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Knowledge and Attitude of Dental Students and Interns towards Treatment Modalities of Bruxism Patients

Cristalle Soman[1], Nourah Alfozan[2*], Sadaa Alsubaie[2], Alhanouf Alaneeq[2], Marwah Bendaleelh[2], Rahaf Alamri[2], Nasser Alqhtani[3]

[1]Department of OMFS & Diagnostic sciences, College of Dentistry, Riyadh Elm University, Riyadh, Saudi Arabia
[2]College of Dentistry, Riyadh Elm University, Riyadh, Saudi Arabia
[3]Department of Oral & Maxillofacial surgery & Diagnostic sciences, College of Dentistry, Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia

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***Corresponding author:** Nourah Alfozan

Abstract

Aim: the aim of the study is to evaluate the knowledge and attitude of Riyadh Elm University (REU) dental students and interns towards treatment modalities of bruxism. ***Materials and methods:*** A cross-sectional electronic-based questionnaire was administered in Saudi Arabia from February-April 2020. Validation of the survey was made according to principal components analysis. The questionnaire had 19 questions and it was sent electronically to Participants after obtaining the ethical approval from the Ethical Committee in Riyadh Elm University on the 24th or February 2020. Participants included undergraduate dental students in clinical years and interns at Riyadh elm university, Saudi Arabia both genders. A response of 288 participants has been collected. ***Results:*** 223 responds were collected, 193 participants were female (86.5%), while 30 (13.5%) were male. The majority of the participants were level 12 students (50.7%), while 19.7% were interns. The most common method of management for awake bruxism stated by participants was relaxation methods, 79.4% followed by splint therapy 40.8%, and pharmacological therapy 35%. However, the most common method of management for sleep bruxism stated by participants was splint therapy 80.3%, followed by relaxation therapy 45.3% and sleep hygiene methods 40.8%. 36.8% of participants have been involved in the treatment of patients with bruxism. However, 78.9 % of practitioners agreed that the occlusal splint used to treat only signs and symptoms of bruxism. Among students who treated patients with bruxism, 53.1% followed up with their patients. ***Conclusion:*** There is sufficient knowledge and awareness of REU undergraduate dental students in clinical years and interns about the treatment modalities of bruxism.

Keywords: bruxism, knowledge, awareness, pain.

INTRODUCTION

Bruxism is defined as: "the parafunctional grinding of teeth which is an oral habit consisting of involuntary rhythmic or spasmodic nonfunctional gnashing, grinding, or clenching of teeth, in other than chewing movements of the mandible, which may lead to occlusal trauma [1]".

Bruxism is classified into primary and secondary types; primary bruxism is not related to any medical condition, whereas secondary bruxism is related to neurological disorders or adverse effects of drugs [2]. The etiology of bruxism is considered multifactorial [3]. Previously bruxism was thought to have peripheral causes, but recently it's more focused on central factors [4]. Primary awake bruxism is associated with stress and anxiety [5]. However, primary sleep bruxism is related to an increase in the rhythmic masticatory muscle activity (RMMA) with sleeping microarousals[6]. Secondary bruxism is associated with neurological disorders such as cranial and cervical dystonia, drug-resistant temporal lobe epilepsy, and Huntigton's disease [2]. Those disorders are presented with severe grinding, which primarily occurs during wakefulness and is involuntary, treatment of mainly associated with enhancement of physiological functions such as chewing, speaking, swallowing, and feeding. Symptomatic relief measures include the use of occlusal splints and medication for the underlying systemic disease [7]. Another treatment modality of

bruxism is the use of botulinum toxin, and it showed promising outcomes and extent of effectiveness according to multiple studies [8].

Treatment of bruxism depends on its type; primary awake bruxism is treated using relaxation as well as biofeedback [9]. However, primary sleep bruxism treatment options include sleep hygiene measures combined with relaxation techniques, splint therapy, pharmacological therapy, and contingent electrical stimulation (CES)[2].

Bruxism is correlated with comorbidities such as attrition, masticatory muscle pain, temporomandibular joint disorder (TMDs), temporal headache, and in severe cases, bruxism can affect functions such as mastication, speech and swallowing [2]. The prevalence of bruxism in adults was 22%-30% in wake bruxism and 1%-15% in sleep bruxism however in children and adolescence sleep bruxism was in 3-49%[10], making it crucial to have excellent diagnostic skills and early detection to prevent further damage and maintain healthy form and function of orofacial complex. A study conducted in France in 2019 aimed to evaluate the diagnostic methods and management of bruxism in a sample of general practitioners concluded that there's wide range of variation and significant insufficiency in the diagnosis and treatment methods of bruxism [11].

Up to now, information about the best treatment modalities of the bruxism has not been widely disseminated. It has been approved for males and females middles ages more prone to this condition. However, many dentists and undergraduate students remain unaware of the best treatment modalities of the bruxism and the role of the best treatment approach in prevention worldwide. Up to date, no study has been conducted to evaluate the knowledge and awareness of REU students and interns about the treatment modalities of bruxism. The aim of this study was to assess the knowledge and awareness of undergraduate dental students and interns towards treatment modalities of bruxism.

MATERIALS AND METHODS

Study design

A cross-sectional electronic-based questionnaire (Google form) using closed-ended questions was administered in Saudi Arabia from February-April 2020. Validation of the survey was made according to principal components analysis after gathering responses from specialists in TMJ and orofacial pain, oral maxillofacial surgeons, prosthodontics, orthodontics, and restorative dentistry. The sample size calculation was carried out by using the online Raosoft® sample size calculator. Informed consent was obtained from the participants before they answered the survey. The questionnaire had 19 questions divided into three sections. The first section of the questionnaire was related to demographic data. The second section of the questionnaire is questions related to etiology, clinical features, and treatment/management modalities of bruxism. The third section of the questionnaire was questioning about the outcome, prognosis, and follow up of bruxism.

Ethical approval

Data of the ethical approval was obtained from the Ethical Committee at The College of Dentistry in Riyadh Elm University in Riyadh province, Riyadh, Saudi Arabia.

DATA COLLECTION

The questionnaire was sent electronically to Participants to collect information through an official email from Riyadh Elm University research center also through social media "whatsapp & twitter "Participants included undergraduate dental students in clinical years and interns at Riyadh elm university, Saudi Arabia both genders.

STATISTICAL ANALYSIS

The questionnaire is examined for its normality via the Shapiro-Wilk test, since the outcome variable is not normally distributed, non-parametric methods, including the Mann-Whitney U test and Kruskal-Wallis tests are used to examine the hypotheses of this study. For the purpose of statistical analysis, IBM SPSS software v.26 and for visualization of the result, GraphPad Prism v.8 is used. In order to calculate the required sample size for this study, Raosoft® sample size calculator was used. With a margin of error of 5%, confidence interval of 95%, and response distribution of 50%, it was recommended to use a sample size of 287 respondents. During the survey, responses of 223 participants have been collected. In order to calculate the potential power of the analysis, G*Power software was implemented. Assuming the effect size (f2) of the predictors in this study would be small with two predictors, if linear multiple regression is used to measure the relationship between outcome and predictor variables, a sample size of 288 seems to have 97% power with a probability of error of around 2%. A p-value of &<0.05 is considered significant.

Hypothesis

Null hypothesis

1. There is no sufficient difference in knowledge and awareness of undergraduate dental students in clinical years and interns about treatment modalities of bruxism

RESULTS

Demographics Q1 and Q2 Table1

Two hundred Twenty-three responses were collected. Up to question 19, all 223 practitioners answered all questions. As shown in Table 1, out of 223 valid responses, 193 participants were female (86.5%), while 30 (13.5%) were male. The majority of the

participants were at the educational level of L12 (50.7%), while 19.7% were interns.

Table-1: Descriptive statistics of Gender and Educational level

Demographics	Frequency	Percentage %
Gender		
Male	30	13.5
Female	193	86.5
Educational Level		
L8	22	9.9
L9	7	3.1
L10	17	7.6
L11	20	9
L12	113	50.7
Intern	44	19.7

Bruxism diagnosis Table2

Concerning the types of bruxism, 36.3 %(n=81) responded that there're two types. And 27.4% (n=61) Responded with, "I don't know." 22.9% (n=51) responded with three types. 13.5 % (n=30) of practitioners responded that there's only one type of bruxism.

Regarding the etiology of bruxism, a significant proportion of participants, 52.9% (n = 118), responded that the etiology is multifactorial. And 37.7% (n =84) answered that the etiology is psychological. And 7.2% (n =16) answered that the etiology is physiological. Only 2.2% (n =5) of respondents answered that the etiology is environmental.

According to this survey, 88.8% (n = 198) of participants considered emotional stress as a risk factor for developing bruxism according to their knowledge. 80.3% (n = 179) of participants considered anxiety disorders.48.9% (n = 109) of participants considered sleep apnea syndrome. 13.5% (n = 30) of participants considered coffee consumption. 12.6% (n = 28) of participants considered tobacco consumption. And 11.2% (n = 25) of participants considered Alcohol consumption.

The survey revealed that 91.9% (n = 205) of practitioners celebrated that the sign and symptoms of bruxism include attrition. 76.2% (n = 170) of practitioners answered with the temporomandibular joint disorder. 74.4% (n = 166) of practitioners responded with masticatory muscle pain. 73.5% (n = 164) of practitioners answered with temporal headache. And only 3.1% (n = 7) of practitioners Responded with "I don't know."

87.4% (n = 195) of the practitioner answered that clinical examination should be performed for the diagnosis of bruxism. 54.3% (n = 121) of practitioners responded that they considered self-report as a diagnostic method. While 35.0% (n=78) included polysomnography recording as a diagnostic method. And few practitioners, 6.3% (n=14), indicated that they weren't aware of bruxism diagnostic methods.60.1% (n=134) of practitioners were aware of antidepressant therapy associated with bruxism, while 39.9% (n=89) of practitioners were not.

Table-2: Diagnosis of bruxism

QUESTIONS	Choices	Frequency	Percentage%
3-How many types of bruxism exists?	1	30	13.5
	2	81	36.3
	3	51	22.9
	I don't know	61	27.4
4-What is the etiology of bruxism among the following?	environmental	5	2.2
	multifactorial	118	52.9
	physiological	16	7.2
	psychological	84	37.7
5-Which of the following are considered as a risk factor for developing bruxism according to your knowledge?	emotional stress	198	88.8
	tobacco consumption	28	12.6
	Alcohol consumption	25	11.2
	coffee consumption	30	13.5
	sleep apnea syndrome	109	48.9
	anxiety disorders	179	80.3
6-What are signs and symptoms of bruxism?	I don't know	7	3.1
	attrition	205	91.9
	masticatory muscle pain	166	74.4
	temporomandibular joint disorder (TMDs)	170	76.2
	temporal headache	164	73.5
7-which of the following do you think should be performed to diagnose bruxism? (choose all correct answers)	I don't know	14	6.3
	clinical examination	195	87.4
	self-report	121	54.3
	polysomnography recordings	78	35.0
8-Are you aware of antidepressant therapy associated bruxism?	No	89	39.9
	Yes	134	60.1

Bruxism management table 3

78.9% (n=176) of practitioners agreed that the occlusal splint used to treat only signs and symptoms of bruxism. However, 21.1% (n=47) of practitioners didn't agree.79.4% (n =177) of practitioners indicated that relaxation methods could be used for the management of awake bruxism. 40.8% (n = 91) of participants proposed splint therapy (nightguard) as a method of management. 35% (n=78) of practitioners indicated that pharmacological therapy could be used for the management of awake bruxism. 26.0% (n = 58) indicated that botulinum toxin injection could be used. 22.0% (n = 49) indicated the use of contingent electrical stimulation (CES). 20.2% (n = 45) of participants included sleep hygiene methods as management of bruxism.18.8% (n = 42) of participants answered that with biofeedback. And only 6.7% (n=15) of practitioners Responded with, "I don't know."

Regarding the management methods of sleep bruxism, the majority of participants 80.3% (n = 179) proposed splint therapy (nightguard) as a method of management. 16.1% (n = 36) of participants indicated that botulinum toxin injection could be used. 45.3% (n =101) of practitioners included relaxation methods. 40.8% (n = 91) of participants indicated sleep hygiene methods. 27.4% (n=61) of practitioners indicated that pharmacological therapy as the management of sleep bruxism. 16.1% (n = 36) of participants indicated that botulinum toxin injection could be used. 14.8% (n = 33) of participants indicated contingent electrical stimulation (CES). 11.2% (n = 25) of participants answered that biofeedback could be used. And only 3.1% (n=7) of practitioners Responded with, "I don't know."

Table-3: Management of bruxism

QUESTIONS	Choices	Frequency	Percentage %
9-Are you aware that occlusal splints are used to treat only signs and symptoms of bruxism?	No	47	21.1
	Yes	176	78.9
10- Which of the following do you think should be performed for the management of awake bruxism?	I don't know	15	6.7
	relaxations methods	177	79.4
	biofeedback	42	18.8
	sleep hygiene methods	45	20.2
	splint therapy (night guard)	91	40.8
	pharmacological therapy	78	35.0
	contingent electrical stimulation (CES)	49	22.0
	botulinum toxin injections	58	26.0
11- Which of the following management methods should be performed for management of sleep bruxism?	I don't know	7	3.1
	relaxations methods	101	45.3
	biofeedback	25	11.2
	sleep hygiene methods	91	40.8
	splint therapy(night guard)	179	80.3
	pharmacological therapy	61	27.4
	contingent electrical stimulation (CES)	33	14.8
	botulinum toxin injections	36	16.1

Follow up and outcomes

78.5% (n = 175) of practitioners indicated that they had learned about bruxism and its treatment modalities in their pre-clinical/clinical years in REU, and only 21.5% (n = 48) of practitioners their answers were no.63.2% (n = 141) of practitioners indicated that they never treated/assisted in the treatment of any patients with bruxism, 36.8% (n = 82) treated/assisted in the treatment of patients with bruxism. The results of questions (14.1-14.2-14.3) for those who treated/assisted in the treatment of any patients with bruxism.

According to this survey, 46.9% (n = 38) of practitioners followed up with their patients, while 53.1 % (n = 43) of practitioners did not follow up with their patients.

72.8% (n =59) of practitioners viewed a relief from symptoms after the management, only 27.2% (n = 22) of practitioners their patient did not get relief from bruxism after the management.

71.3% (n = 57) of practitioners believed that the patient had improvement in signs and symptoms after the management of bruxism. In comparison, only 28.8% (n = 23) of practitioners thought that there was no improvement in the signs and symptoms of patients.85.2% (n = 190) of practitioners think that the management of bruxism depends on Patient compliance. 14.8 % (n = 33) of practitioners believe that the management of bruxism does not depend on patient compliance.

Table-4: Follow-up and outcomes of bruxism

QUESTIONS	Choices	Frequency	Percentage %
13-Have you learned about bruxism and its treatment modalities in your pre-clinical/clinical years at REU?	No	48	21.5
	Yes	175	78.5
14-Have you treated/assisted in the treatment of any patients with bruxism?	No	141	63.2
	Yes	82	36.8
14.1. Did you follow up the patient?	No	38	46.9
14.2. Did the patient get relief from bruxism after the management?	Yes	43	53.1
14.3. Do you think that the patient had improvement in signs and symptoms related to bruxism?	No	22	27.2
	Yes	59	72.8
	No	23	28.8
	Yes	57	71.3
15- Does the management of bruxism depend on Patient compliance?	No	33	14.8
	Yes	190	85.2

Follow up and outcomes

90.1% (n = 201) of participants agreed that lifestyle changes could improve the outcome in patients with bruxism. In comparison, only 9.9% (n = 22) stated that lifestyle changes couldn't improve the outcome in patients with bruxism.92.8% (n = 207) of participants agreed that the attitude of the treating dentist influence the prognosis/outcome of bruxism therapy, and only 7.2% (n = 16) agreed that the attitude of the treating dentist does not influence the prognosis/outcome of bruxism therapy.

92.8% (n = 207) of participants think that there is a need to follow up the patient, only 7.2% (n = 16) answered that there is no need to follow up the patient.90.1% (n = 201) of participants believed that the prognosis on follow-up visits determines the continuation of current therapy/ introduction of a new therapy. However, only 9.9% (n = 22) believed that the prognosis on follow-up visits not determine the continuation of current therapy/ introduction of a new therapy.

Table-5: Follow-up and outcomes of bruxism

QUESTIONS	Choices	Frequency	Percentage %
16-Can lifestyle changes improve the outcome in patient with bruxism?	No	22	9.9
	Yes	201	90.1
17- Does the attitude of the treating dentist influence the prognosis/outcome of bruxism therapy?	No	16	7.2
	Yes	207	92.8
18- Is there a need to follow up the patient?	No	16	7.2
	Yes	207	92.8
19. Does prognosis on follow up visits determine the continuation of current therapy/ introduction of new therapy?	No	22	9.9
	Yes	201	90.1

DISCUSSION

In our study, we found that there is sufficient knowledge of the students and interns toward treatments of bruxism, 36.8% of participants have been involved in the treatment of patients with bruxism, this could be related to the existing results. Additionally, the Mann-Whitney U test showed that there wasn't any significant difference in the level of knowledge between male and female students and interns. There are two types of bruxism sleep bruxism and awake bruxism [12], in our study we found that 36.8% of participants answered that there're two types, whereas 27.4% responded with "I don't know," 22.9% answered that there're three types of bruxism, and only 13.5% answered that there's only one type of bruxism. Regarding the etiology of bruxism, it is multifactorial [13]. The majority of participants in our study, 52.9 %, answered that the etiology of bruxism is multifactorial.

There are multiple risk factors associated with bruxism, including emotional stress, anxiety disorders, as well as tobacco/alcohol/coffee consumption and sleep apnea syndrome [14]. A study conducted in France to evaluate the diagnosis and management of bruxism showed that among general practitioners, 90.9% of practitioners included stress and anxiety as the etiology of bruxism [11], similarly, in our study, 80.3-88.8% included anxiety disorders and emotional stress as a risk factor. Obstructive sleep apnea (OSA) is a sleep disorder associated with multiple comorbidities and mortalities. It has also been associated with bruxism depending on the degree of OSA severity [15]. 48.9% of participants in our study included obstructive sleep apnea as a risk factor for bruxism.

Signs and symptoms of bruxism include attrition, temporal headache, and TMD, as well as masticatory muscle pain [2]. In our study, 91.9% of participants included attrition, 76.2% included TMD, 74.4% included masticatory muscle pain, and 73.5% included temporal headache, only 3.1% of participants answered with "I don't know."

According to the international consensus on the assessment of bruxism the diagnosis of bruxism is classified into; possible, probable and definitive, the diagnosis is considered as possible if it's only based upon a self-report, and it's considered as probable if a self-report and a clinical examination is made, the definitive diagnosis is made when a self-report, clinical examination, as well as polysomnography, is made [12]. In our study 87.4% of participants included clinical examination as a method of diagnosis for bruxism, 54.3% included self-report, 35% included polysomnography and only 6.3% answered with "I don't know."

Antidepressant associated bruxism could be related to the use of serotonergic antidepressants such as; fluoxetine, sertraline, and venlafaxine symptoms that may begin to develop within three to four weeks of medication use [16]. In our study, 60.1% of participants mentioned that they are aware of the association between antidepressant therapy and bruxism.

Splint therapy is used to manage the signs and symptoms of bruxism rather than treating the underlying cause of bruxism [9]. In our study, 78.9% of participants agreed that splint therapy is only used for the management of signs of symptoms. Management of awake bruxism includes relaxation methods as well as biofeedback [9]. In our study, 79.4% included relation methods as management of awake bruxism, 18.8% included biofeedback, and only 6.7% of participants answered with "I don't know."

Management of sleep bruxism include relaxation methods, sleep hygiene methods, splint therapy, pharmacological therapy, contingent electrical stimulation, as well as botulinum toxin injections [2]. majority of participants in our study 80.3%, indicated the use of splint therapy, similarly to, 92.7% of participants in a study conducted by Guillot M (2019) were the majority of participants used splint therapy [11], however, 45.3% indicated the use of relaxation methods, 40.8% stated sleep hygiene methods, 27.4% included pharmacological therapy, 16.1% included botulinum toxin injections, and 14.8% included contingent electrical stimulation and only 3.1% answered with "I don't know."

36.8% of participants treated patients with bruxism, 53.1% of participants in our study followed up their patients. A study conducted in France in 2019, showed that 77.8% of participants included in the study followed-up their patients [11].

A study conducted in France in 2019 aimed to evaluate the diagnostic methods and management of bruxism in a sample of general practitioners concluded that there's wide range of variation and significant insufficiency in the diagnosis and treatment methods of bruxism [11] however, in our study results showed that there's sufficient knowledge of students and interns about the treatment modalities and diagnosis of bruxism.

The study has many limitations; the majority of the participants were from level 12 students and dental interns, this could be related to the fact that there wasn't any significance between the different educational levels. Also, male responses were only 13.5% compared to 86.5% of females, which could be related to the fact that there wasn't any significance between the two different genders. Time constraints and lack of communication due to the COVID-19 outbreak were the main reasons that led to these limitations. Also, we should keep in consideration the fact that the diagnosis of bruxism in our study is limited to "possible" or "probable" rather than "definitive," due to the unavailability of polysomnography at the university hospital.

Questionnaire-based studies are important to evaluate the level of knowledge of a particular group in a specific field .our study essential because of the multiple comorbidities correlated with bruxism making it crucial for dental practitioners to have excellent diagnostic skills and early detection to prevent further damage and maintain healthy form and function of the orofacial complex also for improvements in the academic curriculum.

CONCLUSION

There are sufficient knowledge and awareness of REU undergraduate dental students in clinical years and interns about the treatment modalities of bruxism. Future perspectives include the use of a large sample size that should be included with more male student respondents to assess the gender disparity in the difference in knowledge and attitude towards the treatment of bruxism.

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