## **ORIGINAL ARTICLE**

# Trends of Occlusal Appliance Therapy among Resident Dental Surgeons

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### ABSTRACT

**Objective:** Current study was planned to assess the trends of occlusal appliance construction and selection, among the resident dental surgeons.

**Method:** Data was collected from 51 residents at Fatima Memorial Dental Hospital, which were given a questionnaire that had 20 questions. The frequency of each answer was calculated and compared between residents of different departments and was analyzed by SPSS version 20.

**Results:** The selection and construction of occlusal appliances among the residents was inappropriate. Soft occlusal appliances were the most selected and practiced appliance. Occlusal appliances need to be revisited in the literature with easy to practice guidelines.

Keywords: Occlusal appliances, Soft occlusal appliances, Temporo-mandibular joints.

### INTRODUCTION

The integrity of masticatory system lies in the harmony among the function of temporo-mandibular joints with the action of muscles and the occlusion of the natural dentition. Any discord in these can cause temporo mandibular disorders (TMDs). Varying prevalence of TMDs has been reported. Munir et al have reported 19% prevalence with joint clicking being the most common sign.<sup>1</sup> Ilyas et al have observed signs of TMDs in young population; they reported that 70% females and 80% males showed signs of TMDs. The effected individuals also had parafunctional habits the unaffected individuals. They concluded that psychological stress was the most aggravating factor.<sup>2</sup> The exact etiology of TMDs is not known but some of the main possible etiological factors are Parafunction, muscular hypertrophy and disharmony, occlusal interferences, macro/micro trauma, psychological stress and anatomical defects of the joints.<sup>3</sup> The treatment of TMDs starts with controlling of these etiological factors. One of the most noninvasive, safest and reversible treatment modality is the occlusal appliances. Occlusal appliances are a type of removable prosthesis, which is usually made of acrylic, they are worn on teeth of one arch and contact the teeth of the other arch in the desired jaw relation to minimize the symptoms of TMDs and maximize the healing of the masticatory system.4

Different occlusal appliances have been used for the management of TMDs, they are found effective are reported in the literature.<sup>4,5</sup> However the literature has not reported the standardization of the construction and selection of these appliances, which is crucial in the success of the appliance. This the reason that highly variable results are reported in the literature on the outcome of the appliance wears. Due to similar reason a Cochrane review has found no effect of occlusal appliances on TMDs.<sup>6</sup> The review states that there is a lack of data and standardization across the literature.

The process of standardizing the construction of occlusal appliance selection and construction of these appliances starts with assessing the current knowledge of dentists. The assessment can be divided into knowledge of appliance selection and knowledge of appliance construction. The aim of this study is to assess the knowledge of dentist about selection and construction of occlusal appliances in our hospital. This will provide an initial database for the improvement in provision of these appliances to the required patients. Current study was planned to assess the trends of occlusal appliance construction and selection, among the resident dental surgeons.

#### METHODOLOGY

Informed consent was taken from 51 residents at Fatima Memorial Dental Hospital, which were given a questionnaire that had 20 questions. SECTION (A) had 5 questions which were about selection of appliance, SECTION (B) had 9 questions which were about construction of appliance and SECTION (C) had 6 questions for general preferences. The frequency of each answer was calculated and compared between residents of different departments and was analyzed by SPSS version 20.

#### RESULTS

Response rate was 100% of 51 participants which comprised of 29 females and 22 males. The mean age of participants was 28.5 years. The distribution of participants according to specialty is shown below:

Speciality	No. of residents	Gender	
		Female	Male
		n=27	n=24
Prosthodontics	11	4	7
Maxillofacial Surgery	07	1	6
Operative dentistry	14	11	3
Periodontology	10	4	6
Orthodontics	09	7	2

The frequency of response of all participants is summarized in Table 2.

Table 2: Summary of Responses

SECTION (A) : SELECTION OF OCCLUSAL APPLIANCE					
QUESTION	RESPONSE				
<ol> <li>What is your preferred choice for occlusal</li> </ol>	Stabilization appliance	Anterior positioning	Soft occlusal appliances	Bite planes	Do not know
appliance for TMDs associated with muscular		appliance			
disorder?	40%	20%	33%	7%	0%
<ol><li>What is your preferred choice for occlusal</li></ol>	Stabilization appliance	Anterior positioning	Soft occlusal appliances	Dahl's Appliance	Do not know
appliance for a patient with TMD and pathological		appliance			
non carious occlusal wear?	40%	20%	33%	7%	0%
3. What is your preferred choice for occlusal	Stabilization appliance	Anterior positioning	Soft occlusal appliances	Bite planes	Do not know
appliance for TMDs associated with disc		appliance			

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Construct Write splance for TMDs for a user prefered choice for accusal splance for TMDs for a splance in advecture passing appliance for TMDs for a splance in advecture passing appliance for TMDs for a patient that compares of the theory preferes choice for accusal splance for TMDs for a patient that compares of accurate para function hadr?         Down TMDs	dianlocoment	269/	269/	209/	100/	09/
A. minit syour preterest choice for concust preparations for Mick for an electriculus preference for concust preparations for Mick for an electriculus preference for concust preparations for Mick for a planetic at concust of the preparation of the mick for an electriculus preparation of the formation makes for a planetic at concust of the planetic for an electriculus preparation for Mick for a planetic for concust of the planetic for an electriculus preparation for Mick for a planetic for an electricule preparation for Mick for a planetic for concust of the planetic for an electricule preparation for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule preparation for Mick for a planetic for an electricule preparation for Mick for Mi	uispiacement?	20%	30%	30%	10%	0%
S.         Offs         Offs         Offs         Offs         Offs         Offs         Offs         Offs         Offs           Soft contained pare hundring optimics         Biblication appliance         Biblication appliance         Biblication appliance         Biblication appliance         Do not know           SECTOR (B): CORSTRUCTION CF OCCLUSEL APPLIANCE         Eccentric relation         Mouth just open in retruided         Mouth just open and no teefh         Do not know           SECTOR (B): CORSTRUCTION CF OCCLUSEL APPLIANCE         Eccentric relation         Mouth just open in retruided         Mouth just open and no teefh         Do not know           Sector as ababitation spating         Statistication         Eccentric relation         Mouth just open in retruided         Mouth just open and no teefh         Do not know           To Mait is your preferred choics for hibiness         Offs         20%         40%         12%         10%         00%           6         Mouth just open in netword         Application teefh         20%         40%         10%         0%	4. What is your preferred choice for occlusal appliance for TMDs for an edentulous patient?	Stabilization appliance	Anterior positioning appliance	Soft occlusal appliances	Occlusal pivots	Do not know
5.         What is your prefered choice for cockusal appliance appliance appliance appliance for park function habits?         Stabilization appliance appl		6%	0%	0%	18%	74%
Induction habits?         3%         12%         24%         2%         2%         0%           6         What is your preferred choics for jew relation record for an anterior postioning spin??         Centric Relation         Eccentric relation         Mouth just open in retructed contact postioning         Mouth just open and no teeth are touching         Do not know           7         What is your preferred choics for jew relation record for an anterior postioning spin??         Centric Relation         Eccentric relation         Mouth just open in retructed are touching         0%         0%           8         What is your preferred choics for jew relation record for an anterior postioning spin?         Do not know         10%         10%         10%         0%	<ol> <li>What is your preferred choice for occlusal appliance for TMDs for a patient that complains of</li> </ol>	Stabilization appliance	Anterior positioning appliance	Soft occlusal appliances	Bite planes	Do not know
EECTEM (B)         CONSTRUCTION OF OCCUSEAL APPLIANCE         Down (b)	nocturnal para function habits?	36%	12%	24%	28%	0%
E         What is your prefered choice for jour relation record for a sublication splint?         Centric Relation         Eccentric relation         Mouth just open in returde contact position         Mouth just open and to tech explication         Do not know           7.         What is your prefered choice for jour relation record for a anterior positioning splint?         19%         6%         24%         0%         0%           8.         What is your prefered choice for thickess construction should be?         Eccentric relation         Mouth just open in returded contact position         0%         0%         0%           9.         In your opinion, the Maximum intercasplant for a sublication appliance should concide with which jour relation?         0%         24%         0%         0%         0%         0%           9.         In your opinion, the Maximum intercasplant for a sublication applicance should concide with which jour relation?         0% <td>SECTION (B) · CONSTRUCTION OF OCCUUSAL APP</td> <td></td> <td>1270</td> <td>2170</td> <td>2070</td> <td>0,0</td>	SECTION (B) · CONSTRUCTION OF OCCUUSAL APP		1270	2170	2070	0,0
Control         Control <t< td=""><td>6 What is your preferred choice for jaw</td><td>Centric Relation</td><td>Eccentric relation</td><td>Mouth just open in retruded</td><td>Mouth just open and no teeth</td><td>Do not know</td></t<>	6 What is your preferred choice for jaw	Centric Relation	Eccentric relation	Mouth just open in retruded	Mouth just open and no teeth	Do not know
2.         What is your preferred choice for jaw relation record for an anterior positioning splint?         22%         18%         6%         24%         24%         0%	relation record for a stabilization splint?			contact position	are touching	Do not know
7.         What is your prefered choice for jaw relation record for an anknor positioning splin?         Centric Relation         Mouth just open in releved contagestion.         Mouth just open and notesh biochosplant.         Do not know           8.         What is your prefered choice for thicness of the jaw relation record for any applance construction should be?         20%.         40%.         12%.         10%.           9.         In your opinion, the Maximum intercuspation for a stabilization applance condice with which jaw relation?         20%.         24%.         50%.         18%.         2%.           10.         in your opinion, the Maximum intercuspation for a stabilization applance condice with which jaw relation?         Centric relation         Canine guidance         Group function         Mouth just open         Do not know           11.         in your opinion, the Maximum intercuspation for a stabilization applance should conde with which jaw relation?         Centric relation         Canine guidance         Group function         Mouth just open         Do not know           28%.         29%.         39%.         0%.         0%.         0%.         0%.           11.         in your opinion, what should be the duration of weating a stabilization applance for muscular pain when symptoms // a taw should pain communication weating applance?         0%.         0%.         0%.         0%.         0%.           12.         in you		52%	18%	6%	24%	0%
8. What is your prefered holies for thickness, with velocities of the jays will on record for any appliance construction should be?         10%         10%         10%         00%         10%         00% </td <td>7. What is your preferred choice for jaw relation record for an anterior positioning splint?</td> <td>Centric Relation</td> <td>Eccentric relation</td> <td>Mouth just open in retruded contact position</td> <td>Mouth just open and no teeth are touching</td> <td>Do not know</td>	7. What is your preferred choice for jaw relation record for an anterior positioning splint?	Centric Relation	Eccentric relation	Mouth just open in retruded contact position	Mouth just open and no teeth are touching	Do not know
Bits         What is your preferent choice for thickness         Depend on height of pasterior testh         20-2 Smm         Bate with minimum pasterial         Only testh occuding in contric relation should pierce the bits         Do not know           9.         In your opinion, the Maximum intercuspetion for stabilization applicate should coincide with which jaw relation?         Centric relation         Canine guidance         Group function         Mouth just open         Do not know           10.         In your opinion, the Maximum intercuspetion for stabilization applicance bits         Centric relation         Canine guidance         Group function         Mouth just open         Do not know           11.         In your opinion, the Maximum intercuspetion for stabilization applicance for unscular pain after waking up in the moning?         28%.         35%.         0%.         0%.         0%		18%	20%	40%	12%	10%
Bit Number of Strange         6%         24%         50%         19%         2%           0         In your opinion, the Maximum intercuspation for a stabilization appliance should concide with which aw relation?         Certric relation         Carine guidance         Group function         Mouth just open         Do not know           10.         In your opinion, the Maximum intercuspation for a nametror positioning appliance should coinide with which aw relation?         Do         O%	<ol> <li>What is your preferred choice for thickness of the jaw relation record for any appliance construction should be?</li> </ol>	Depend on height of posterior teeth	2.0-2.5mm	Bite with minimum possible thickness with teeth not piercing the material	Only teeth occluding in centric relation should pierce the bite	Do not know
9.         In your opinion, the Maximum         Centric relation         Canine guidance         Group function         Mouth just open         Do not know           10.         In your opinion, the Maximum         Centric relation         Canine guidance         O%         0%<		6%	24%	50%	18%	2%
Intercognation for a submitted in the Maximum intercurspation for an anterior positioning appliance should concide with which jaw relation?         66%         28%         0%         0%         0%         0%           10.         In your opinion, the Maximum intercurspation for an anterior positioning appliance should concide with which jaw relation?         28%         33%         0%         0%         0%         0%           11.         In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain are recognized         39%         33%         0%	9. In your opinion, the Maximum	Centric relation	Canine guidance	Group function	Mouth just open	Do not know
Lonited part maturity or relation         D0%         D7%         D7%         D7%           10.         In your opinon, the Maximum intercuspation for an anterior positioning appliance should concide with which gave relation?         Centric relation         Canine guidance         Group function         Modth just open         D0 not know           11.         In your opinon, the Maximum intercuspation for an anterior positioning appliance should concide for muscule part of vearing a statization applicance for muscule part of vearing a statization applicance?         Night time wear and when symptoms/habits are recognized 40%         Only when symptoms/ habits recognized         Worn from noon till before sleep         Do not know           13.         In your opinion, what should be the duration of vearing an anterior positioning appliance?         Night time wear and when symptoms/ habits recognized         Only when symptoms/ habits recognized         Worn from noon till before sleep         Do not know           14.         In your opinion, what is the guide for taking a jaw relation for anterior positioning appliance?         Only when symptoms/ habits recognized         Worn from noon till before sleep         Do not know           15.         In your opinion, what is t	coincide with which jaw relation?	669/	26%	0%	0%	0%
10.         my our opinion, me ket ximum intercurspation for an anterior positioning appliance should coincide with which jew relation?         Centric relation         Canne guadance         Croup titution         Modith jiet open         0%           11.         In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain are recognized         39%         0%         0%         0%         0%         0%           12.         In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain occurring after moon or in the evening?         0%         0%         24%         76%         0%         0%           13.         In your opinion, what should be the duration of wearing an anterior positioning appliance?         Night time wear and when symptoms/habits are recognized         0hy when symptoms/ habits recognized         Wom from awakening till night         Wom from noon till before sleep         Do not know           13.         In your opinion, what should be the duration of wearing an anterior positioning appliance?         Centric relation         Only when symptoms/ habits recognized         Wom from awakening till night         Wom from noon till before sleep         Do not know           14.         In your opinion, what is the guide for taking a jaw relation for anterior positioning appliance?         Centric relation appliance         Anterior positioning appliance         Soft occlusal appliance         Anterior positioning appliance	coincide with which jaw relation?	00%	20%	0%	0%	0%
should coincide with which jaw relation?         28%         39%         33%         0%         0%         0%           11.         In your opinon, what should be the duration         Night time wear and when symptoms/habits recognized         Nohy when symptoms/habits recognized         Worn from awakening till night         Worn from noon till before sleep         Do not know           12.         In your opinon, what should be the duration or in the evening?         Night time wear and when symptoms/habits are recognized         ON         0%         24%         76%         0%         0%           13.         In your opinon, what should be the duration of wearing a statistication appliance?         Night time wear and when symptoms/ habits recognized         Nohy when symptoms/ habits recognized         Worn from noon till before sleep         Do not know           13.         In your opinion, what should be the duration of wearing a natterior positioning appliance?         Night time wear and when symptoms/ habits recognized         Worn from awakening till night         Worn from noon till before sleep         Do not know           14.         In your opinion, what is the guide for taking a peliance         20%         27%         13%         0%         0%           15.         In your opinion, which of the following appliance         Soft acclusal appliance         Soft acclusal appliance         Soft acclusal appliance         Soft acclusal appliance <td< td=""><td>intercuspation for an anterior positioning appliance</td><td>Centric relation</td><td>Canine guidance</td><td>Group function</td><td>Mouth just open</td><td>Do not know</td></td<>	intercuspation for an anterior positioning appliance	Centric relation	Canine guidance	Group function	Mouth just open	Do not know
11.         In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain after waking up in the morning?         Only when symptoms / habits recognized         Wom from awakening till night         Wom from noon till before sleep         Do not know           12.         In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain after recognized         Night time wear and when symptoms / habits recognized         Wom from awakening till night         Wom from noon till before sleep         Do not know           13.         In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain are recognized         Only when symptoms / habits recognized         Wom from awakening till night         Wom from noon till before sleep         Do not know           13.         In your opinion, what should be the duration of wearing an anterior positioning appliance?         Night time wear and when symptoms/ are recognized         Only when symptoms / habits recognized         Wom from awakening till night         Wom from noon till before sleep         Do not know           14.         In your opinion, what is the guide for taking a jaw relation or anterior positioning appliance?         Centric relation         Jaw protruded till egge degrees         Wom from noon till before sleep         Do not know           15.         In your opinion, which tipe of an appliance         Stabilization appliance appliance         Soft occlusal appliances         Do not know           <	should coincide with which jaw relation?	28%	39%	33%	0%	0%
O%         O%         24%         76%         O%           12.         In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain occurring after noon or in the evening?         Night time wear and when symptoms/habits are recognized         Only when symptoms/ habits recognized         Worn from awakening till night         Worn from noon till before sleep         Do not know           13.         In your opinion, what should be the duration of wearing an anterior positioning appliance?         Night time wear and when symptoms/ are recognized         Only when symptoms / habits recognized         Worn from awakening till night         Worn from noon till before sleep         Do not know           14.         In your opinion, what is the guide for taking a jaw relation for anterior positioning appliance?         Centric relation         Jaw protruded till edge to edge         27%         13%         0%         0%           5ECTION (C): GENERAL QUESTIONS         Centric relation appliance?         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Bite planes         Do not know           15.         In your opinion, which of the following appliances can be worn during meals?         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Do not know           16.         In your opinion, which of the following share and headache         Jawitre coclusal appliances	11. In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain after waking up in the morning?	Night time wear and when symptoms/habits are recognized	Only when symptoms / habits recognized	Worn from awakening till night	Worn from noon till before sleep	Do not know
12.       In your opinion, what should be the duration of wearing a stabilization appliance for muscular pain cocurring after noon or in the evening?       Night time wear and when symptoms/habits are recognized       Worn from awakening till night       Worn from noon till before sleep       Do not know         13.       In your opinion, what should be the duration of wearing a metrior positioning appliance?       Night time wear and when symptoms/habits are recognized       Worn from awakening till night       Worn from noon till before sleep       Do not know         14.       In your opinion, what is the guide for taking a jaw relation for anterior positioning appliance?       Centric relation       Jaw protruded till edge to edge       Jaw protruded till edge to edge       Jaw protruded till symptoms touching appliance?       Do not know         15.       In your opinion, which of the following appliances can be worn during meals?       Stabilization appliance       Stabilization appliance       30%       30%       47%       23%         16.       In your opinion, which type of an appliance is the nociceptive trigeminal inhibition tension suppression system is similar to 0%       O%       0%       47%       2%       78%         17.       In your opinion, which type of an appliance in indicated for which of the following appliance is defined and headache indicated for which of the following conditions?       Stabilization appliance       30%       47%       2%       78%         18.       In your opinion noc		0%	0%	24%	76%	0%
12. In Your Option, What is the quide for muscular pain occurring after noon or in the evening?       Night after noon or in the evening?       Point mode matching and phabts recognized       Noon demote and phabts	12 In your opinion what should be the duration	Night time wear and	Only when symptoms /	Worn from awakening till	Worn from noon till before	Do not know
22%         24%         28%         28%         0%           13.         In your opinion, what should be the duration of wearing an anterior positioning appliance?         Night time wear and when symptoms / habits recognized         Wom from noon till before sleep         Do not know           14.         In your opinion, what is the guide for taking a para reacognized         20%         27%         13%         0%         0%           14.         In your opinion, what is the guide for taking a wreation for anterior positioning appliance?         20%         27%         13%         0%         0%           SECTION (C): GENERAL QUESTIONS         Centric relation         Jaw protruded till symptoms appliance         15%         5%         5%           15.         In your opinion, which of the following appliance         Stabilization appliance         30%         30%         47%         23%         0 not know           16.         In your opinion, which type of an appliance         Stabilization appliance         0%         4%         2%         78%         0%         78%           17.         In your opinion nociceptive trigeminal inhibition tension suppression system is indicated in?         Migraine and headache         Joint clicking         Bruxism         Clenching         Do not know           17.         In your opinion, Stot occlusal appliance is indicated in? <td rowspan="2">of wearing a stabilization appliance for muscular pain occurring after noon or in the evening?</td> <td>when symptoms/habits are recognized</td> <td>habits recognized</td> <td>night</td> <td>sleep</td> <td>Do not know</td>	of wearing a stabilization appliance for muscular pain occurring after noon or in the evening?	when symptoms/habits are recognized	habits recognized	night	sleep	Do not know
13.       In your opinion, what should be the duration of wearing an anterior positioning appliance?       Night time wear and when symptoms/habits are recognized       Only when symptoms / habits recognized       Wom from awakening till night       Wom from noon till before sleep       Do not know         14.       In your opinion, what is the guide for taking a wrelation for anterior positioning appliance?       Centric relation       Jaw protruded till edge to edge       Jaw protruded till symptoms decrease       Mouth just open and no teeth to edge       Do not know         30%       35%       15%       15%       15%       5%         SECTION (C): GENERAL QUESTIONS       Stabilization appliance       Anterior positioning appliance       Bite planes       Do not know         16.       In your opinion, which of the following appliance is the nociceptive trigeminal inhibiton tension suppression system is similar to       Stabilization appliance       Anterior positioning appliance       Anterior positioning appliances       Do not know         17.       In your opinion, which of the following conditions?       16%       2%       4%       0%       78%         18.       In your opinion, soft occlusal appliance is indicated in?       Bruxism       High bite forces       During sports       When centric relation and maximum intercuspation do not know         19.       In your opinion, Soft occlusal appliance is indicated in?       Bruxism       High bit		22%	24%	28%	28%	0%
40%         20%         27%         13%         0%           14.         In your opinion, what is the guide for taking a jaw relation for anterior positioning appliance?         Jaw protruded till edge to edge         Jaw protruded till edge decrease         Jaw protruded till edge to edge         Jaw protruded till edge decrease         Mouth just open and no teeth to edge         Do not know           SECTION (C) : GENERAL QUESTIONS         5%         15%         15%         5%           15.         In your opinion, which of the following appliances can be worn during meals?         Stabilization appliance appliance         Anterior positioning appliance         Soft occlusal appliances         Bite planes         Do not know           16.         In your opinion, which type of an appliance is the nociceptive trigeminal inhibition tension suppression system is similar to         Migraine and headache         Joint clicking         Bruxism         Clenching         Do not know           17.         In your opinion, Soft occlusal appliance is indicated for which of the following conditions?         Bruxism         Clenching         Do not know           18.         In your opinion, the occlusal contacts on Soft occlusal appliance are.         Wide spread and equal         Random and unequal         Light and wide spread         Only on anterior teeth         Do not know           19.         In your opinion, the occlusal contacts on Soft occclusal appliance are.	13. In your opinion, what should be the duration of wearing an anterior positioning appliance?	Night time wear and when symptoms/habits are recognized	Only when symptoms / habits recognized	Worn from awakening till night	Worn from noon till before sleep	Do not know
14.       In your opinion, what is the guide for taking a jaw relation for anterior positioning appliance?       Centric relation       Jaw protruded till edge to edge       Jaw protruded till symptoms decrease       Mouth just open and no teeth touching       Do not know         SECTION (C) : GENERAL QUESTIONS       35%       15%       5%         15.       In your opinion, which of the following appliances can be worn during meals?       Stabilization appliance       Anterior positioning appliance       Soft occlusal appliances       Bite planes       Do not know         16.       In your opinion, which type of an appliance is the nociceptive trigeminal inhibition tension suppression system is similar to       Stabilization appliance       Anterior positioning appliance       Soft occlusal appliances       Anterior Bite planes       Do not know         17.       In your opinion, Soft occlusal appliance is indicated for which of the following conditions?       Bitusian appliance is indicated for which of the following conditions?       Bruxism       High bite forces       During sports       When centric relation and maximum intercuspation do not cincide       Do not know         19.       In your opinion, the occlusal contacts on Soft occlusal appliance are.       O%       Q%       Q% <td></td> <td>40%</td> <td>20%</td> <td>27%</td> <td>13%</td> <td>0%</td>		40%	20%	27%	13%	0%
Section         30%         35%         15%         15%         5%           SECTION (C) : GENERAL QUESTIONS         30%         35%         15%         15%         5%           15.         In your opinion, which of the following appliances can be worn during meals?         Stabilization appliance         Soft occlusal appliances         Bite planes         Do not know           16.         In your opinion, which type of an appliance is the nociceptive trigeminal inhibition tension suppression system is similar to         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Anterior Bite planes         Do not know           17.         In your opinion nociceptive trigeminal inhibition tension suppression system is indicated in?         Migraine and headache         Joint clicking         Bruxism         Clenching         Do not know           18.         In your opinion, Soft occlusal appliance is indicated in?         Bruxism         High bite forces         During sports         When centric relation and maximum intercuspation do not clocicide         Do not know           19.         In your opinion, the occlusal contacts on soft occlusal appliance are.         0%         22%         78%         0%         0%         0%         0%         0%         0%         0%         0%         0%         0%         0%         0%         0%	14. In your opinion, what is the guide for taking a jaw relation for anterior positioning appliance?	Centric relation	Jaw protruded till edge to edge	Jaw protruded till symptoms decrease	Mouth just open and no teeth touching	Do not know
SECTION (C) : GENERAL QUESTIONS         Stabilization appliance         Anterior positioning appliances         Bite planes         Do not know           15.         In your opinion, which of the following appliances can be worn during meals?         Stabilization appliance         Anterior positioning appliance         Bite planes         Do not know           16.         In your opinion, which type of an appliance is the nociceptive trigeminal inhibition tension suppression system is similar to         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Anterior Bite planes         Do not know           17.         In your opinion nociceptive trigeminal inhibition tension suppression system is indicated in?         Migraine and headache         Joint clicking         Bruxism         Clenching         Do not know           18.         In your opinion, Soft occlusal appliance indicated in?         Bruxism         High bite forces         During sports         When centric relation and maximum intercuspation do not coincide         Do not know           19.         In your opinion, the occlusal contacts on soft occlusal appliance are.         O%         22%         78%         O%         0%         0%         0%         0%         0%         10         Interior positioning appliance         Interior position and maximum intercuspation do not know         Interior position and maximum intercuspation do not know         Do not know	·	30%	35%	15%	15%	5%
15.         In your opinion, which of the following appliances can be worn during meals?         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Bite planes         Do not know           16.         In your opinion, which type of an appliance is the nocicceptive trigeminal inhibition tension suppression system is similar to         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Anterior Bite planes         Do not know           17.         In your opinion nocicceptive trigeminal inhibition tension suppression system is indicated in?         Migraine and headache         Joint Clicking         Bruxism         Clenching         Do not know           18.         In your opinion, Soft occlusal appliance is indicated for which of the following conditions?         Bruxism         High bite forces         During sports         When centric relation and maximum intercuspation do not coincide         Do not know           19.         In your opinion, the occlusal contacts on soft occlusal appliance are.         O%         22%         78%         O%         O%           20.         Which of the following appliance has been your made the most?         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Bite planes         I do not know           21%         0%         0%         0%         0%         0%         0%	SECTION (C) : GENERAL QUESTIONS	•		•	•	
O%         O%         O%         30%         47%         23%           16.         In your opinion, which type of an appliance is the nociceptive trigeminal inhibition tension suppression system is similar to         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Anterior Bite planes         Do not know           17.         In your opinion nociceptive trigeminal inhibition tension suppression system is indicated in?         Migraine and headache         Joint clicking         Bruxism         Clenching         Do not know           18.         In your opinion, Soft occlusal appliance is indicated for which of the following conditions?         Bruxism         High bite forces         During sports         When centric relation and maximum intercuspation do not coincide         Do not know           19.         In your opinion, the occlusal contacts on Soft occlusal appliance are.         Wide spread and equal         Random and unequal         Light and wide spread         Only on anterior teeth         Do not know           20.         Which of the following appliance has been your made the most?         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Bite planes         I do not make occlusal appliance in my practice	15. In your opinion, which of the following appliances can be worn during meals?	Stabilization appliance	Anterior positioning appliance	Soft occlusal appliances	Bite planes	Do not know
16.       In your opinion, which type of an appliance is the nociceptive trigeminal inhibition tension suppression system is similar to       Stabilization appliance       Anterior positioning appliance       Soft occlusal appliances       Anterior Bite planes       Do not know         17.       In your opinion nociceptive trigeminal inhibition tension suppression system is indicated in?       Migraine and headache       Joint clicking       Bruxism       Clenching       Do not know         18.       In your opinion, Soft occlusal appliance is indicated for which of the following conditions?       Bruxism       Using sports       When centric relation and maximum intercuspation do not coincide       Do not know         19.       In your opinion, the occlusal contacts on Soft occlusal appliance are.       Wide spread and equal       Random and unequal       Light and wide spread       Only on anterior teeth       Do not know         20.       Which of the following appliance has been your made the most?       Stabilization appliance       Anterior positioning appliance       Soft occlusal appliances       Bite planes       I do not make occlusal appliance in my practice	, ··· ř	0%	0%	30%	47%	23%
suppression system is similar to         0%         16%         4%         2%         78%           17.         In your opinion nociceptive trigeminal inhibition tension suppression system is indicated in?         Migraine and headache         Joint clicking         Bruxism         Clenching         Do not know           18.         In your opinion, Soft occlusal appliance is indicated for which of the following conditions?         Bruxism         High bite forces         During sports         When centric relation and maximum intercuspation do not coincide         Do not know           19.         In your opinion, the occlusal contacts on Soft occlusal appliance are.         Wide spread and equal 22%         Random and unequal 22%         Light and wide spread         Only on anterior teeth         Do not know           20.         Which of the following appliance has been your made the most?         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances 21%         O%         0%         1d on ot make occlusal appliance         I do not make occlusal appliance	16. In your opinion, which type of an appliance is the nociceotive trigeminal inhibition tension	Stabilization appliance	Anterior positioning appliance	Soft occlusal appliances	Anterior Bite planes	Do not know
17.       In your opinion nociceptive trigeminal inhibition tension suppression system is indicated in?       Migraine and headache 16%       Joint clicking       Bruxism       Clenching       Do not know         18.       In your opinion, Soft occlusal appliance is indicated for which of the following conditions?       Bruxism       High bite forces       During sports       When centric relation and maximum intercuspation do not coincide       Do not know         19.       In your opinion, the occlusal contacts on Soft occlusal appliance are.       Wide spread and equal 0%       Random and unequal 22%       Light and wide spread 0%       Only on anterior teeth       Do not know         20.       Which of the following appliance has been your made the most?       Stabilization appliance 21%       Anterior positioning appliance       Soft occlusal appliances appliance       Bite planes       I do not make occlusal appliance in my practice	suppression system is similar to	0%	16%	4%	2%	78%
Inhibition tension suppression system is indicated in?     Ingene and declare     Own stating     Directioning     Do not may       18.     In your opinion, Soft occlusal appliance is indicated for which of the following conditions?     Bruxism     High bite forces     During sports     When centric relation and maximum intercuspation do not coincide     Do not know       19.     In your opinion, the occlusal contacts on Soft occlusal appliance are.     Wide spread and equal     Random and unequal     Light and wide spread     Only on anterior teeth     Do not know       20.     Which of the following appliance has been your made the most?     Stabilization appliance     Anterior positioning appliance     Soft occlusal appliances     Bite planes     I do not make occlusal appliance in my practice       21%     0%     60%     0%     19%	17 In your opinion nocicentive trigeminal	Migraine and headache	Joint clicking	Bruxism	Clenching	Do not know
18.       In your opinion, Soft occlusal appliance is indicated for which of the following conditions?       Bruxism       High bite forces       During sports       When centric relation and maximum intercuspation do not coincide       Do not know         19.       In your opinion, the occlusal contacts on Soft occlusal appliance are.       Wide spread and equal       Random and unequal       Light and wide spread       Only on anterior teeth       Do not know         20.       Which of the following appliance has been your made the most?       Stabilization appliance       Anterior positioning appliance       Soft occlusal appliances       Bite planes       I do not make occlusal appliance in my practice         21%       0%       0%       0%       19%	inhibition tension suppression system is indicated in?	16%	2%	4%	0%	78%
40%         0%         24%         36%         0%           19.         In your opinion, the occlusal contacts on Soft occlusal appliance are.         Wide spread and equal 0%         Random and unequal 22%         Light and wide spread         Only on anterior teeth         Do not know           20.         Which of the following appliance has been your made the most?         Stabilization appliance 21%         Anterior positioning appliance         Soft occlusal appliances appliance         Bite planes         I do not make occlusal appliance in my practice	18. In your opinion, Soft occlusal appliance is indicated for which of the following conditions?	Bruxism	High bite forces	During sports	When centric relation and maximum intercuspation do	Do not know
19.         In your opinion, the occlusal contacts on Soft occlusal appliance are.         Wide spread and equal 0%         Random and unequal 22%         Light and wide spread 78%         Only on anterior teeth 0%         Do not know           20.         Which of the following appliance has been your made the most?         Stabilization appliance 21%         Anterior positioning appliance         Soft occlusal appliances soft occlusal appliances         Bite planes         I do not make occlusal appliance in my practice		40%	0%	24%	36%	0%
Soft occlusal appliance are.         Off         22%         78%         O%         O%           20.         Which of the following appliance has been your made the most?         Stabilization appliance         Anterior positioning appliance         Soft occlusal appliances         Bite planes         I do not make occlusal appliance in my practice           21%         0%         0%         0%         19%	19 In your opinion, the occlusal contacts on	Wide spread and equal	Random and unequal	Light and wide spread	Only on anterior teeth	Do not know
20.     Which of the following appliance has been your made the most?     Stabilization appliance     Anterior positioning appliance     Soft occlusal appliances     Bite planes     I do not make occlusal appliance in my practice       21%     0%     60%     0%     19%	Soft occlusal appliance are	0%	22%	78%	0%	0%
21% 0% 60% 0% 19%	20. Which of the following appliance has been your made the most?	Stabilization appliance	Anterior positioning appliance	Soft occlusal appliances	Bite planes	I do not make occlusal appliance in my practice
		21%	0%	60%	0%	19%

In the Section A: Selection of Appliance, Soft occlusal appliance was the most selected occlusal appliance by the participants. However the prosthodontic residents did not chose the soft occlusal appliance in any question. Table 3

Table 3: Most selected Appliance

Question	Percentage of Most selected Occlusal appliance with respect to speciality				
	Prosthodontics	Maxillo-facial surgery	Operative dentistry	Periodontology	Orthodontics
1. What is your preferred choice for	Stabilization Appliance	Soft Occlusal Appliance	Soft Occlusal	Soft Occlusal Appliance	Soft Occlusal Appliance
muscular disorder?	90%	57%	45%	50%	45%
<ol><li>What is your preferred choice for</li></ol>	Stabilization Appliance	Soft Occlusal Appliance	Dahl's Appliance	Dahl's Appliance	Soft Occlusal Appliance
occlusal appliance for pathological non carious occlusal wear?	90%	57%	36%	50%	45%
<ol> <li>What is your preferred choice for occlusal appliance for TMDs associated with</li> </ol>	Anterior Positioning Appliance	Anterior Positioning Appliance	Stabilization Appliance	Stabilization Appliance	Stabilization Appliance
disc displacement?	100%	72%	32%	35%	67%
<ol><li>What is your preferred choice for</li></ol>	Pivoting appliance	Do not know	Do not know	Do not know	Do not know
occlusal appliance for TMDs for an edentulous patient?	82%	72%	82%	86%	100%
<ol> <li>What is your preferred choice for occlusal appliance for TMDs for a patient that</li> </ol>	Stabilization Appliance	Soft Occlusal Appliance	Soft Occlusal Appliance	Posterior bite plane	Soft Occlusal Appliance
complains of nocturnal para function habits?	100%	33%	33%	70%	36%

For the Section C: General Questions, Table 4 show the gender and department wise response for the most appliances made in practice. Soft occlusal splint was the most practiced appliance.

Table 4: Most Practiced Occlusal Appliance

Percentage of Most Practiced Occlusal Appliance with respect to speciality						
Prosthodontics	Maxillo-facial surgery	Operative dentistry	Periodontology	Orthodontics		
Stabilization Appliance	Soft Occlusal Appliance	Soft Occlusal Appliance	Soft Occlusal Appliance	Soft Occlusal Appliance		
100%	72%	77%	80%	100%		

#### DISCUSSION

The success of occlusal appliance therapy lies in the meticulous selection of the appliance and intricate detailing of its construction.<sup>7</sup> Unfortunately In the dental literature the occlusal appliances have been used with many names. For example the stabilization appliance has been referred to as Flat plane stabilization appliance, Michigan splint, orthopedic appliances, muscle relaxant appliances and many more titles the literature.<sup>5</sup> This creates a confusion and ambiguity among the data acquired from the literature. Okeson et al has described occlusal appliances according to their characteristic features and this description is scientific and self-explanatory.<sup>8</sup>

This study aimed to identify the ambiguities among the dental surgeons regarding the construction and selection of occlusal appliances for various diseases of TMDs and occlusion. The most shocking and worrying fact that can be derived from this study is that the soft occlusal appliance was the most used appliance for the treatment of TMDs and occlusion. Which in most literature is either ineffective or has significantly less impact on symptoms as compared to other appliances.9 The use of soft appliance can only be explained due to the lack of knowledge and skill in making a hard acrylic appliance, furthermore it is easier to construct in laboratory and insert in the patient's mouth. There is a dire need of education among the dental surgeons about the soft occlusal appliances. This lack of knowledge and competence towards occlusal appliance is reflected in many other studies as well.<sup>10-15</sup> Thus to improve patient care for TMDs, betterment in undergraduate and post graduate training is required.<sup>10</sup>

The participants have also selected inappropriate jaw relations for appliances. For stabilization appliance the desired jaw relation selected was centric relation and for anterior repositioning appliance desired jaw relation selected was Mouth just open in retruded contact position. Inappropriate jaw relations can lead to worsen of symptoms, excessive chair side adjustments or even clinical failure.<sup>5,9</sup> The participants showed a lack of knowledge of management of TMDs of edentulous patients. Only the prosthodontic resident selected the occlusal pivots.

As highlighted earlier that there is a huge ambiguity across the literature that has reflected upon participants and may lead to failure of treatments and outcomes and reported in earlier literature.<sup>4,16,17</sup> A major loop hole in assessing the outcomes of occlusal appliance on management of TMDs is that the assessment is mostly subjective, which mostly relate to decrease of symptoms as reported by the patient.<sup>10,18</sup> Thus, there is a dire need of revisiting this important and crucial aspect of minimal intervention dentistry. A simple classification of occlusal appliances, an easy algorithm of selection of occlusal appliances and the concise occlusal characteristic of each appliance must be generated. A classification of TMDs has been proposed and is in accord with the code number that has been established by the American Academy of Orofacial Pain in cooperation with the International Headache Society.<sup>19</sup> This classification can aid in generating a classification for treatment modalities for TMDs.

#### CONCLUSION

With the limited data of this study it can be concluded that

- 1. The selection and construction of occlusal appliances among the residents was inappropriate.
- Soft occlusal appliances were the most selected and practiced appliance.

3. Occlusal appliances need to be revisited in the literature with easy to practice guidelines.

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