



RESEARCH ARTICLE

PREVALENCE OF TEMPOROMANDIBULAR JOINT-TMJ DISORDERS IN A SAMPLE OF THE LEBANESE POPULATION

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Abstract

Objective: The aim of this study was to evaluate the prevalence of temporomandibular joint (TMJ) disorders in a sample of the Lebanese population.

Materials and Methods: This study analyzed data of TMJ disorder rates and their links to age and sex from 689 patients referred to a private dental clinic in Beirut, Lebanon, from 2012 to 2017.

Results: The overall prevalence was 17.8%, with disc displacement with reduction (DDR) most common (10.2%), followed by myalgia (6.4%) and disc displacement without reduction (DDwR) (1.2%). Prevalence peaked in the 46–60 age group (27.5%) and showed no significant gender difference.

Conclusion: This study highlights a significant prevalence of TMJ disorders among Lebanese dental patients, particularly in older age groups, underscoring the need for targeted interventions, early diagnosis, and tailored treatment strategies to improve patient care and inform future research.

Keywords: Temporomandibular Joint, disorder, prevalence, disc displacement, myalgia.

Introduction

The temporomandibular joint (TMJ) disorder pertains to a group of conditions where there is pain in the TMJ or the tissues around it, limitations in the functional movement of the mandible, or clicking sensations in the TMJ when it is in motion.¹ Pain in this area can arise from internal joint-related conditions, surrounding structures, or a combination of both factors. Possible causes of the pain include degenerative joint disease, inflammatory issues affecting the TMJ, disc displacement, and trauma.²

A 2021 systematic review and meta-analysis revealed that the worldwide prevalence of TMJ disorders, representing a significant oral health concern, is approximately 31% among the adult and elderly population.³

Because of the remarkable prevalence of this

condition, it becomes essential to precisely diagnose it. In order to diagnose TMJ disorders, a healthcare professional usually conducts a comprehensive medical history review, a thorough physical examination, and may also employ imaging tests. The diagnosis relies on the patient's reported symptoms and the findings from the physical examination.⁴

A spectrum of treatment options is available for TMJ disorders, often starting with conservative, non-invasive approaches such as physical therapy, medications including analgesics or muscle relaxants, occlusal adjustments, and intraoral splints. If necessary, interventions such as trigger point injections, electrostimulation, and surgical procedures may be considered.^{5,6}

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The most suitable treatment plan must be individualized, considering the underlying etiology of the disorder, symptom severity, patient preferences, and the potential risks and benefits of each approach. This study aims to determine the prevalence of TMJ disorders among patients seeking care at a private dental practice in Lebanon. Guided by this goal, we sought to answer the following research question: What is the prevalence of TMJ disorders among patients seeking dental care at a private practice in Lebanon, and is there an association between age, sex, and TMJ disorders prevalence in this population?

The findings of this study can be used to guide decisions regarding the allocation of resources within the practice (e.g., specialized equipment, staff training). Furthermore, it establishes a baseline for future research, allowing healthcare professionals to track changes in TMJ disorders prevalence over time within different patient groups and assess the effectiveness of prevention and treatment strategies. Notably, this research addresses a significant gap in the literature, as only one previous study⁷ had explored TMJ disorders prevalence in Lebanon. Using a comprehensive dataset from patients' diagnostic records, this study explores the potential correlations between demographic factors and the presence of different TMJ disorder groups.

Materials and Methods

Study Design

This observational study utilized a retrospective analysis of data collected from patients at a private dental practice in Mount Lebanon Governorate, Lebanon, between 2012 and 2017. The reporting of this study was guided by the Standards for Reporting Qualitative Research (SRQR) guidelines.⁸

Inclusion/Exclusion Criteria

Inclusion Criteria:

- Lebanese adults
- Males and Females

Exclusion Criteria:

- Non-Lebanese adults
- Individuals with missing age or sex data
- Patients presenting with subluxation or hyperlaxity

Data Collection and Management

Patients who first presented to the clinic between 2012 and 2017 underwent TMJ screening as part of their initial clinical evaluation. All patients provided informed consent for their anonymized data to be used in future research. All diagnoses were made by a single specialist with advanced training in occlusion and TMJ disorders, ensuring consistency of the examination. Medical and dental students, under the supervision of the research team, assisted with data entry, transferring information from clinical records into a standardized format using a pre-defined data entry protocol. This protocol included procedures for ensuring data accuracy, such as double-entry verification. Data was managed and analyzed using Microsoft Excel (Microsoft Corporation, USA) and Statistical Package for the Social Sciences (SPSS) software (IBM, 2014).

Variables

- Outcome Variable: Presence of TMJ disorders (Yes/No) based on diagnosis.
- Predictor Variables:
 - Age (continuous and grouped)
 - Sex (Male, Female)
 - TMJ disorders Subtypes:
 - Myalgia of head and neck (Yes/No)
 - Disc Displacement with Reduction (DDR) (Yes/No)
 - Disc Displacement without Reduction (DDwR) (Yes/No)

Statistical Analysis

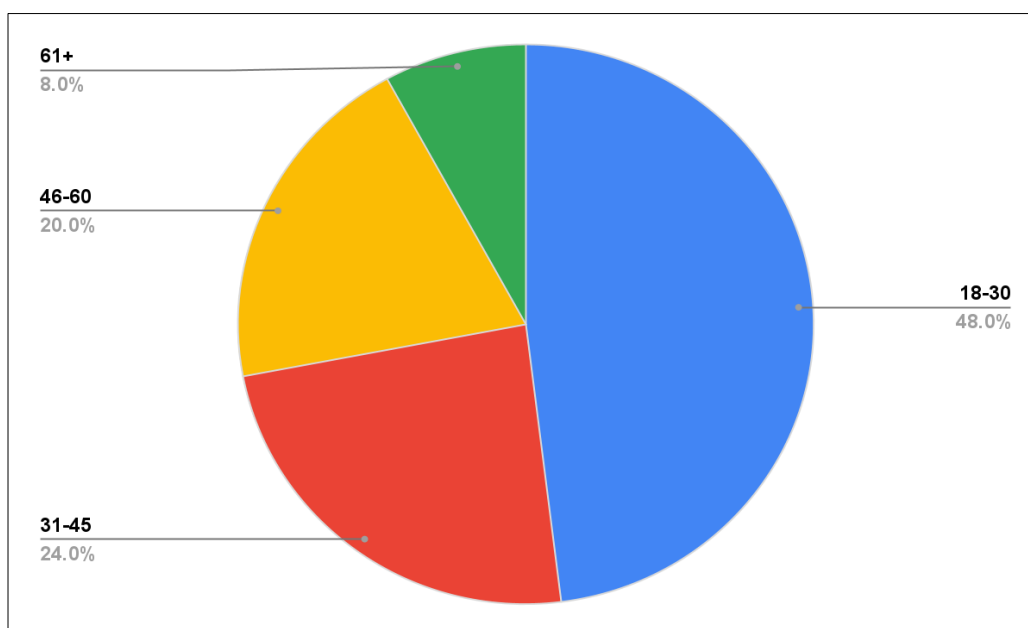
Data cleaning procedures were performed prior to analysis to identify and correct any errors in data entry. These procedures included checks for outliers, missing values, and inconsistencies. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize sample characteristics and prevalence rates. Chi-square tests assessed the association between TMJ disorders and categorical variables (age group, sex, subtypes). A p-value of less than 0.05 was considered statistically significant for all analyses.

Results

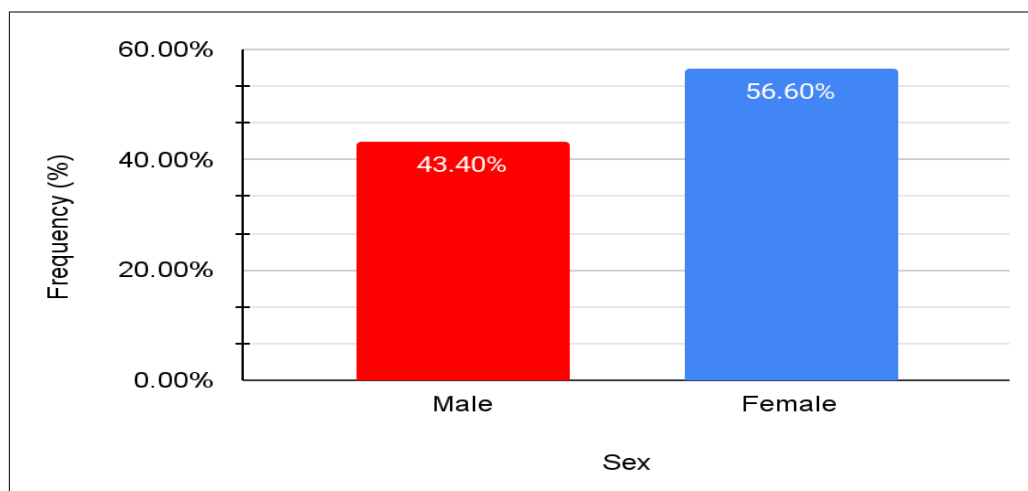
Sample Characteristics

The study sample consisted of 689 individuals. The mean age of participants in our study was 39.47 years.

The distribution of age and sex is presented in Graphs 1 and 2.



Graph 1. Distribution of participants in different age groups



Graph 2. Gender distribution of participants

Prevalence of TMJ disorders

The overall prevalence of TMJ disorders in this sample was 17.8%. Disc displacement with reduction (DDR) was the most common (10.2%), followed by myalgia (6.4%), and disc displacement without reduction (DDwR) (1.2%).

TMJ Disorders Prevalence by Age Group and Sex

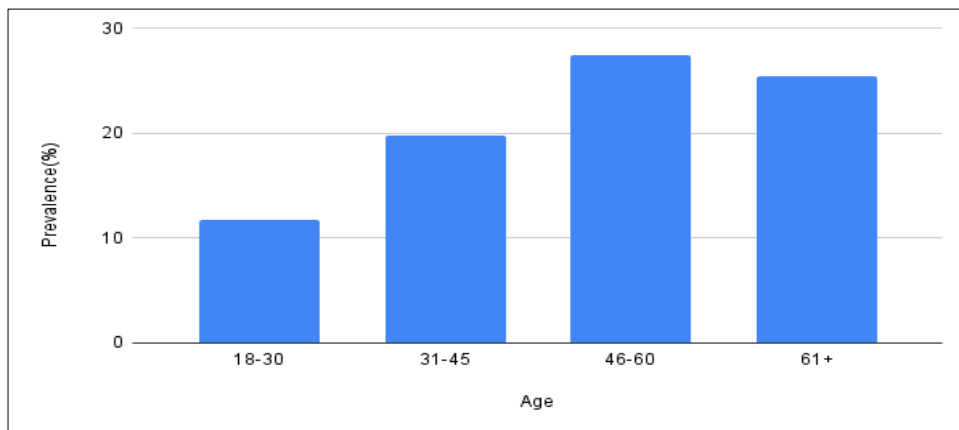
The prevalence of TMJ disorders varied across age groups and by sex.

As shown in Graph 3, the prevalence of TMD was 11.7% among individuals aged 18-30, increasing to 19.8% in the 31-45 age group and peaking at 27.5%

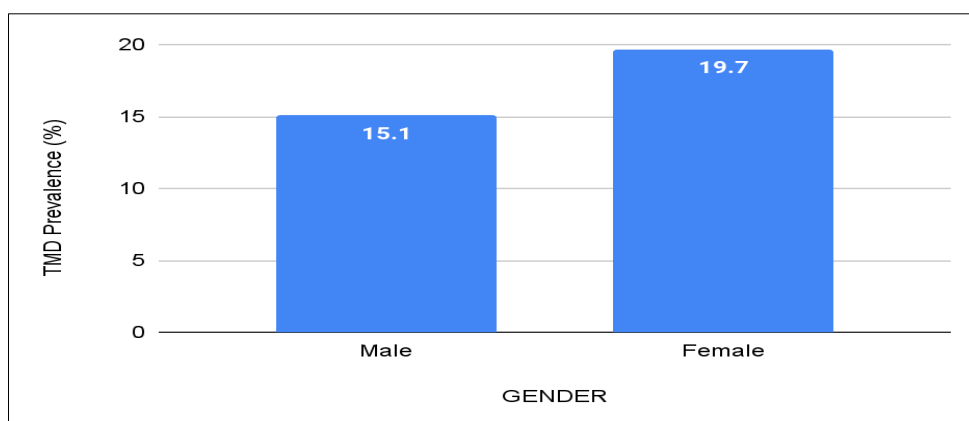
among those aged 46-60. The prevalence slightly decreased to 25.5% in the 61+ age group, suggesting that TMD is more common in middle-aged and older adults. A chi-square test confirmed a statistically significant association between age group and TMD prevalence ($p = 0.007$).

Older age groups (46-60 and 61+) demonstrated significantly higher prevalence rates compared to younger age groups. Regarding sex, 19.7% of females and 15.1% of males presented with TMD (Graph 4).

A chi-square test showed no significant association between sex and TMD prevalence ($p=0.067$).



Graph 3. TMJ disorders prevalence in different age group



Graph 4 TMJ disorders prevalence according to gender

TMJ disorders Subtype Prevalence by Granular Age Group

TMJ disorders subtype prevalence by granular age group is summarized in Table 1

Table 1: Prevalence of TMJ disorder subtypes across age groups (in percentages)

Age Group	Myalgia (%)	DDR (%)	DDwR (%)
18-27	6.1	3.0	0.0
28-37	7.4	5.9	0.0
38-47	11.6	11.6	0.8
48-57	13.7	12.0	2.6
58-67	12.5	12.5	2.8
68+	8.7	17.4	2.2

Both myalgia and DDR showed a general trend of increasing prevalence with age. While DDwR remained relatively uncommon, it also exhibited a slight increase in older age groups.

Discussion

The prevalence of TMJ disorders represents a significant global oral health burden. Our study contributes to this growing body of research by investigating the prevalence of TMJ disorders among the Lebanese population. Valesan et al. conducted a meta-analysis on different populations, suggesting a prevalence of 30% among adults.³

Consistent with previous reports from different countries, our findings revealed a high prevalence of TMJ disorders in Lebanon, with 17.8% of participants meeting the diagnostic criteria. This aligns with studies by Progiante et al.⁹ in Brazil (32.7%), Loster et al.¹⁰ in Poland (18% in 18-year-olds), and Guerrero et al.¹¹ in Chile (49.6% in adults). These changes can be attributed to the heterogeneity in diagnosis criteria as well as the variability in many areas, including cultural and other factors, among the different groups evaluated. Notably, this prevalence is slightly lower than that reported by Kmeid et al. in their Lebanese study (19.7%), which could be attributed to differences in sample characteristics, diagnostic criteria, or study methodologies.⁷

Furthermore, the strengths of our study include the large sample size of 689 participants based on clinical examination ensuring robust statistical power and representativeness. Regarding Kmeid et al.,⁷ their study involved 459 respondents who completed a survey, which is thought to be more subjective and susceptible to biases according to Berman.¹² Additionally, the rigorous data collection process, involving specialized medical professionals and supervised data entry, ensured the accuracy and quality of the data.

This current study demonstrated a statistically significant correlation between advancing age and increased TMJ disorders prevalence, emphasizing the need for age-specific clinical approaches.

Furthermore, we observed a higher prevalence among females (19.7%) compared to males (15.1%), which corresponds with the findings of Al-Khotani et al.¹³ in Saudi Arabia (59.6% females vs. 40.4% males in children/adolescents) and De Melo Júnior et al.¹⁴ in Brazil (68.7% females vs. 31.3% males in adolescents). This gender disparity in TMJ disorder

prevalence is well-documented in the literature and may be attributed to hormonal factors and psychosocial influences. Al Khotani et al. demonstrated, along with previous research, that TMJ disorders onset typically occurs after age 12, suggesting that puberty and associated hormonal changes may contribute to the higher prevalence of TMJ disorders in older age groups.¹³

These physiological transformations could potentially explain the observed increase in temporomandibular disorder symptoms with advancing age.

However, while females (19.7%) had a slightly higher prevalence of TMJ disorders than males (15.1%) in the sample, this difference was not statistically significant.

Regarding the specific subtypes of TMJ disorders, this study found that DDR was the most common (10.2%), followed by myalgia (6.4%), and DDwR (1.2%). These results are comparable to the findings of Aravena et al. in Chile, who reported prevalence rates of 39%, 8.5%, and 6.5% for myalgia, DDR, and DDwR, respectively.¹⁵

Bertoli et al. also observed a high prevalence of myalgia (10.3%) among Brazilian adolescents.¹⁶ Examining the prevalence of these subtypes across different age groups revealed that both myalgia and DDR exhibited an increasing trend with age: specifically, for each one-year increase in age, the odds of having TMJ disorders increased by 4.5%. This suggests that older individuals may be more susceptible to developing these specific TMJ disorder subtypes, potentially due to age-related degenerative changes in the TMJ or surrounding tissues. While DDwR remained relatively uncommon, it also showed a slight increase in older age groups.

These findings contribute to the growing body of literature on TMJ disorders and highlight the need for targeted interventions to address this significant health issue in Lebanon. Future research should aim to replicate and expand upon these findings, explore underlying mechanisms and risk factors, and evaluate the efficacy of various treatment modalities for improving patient outcomes and quality of life.

The retrospective nature of this study design limits our ability to draw causal inferences. Prospective, longitudinal studies are essential in assessing other risk factors such as jaw injuries and genetics and in enhancing the quality of care. This approach could be crucial for better diagnosis through early detection, preventative strategy development, and individualized treatment plans.

This study was limited to a single private practice, which limits the generalizability of the findings, as the patient population at this private practice may not be fully representative of the broader Lebanese population in terms of socioeconomic status, access to care, or other demographic factors. Further research involving a more diverse sample drawn from multiple clinics or a community-based setting would enhance the generalizability of these findings.

Conclusion

This study provides valuable insights into the prevalence and risk factors of TMJ disorders among the Lebanese population, serving as a foundation for further research, raising awareness and informing clinical efforts to improve the diagnosis, treatment, prognosis, and overall management of these conditions.

Declarations

Conflicts of interest and financial disclosures

The authors declare that they have no conflicts of interest, and there was no external source of funding for this research.

Ethical approval

The study was approved by the Institutional Ethics Committee and was conducted in accordance with the Declaration of the World Medical Association.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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The work was not funded.

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