

Research Article

## Correlation between Nails Biting and Temporomandibular Joint Disorders and Emotional Status among Teenagers in Riyadh: A Cross sectional study

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### ABSTRACT:

**Aim Of Investigation:** The aim of this study was to investigate the relationship between temporomandibular disorders (TMDs) and nail biting among high school students in Riyadh, Saudi Arabia.

**Methods:** Five high schools in Riyadh were selected from five different regions to collect Randomly 424 students divided into two groups; 224 students with nail biting habit in the first group, and 200 students who does not have that habit in the second group. A questionnaire and TMJ examination were performed on both groups.

**Results:** The most common symptoms of TMDs in the first group was pain in the TMJ (23.2%) ( $p < 0.000$ ), with emotional stresses reached (23.9%) ( $p < 0.000$ ), while the most common signs found in the experimental group were tenderness in the masseter muscle (26.8%) ( $p < 0.000$ ), and pain upon posterior palpation of TMJ capsule (46.4%) ( $p < 0.000$ ).

**Conclusion:** The results shows a strong influence of nail biting on TMDs, so it is important to increase the level of awareness about the risks of nail biting habit among teenagers and parents.

**Keywords:** Biting, Nail, TMJ, Stress, and Teenagers.

### Introduction:

Oral parafunctional habits are a group of behaviors that involve the mouth, tongue and jaw; they may include bruxism, tongue thrust, and nail biting, pencil or pen chewing and thumb sucking<sup>(1)</sup>. These behaviors normally do not cause any permanent damage to the masticatory system<sup>(2)</sup>. But when the load on these tissues exceeds the limit of tolerance it might lead to what is known as Temporomandibular disorders (TMDs)<sup>(1)</sup>. TMDs as defined by the American Academy of Orofacial Pain in 2013 is a collective term for a group of musculoskeletal and neuromuscular conditions, which includes several clinical signs and symptoms involving the muscles of mastication, the TMJ, and associated structures<sup>(3)</sup>. Factors like traumatic, anatomic, pathophysiologic, genetic and psychosocial can lead to TMDs<sup>(1,3,7)</sup>. Many studies have linked the etiology of TMDs to the Oral para-functional habits and other etiological factors<sup>(4-8)</sup>. Most of the studies were considering the oral parafunctional habits as one unit while they are different in their effect on the TMJ depending on the nature, patient's age the frequency of the habit. The association between oral parafunctional habits in general (or as one unit) and TMDs was discussed in many articles. Most of the studies were done on the relationship between parafunctional habits and TMDs in children and young adults<sup>(9)</sup>, however, none of them studied the relationship specifically between NBH and TMDs.

Farsi (2003) conducting study by using questionnaire and clinical examination found that nails biting is the most

common oral parafunctional habit. He also revealed that the signs of TMDs have been observed in 20.7% of children and

the TMJ sounds were the most common sign<sup>(9)</sup>. In 2000 Gavish et. al., performed their study on adolescent girls selected from high school, they used questionnaire and clinical examination to collect the data, they found that the frequency of nail biting in girls was 25,5%.<sup>(5)</sup>

Alamoudi (2001) studied the correlation between oral parafunctional habits and TMDs and emotional status among Saudi children, a questionnaire and clinical examination were used as experimental tool to collect data.<sup>(4)</sup>

Feteih (2006) studied in Jeddah to investigate the prevalence of signs and symptoms of TMD in adolescent school children, and found that NBH was the second most frequent habit<sup>(8)</sup>.

This study dissected the oral parafunctional habits and concentrated on the relationship between NBH and TMDs.

The aim of the study was to investigate the prevalence and the association between NBH and the signs and symptoms of the TMDs through a cross sectional study.

### Material and Methods:

The sample consisted of 424 students from five different high schools that have been chosen from different geographic areas in Riyadh, Kingdom of Saudi Arabia. This study was approved by the Research Center at the college of Dentistry (CDRC), King Saud University with a protocol number (RF 0225).

At the beginning, a simple ‘yes-no-sometimes’ question (do you bite your nails?) was given to the students. Then two different groups were made depending on their answers; the experimental group (224 students) was those who answered ‘yes’ while the control group (200 students) was those who answered ‘no’, and those who chose ‘sometimes’ were excluded immediately from this study. After that a questionnaire containing 17 ‘yes-no’ questions written in Arabic language was given to the students.

The example of the questions are: “Do you have pain in your temporomandibular joint?”, “Do you use this habit to relieve stresses?”, “Do you have any psychological stresses?” (Table #1).

Students with nail biting habit answered all the questions while students without nails biting habit answered from question 12 to 17 only. Two examiners performed the clinical examination, both of them were calibrated to insure that they were standardized before each session by measuring the amount of pressure, they used regular weight scale to calibrate and read the number after pressing the scale for both of them, the average number of pressure was between 6-8kg, using the middle and index fingers bilateral palpation to examine the muscles of mastication such as: masseter, temporalis, preterigoid muscles and temporomandibular joints palpation laterally and posteriorly. Both of the examiners were purposely unaware of the results of the questionnaire.

All the data were collected and analyses were done by using SPSS statistic software program version 20. The chi square test was used and the level of statistical significance was set at a 5% level.

Questions	Yes	No
1- Do you still have nail biting habit?		
2- Have you ever try to stop nail biting habit?		
3- Do you use nail biting habit to reduce stress?		
4- Do you use this habit to relieve stresses?		
5- Have you ever inform your dentist or physician about nail biting habit?		
6- Do you have pain in your teeth while biting your nails?		
7- If you have a chance to stop this nail biting habit would you stop it?		
8- Do hobbies and sports reduce your nail biting habit?		
9- Does your nail biting habit affects the growth and shape of your nails?		

10- Have you ever break your anterior teeth because of nail biting?		
11- Have you ever been advised about the risks of continuing nail biting?		
12- Do you have pain in your temporomandibular joint?		
13- Do you have psychological stresses?		
14- Do you have any one of your family member have the nail biting habit?		
15- Are you the first member in your family?		
16- Are you the last member of your family?		
17- Do you consider nail biting as a wrong habit?		

Table #1: The questionnaire of the study (17 questions)

The examination form that has been used in this study was done according to the Research Diagnostic Criteria of Temporomandibular Joint RDC\TMJ at 1992<sup>(17)</sup> (table #2).

Clinical form Items	Yes	No
1-Pain during mouth opening		
2-Pain during Chewing		
3-Pain during Yawning		
4-Pain during Talking		
5-Jaw "locks "or "goes out"		
6-Pain in temporalis muscle during palpation		
7- Pain in masseter muscle during palpation		
8- Pain in lateral capsule of TMJ during palpation		
9- Pain in posterior capsule of TMJ during palpation		
10- Pain in protrusion of mandible		
11- Anterior disc displacement with reduction		
12- Anterior disc displacement without reduction		
13- Deviation on opening		

Table #2: The Clinical examination form

Results:

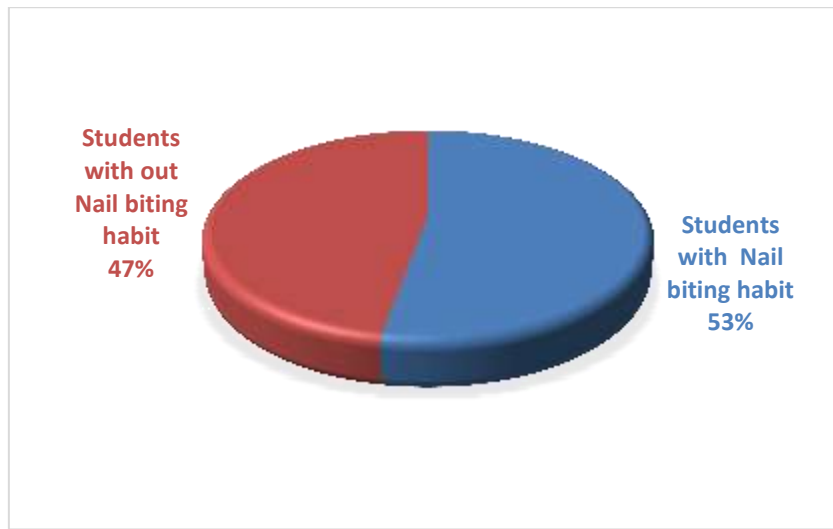
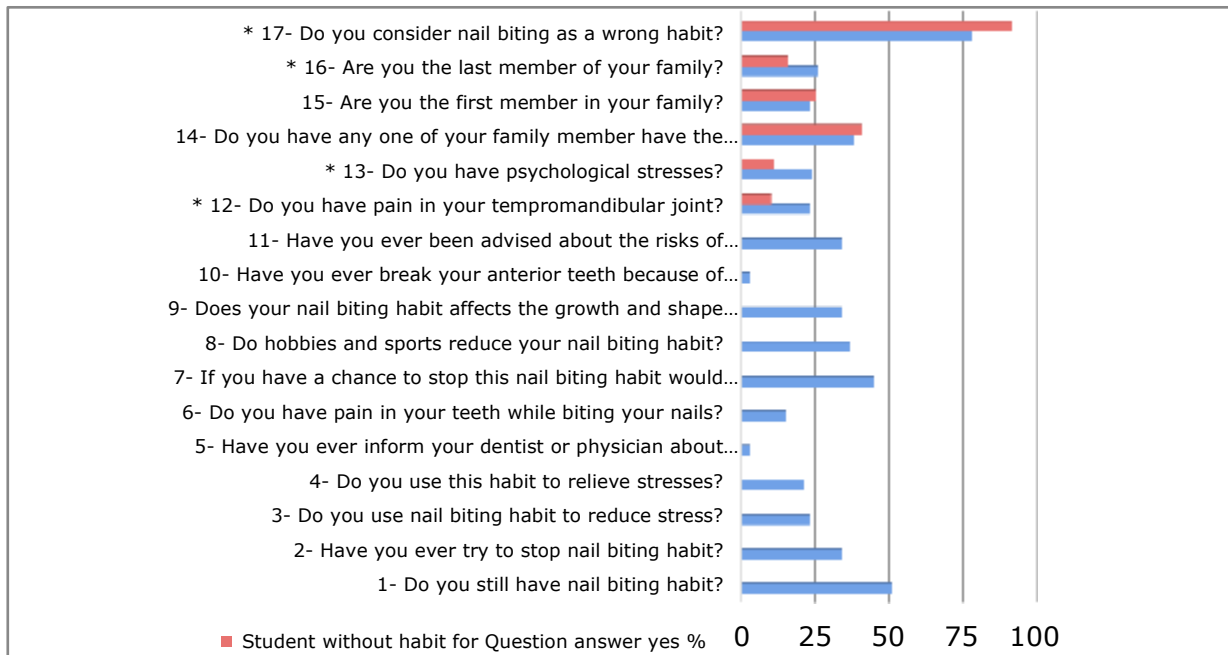


Figure #1: Sample distribution



Figure#2: Questionnaire result

\* chi-square test at a 5 % level.

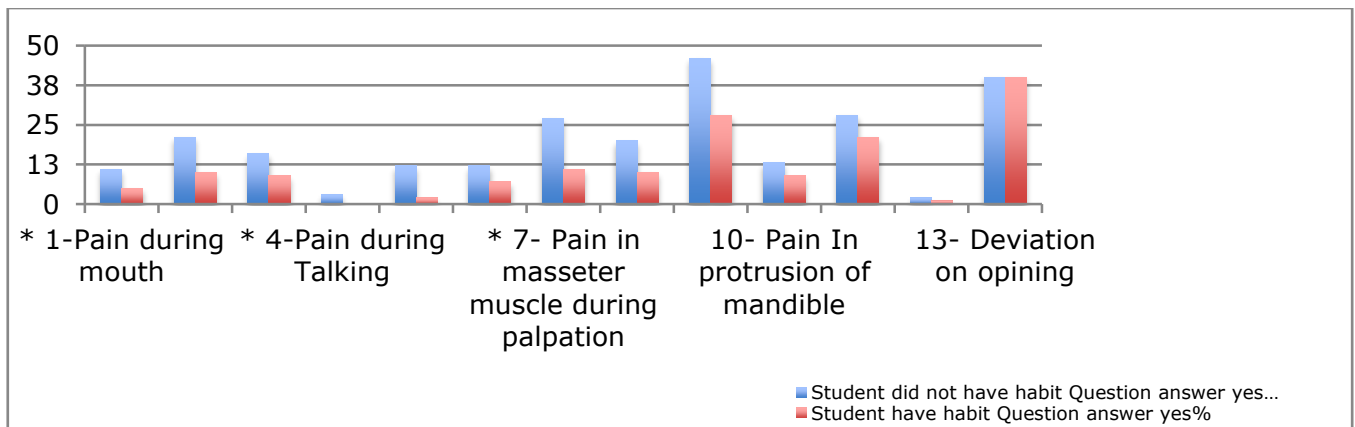


Figure 3: clinical examination form for clinical items.

\* chi-square test at a 5 % level

224 out of 424 students were having the NBH, while 200 students were not having the habit (Figure #1). Several significant results were achieved from TMJ examination: Difficulties in mouth opening, chewing, and yawning were 11.16%, 20.53%, 16.07% respectively in students with NBH with p value ( $P<0.000$ ), ( $P<0.002$ ), ( $P<0.02$ ). Pain upon masseter muscle palpation was 26.78% of students with NBH ( $P<0.000$ ). Pain in lateral and posterior TMJ palpation was 19.64%, 46.42% respectively in students with NBH ( $P<0.003$ ), ( $P<0.000$ ) (Figure 3)

In the present study, 23.87% of students with NBH reported that they have been gone through psychological stresses in their lives ( $P<0.000$ ), and 25.56% of them were the last member of their family ( $P<0.008$ ), and finally most of the students with NBH (77.67%) consider NBH as wrong behavior ( $P<0.000$ ). (Figure 2)

### Discussion:

Most of studies were done on the relationship between parafunctional habits and TMDs in children and young adults<sup>(9)</sup>, but none of them found a relationship between NBH and TMDs. To represent the prevalence and association between (NBH and the signs and symptoms of the TMDs among high school male students aged 15-19 years with average socioeconomic status, Alamoudi N. did examination on four different geographic areas in Jeddah city and selected two schools for each area<sup>(4)</sup>. But Feteih R. did random selection for schools by using a stratified statistic selection technique and finally she had six public schools from different areas in Jeddah city in Saudi Arabia<sup>(8)</sup>.

This study was performed in four different regions of Riyadh city in the Kingdom of Saudi Arabia and one school was selected for each region. The clinical examinations was done through digital palpation for the TMJ by using the middle and index fingers and no stethoscope was used according to Feteih R., Goho C. et al., and Gross A. et al.<sup>(8,15,16)</sup>. In accordance with Motghare et al., Winocur E et al., and Troeltzsch M et al., the present study showed that there was statistically significant association between NBH and TMDs<sup>(6,10,11)</sup>. However, Michelotti et al., was not considering the nail biting habit as a risk factor for TMJ, while Emodi- Perlman A et al., did not find any association<sup>(7,12)</sup>.

Alamoudi observed significant relationship between nails biting and clicking of the TMJ, and Nilner and Kopp were reported that the cheek and nails biting are common parafunctional habits by (55%) in their studies<sup>(4,14)</sup>.

Schiffman et al., (1992) and Gavish et al., (2000) have been reported that about 25% of the students with NBH were associated with Psychological stresses<sup>(5)(13)</sup>.

Schiffman et al. was reported high association between nails and foreign objects biting, could be explained as psychological

situation need to hold things in the mouth but according to our present study 23.3% of students with NBH were using this method to relief their stresses.

In this study the Masseter muscle was the most tender to palpation among the muscles of mastication during examination followed by temporalis muscle.

Pain in posterior side of the TMJ was significantly observed almost in half of the students with NBH. and pain in lateral side of the TMJ was also found around 20% of the students with NBH. A similar percentage of deviation during mouth opening was found in both groups. (Figure 3)

In this study most of the students in both groups admitted that NBH is a wrong behavior and it might harm their TMJ. In 40% of the students with NBH, one of their family members also has NBH.

More than 25% of the students with NBH were the last member in their families, and this habit may play role as a stress reliever. Therefore, it is suggested that awareness should be raised toward those who sometimes being neglected by the parents or elderly siblings.

### Conclusion:

The findings of this study indicate that there is a strong association between NBH and TMDs among teenagers. Therefore, this study suggests that nail biting should be considered as one of the important risk factors causing TMDs.

Further, the psychological stresses may have an important role in NBH among teenagers. Therefore, the psychological stresses should be taken into consideration by the clinicians while treating patients with NBH.

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### References:

1. Okeson, J.P. (2008) Management of Tempromandibular Disorders and Occlusion, 6<sup>th</sup> edn pp: 130-163. Mosby Year Book, St Louis, MO.
2. Rugh, J.D. & Ohrbach, R. (1998) Occlusal parafunction. In: A Textbook of Occlusion (eds N. Mohl, G. A. Zarb, G. Carlsson & J.D. Rugh), pp. 249-261. Quintessence Publishing Co., Inc, Chicago, IL.
3. DeLeeuw R, Klasser GD eds (2013) American Academy of Orofacial Pain. Orofacial pain: Guidelines for assessment, diagnosis, and management. 5<sup>th</sup> edition. Chicago, IL: Quintessence Publishing. 127-186.
4. Alamoudi, N. (2001) Correlation between oral parafunction and tempromandibular disorders and

- emotional status among Saudi children, *The Journal of Clinical Pediatric Dentistry* Vol. 26 No# 1/2001.
5. Gavish, A. Halachmi, M. Winocur, E. & Gazit, E. (2000) Oral habits and their association with signs and symptoms of temporomandibular disorders in adolescent girls, *Journal of Oral Rehabilitation*, 27;22-32.
  6. Motghare, V. Kumar, j. Kamate, S. Kushwaha, S. Anand, R. Gupta, N. Gupta, B. Singh, I. (2015) Association between harmful oral habits and signs and symptoms of temporomandibular joint disorders among adolescents, *Journal of Clinical and Diagnostic Research*. Aug, Vol-9.
  7. Michelotti, A. Cioffi, I. Festa, P. Scala, G. & Farella, M. (2010) Oral parafunctions as risk factors for diagnostic TMD subgroup. *Journal of Oral Rehabilitation*, 37; 157-162.
  8. Feteih, R.(2006) Signs and symptoms of temporomandibular disorders and oral parafunctions in urban Saudi Arabian adolescents: a research report, *Head & Face Medicine*. 2:25.
  9. Farsi, NM. (2003) Symptoms and signs of temporomandibular disorders and oral parafunctions among Saudi children. *Journal of Oral Rehabilitation*, 30: 1200-1208.
  10. Winocur, E. Gavish, A. Finkelshtein, T. Halachmi and E. Gazit. ( 2001): Oral habits among adolescent girls and their association with symptoms of temporomandibular joint disorders. *Journal of Oral Rehabilitation*, 28; 624-629.
  11. Troeltzsch, M. Cronin, RJ, Brodine, AH. R. Frankenberger, K. Messlinger, ( 2011) : Prevalence and association of headaches, temporomandibular joint disorders, and occlusal interferences. *Journal of Prosthet Dent*. 105: 410-417.
  12. Emodi-Perlman A, Eli I, Freidman-Rubin P, C. GOLDSMITH, S. REITER1 and E. WINOCUR .( 2012): Bruxism, oral parafunctions, anamnestic and clinical findings of temporomandibular disorders in children. *Journal of Oral Rehabilitation*, 39; 126-135.
  13. Schiffman, E.L., Fricton, J.R. & Haley, D. (1992): The relationships of occlusion, parafunctional habits and recent life events to mandibular dysfunction in a non-patient population. *Journal of Oral Rehabilitation*, 19; 201.
  14. Nilner M, Kopp S (1983): Distribution by age and sex of functional disturbance and disease of the stomatognathic system in 7-18 years old . *Swed Dent J* 7:191-198
  15. Goho C, Jones HL(1991) : Association between primary dentition wear and clinical temporomandibular dysfunction. *Pediatr Dent*. 13:263-266
  16. Gross A, Gale EN: A prevalence study of the clinical sign associated with mandibular dysfunction . *J Am Dent Assoc* 1983, 107:932-936
  17. Dworkin SF, Leresche L. Research diagnostic criteria for temporomandibular disorders: review, criteria, examinations and specifications, critique. *J Craniomandib Disord Facial Oral Pain* 1992;6:301-55