

# Bruxism in Mosul City Part 1

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**Abstract** This study consist of 450 patients with TMDs, 271 females and 179 males, 13-65 years were age range of the sample. Helkimo index was used to assess the TMDs by scores, grinding and clenching were recorded, the most relevant age group was 21-30 years, they signify (59.3%) from the whole sample, female patients signify 60.4% from the total participant. 130 (28.8%) patients were reported grinding where as 122 (24.8%) were complained from clenching. Significant relations ( $p \leq 0.001$ ) of grinding and clenching with age, sex, symptoms and signs of TMDs were found in this study. In conclusion grinding and clenching implicated in etiology and severity of TMDs and their incidence decrease with age.

**Keywords:** grinding, clenching, Helkimo, TMDs

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## 1. Introduction

The extreme involuntary grinding of the teeth during unconscious known as bruxism. Bruxism can be classified to two main types, bruxism that happens once people are conscious can be named wakeful or daytime bruxism and the bruxism that happens at night can be called night-time bruxism. The etiology of the bruxism still obscured but multiple factors influenced it [1,2,3]. Bruxism is a public complain, and is expected to happen in 8-31% of the people regardless the subtypes of bruxism and without important difference in relative to sex [4]. Wakeful bruxism (AB) happens in 22-31% and sleep bruxism (SB) in around 13% of adults [4,5]. The incidence of bruxism less account in old age. Presently, bruxism is not regarded as a disorder in adults, it regarded as a jeopardy factor for other medical concerns [4,6]. While bruxism which happening through sleep may possibly a physiological component of the normal development of the central nervous system, it may possibly also be regarded as a reaction to extreme tension, be produced by certain independent psychosomatic and communal factors, or establish a defensive mechanism in people with sleep complaints [5,7]. There are scientific intelligences showing the relation of bruxism with systemic disorders, comprising thyroid illnesses, complaints of the gastrointestinal system, sleep complaints, and circulatory illnesses. The broadly accepted description of bruxism was formed in 2013 in a global agreement. Bruxism is definite as a repetitive action of the jaw muscles, categorized by teeth clenching or grinding and/or bracing or pushing of the jaw. This movement of chin muscles may happen though awaken (awake bruxism—AB) or throughout sleep (sleep bruxism—SB) [4]. In 2018, Lobbezoo et al, suggested two

distinct descriptions for bruxism. SB can be well-defined as the action of the muscle of mastication during sleep, which can be periodic (phasic) or non-periodic (tonic), and should not be considered as a movement complaint or a sleep complaint in otherwise medically fit persons. Alternatively, AB is well-defined as an action of the muscles of mastication during daytime which is categorized by recurrent or constant tooth contact and/or by bracing or pushing of the jaw and should not be regarded as a movement complaint in else medically fit persons [5]. Presently, bruxism is not regarded as a illness but referred to it as a performance that can doing as a jeopardy factor for harmful illnesses, or in compare a protecting issue for others [8]. Due to the multifactorial involved, diagnosis of SB is puzzling. SB may causes medical problems, containing ache in the muscles of mastication, restriction of jaw movement, orofacial ache, headache in the temporal area and the range of signs associated with injury to the tooth structure and mucous membrane of oral cavity. Presently, merely video-polysomnography can professionally identify SB [9]. Throughout electromyography record, these contractions can visible as a series of recurrent actions (phasic contractions) permanent for 0.25-2 s or as lonely, long-term jaw clenching (tonic contractions) permanent over 2 s. A third kind of muscles activity is also noted, which is a mixture of periodic and non-periodic muscles activity, named mixed contractions [9,10]. So that, pain is still the chief motive for patients to request for instruction and management and the key target for judgment and management [11].

## 2. Material & Methods

This training enroll 450 participants whom referred to oral medicine health center at Mosul academy for about 2

years, the participants involved 271 woman & 179 man, the oldness extended from (13-65) years old. Altogether participants identified to have TMDs since of the nonappearance of additional illness entities, which related for their symptoms. Participants were scanned by author to lessen unfairness and to mark regularization. We depend on the Helkimo index to assess the TMDs signs and symptoms through scoring which is essential to control the management requirement and to enable contrast with further trainings. Bruxism were described by participants as grinding (sleep bruxism) or reported by their relatives and clenching (awake bruxism) were recorded. SPSS (statistical package of social science) window 11.5, with a chi square and paired t tests were used for statistical analysis,  $p \leq 0.005$  considered as a significant value while  $p \leq 0.001$  as highly significant value.

### 3. Result

Table 1 show patients sharing concerning age and sex, the age range between twenty one to thirty years was the greatest prevailing cluster, they represent 59.3% among the participants, women was dominate man in this study she represent 60.4% of the patients sample.

**Table 1. Sample distribution in relation to age and sex.**

Age range/years	Man %	Woman %	Entire %
11-20	3 (18.5%)	64 (23.5%)	97 (21.5%)
21-30	121 (67.9%)	146 (53.7%)	267 (59.3%)
31-40	14 (7.8%)	44 (16.1%)	58 (12.8%)
41-50	5 (2.8%)	16 (5.7%)	21 (4.6%)
51-65	5 (2.8%)	2 (0.7%)	7 (1.5%)
	178 (39.5%)	272 (60.4%)	450

Patients with grinding represent 28.8% (130 patients) from the whole sample, also the age 21-30 years was the most relevant group whom complaining with sleep bruxism, women were claimed sleep bruxism more frequently than men, she signify 70% in contrast with men whom signify 30% from the sample as demonstrated in Table 2.

**Table 2. Distribution of sleep bruxism participants in relation to age group and sex.**

Age range/years	Man %	Woman %	Entire %
11-20	8 (20.5%)	23 (25.2%)	31 (23.8%)
21-30	26 (66.6%)	49 (53.8%)	75 (57.6%)
31-40	4 (10.2%)	16 (17.5%)	20 (15.38%)
41-50	1 (2.56%)	3 (3.2%)	4 (3.07%)
51-65	0 (0%)	0 (0%)	0 (0%)
	39 (30%)	91 (70%)	130

Table 3 reveal the proportion of the patients whom claimed clenching, 112 patients were reported clenching, again the age range between 21-30 years was the most prevailing group and female proportion exceeding male patients at a ratio 2:1.

**Table 3. Distribution of awake bruxism participants in relation to age group and sex.**

Age range/years	Man %	Woman %	Entire %
11-20	5 (12.1%)	18 (25.3%)	23 (20.5%)
21-30	31 (75.6%)	34 (47.8%)	65 (58%)
31-40	3 (7.3%)	13 (18.3%)	16 (14.2%)
41-50	1 (2.4%)	6 (8.4%)	7 (6.25%)
51-65	1 (2.4%)	0 (0%)	1 (0.89%)
	41 (36.6%)	71 (63.3%)	112

Table 4 demonstrate the relation of sleep bruxism with sex, symptoms and signs of TMDs, there were highly significant relationship ( $p \leq 0.001$ ) of grinding with sex, severity of symptoms (Ai), impaired TMJ function index, which includes clicking, crepitation and locking, mobility index which mean limitation of vertical and horizontal movements, muscle pain index and TMJ pain index, also there was highly significant relation ( $p \leq 0.001$ ) of grinding with severity signs of TMDs (DI mild, DII moderate & DIII severe sign).

**Table 4. Relation of grinding with different TMJ variables.**

GRINDING	CHI SQUIRE TEST	P-VALUE	Significance
Sex	19.636	0.000	s
Anamnestic dysfunction (AI) index	108.40	0.000	s
Impaired TMJ function index	263.520	0.000	s
Mobility index	453.00	0.000	s
Muscle pain index	30.093	0.000	s
TMJ pain index	99.773	0.000	s
Pain on movement index	70.173	0.000	s
Clinical dysfunction index (DI)	148.027	0.000	s

Table 5 shows highly significant relationships ( $p \leq 0.001$ ) between awake bruxism with sex, anamnestic dysfunction index (Ai), impaired TMJ function index, mobility index, muscle pain index, TMJ pain index and clinical dysfunction index (DI mild, DII moderate, DIII severe signs).

**Table 5. Relation of clenching with different TMJ variables.**

CLENCHING	CHI SQUIRE TEST	P-VALUE	Significance
Sex	19.636	0.000	s
Anamnestic dysfunction (AD) index	108.40	0.000	s
Impaired TMJ function index	263.520	0.000	s
Mobility index	453.00	0.000	s
Muscle pain index	30.093	0.000	s
TMJ pain index	99.773	0.000	s
Pain on movement index	70.173	0.000	s
Clinical dysfunction index (DI)	148.027	0.000	s

Figure 1 reveal grinding patients distribution concerning the age and sex, highly considerable relations  $p \leq 0.001$  were found.

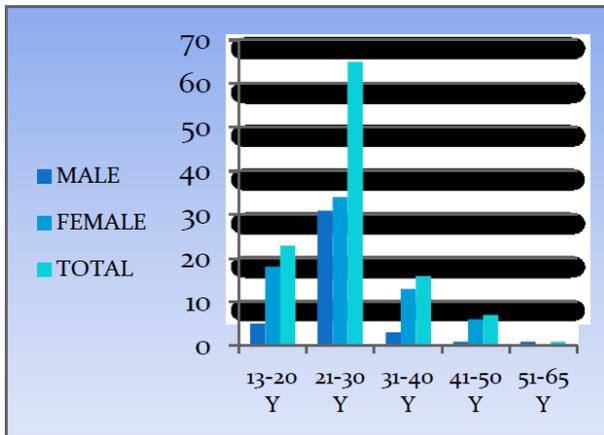


Figure 1. Age and sex sharing in relation to grinding. (Paired t test = 65.489, df= 449,  $p=0.000$ )

Highly considerable relations  $p \leq 0.001$  were found between clenching, age and sex as shown in Figure 2.

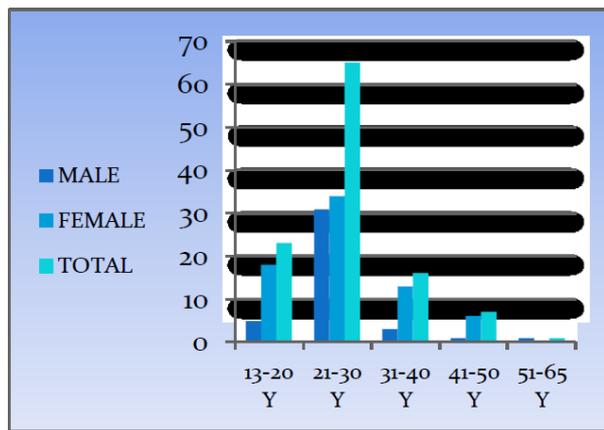


Figure 2. Age and sex sharing in relation to clenching. (Paired t test = 65.489, df= 449,  $p=0.000$ )

## 4. Discussion

The etiology of TMD is multifactorial [12], involving systemic and local factors, and is strongly influenced by biopsychosocial aspects. In addition, gender, age and the socioeconomic profile are determinant factors in the development of TMD signs and symptoms. The wide etiologic factors involved in this disorder may hinder a proper diagnosis [13]. Among the signs and symptoms involved in TMD, the most cited are pain in the TMJ region, pain or fatigue in the craniocervical and facial muscles (especially masticatory muscles), presence of clicking joint sounds, and limited mandibular movements [14]. The present research designed to evaluate the occurrence of grinding with clenching at Mosul city, and their association with age and sex. The age range between twenty one to thirty years was the greatest prevailing group, they represent 59.3% among the participants. This finding come to an agreement with other studies [15,16]. This is may be due to that young people are more anxious

and they revealed highly stressful life which is a significant risk factor and these impacts significantly decrease with age. Both clenching and grinding were described highly by females than by males: 63.3% vs 36.6% for clenching and 70% vs 30% for grinding with mention to gender differences, the bulk of authors described one and the same occurrence for males and females [17]. In our study the prevalence of grinding (sleep bruxism) is more than clenching (awake bruxism) 28%, 24% respectively, while in other studies describe a greater complete occurrence of clenching in compare to grinding [18]. In this research a positive relationships among symptoms and signs of TMDs with grinding and clenching ( $p \leq 0.001$ ) were reported, and this outcome come to an agreement with other researches [19], and not in agreement with other research [20]. The highest injuries produced by the bruxism can be noted as alterations in teeth, periodontal ligament, muscle of mastication, temporomandibular joint, headaches, communicative and psychosomatic effects [21]. Muscle signs comprise tiredness, increased stiffness in closure muscle (Masseter and Temporalis). The usual sign is exhaustion of muscle that characterizes by fatigue over a continued exertion, without obvious feature of aching or distress [22,23]. This may explain the presence of muscle aching with sensitivity on digital examination of temporomandibular joint, pain, clicking and extra noises in the joint due to absence of harmonization of the lateral pterygoid muscles. In some people loss of the vertical height and mandibular dislodgment on the maximum intercuspidal point (MIP) may develop [24]. Injury to the articular disc may be a source of temporomandibular disorder. Several investigators have revealed that severe mechanical load may cause more cartilage injury [25]. The pressure are spread over the articular faces, mostly on the meniscus, which act as a pressure absorber and a pressure distributor. When the tonus of the closure muscle elevated this will leads to elevation of intra-articular stress in the TMJ and change in its usual biomechanics resultant in micro disturbing injury to the TMJ capsule and meniscus connection [26]. These disturbing circumstances might be the etiology for meniscus dislocation and TMJ injury with internal derangement or osteoarthritis [27]. Degenerative alterations in the temporomandibular joint, like osteoarthritis, possibly will consequence from lack of sufficient articular remodeling due to a reduced adaptive ability of the TMJ component or extreme physical pressure on the temporomandibular joint [28]. Extra injury might be happened since the disk is a stress absorber and its ability to repair can be in a risk. On the whole, the applying of shear pressure was seen to cause molecular alterations accompanying with apoptosis. shear pressures triggering the production of nitric oxide that doings as reactive oxygen metabolite implicated in joint pathology. The rise in nitric oxide was accompanying with elevation in chondrocyte apoptosis [29]. Newly, a collection from Japan anticipated a weak link of clenching and grinding with a gene coding for serotonin receptor 2A (HTR2A), a nonspecific biomarker of numerous behavior and cognitive functions. This research, along with many other genetic studies, validates the study of gene factors influencing the grinding alone or with the comorbid sleep and pain complaints [30,31]

## 5. Conclusion

Bruxism is a common illness in Mosul city. The incidence of sleep bruxism is 24% where as the incidence of awake bruxism was 28%, 21-30 years was the most relevant age group, the incidence of bruxism was decreased with age. Female were represented more than male at a ratio of 1.5-1. Significant relationship between both sleep and awake bruxism and signs and symptoms of TMDs were found. Significant relationships between both sleep and awake bruxism and sex were found. Recently they discover genetic predisposition for bruxism.

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