

Temporomandibular Disorders: A cross Sectional Study into the Knowledge and Awareness Among Saudi Arabian Population

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Abstract

Temporomandibular disorder (TMD) is a group of clinical troubles and is considered one of the major causes of non-dental pain. TMD is characterized by a wide range of signs and symptoms associated with TMJ and other related structures that negatively affect the Quality of life (QoL). This study investigated the public knowledge about TMD among people living in the Kingdom of Saudi Arabia's main cities and provinces. An electronic survey was designed, containing 16 questions in Arabic and English. The survey was distributed via email and other social media platforms. Six hundred and four participated in the survey; 18 participants were excluded from the study as they refused to sign the consent form. The participants' ages ranged from 18-65 years old, and 68% ranged from 18-30 years old. The knowledge score about TMD was out of 9; the participants were categorized into three groups; group 1 had a low knowledge level, scored 1-3, and their percentage was 38%. Group 2 had an intermediate level of knowledge; their score was 4-6, and their percentage was 46%. Group 3 had a high knowledge level, scored 7-9, and their percentage was 16%. 50.5% of participants answered that females are at greater risk of developing TMD, and 60% believed that children could also have it. 22.7% of participants voted for dentists as a qualified specialty to treat TMD, and 74.5% chose physicians. The present survey data revealed inadequate knowledge about TMD. Awareness programs might be necessary for improving public awareness.

Keywords: TMD, Survey, Quality of life, Saudi Arabia

INTRODUCTION

Temporomandibular disorder (TMD) is a multifactorial disease. It is considered the primary cause of non-dental pain. Lack of knowledge concerning orofacial pain, particularly in children and adolescents, could be a significant boundary to adequate pain management [1]. The etiology of TMD incorporates the following factors; biological, environmental, social, emotional, and cognitive triggers [2]. The clinical manifestation of TMD may involve but is not limited to TMJ pain, restricted jaw movement, muscle tenderness, intermittent joint sounds, and headaches that negatively influence the Quality of life (QoL) [3, 4]. Not only does it affects the Quality of life, but also, it can be associated with impaired general health, depression, and other mental inabilities [5].

As Temporomandibular Disorders have a negative effect on an individual's Quality of Life (QoL) and burden on the health care system, adequate public knowledge about TMD could help in the TMD early diagnosis and treatment to improve an individual's Quality of life (QoL) and decrease the burden on the health care system.

The prevalence of TMD in different countries ranges from 4-46%. The prevalence rate of TMD in Saudi Arabia is 27.4 %, Poland at 26.5%, Brazil at 33.2 %, Mexico at 46.1%, and Lebanon at 19.7 %, while the prevalence in Sweden is 4.2 % and Norway at 7% [6-13]. Early diagnosis and treatment of TMD are critical to reduce the risk of developing chronic pain and prevent possible irreversible articular tissue destruction [14]. Therefore, this study aimed to investigate the public knowledge about Temporomandibular disorders among the Saudi Arabian

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population.

MATERIALS AND METHODS

An exemption of the Institutional Review Board (IRB) was obtained from the IRB committee of Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia (IRB registration number with KACST, KSA: (H-01-R-059). This multicenter cross-sectional survey aimed to investigate the public knowledge about Temporomandibular disorders among the Saudi Arabian population.

An electronic survey designed for this study containing 16 questions, written in two languages, Arabic and English, was distributed to people living in Saudi Arabia's main cities and provinces.

According to the general authority of statistics, the population of Saudi Arabia is approximately 34,218,169 [15]. based on this, population Estimates with a 0.05 margin of error, a 95 % confidence level, and a response rate of 50%. The minimum sample size is 385. However, to account for sampling error and variability between the characteristics of our sample and the general Saudi population, the targeted sample size was 600 Participants. Similarly, calculations were performed at the 95% confidence level using a free online sample Size calculator (<https://www.calculator.net/sample-size-calculator.html?type=1&cl=95&ci=5&pp=50&ps=500&x=76&y=28>). The survey was distributed via email and other social media platforms to join the online survey voluntarily and anonymously. All participants had to sign an informed consent by checking the agree box, indicating their willingness to complete the questionnaire. Descriptive analysis was done and an independent t-test using IBM SPSS Advanced Statistics 28.0.1.1. Descriptive data, frequency, percentage, means(M), and standard division (SD) were used for comparison. P-value was 0.05.

RESULTS AND DISCUSSION

Participant's Demographic Data

A total number of 604 participants agreed to participate. The participant's demographic data are presented in **Table 1**. 72.3% of the sample were female, and most participants' ages ranged from 18-30 years old and from the central region of Saudi Arabia. 65.8% of the sample size had a bachelor's degree.

(94.5%) of the participant were Saudi, and 2.6% were non-Saudi. 35.5% of participants had private medical insurance, and (61.6%) had governmental coverage for healthcare.

Table 1. Demographic details of the study participants.

| Questions | Frequency and percentage (%) |
|-----------|------------------------------|
|-----------|------------------------------|

| | |
|---|-------------|
| Consent | |
| Agree | 604 (97.1%) |
| Disagree | 18 (2.9%) |
| Gender | |
| Male | 154 (25.5%) |
| Female | 450(74.5%) |
| Age | |
| 18-30 | 411 (68%) |
| 31-40 | 110 (18.2%) |
| 41-65 | 81 (13.5%) |
| More than 65 | 02 (0.3%) |
| Region | |
| Northern region | 18(2.9%) |
| Southern region | 117(18.8%) |
| Western Region | 03(0.5%) |
| Eastern Region | 160(25.7%) |
| Central Region | 306(49.2%) |
| Education | |
| High school | 152(24.4%) |
| Bachelor degree | 409(65.8%) |
| Master degree | 38(6.1%) |
| Ph.D. or equivalent | 04(0.6%) |
| Not educated | 01(0.2%) |
| Nationality | |
| Saudi | 588 (97.3%) |
| Non- Saudi | 16 (2.7%) |
| Do you have private medical insurance? | |
| Yes | 221 (36.5%) |
| No (Have governmental coverage only) | 383(63.5%) |

The frequencies of gender, age, region, nationality, education, and medical insurance of participants are mentioned in **Table 1**. Majority of the participants belonged to central province (49.2%), having bachelor degree (65.8%), 97.3% were Saudis and 36.5% had medical insurance.

Participants' Knowledge about Temporomandibular Disorders

Possible symptoms of TMD are presented in **Table 2**. (23.2%) of participants chose headache, (20.7%) chose earache, (20.4%) chose neck pain, (16.9%) chose the sound of the joint clicking while opening and closing the mouth, (9.9%) chose pain in the area of TMJ, and (8.9%) chose limited mouth opening.

Regarding the affected gender of TMD, 52% of participants believed that females were at greater risk of developing TMD, and 48% chose males. 60% believed that children could also have a risk of developing TMD.

Of those eligible professionals to treat TMD, (22%) of participants chose a dentist, and (74.5%) believed that physicians could treat and manage TMD. (8.7%) of the total sample that had been diagnosed with TMD, (22%) underwent limited mouth opening, followed by (21%) had to pain in the Temporomandibular joint area, then (18%) had a headache.

Most affected people received oral stents as a treatment option. (64%) improved with an oral stent and physiotherapy as the most affected treatment option, followed by painkillers and jaw exercise.

| Table 2. Participant's Knowledge of Temporomandibular Disorders | |
|---|---------------|
| Questions | Frequency (%) |
| What are the possible symptoms of Temporomandibular Disorders? | |
| Headache | 140 (23.2%) |
| Earache | 125 (20.7%) |
| Neck Pain | 123 (20.4%) |
| Sound of the joint clicking while opening and closing the mouth | 102 (16.9%) |
| Pain in the area of the Temporomandibular joint | 60 (9.9%) |
| Limited mouth opening | 54 (8.9%) |
| Who is at risk for developing TMD? | |
| Male | 290(48%) |
| Female | 314(52%) |
| Are children at risk of developing TMD? | |
| Yes | 373 (62%) |
| No | 231 (38%) |
| Who is qualified to treat and manage TMD? | |
| Physician. | 450(74.5%) |
| Dentist | 137 (22.7%) |
| General Practitioner | 17 (2.8%) |
| Have you been diagnosed with TMD before? | |
| Yes | 54 (8.9%) |
| No | 550 (91.1%) |
| What were your symptoms? | |
| Headache | 26 (18 %) |
| Earache | 18 (13 %) |
| Neck Pain | 13 (9 %) |
| Sound of the joint clicking while opening and closing the mouth | 24 (17 %) |
| Pain in the area of the Temporomandibular joint | 29 (21%) |
| Limited mouth opening | 31 (22%) |
| What was the treatment that has been provided to you? | |
| Physiotherapy and jaw exercise | 14 (26%) |
| Oral stent | 22 (40.7%) |
| Pain killers | 13 (24.1%) |
| Surgical intervention | 5(9.2%) |
| Have you noticed any improvement from the treatment given? | |
| Yes | 34(63%) |
| No | 20 (37%) |
| Which treatment options do you received and noticed improvement? | |
| Physiotherapy and jaw exercise | 11 (32.3%) |
| Oral stent | 11 (32.3%) |
| Pain killers | 8 (23.6%) |
| Surgical intervention | 4(11.8%) |

Participant's Knowledge Score about Temporomandibular Disorders is Presented in Table 3

38% of the participants had scored from 1-3 out of 9 related to their knowledge of Temporomandibular Disorders, and

46% of the participants had achieved 4-6 out of 9 in their understanding. Hence, 16% of the participants had scored from 7-9 related to their knowledge of Temporomandibular Disorders. The mean value of scores was 4.33 with a standard deviation of ± 1.88 .

Table 3. The score of people's knowledge about TMD

| The score of people's knowledge about TMD | | |
|---|-------------|-----------------|
| Score | Frequency % | Mean \pm SD |
| 1-3 | 38% | 4.33 \pm 1.88 |
| 4-6 | 46% | |
| 7-9 | 16% | |

Comparison of People's Knowledge about TMD Across Gender, Insurance Status, and Diagnosis of TMD

The Independent T-test showed no statistically significant difference in gender; females scored (4.49 ± 1.86) compared to males ($3.85, \pm 1.86$) with a P value of 0.883. However, there was a statistically significant difference across insurance status. Participants without insurance and governmental coverage for health care scored (4.45 ± 1.94) compared to those with private insurance (M 4.11 ± 1.76) with a p-value of 0.026. There was a statistically significant difference across people with or without a TMD diagnosis. Participants diagnosed with TMD had a higher mean value (5.11 ± 2.26) than those who were not diagnosed with TMD (4.25 ± 1.82), and P-value was 0.002 (Table 4).

Table 4. Independent T-test across Gender, Insurance Status, and people diagnosed with TMD or NOT

| Variable | Results (Mean \pm SD) | P-value |
|-----------|---------------------------------------|---------|
| Gender | Male 3.85 \pm 1.86 | .883 |
| | Female. 4.49 \pm 1.86 | |
| Insurance | Private 4.11 \pm 1.76 | .026* |
| | governmental coverage 4.45 \pm 1.94 | |
| Diagnosis | Yes: 5.11 \pm 2.26 | .002* |
| | No: 4.25 \pm 1.82 | |

There is a statistically significant difference in the mean scores of participants grouped based on insurance and diagnosis ($p < 0.05$).
SD: standard division

The present study aimed to assess the knowledge and awareness about temporomandibular disorders in Saudi Arabia, as no published data was related to that topic in Saudi Arabia. In order to test the validity and reliability of our questions, content Validation was performed by inviting 2 experts to validate each question of the survey over a scale of 4 ranks: the question is not relevant, the question is somewhat relevant, the question is quite relevant, or the question is highly relevant. All of them ranked all questions as relevant or highly relevant. Demographic data, including

the area and facilities, were among the items analyzed. Similarly, a pilot study was performed on 30 subjects before initiation. After that, the survey spread to the targeted population.

Most participants were female, which could be due to focusing only on some social media platforms without covering the rest. In this study, the platforms used were mainly Twitter and Snapchat. In contrast, other studies show that the most used social media platforms are Facebook, followed by WhatsApp and Twitter. Snapchat ranked 6th and 7th, respectively [16]. In addition, statistics showed that Females are more active on social media than males [17].

The present study showed that people had inadequate knowledge regarding TMD, which could result from a lack of preliminary information regarding TMD, which could be related to a lack of evidence-based reachable recourses that patients could learn [7, 18, 19]. Also, this could be related to the limited knowledge of treating dentists and physicians; as previous studies show [14], the one who is responsible for giving the knowledge has limited knowledge, and this could affect public knowledge. Also, there is a lack of awareness campaigns about TMD.

Most participants marked headache, earache, neck pain, and clicking as symptoms of TMD; this coincides with the Olsen *et al.* study, which showed that the most frequent symptom on clinical examination for both genders was clicking, followed by discomfort on palpation of jaw muscles. However, the most prevalent self-reported complaint was a headache, with the clicking of TMJ coming as the second symptom [20]. Plesh *et al.* (2011) reported that 53% of individuals with TMD had severe headaches/migraines, and 54% had neck pain [21].

WHO defined quality of life as a sentient to several physicals, social, psychological, and environmental changes [22]. Moreover, any pain-related issues could impact physical and mental health. The pain resulting from the TMD could influence people's lives affecting their work, school, and social life. Therefore, one must have good physical and mental health to maintain a good quality of life [3].

The present study revealed that people believe that females are at greater risk of developing TMD, which matched the previous research findings, which reported that females had a higher probability than males of developing TMD; another study showed that the female-to-male ratio was 2:1 [23, 24]. The explanation of why females are at greater risk of TMD could be due to differences in biological and hormonal factors, as females have temporal fluctuations of hormonal states each month. The connection between hormonal changes and pain is also shown by studies that suggest that the risk of TMD pain and low back pain increases with the use of exogenous hormones and changes in reproductive hormones [25-28].

22% of the participants mentioned that dentists qualified to treat TMD problems, which contradicted the job description of dentists that indicated; that dentists are responsible for diagnosing and managing TMD disorders [29, 30] and this could be due to the low level of people's awareness about dentists' jobs and TMD. Al-Khotani *et al.* (2016) showed that the prevalence of TMD among children and adolescents was 27.2% [6]. Interestingly in the present study, 8.9 % of participants were professionally diagnosed with TMD, so there is a gap between true prevalence and professional diagnosis, which could be due to the long waiting lists in healthcare systems that necessitated the need for establishing an accessible TMD clinic.

The current study revealed that for those diagnosed with TMD, the treatment was physiotherapy or jaw exercise followed by an oral stent and painkillers. Only 4 of them had undergone surgical intervention. The majority of them noticed improvement after treatment. These results correspond with the previous study that reported physical therapy as an effective treatment method for decreasing subjective TMD pain [31].

Physiotherapy is affordable and poses little danger to the patient's health, making it a less expensive and invasive option than other treatments such as surgery. Also, other studies support the use of conservative treatment modalities as these modalities are effective in providing symptomatic relief as the several more invasive treatments [32, 33].

Regarding the association between people's knowledge and insurance status, people with government health care had almost identical scores as those with private medical insurance, meaning that the private sector takes some of the health care burdens from the governmental sector. The previous systematic review revealed the impact of public health insurance on healthcare utilization, financial protection, and health status in low- and middle-income countries. It showed that insurance coverage improved health status and higher accessibility to healthcare facilities [34]. The results of the current study agreed with the results of the previous systemic review.

The Ministry of Health in Saudi Arabia provides free healthcare services to all Saudi citizens [35]. Concerning private health insurance, it eases the pressure by moving healthcare demand to private sectors, increasing the chance of people having check-ups and getting diagnosed earlier. Moreover, they'll attain adequate knowledge and earlier awareness. In contrast, governmental Saudi Arabia's healthcare is accessible to everyone [36].

Long waiting because of patient overflow might result in receiving late treatments and knowledge.

Therefore, private health care insurance profoundly decreases some of the burdens from the public health care system. Also, the governmental healthcare sector's burden

can be minimized by increasing public awareness and providing adequate knowledge to improve individuals' healthcare.

CONCLUSION

Within the limitation of the current study, it could be drawn that the Saudi Arabian public had inadequate knowledge about TMD, which necessitates more public awareness that could help in the early diagnosis and treatment of TMD.

Recommendations

- Having credible and easily accessed evidence-based websites on TMD is critical for proper patient education.
- Implementing TMD in the dental education curriculum in dental colleges with more focus on TMD diagnosis, prevention, and patient education, in addition to creating accessible, evidence-based courses about TMD.
- Encouraging the development of dental campaigns and awareness about TMD using the different available social media platforms.
- Establishing a multidisciplinary TMD clinic.

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