Place of study	N	Parameters compared	Conclusion
1.	Baharvand M et al., 2010 [14]	Tehran, Iran	N=200	A questionnaire, containing 29 questions on aetiology, signs and symptoms, diagnosis and treatment of TMD, was handed to every participant pertaining to their office or clinic.	The level of knowledge and attitude of TMD among the assessed group of general dental practitioners is insufficient. Maximum of them aren't willing to go to TMD patients, believing they did not have enough professional education on the topic, nor the diagnosis and treatment of TMD.
2.	Aldrigue RHS et al., 2016 [8]	Southern brazil	N=151	The participants were given a questionnaire related to the behaviour, cause and treatment of patients with TMD among GDP's.	The evaluated general dental practitioners manage TMD patients consistent with international guidelines.
3.	Vinod VC et al., 2015 [15]	New Delhi NCR, India	N=100	A questionnaire, containing 10 questions associated with the aetiology, signs and symptoms, diagnosis and treatment of TMD, was dispensed to randomly selected general dental practitioners had clinical experience of 0-5 years and had clinical experience of more than 5 years.	The results of the study represented more experienced GDP have an overall advantage in diagnosing and treating the TMD patients in comparison with less experienced practitioners in their clinical practice, more emphasis should be given to TMDs as a part of curriculum during training period

4.	Patil S et al., 2016 [4]	India	N=200	A questionnaire consisted of 21 issues which consisted of 4 sections, namely, demographic, Knowledge and Attitude among GDP's. was distributed through web designed survey among GDP's.	In the survey, a sufficient level of knowledge and positive attitude was noted in TMD experts, while low/fair levels were found among the GDPs. Many of the TMD experts and GDPs lacked confidence in managing TMDs.
5.	Lindfors E et al., 2016 [16]	Sweden	N=128	The questionnaire consist of 20 MCQ's related to Demographic information, Quality assurance, Clinical experience and treatment, need for specialist resources in the field of TMD and Attitudes were distributed to GDP's through a web designed survey.	The GPDs felt more insecure concerning TMD diagnostics, therapy decisions and treatment in children/adolescents compared to adults. There is a high requirement for OFP/TMD specialists and most of the GPDs want the specialists to provide continuing education in TMD.
6.	Kiran MS et al., 2016 [17]	Southern India	N=100	The questionnaire consisted of 17 questions concerning to aetiology, signs and symptoms, diagnosis and management, and another part regarding the necessity for continuing education programs on TMDs and were distributed personally.	General dental practitioners may benefit from education programs aimed toward highlighting the management aspect of TMD.
7.	Sam P et al., 2018 [18]	Chennai	N=100	A questionnaire containing questions on aetiology, signs and symptoms, diagnosis and treatment of TMD was given to GDP's through web designed survey.	The GDPs felt more confident in TMD diagnostics, therapy decisions but were not confident enough in treating a TMD patient even after they received a positive response after their first line of treatment.
8.	Shrivastava V 2020 [19]	Bhopal city, Madhya Pradesh, Central India	N=100	An electronic survey was administered. All participants were sent mail with the description about the study and also survey link. 10 closed ended questions were asked within the questionnaire.	A large percentage of the dentists were aware of the TMJ disorder symptoms, diagnosis and treatment modalities. Future studies should investigate about multidisciplinary collaborations between dentists and other disciplines.
9.	Samejo B et al., 2020 [20]	Mirpur Khas Sindh	N=55	The questionnaire were distributed personally which comprised of three sections of general questions regarding referral to physiotherapy, attitude, and practice of general dental practitioners in managing TMD.	There is a requirement for TMD experts to deal with patients suffering from TMDs. General dental practitioners of Mirpur Khas, Sindh know little about the physiotherapeutic benefits for TMD. Most of GPDs have less confidence in making a diagnosis and treating patients suffering from temporomandibular dysfunctions.
10.	Present study	Central India	N=200	This questionnaire survey consisted of 17 questions related to demographic data, behaviour, treatment and cause related to TMD which were distributed to the GDP's through a web designed program.	General dental practitioners felt confident in treating Temporomandibular disorders at their dental clinic and treated them with an occlusal splint. While, few practitioners are insecure concerning diagnosis, treatment and referral to a specialist. The findings also suggest that there is inconsistency among GDP's in Central India concerning TMD treatment approaches.

[Table/Fig-2]: Summary of various studies and comparison of the present study.

The majority of GDPs considered the aetiology of TMD to be multifactorial, and thought of multidisciplinary medical and dental treatment to be necessary. However, to make a protocol it is essential to link the steady flow of latest findings with predoctoral dental education, considering the particular applicability of these in practice.

Limitation(s)

The study was limited to only undergraduates without any training in TMD management. The questions in the study should be related to the level of education, experience, and training taken up by the practitioners.

CONCLUSION(S)

Most of the GDPs felt confident in treating TMDs at their dental clinic and treated them with an occlusal splint. The findings also suggest that there is inconsistency among GDP's in Central India concerning TMD treatment approaches. Hence, there is a need for the development of a valid, reproducible patient-centered protocol to enable dental practitioners to feel confident in managing TMD. It is thus essential to train GDPs to identify individuals with TMD's through professional courses and training. It would be more beneficial to educate the undergraduates regarding the diagnosis of TMD's in their curriculum.

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Sr. No.	Questions	Answers
Demographic data		
D1	Age (years)	22-24
		25-27
		28-31
D2	Gender	Male
		Female
D3	Are you practicing dentistry?	Yes
		No
The following behaviour-related questions were included		
B1	Does the TMD patients are treated at your clinic?	Yes
		No
B2	What procedures do you use to diagnose these patients?	Medical history
		Physical examination
		Imaging studies
		Study models
		Combination of these
B3	What is your approach toward these patients?	Offer treatment
		Refer to an academic institution
		Refer to another dentist
B4	If you do not treat these patients, what specialty do you refer them to?	Prosthodontics
		Orthodontics
		Neurology
		Maxillofacial surgeon
B5	If you do treat these patients, what treatments do you offer them?	Counselling
		Thermotherapy
		Physiotherapy
		Occlusal splinting
B6	Is the treatment provided by you is beneficial to the patients?	Yes
		No

Considering that splints are the most common choice of treatment for TMD, the following questions were included		
S1	What kind of splint do you employ?	Anterior bite appliances
		Posterior bite appliances
		Hard stabilisation appliances with chewing surfaces
		Soft stabilisation appliances
S2	Do you use semi-adjustable articulators?	Yes
		No
S3	In what occlusal relationship do you fabricate the splint?	Centric Relation (CR)
		Depending on individual case
		Maximum Habitual Intercuspation (MHI)
S4	Do you adjust the occlusal surface of the splint at the time of fitting?	Yes
		No
S5	What are your instructions regarding the duration of splint use?	Daytime
		All the time
		Depending on individual patient
		Nocturnal
S6	How often do the patients return to the office for followup?	Weekly
		Monthly
		Depending on individual patient.
Furthermore, two questions about the cause/effect relationship were included		
C-E1	What do you attribute the TMD aetiology to?	Multifactorial
		Occlusion factors
		Parafunction
		Stress
		Trauma
C-E2	Do you believe in multidisciplinary medical and dental treatment?	Yes
		No

[Annexure-1]: Questionnaire on TMDs.