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Knowledge, Attitude and Practices of Dental Students towards Management of Patient with Temporomandibular Disorder

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ABSTRACT:
BACKGROUND: Temporomandibular disorders(TMDs) are the most common oro-facial pain of non-dental origin associated with tenderness at temporomandibular joint, muscles of mastication and adjacent structures. Diagnosis and Management of TMDs are often challenging that requires adequate knowledge and awareness essential for appropriate analysis, formulating treatment plans with effectiveresults.
AIM: The present study was aimed to evaluate and assess theknowledge, attitude and practices towards management of patients with temporomandibular disorder among dental students.
METHODOLOGY:A cross sectional online-survey was conducted using self-administered questionnaires, through Google forms among the dental students across the state of Tamil Nadu, India.
RESULTS: On assessment of the 183 respondents it was observed that more than half of the dental students (69.75%) had adequate knowledge; positive attitude (66.42%) and good practice awareness (68.66%) towards temporomandibular disorders; however majority of the respondents have expressed lack of confidence in diagnosis and management of the TMDs.
CONCLUSION: Hence the current study emphases the need for establishing new standard training protocols, advanced teaching learning methods along with continuing dental education programs in their course syllabus to ensure effective management of TMDs in their practice thus improving the standard of care and quality of life.
KEYWORDS: DENTAL SURVEY, DENTAL CURRICULUM, TENDERNESS, TEMPOROMANDIBULAR JOINT DISORDERS, POSITIVE ATTITUDE.

I. INTRODUCTION:

Temporomandibulardisorder(TMD) is a common conditionthat accounts for most of the oro-facial pain of non-odontogenic origin that represents a complex disorder characterized by moderate to severe pain and tenderness in the pre-auricular area and/or temporomandibular joints (TMJ), muscles of mastication, adjacent soft tissues and associated structures [1]. Usually TMDs are associated with joint pain, limited mouth opening and/or deviated mandibular lateral movements or protrusion and TMJ sounds such as clicking and/or crepitus during masticatory function [2]. Other signs and symptoms include weakened jaw function, malocclusion, and restricted range of motion, and lock jaw. Neurological disturbances, otology symptoms like recurrent headaches, tinnitus, itching in the ear, vertigo and in some cases visual changesmay also accompany TMDs [3, 4].The diagnosis of oro-facial pain associated with TMDs are often challenging due to its multifaceted etiological factors such as muscular hyper-function or para-function, hormonal disturbances, traumatic injuries, and articular changes related to age and several systemic factors within the joint [5]. Schiffmanproposed diagnostic criteria for TMDs based on clinical examination, self-reporting questionnaire as well as disability index score without considering radiographic investigations [6]. Later, American Dental Association (ADA) adopted Weldon Bell'sclinical classification and proposed four broader categories systems that include disorders of masticatory muscle, disorders of temporomandibular joint, Chronic Mandibular Hypomobility (CMH), and growth disorders and also recommended complete history, relevant physical examination supplemented by radiographic investigations are crucial in diagnosis of TMDsto suggest proper treatment plan [7].Management of TMD is always a multidisciplinary approach involving general dentist accompanied by diagnostic medicine specialist, radiologist, orthodontist, oral and maxillofacial surgeon, physicians, physiotherapist as well as psychiatrist. There are numerous treatment options ranging from symptomatic care

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with the help of soft diet, mild non-steroidal anti-inflammatory agents, and moist heat packs alternating with ice in the region of severe pain, and intentionalremoval of tooth; conservative approach with minimally invasive therapy to aggressive surgical approaches [8].Thus identifying the TMDs and managing it could be challenging. Though TMDs are part of dental curriculum training commonly at the post graduate level rather at the undergraduate level [9], adequate knowledge, attitude, skill and experience of dental students is vital to determine this common disorder with appropriate evidence in distinguishing any abnormalities in the temporomandibular joint during clinical examination by proper recording of history, followed by referring the patient to the appropriate specialist as required. Very few literature studies have assessed the knowledge and familiarityin relation to the diagnosis and treatment of TMD among dental students In India. Hence the present study was carried out to evaluate and assess the knowledge, attitude and practices towards management of patient with temporomandibular disorder among dental students in Tamil Nadu, India.

II. METHODOLOGY:

The present cross-sectional questionnaire survey was conducted amongst the dental students across Tamilnadu, India to assess the knowledge, attitude and practices towards management of patient with temporomandibular disorder. The required information was collected through published scientific articles pertaining to the study and self-administered structured questionnaires, comprising of 16 questions in English language was prepared and evaluated. The questionnaire had both combination of selected response to the certain questions and also few close ended questions (Yes / No/ don't know). Since this study was conducted during COVID-19 Pandemic lockdown period, online Google forms were generated and distributed through social media platforms and all the participants were informed about the purpose of the study and assured that their participation was purely voluntary.

III. RESULTS:

Non-probability, stratified sampling technique was employed that yielded information from 183 responses among the selected population group under the study and evaluated for statistical analysis by SPSS software Version 19.0. On statistical evaluation it was observed all 183 samples were valid for the study with Cronbach's alpha reliability score being **0.847** (Significant score).

On analysis of the given data the mean age of study population was observed as 21.606 ± 1.6132 years (mean ± S.D) with 0.235 at 95% confidence level comprising of 61 (33.3%) male and 122 (66.7%) female participants. It was also observed majority of the study participants 36.61% pursue internship (67 out of 183) followed by 26.23% (48) were 3rd year students, and 18.58% (34) were 2nd year and 4th year students respectively. Chi-square test analysis to correlate interrelationship between the year-wise distributions of the study participant showed chi-square statistic of 13.975 with p value .00294. The result is significant at $p < .05$ (**Table 1**).

On evaluation of the knowledge based on responses it was noted 81.42% were familiar with the common symptoms of temporomandibular disorder among which 86.89% are aware of several causes and 68.85% reported that lateral pterygoid muscles are commonly involved associated with tenderness. Among various diagnostic and therapeutic strategies 44.81% opted for orthopedic management by using occlusal splint and 65.57% recommended surgical intervention preceded by performing Blood test, CT, MRI, Ultrasound to confirm diagnosis of TMDs.On assessment of Attitude and practice towards TMDs it was observed 96.72%believe they have sufficient knowledge among which only 31.15%prefer prosthodontic treatment optionwhereas 58.87%prefer medications/pharmacological management. However 33.33% consider prosthodontic treatment can cause temporomandibular disorder and 75.96% recommend splint therapy despite 93.44%feel surgery to be a better option to correct TMDs compared to orthopedic or prosthodontic rehabilitation(**Table 2**).

Table1: Table showing the Demographic data and Distribution of the study Participants

S No	**Demographic data and Distribution**		
1	Age (in Years)	(Mean ± S.D)	**21.6065** ± 1.6132
2	**Distribution of the Study Participants**		
	Year of study	**N (Total)**	**Frequency (%)**
	Second year	34	18.58 %

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	Third year	48	26.23 %
	Fourth year	34	18.58 %
	Internship	67	36.61 %
	Total	183	100%
The Chi^2 value is 13.975. The p-value is .00294. The result is significant at p < .05.			

Table 2: Table Showing the Responses of the study participants towards Management of Temporomandibular Disorders

Questions	Option	Observed	N (%)	Expected	Difference	Difference Sq.	Diff. Sq. / Exp Fr.	P value
1. Knowledge about temporomandibular disorder?	Yes	177	96.72	92	85.00	7225.00	78.53	p < .05*
	No	6	3.28	91	-85.00	7225.00	79.40	
2. Have you previously been treated for a temporomandibular disorder?	Yes	16	8.74	91	-75.00	5625.00	61.81	p < .05*
	No	167	91.26	92	75.00	5625.00	61.14	
3. Are you aware of noises in the temporomandibular disorder?	Yes	60	32.79	91	-31.00	961.00	10.56	p < .05*
	No	123	67.21	92	31.00	961.00	10.45	
4. Common symptoms of temporomandibular disorder?	Pain	26	14.21	37	-11.00	121.00	3.27	p < .05*
	Restricted Movement	6	3.28	37	-31.00	961.00	25.97	
	Muscle Tender	1	0.55	37	-36.00	1296.00	35.03	
	Int Joint Sounds	1	0.55	36	-35.00	1225.00	34.03	
	All	149	81.42	36	113.00	12769.00	354.69	
5. The main cause of temporomandibular disorder?	Trauma	6	3.28	36	-30.00	900.00	25.00	p < .05*
	Malocclusion	2	1.09	36	-34.00	1156.00	32.11	
	Stress	4	2.19	36	-32.00	1024.00	28.44	
	Arthritis	11	6.01	37	-26.00	676.00	18.27	
	All the above	159	86.89	37	122.00	14884.00	402.27	
6. Does pain increase in stress	Yes	74	40.44	61	13.00	169.00	2.77	p < .05*
	No	35	19.13	61	-26.00	676.00	11.08	
	Maybe	74	40.44	61	13.00	169.00	2.77	
7. Muscle that more frequently reported to tenderness?	Lateral pterygoid	126	68.85	61	65.00	4225.00	69.26	p < .05*
	Posterior digastric	20	10.93	61	-41.00	1681.00	27.56	
	Masseter	37	20.22	61	-24.00	576.00	9.44	
8. Can prosthodontic treatment cause temporomandibular disorder?	Yes	61	33.33	61	0.00	0.00	0.00	p < .05*
	No	45	24.59	61	-16.00	256.00	4.20	
	Maybe	77	42.08	61	16.00	256.00	4.20	

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9. Should prosthodontic be a treatment option for temporomandibular disorder?	Yes	57	31.15	61	-4.00	16.00	0.26	.00751
	No	51	27.87	61	-10.00	100.00	1.64	
	Maybe	75	40.98	61	14.00	196.00	3.21	
10. Drugs used in temporomandibular disorder?	Yes	107	58.47	61	46.00	2116.00	34.69	p < .05*
	No	36	19.67	61	-25.00	625.00	10.25	
	Maybe	40	21.86	61	-21.00	441.00	7.23	
11. Does splint therapy work for temporomandibular disorder?	Yes	139	75.96	61	78.00	6084.00	99.74	p < .05*
	No	9	4.92	61	-52.00	2704.00	44.33	p < .05*
	Maybe	35	19.13	61	-26.00	676.00	11.08	
12. What are the orthopedic appliance therapies?	Occlusal splint	82	44.81	46	36.00	1296.00	28.17	p < .05*
	Night guards	6	3.28	45	-39.00	1521.00	33.80	
	Bruxism appliance	9	4.92	46	-37.00	1369.00	29.76	
	all of above	86	46.99	46	40.00	1600.00	34.78	
13. Is there surgery to correct temporomandibular disorder?	Yes	171	93.44	92	79.00	6241.00	67.84	p < .05*
	No	12	6.56	91	-79.00	6241.00	68.58	
14. What is temporomandibular disorder surgery called?	Arthrocetesis	29	15.85	46	-17.00	289.00	6.28	p < .05*
	Arthroscopy	26	14.21	46	-20.00	400.00	8.70	
	TMJ implants	8	4.37	45	-37.00	1369.00	30.42	
	All the above	120	65.57	46	74.00	5476.00	119.04	
15. Which muscles are most likely involves in temporomandibular disorder?	Masseter	21	11.48	46	-25.00	625.00	13.59	p < .05*
	Temporal	10	5.46	45	-35.00	1225.00	27.22	
	Both pterygoid	36	19.67	46	-10.00	100.00	2.17	
	All the above	116	63.39	46	70.00	4900.00	106.52	
16. What are the diagnostic radiographic used for temporomandibular disorder?	Conventional radiograph	2	1.09	35	-33.00	1089.00	31.11	p < .05*
	Blood test - ESR , CRP	3	1.64	35	-32.00	1024.00	29.26	
	CT & MRI	31	16.94	36	-5.00	25.00	0.69	
	Conv, Blood test, Ultrasound	55	30.05	36	19.00	361.00	10.03	
	Blood test, CT MRI, Ultrasound	87	47.54	36	51.00	2601.00	72.25	

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(P<.05* statistically significant)

IV. DISCUSSION:

TMDs are the most common complex clinical disorders which affect masticatory muscles, TMJ and adjacent structures associated with joint pain, limited mouth opening and/or deviated mandibular lateral movements or protrusion and TMJ sounds such as clicking and/or crepitus during masticatory function. In the present study on evaluation of the knowledge on signs and symptoms of TMDs 81.42% dental students had good knowledge of the common symptoms similar to the studies by Baharvand et al [2], Sam et al [10] and slightly higher than studies by Vinod VC et al [3], Dhakshinya and Santhosh [6], Ashwin and Siri [8] in their respective studies. This could be attributed to the fact that majority of dental students acquire knowledge about signs and symptoms provided in the course syllabus during the undergraduate years. However 86.89% are familiar with several causes in contrast to the above studies that demonstrate more attention was given to incorporate knowledge on etiological aspects by modified teaching-learning methods integrated by problem based learning, exposing both undergraduate and post graduate students to TMD cases during their clinical postings.

Among various diagnostic strategies only 65.57% recommended performing Blood test, CT, MRI, Ultrasound to confirm diagnosis of TMDs and 68.85% reported that lateral pterygoid muscles are commonly involved associated with tenderness. Similar studies by Baharvand et al [2], Resche et al [11], Just et al [12], Patil et al [9] and DeBoever JA et al [13] have shown lower knowledge and attitude during their practice towards diagnostic methods was related to lack of enough effort in recording complete case history, time constraints in observingfor the underlying cause as well as personal experiences resulting in a hasty diagnosis based on first sign and symptom focused chiefly on the management of relieving pain and discomfort in the least amount of time available thus strongly suggesting a need of valid diagnostic system for TMDs combining biophysical and radiological diagnosis with a disability indexin the dental practice and curriculum.

Further evaluation of Knowledge and practice towards various therapeutic strategies only 44.81% opted for orthopedic management by using occlusal splint, 31.15% prefer prosthodontic treatment option, 58.87% prefer medications/pharmacological management whereas majority (93.44%) felt surgery to be a better option. High degree of disagreement in treatment of TMDs were observed between general dental practitioners and TMD specialists in studies by Dhakshinya and Santhosh [6], Resche et al[11] in compared to the present study. Egermark and Thilander [14], Varga et al [15] observed that initiation of orthodontic treatment could be done in very mild cases presenting with painless clicking and minimal deviation. Durham and Wassell R [16] suggested cautious evaluation and occlusal interference correction is required and possibly effective in relieving severe pain in TMD patients.Tegelberg et al [17] recommended need for specialist in the treatment of TMD in children and adolescents. Majority of the present study participants opted for surgical management rather than non-surgical line of management such as physical therapy, laser therapy, heat application, Transcutaneous electrical nerve stimulation(TENS), behavioral modification followed by pharmacological management.Theabove observation clearly shows lack of practice, clinical experiences, knowledge and up-to-date information on role of TMD specialists or experts. Literature studies [18, 19, 20, 21] have shown Integrated approach is essentialfor proper management however higher knowledge about TMDs and expert opinions to choose prosthodontics as the most qualified specialty for TMD was observed. Furthermore, the only specialty that was comprehensively willing to visit TMD case for diagnosis and treatment were prosthodontist.

According to the results obtained in the present study, more than half of the dental students (69.75%) have adequate knowledge towards temporomandibular disorders. Nevertheless 66.42% had positive attitude and 68.66% had good practice consciousness it is evident that the majority of the dental students are in a reasonable awareness, attitude and also about the management practice towards TMDs slightly higher than studies by Baharvand et al [2], Dhakshinya and Santhosh [6], Patil et al [9], Tegelberg [17], and Lindfors [22], Gnauck et al [23].It appears that the several differencesamong various study observations were related to lack of inadequate knowledge and practice towards management among dental students and preference of TMD specialists over undergraduate dental students or General dental practitioners.Thus a standard protocol regarding the training of undergraduate as well as post graduate dental students irrespective of their domain specializations have to be formulated and incorporated in their curriculum for prevention, early diagnosis and treatment of

temporomandibular disorders as well as adopting continuous education programs, hands-on workshops, along with live demonstrations of clinical case scenarios to cultivate confidence and positive attitudein their clinical practice while managing the patients with TMDs.

V. CONCLUSION:

The present study clearly shows dental students have adequate level ofknowledge, positive attitudes totemporomandibular disorders obtained through their curriculum whereas lack sufficient practice awareness, confidence and had difficulties towards diagnosis and management of the same. Hence the current study emphases the need for establishing new standard training protocols, advanced teaching learning methods along with continuing dental education programs in their course syllabus to ensure effective management of TMDs in their practice thus improving the standard of care and quality of life.

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