

Original Article

Practice of Occlusal Splint Therapy for Treating Temporomandibular Disorders by General Dentists of Jabalpur – A Cross-Sectional Survey

Anubhuti Sabhlok¹, Shreya Gupta², Muktha Girish³, Rahul Ramesh KV⁴, Harshit Shrivastava⁵, Sadananda Hota⁶

¹Department of Prosthodontics and Crown and Bridge, Hitkarini Dental College and Hospital, Jabalpur, Madhya Pradesh, India, ²Department of Prosthodontics and Crown and Bridge, Triveni Institute of Dental Sciences, Hospital and Research Centre, Bilaspur, Chhattisgarh, India, ³Consultant Prosthodontist, Vijaya Dental Care, West Nadakkavu, Calicut, Kerala, India, ⁴Department of Prosthodontics and Crown and Bridge, Century International Institute of Dental Science, Kasaragod, Kerala, India, ⁵Department of Oral and Maxillofacial Surgery, Saraswati Dhanvantari Dental College and Hospital, Parbhani, Maharashtra, India, ⁶Department of Prosthodontics, Kalinga Institute of Dental Sciences, KIIT Deemed to be University, Bhubaneswar, Odisha, India

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ABSTRACT

Aim: The aim of this study was to conduct a cross-sectional questionnaire-based survey concerning the practice of occlusal splint for treating temporomandibular disorders (TMDs) by the dental practitioners of Jabalpur. **Materials and Methods:** A questionnaire containing questions on diagnosis, treatment, and management of TMD was given to a total of 157 general dental practitioners in Jabalpur. The responses were collected; data analysis was done by Chi-square test. **Results:** Of the General Dental Practitioner's, nearly 78% of participants did not attend any continuing dental education on TMD per year. More than 10 years of experience (82%) was associated with increase in positive response for treatment of TMD patient. Both the diagnosis and treatment of TMD patient were done using combination methods. The duration of splint use was considered patient dependent (42.27%) irrespective of the years of practice. Soft splint was most commonly employed for treatment, and fabrication of splint was done on hinge and mean value articulator. **Conclusion:** The knowledge of occlusal splint by general practitioners was found to be insufficient for treating TMDs.

KEYWORDS: General dentists, occlusal splints, survey, temporomandibular disorder treatment, temporomandibular disorders

INTRODUCTION

Temporomandibular disorder (TMD) is a condition producing abnormal, incomplete, or impaired function of the temporomandibular joint(s) (TMJ) and/or the muscles of mastication.^[1] It is recognized as one of the most controversial topics in dentistry. TMDs constitute a major public health problem with a large impact on health-related expenses. TMDs consist of clinical signs and symptoms that involve imbalance between structures of the stomatognathic system

involving masticatory muscles, TMJ, and associated structures.^[2] The pathophysiology of TMD is not entirely understood; the etiology is believed to be multifactorial.^[3]

Address for correspondence: Dr. Anubhuti Sabhlok, Department of Prosthodontics and Crown and Bridge, Hitkarini Dental College and Hospital, Jabalpur, Madhya Pradesh, India. E-mail: anubhuti.sabhlok@gmail.com

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There are various treatment modalities for TMDs such as joint surgery, orthodontics, occlusal splint therapy, physiotherapy, pharmacotherapy, and behavioral therapy. The occlusal splint is the most commonly used as it is a noninvasive, reversible, and economic form of interventions.

Epidemiological studies have estimated that approximately 50%–75% of the population exhibit some signs of TMDs. The frequency to seek treatment increases if the symptoms interfere with daily activities. Identification of the signs of an attainable TMD is crucial to diagnose TMDs.^[4] Occlusal splint therapy is the most common treatment modality for TMDs. There are very little data concerning about general dentists' approaches toward occlusal splints for TMJ disorders in currently Central India, and this was the first survey conducted in Madhya Pradesh. This study was aimed to conduct a cross-sectional questionnaire-based survey concerning the practice of occlusal splint for treating TMDs by the dental practitioners of Jabalpur.

MATERIALS AND METHODS

Jabalpur city has 253 dentists including both registered and nonregistered to the Indian Dental Association. Initially, a pilot study was conducted on 25 samples of a dental college faculty. Suggested revisions were incorporated, and then, the final questionnaire was printed. The final study was conducted on a sample size of 157; dentists already involved in the pilot study were not included again. The survey took place from February to April 2018.

A cross-sectional study was conducted by a single examiner, examining a random sample of dentists in Jabalpur. This sample size consists of both dentists associated and not associated with any academic institution. Inclusion was independent of gender, age, and years of experience as a practitioner. The participants were informed about the study and their written consent was obtained personally. The researcher spoke one to one to each dentist included in the study at his/her clinic to assess his/her immediate knowledge after providing immediate consent. The questionnaire comprises of 15 multiple-choice questions which was used in the survey. The dentist was asked questions in the following categories – demographic data and clinical experience to treated patients with occlusal splint. A portion of a dentist who incompletely filled the forms was not included in the study.

Survey questions

1. Gender
 - a. Male
 - b. Female
2. Age
3. Years of experience as a practitioner
 - a. Less than 5 years
 - b. 5–10 years
 - c. More than 10 years
4. Type of practice
 - a. General practice
 - b. Specialty practice
5. Do you attend continuing dental education (CDE) program for TMD?
 - a. No course per year
 - b. One course per year
 - c. More than one course per year
6. What diagnosing tools do you employ for evaluating these patients?
 - a. Medical history
 - b. Physical examination
 - c. Imaging studies
 - d. Study models
 - e. A combination of these
7. At your clinic, do you treat patients with potential TMD?
 - a. Yes
 - b. No

If your response is “Yes” for above question (question 7), please proceed further.
If your response is “No” for above question (question 7), then you need not to respond for questions ahead.
8. If you do plan to treat these patients, what treatments do you give?
 - a. Counseling
 - b. Diet plans
 - c. Thermotherapy
 - d. Physiotherapy
 - e. Pharmacotherapy
 - f. Occlusal splints
 - g. Occlusal adjustment
 - h. Orthodontics
 - i. Full-mouth rehabilitation
 - j. Combination
9. For what purpose, do you use occlusal splints?
 - a. Diagnostic
 - b. Therapeutic
 - c. Both of the above
10. What type of material do you use for splint?
 - a. Soft
 - b. Hard
11. Which type of articulator do you use for fabrication of occlusal splints?
 - a. Hinge articulator
 - b. Mean value articulator
 - c. Semi-adjustable articulator
 - d. Fully adjustable articulator
12. What instructions do you give regarding the duration of splint use?

- a. Less than 6 months
 - b. 6–12 months
 - c. More than 1 year
 - d. Till the condition subsides
13. What advice do you give regarding the timing of splint use?
- a. Nighttime
 - b. Daytime
 - c. All the time
 - d. Depending on individual patient
14. When do you prefer to do occlusal correction in TMD patients?
- a. Before splint therapy
 - b. After splint therapy
15. In which situations do you give occlusal splint?
- a. Bruxism
 - b. TMJ pain
 - c. Myofascial pain
 - d. Combination of the above
 - e. Others.

Statistical analysis

Data were entered in Microsoft Excel 2016 for Windows. The mean, standard deviation (SD), frequency, and percentages of variables were calculated. As responses of participants were categorical, Pearson's Chi-square test was applied for further data analysis. $P < 0.05$ was considered statistically significant. Data analyses were performed using version 21.0 of the Statistical Package for Social Sciences (IBM Corporation, Armonk, NY, USA).

Table 1: Demographic details of study participants (n=150)

Characteristics	n (%)
Age (years), mean±SD	32.44±7.09
Gender	
Male	79 (52.67)
Female	71 (47.33)
Years of experience as practitioner (years)	
<5	76 (50.67)
5-10	45 (30.00)
>10	29 (19.33)
Type of practice	
General practice	122 (81.33)
Specialty practice	28 (18.67)

SD: Standard deviation

RESULTS

As per the data available, there are 253 dentists in Jabalpur city. Based on the response rate in pilot study, i.e., 70%, 95% confidence interval, and 5% absolute precision, the sample size calculated was 143 individuals. Considering the unfinished and errors in the responses for the questionnaire, 10% increase in the calculated sample size was considered. Thus, the final sample size for this study was 157 individuals. A total of 157 questionnaires were distributed. Out of that, 150 were completely filled; hence, the response rate was 95.54%.

The mean and SD of the age of practitioners was 32.44 ± 7.09 years. Nearly, 78% of participants in <5 years of experience were not attending any CDE on TMD per year. Eighteen percent in 5–10 years of experience group and 41% in more than 10 years of experience were attending more than one CDE course on TMD per year; a significant difference was observed between participants ($\chi^2 = 21.952$, $df = 4$, $P < 0.001$) [Tables 1 and 2].

Ninety-eight (65.34%) dentists were using combination methods as a diagnosing tool for evaluation and treating TMD patients.

Thirty-nine (51.32%), 34 (75.56%), and 24 (82.76%) in <5 years, 5–10 years, and more than 10 years, respectively, were treating TMD patients in clinic. Statistically significant result was found, increase in years of experience was associated with increase in positive responses for treatment of TMD patients in clinic ($\chi^2 = 12.418$, $df = 2$, $P < 0.01$). Fifteen (38.46%) in <5 years of experience group, 12 (35.30%) in 5–10 years of experience group, and 6 (25.00%) in more than 10 years of experience group responded that occlusal splints can be used for diagnostic as well as therapeutic purpose. Soft material for fabrication of occlusal splints was most commonly used. During splint fabrication, in the <5 years and 5–10 years of experience groups, maximum number of participants were using hinge and mean value articulator. In more than 10 years of experience group, maximum number of participants were using mean value and

Table 2: Responses of participants for attending number of continuing dental education on temporomandibular disorder per year according to years of experience as practitioner

Number of CDE per year	Years of experience as practitioner			Total, n (%)
	<5, n (%)	5-10, n (%)	>10, n (%)	
No course per year	59 (77.63)	26 (57.78)	10 (34.48)	95 (63.33)
One course per year	11 (14.47)	11 (24.44)	7 (24.14)	29 (19.33)
>1 course per year	6 (7.90)	8 (17.78)	12 (41.38)	26 (17.34)
Total	76 (100.00)	45 (100.00)	29 (100.00)	150 (100.00)

Chi-square test value=21.952, df=4, P=0.000 (<0.001), significant difference. CDE: Continuing dental education

Table 3: Responses of participants for treatment of temporomandibular disorders patients in clinic according to years of experience as practitioner

Treatment patients with potential TMD	Years of experience as practitioner			Total, n (%)
	<5, n (%)	5-10, n (%)	>10, n (%)	
Yes	39 (51.32)	34 (75.56)	24 (82.76)	97 (64.67)
No	37 (48.68)	11 (24.44)	5 (17.24)	53 (35.33)
Total	76 (100.00)	45 (100.00)	29 (100.00)	150 (100.00)

Chi-square test value=12.418, df=2, P=0.002 (<0.01), significant difference. TMD: Temporomandibular disorder

Table 4: Responses of participants for instructions for timing of splint use according to years of experience as practitioner

Timing of splint use	Years of experience as practitioner			Total, n (%)
	<5, n (%)	5-10, n (%)	>10, n (%)	
Nighttime	18 (46.16)	10 (29.41)	7 (29.17)	35 (36.08)
Daytime	4 (10.26)	0	0	4 (4.12)
All the time	3 (7.69)	8 (23.53)	1 (4.17)	12 (12.37)
Depending on individual patient	14 (35.89)	16 (47.06)	16 (66.66)	46 (47.43)
Total	39 (100.00)	34 (100.00)	24 (100.00)	97 (100.00)

Chi-square test value=16.168, df=6, P=0.013 (<0.05), significant difference

semi-adjustable articulator ($\chi^2 = 10.802$, $df = 6$, $P > 0.05$) [Tables 3 and 4].

Forty-one (42.27%) participants irrespective of the years of practice responded that splints should be used till the condition subsides. Regarding timing of splint use significant difference between the participants were noted, Maximum number of participants in <5years of experience group responded that splints should be used at night time. Whereas maximum number of participants in 5 to 10and >10 years of experience responded that occlusal correction in TMD patients should be before splint therapy. Thirty (76.92%), 25 (73.53%), and 16 (66.67%) in <5 years, 5–10 years, and more than 10 years of experienced dentists responded that occlusal correction in TMD patients should be before splint therapy. Almost all participants, that is, 24 (61.54%), 24 (70.59%), and 17 (70.84%) in <5 years, 5–10 years, and more than 10 years, responded that occlusal splints can be used in combination of conditions such as bruxism, TMJ pain, and myofascial pain.

DISCUSSION

To best of our knowledge, this was the first cross-sectional survey study, about the practice of occlusion splint for patients with TMJ disorders by the general dentist of Jabalpur and Central India. However, the obtained finding can be compared with the scientific evidence, studies investigating dentist knowledge and clinical practice for treating TMD. In this study, the respondent provided answers immediately, so the instant knowledge and management for TMD could be evaluated.

According to the results of the present study, most of the practitioner's with <5years of experience did not choose

to treat TMD patients as they could be due to insufficient knowledge and skill for managing TMD'S. Similar results were found by Aldrigue *et al.*^[5] The young practitioners do not put enough effort into looking for the underline cause and diagnose the TMD. Instead choose not to treat and refer their patients to a specialist.^[6]

On the contrary, as the clinical exposure to TMD patients increases in the clinical scenario, it compels the clinician to attend more TMD-related CDE programs, hence the knowledge and confidence to treat TMD might also increases.

According to the results of the present study, a fair level of knowledge was seen in the diagnosis and treatment of TMDs by the dentist;, methods employed for treating patients are discussed in Okeson's study.^[7]

The finding of this study suggests that most general dental practitioners believe that soft splint is effective for treating TMD. The reason for increased use of soft splints could be easy to use and does not require occlusal adjustment thereby reducing chairside time in comparison to hard splints. Other reason could be dentist's knowledge might not be updated up to the recent literature. Forty-two percent of the participating dentists implemented splints till the symptoms subside.

However, this lengthy application of splint therapy indicated that the dentist had insufficient knowledge of scientific knowledge about the appropriate duration of the therapy. Regardless of the diagnosis, excessive long-term initial screen therapy is known to lead to pathological and to some extent irreversible changes in the masticatory systems.^[8]

A lack of dentist awareness about the type of articulator to be used for fabrication of occlusal splints was seen. Most of the dentists did not employ a semi-adjustable articulator and adjusted the appliance at the time of fixing.

The timing of splint use was considered to be patient dependent, practitioner with more than 10 years of experience. Evidence on this topic is limited and so each condition may have different healing periods.^[5,9] Limitation of study: the results of the study should be interpreted with caution since there was no evidence for the study population available supporting the obtained results. Majority of the dentists who responded to the survey were general dentists (81%). Results may not be generalizable when data were analyzed by specialty.

CONCLUSION

The diagnosis and treatment choices for TMD patients by the general dental practitioner were in accordance with international guidelines. The participants showed insufficient knowledge regarding use, type, duration, and timing of occlusal splint. Their knowledge increased with increasing experience. Thus, national dental associations and dental faculties ought to work together to arrange symposium across the nation and dentist should be encouraged to attend.

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Conflicts of interest

There are no conflicts of interest.

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