Prevalence of Temporomandibular Disorder among Schoolchildren in Jordan

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ABSTRACT

Purpose: The purpose of this study was to evaluate the prevalence of temporomandibular disorders (TMDs) in schoolchildren.

Materials and methods: In this study a questionnaire taken as part of RDC/TMD of the samples on TMD symptoms. The samples were school students, who were of the age range 15–17 years old (n = 396), 200 are males and 196 are females. All from eight randomly selected schools. They were asked to answer the questionnaire in their classrooms.

Results: The prevalence of periauricular pain was 29.0%. More males were affected by TMD than females and most of the affected students were of ages 16 and 17 years old. Severe depression occurs in 69.6% of the affected students with periauricular pain. Periauricular pain resulted in low disability low-intensity pain (grade I) in 64.9%.

Conclusion: Based on the results obtained it can be concluded that: (1) Data obtained from the questionnaire identified a nearly lower percentage of TMD in schoolchildren than most of the studies published in the literature; (2) Comparing with females, males with TMD had a higher disability, depression, and non-specific symptoms with and without pain.

Clinical significance: Temporomandibular disorder in adolescents is relatively high, in addition, the accompanying pain and depression that is high to worsen the condition.

Keywords: Pain, Periauricular, Prevalence, Temporomandibular disorder.

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INTRODUCTION

The temporomandibular joint (TMJ) is the joint that produces the articulation of the mandibular condyle with the temporal fossa of the temporal bone. The joint includes two compartments separated by a biconcave disc. This joint produces two movements during its function are rotational and transitional; in the rotational movement, the condyle rotates in its position (motionless move), while in the transitional move the condyle with the disc moves anteriorly.

There is increased attention toward temporomandibular disorders (TMDs) in children and adolescents in the past 30 years. When the activity passes the physiological tolerance of an individual, this can produce damage to the TMJ, musculature, or dentition. Temporomandibular disorder was defined in all the past studies; by the presence of one or more signs and symptoms listed in each clinical examination and questionnaire investigation.1 Temporomandibular disorder has been clinically characterized by describing signs only or a combination of signs and symptoms.2

The American Dental Association (ADA) has suggested the term TMDs; to describe a group of abnormalities that are characterized by: pain in the TMJ, the muscles of mastication, or periauricular area with deviation or limitation in the range of motion of TMJ, also noises in the TMJ during the mandibular function.3

The major challenge in identifying TMD rises from its complicated association with other structures of the head, the neck, and the scapular girdle. In addition to the large variety of signs and symptoms associated with TMJ by these structures and vice versa. The importance of epidemiology regarding TMD concerns the understanding of several symptomatic associations and therapeutic strategies, allowing the establishment of prevention and control programs.4

Temporomandibular disorder represents a general health problem, and in many situations, if diagnosed too late, it will move into a state of irreversible damage of the intra-capsular TMJ components.1 Temporomandibular disorder pain confirmed as a condition of principal public health value with a prevalence of about 10% in adults.2

The etiology of TMDs continues as a subject of debate, particularly concerning the role of occlusion.3

It is pleasing to note that the incidence of signs and symptoms usually raised with age. Magnusson et al. studied 119 over 4 years and inscribed a significant rise in signs and symptoms of TMD with age.6

The objectives of this study are: (1) to assess the psychosocial condition of TMD, in terms of chronic pain dysfunction (i.e., pain intensity and reliability, and disability), depression, and non-specific physical symptoms. (2) To assess the limitations in the ability to use the jaw.

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This study assessed the prevalence of TMD in schoolchildren in the north of Jordan.

Literature Review
Some investigators have suggested that oral parafunctions are possible factors in the etiology of TMD in patients with younger age.

To conclude from the outcomes of epidemiological and more new clinical studies, the questionnaire has some advantages. Researchers insisted that it is more trustworthy than the clinical interview and other methods, as it excludes the expectations and biased opinions of the examiner. A questionnaire tries to promptly identify patients who may have TMD, so helping the dentist to perform a precise diagnosis.

The prevalence of TMD has been broadly studied for diverse populations, e.g., in different cultural regions, environments, and children. Though, the outcomes for older cases have been incompatible: some studies have stated that the frequency of symptoms of TMD was alike for different age groups; others have noticed that it was lower among older cases.

By the end of 1998, there is only one study that described the prevalence of TMD’s signs and symptoms among Saudi children aged 3–7 years. A total of 12 schools of Saudi Arabia, in Farsi’s study in 2003, with a total of 1,976 children selected. The prevalence of TMD signs was 20.7%, with the most frequent sign of TMD was joint sounds with a percent of 11.8%. The next most common sign is restricted mouth opening, and its percent was 5.3%. Muscle pain TMJ pain, as well as the deviation in jaw opening, occurred unusually.

Temporomandibular disorder symptoms as described by the parents were apparent in 24.2% of the answered questionnaires. The most frequent symptoms were a headache with 13.6% and pain on chewing with 11.1%. The incidence of headache reported as significantly increased in primary compared with permanent dentition. The least common oral parafunction was bruxism with 8.4%, while the most common was nail-biting with 27.7%.

Various studies have investigated the prevalence of TMD and revealed that from 33 to 86% of the population exhibits at least one sign of TMD, and from 12 to 51% of the population reported perception of symptoms. Older citizens more often presented objective symptoms of TMD as joint sound on opening with 38%, but rarely suffered from pain, so there is no pain at rest or joint pain and rare muscle pain of 12%. On the opposite, young subjects rarely showed objective symptoms, so joint sounds of 7% but suffered more frequently from pain; facial with 7%, joint pain with 16%, muscle pain with 25%. In young cases, there is a higher mandibular range of motion.

Two hundred and fifty-four senior dental students (159 males, 95 females), this study of schoolchildren was done to define the prevalence of TMD. In addition, object analysis was performed to find out if there were any differences related to sex in children. The percentage of who has more than four “yes” answers was 5.66% in males and 15.79% in females, and the difference between males and females was significant ($p < 0.001$).

A total of 140 Indians attending a mobile dental health caravan in Ecuador were examined subjectively and objectively for symptoms and signs of TMD using a manner similar to that used in earlier studies. There was a prevalence of 63% having at least one sign.

Temporomandibular disorder is a common pain disorder affecting up to 15% of North American adults, Pain in TMJ or the muscles of mastication are the predominant symptoms of the disorder. Temporomandibular disorder disorders have their highest prevalence among women during their reproduction years. They are one and a half to two times less prevalent in men than in women in the population. Temporomandibular disorder is now generally considered to be one of the health risks linked to malocclusion. Symptoms and signs of TMD and their association with malocclusion have been less extensively studied in children and adolescents. A raised prevalence of headache and TMJ clicking with age and higher prevalence in girls compared with boys have been declared. Nilner reported in a review that the prevalence of TMD varied from 12 to 58% in different epidemiological studies.

The need for stomatognathic treatment in a population of adolescents and young adults has been approved to be 5–27%.

Materials and Methods
A descriptive cross-sectional study was used to investigate the prevalence of TMD in a group of school students.

A random cluster sample was selected from the Bani Kenanh schools in the north of Jordan that contains 13 male secondary schools while the number of female secondary schools is 19. Four female schools were selected are Kufor Som, Um Qais, Saham, and Khajra schools. And four male schools were selected are Kufor Som, Saham, Malka, Hubras schools with a total of 396 students (196 males and 200 females) with an age range between 15 years and 17 years, and about 10 of the students refused to complete the questionnaire. Only the tenth and first secondary classes were asked to answer a 23-item questionnaire by giving the questionnaire to the students at school and any unclear question has been explained to the students. The questionnaire was translated into the Arabic language by an English specialist with the help of a dentist and then re-translated into the English language again to be sure that its translation to the Arabic language is right. The questions related to sexual activity are omitted because the questions are sensitive and unacceptable in our society. A question related to races was canceled too because the sample was chosen from a rural area and there are no racial differences and the question about the date of birth changed to ask about age in years. The process of collecting data was started by posting a document to the ministry of education.
The benefit of the questionnaire is that the individual can view the question calmly or that their guardians can help their children.1

The questionnaire is a Research Diagnostic Criteria for TMD also named RDC/TMD that has been developed by Doworkin et al. in 1992 to create valid and reliable standardized diagnostic criteria for defining and/or classifying the different types of TMD. RDC/TMD involves two sections:

Axis I: called the clinical TMD conditions and measures physical findings. Named the pain-related disability and psychological situation that assess the TMD, in terms of depression, chronic pain dysfunction, and unspecific physical symptoms.

Axis II: involve questions about pain-related disability, chronic pain, and a scale of scoring pain with interference of activity from 1 to 10. So, our concentration was based on Axis II.

Results
This study included a total of 396 schoolchildren aged between 15 years and 17 years. The sociodemographic features of the subjects have been described in Table 1. About 12.6% were 15 years old, where the majority were between 16 years and 17 years old. The proportion of males was similar to that of females. More than 90% of participants have good to excellent general health, and nearly the same proportion have good to excellent oral health. The prevalence of periauricular pain expressing TMD was 29%.

Table 2 shows how the prevalence of periauricular pain is affected by self-reported oral and general health, as well as sociodemographic characteristics. The prevalence of periauricular pain was dependent on gender, class, and general health. Around 40% of 15 years old children, 28.2% of 16 years old children, and 27.4% of 17 years old children had periauricular pain. About 41.5% of the males and 17.6% of females had periauricular pain with a significant difference, observed from the table. Of the students of the tenth class, there was 34%, and from the students of the eleventh class, 24.5% had periauricular pain.

Disability, depression, pain, and unspecific physical pain with and without the pain of students with periauricular pain described in Table 3; Males had more disability, depression, and unspecific physical symptoms than females. The bulk of students with TMD are grade I, i.e., low disability-low-intensity pain, which represents about 64.9%, while nearly the same majority had severe depression representing 69.6%, this is with significant difference between males and females. Fifty-three percent of students with TMD have severe not specific physical symptoms without pain and 57.4% have severe not specific physical symptoms with pain. It worth noting that 0% of the females have high disability-severely limiting pain (grade IV).

Assessment of the limitation of ability to use the jaw in students with periauricular pain depicted in Table 4; showed that the limitations to using the jaw were all more common in males than females with no significance in the differences. It was found that the most common limitation is the jaw pain limit certain activities that represented 51.3% and stiffness in the jaw with a percent of 46.0%, and headache that represented 45.2%. It should be mentioned that

Table 1: The sociodemographic characteristics of participants

| Variables                  | N (%)       |
|----------------------------|-------------|
| Age                        |             |
| 15 years                   | 50 (12.6)   |
| 16 years                   | 175 (44.2)  |
| 17 years                   | 171 (43.2)  |
| Gender                     |             |
| Male                       | 196 (49.5)  |
| Female                     | 200 (50.5)  |
| Class                      |             |
| 10th grade                 | 201 (50.8)  |
| 11th grade                 | 195 (49.2)  |
| General health             |             |
| Excellent                  | 155 (39.1)  |
| Very good                  | 165 (41.7)  |
| Good                       | 54 (13.6)   |
| Accepted                   | 14 (3.5)    |
| Bad                        | 7 (1.8)     |
| Oral health                |             |
| Excellent                  | 117 (29.5)  |
| Very good                  | 169 (42.7)  |
| Good                       | 80 (20.2)   |
| Accepted                   | 19 (4.8)    |
| Bad                        | 10 (2.5)    |
| Periauricular pain         |             |
| Yes                        | 115 (29.0)  |
| No                         | 281 (71.0)  |

Table 2: Prevalence of periauricular pain by sociodemographic, general, and oral health

| Variable                  | Yes N (%) | No N (%) | Total N | p value |
|---------------------------|-----------|----------|---------|---------|
| Age                       |           |          |         |         |
| 15 years                  | 20 (40.0) | 30 (60.0)| 50      | 0.205   |
| 16 years                  | 49 (28.2) | 125 (71.8)| 174     |         |
| 17 years                  | 46 (27.4) | 122 (72.6)| 168     |         |
| Gender                    |           |          |         |         |
| Male                      | 80 (41.5) | 113 (58.5)| 193     | 0.00    |
| Female                     | 35 (17.6) | 164 (82.4)| 199     |         |
| Income                    |           |          |         |         |
| <250                      | 65 (29.0) | 159 (71.0)| 224     | 0.873   |
| >250                      | 50 (29.8) | 118 (70.2)| 168     |         |
| Class                     |           |          |         |         |
| 10th grade                | 68 (34.0) | 132 (66.0)| 200     | 0.038   |
| 11th grade                | 47 (24.5) | 145 (75.5)| 192     |         |
| General health            |           |          |         |         |
| Excellent                 | 35 (22.7) | 119 (77.3)| 154     | 0.011   |
| Very good                 | 47 (28.7) | 117 (71.3)| 164     |         |
| Good                      | 26 (48.1) | 28 (51.9)| 54      |         |
| Accepted                  | 5 (38.5)  | 8 (61.5) | 13      |         |
| Bad                       | 2 (28.6)  | 5 (71.4) | 7       |         |
| Oral health               |           |          |         |         |
| Excellent                 | 28 (24.1) | 88 (75.9)| 116     | 0.392   |
| Very good                 | 51 (30.5) | 116 (69.5)| 167     |         |
| Good                      | 29 (36.3) | 51 (63.8)| 80      |         |
| Accepted                  | 4 (21.1)  | 15 (78.9)| 19      |         |
| Bad                       | 3 (30.0)  | 7 (70.0) | 10      |         |
The prevalence of temporomandibular disorder in Jordan was studied. Jaw-made grinding noise occurred in 17.4%, clinching during night occurred in 32.2%, and during the day is 38.3%.

In Table 5, average incomes for males and females are $(262.8 \pm 200.3)$ and $(310.1 \pm 149.5)$, respectively. The average time of facial pain is $5.1 \pm 2.0$ for males and $3.2 \pm 3.2$ for females, and if pain persists $>1$ year, the mean for males is $1.06 \pm 1.12$, and for females, it is $1.03 \pm 1.26$. When students were asked to rate their facial pain, the intensity of the worst pain, and intensity of the average pain on a graduated scale, the means are $3.5 \pm 2.0$, $4.0 \pm 2.5$, and $3.3 \pm 2.4$ for males and: $3.1 \pm 2.0$, $3.3 \pm 2.6$, and $3.1 \pm 2.4$ for females, respectively.
The prevalence of Temporomandibular Disorder in Jordan

All of the above variables showed insignificance between males and females except for four variables that are pain interfere with student’s usual activities, number of disability days, the mean for depression, and the mean for disability points.

**DISCUSSION**

The variety of TMD prevalence among different studies has been ascribed to the differences in the ages of different samples, sample size, and composition.\(^7\) The prevalence of head pain has been investigated widely in medical research and has seldom been connected with the presence of TM disorders in the dental literature.\(^7\)

Farsi reported that the prevalence of TMD among Saudi children was 20.7%. It had been noted that his age group nearly close to that of this study, and the prevalence too. Farsi’s study used the questionnaire as well as the clinical examination, but TMD symptoms were described in 24.2% of the returned questionnaires, which will be closer to the prevalence of this study.

Nekora-Azak proposed that there is a potential link between its TMD pathogenesis and female hormones. The survey of the literature showed that most of the patients treated for TMD are women.\(^15\)

Opposite to other studies, this study showed that males are more affected by TMD than females with a significant \(p\) value; this may be related to lower ages or low educational levels. The demand for further studies in Jordan may be essential in this age group and elder once.

Among TMD prevalence studies, the study by Nassif et al. noted that there are positive TMD findings in 69%, including muscle disorders with 23%, joint disorders with 19%, or both with 27%.\(^10\)

In addition, a study by Solberg et al. correlates positively with the study by Schiffman et al. where 65% of 739 university students had one or more symptoms/signs of TMDs.\(^16,17\)

In this study, the prevalence of facial pain indicating TMJ pain is 29.0% used the classification for depression disability and showed that severe depression found in a total of 69.6% of whom have facial pain and grade VI disability found in only 2.6% of the total of whom have facial pain and it has been found here that as the age increases the symptoms increases too and this is in agreement with previous studies.\(^18–20\)

This survey consisted of 23 interrogatories that covered relevant symptoms and studied the subjective reactions to symptoms. In addition to joint sounds, the other symptoms assessed in TMD include headache, grinding, and clenching.

In Farsi et al.’s study, clicking was the most common sign of TMD clinically; and the absence of crepitus in children and adolescents is in harmony with similar findings published earlier.\(^21\)

In one study,\(^22\) 34% of 80 dental cases described having recurring headaches; however, an increasing sample in other studies reported a prevalence between 12.5 and 24%.\(^16,23,24\)

In Chuang’s study for headache was 16 54%. It has been inferred that the prevalence of listed signs and symptoms of TMD will depend hugely on the ways of judgment.\(^9\)

In this study, the prevalence of headache or migraine is 45.2%, which is much higher than that of the study by Chuang, but sometimes many other conditions are correlated with headache, so its presence solely cannot be a measure of TMD.

In this study, difficulty or pain in mouth opening, in addition to joint sounds, the other symptoms assessed in TMD include headache, grinding, and clenching.

In this study, difficulty or pain in mouth opening, in addition to joint sounds, the other symptoms assessed in TMD include headache, grinding, and clenching.
However, Bagis et al.'s study showed a very high prevalence of TMJ disease compared with the result of this study and that was exceeding the rate described in the study by Farsi et al., this could be explained by a relatively higher average age range as well as the type of the sample that was selected in the study who were patients referred to the prosthodontic department (Table 6). 25

Finally, Weiss et al. measured the prevalence in arthritis patients where the gender distribution seems similar to this study, where he observed that the males were at a higher prevalence of TMJ disease. 26

**Conclusion**

Based on the results obtained, it can be concluded that:

- Data gathered by the survey questions recognized a nearly lower percentage of TMD in schoolchildren than most of the studies published in the literature
- Comparing with females, males with TMD had a higher disability, depression, and unspecific symptoms without and with pain.

**Recommendations**

At the end of the study, it was recommended that:

- Further studies were required to clarify the prevalence in other age groups.
- This age group needs some actions to prevent or treat TMD and decrease the pain, depression, and disability that resulted from it.

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