PREVALENCE OF OROFACIAL PAIN: CONSISTENT GENDER PREDOMINANCE AND AGE-RELATED VARIATIONS ACROSS STUDIES

Kalanov A.B., Abdukadirov E.I.,
Inoyatova S.O., Abdullayeva M.B., Tairova D.Z.
Tashkent State Medical University

Abstract. Background: Orofacial pain, including temporomandibular disorders (TMD), represents a major chronic pain condition with significant impacts on quality of life. This narrative synthesis reviews contemporary epidemiological evidence on the prevalence of orofacial pain and TMD, focusing on gender and age variations.

Methods: Five key studies published between 2024 and 2025 were selected, including a global meta-analysis, longitudinal population-based research, cross-sectional young adult cohorts, retrospective clinical data, and an umbrella review. Data on prevalence, gender differences, and age patterns were qualitatively extracted and synthesized.

Results: Overall TMD prevalence ranged from approximately 26–38%, with broad diagnostic criteria yielding around 30%. A marked female predominance was consistent across all studies, with women affected 1.75–2.2 times more than men, including poorer symptom development and recovery trajectories. Age-related patterns showed peaks in young to middle adulthood (20–40 years), with painful symptoms often increasing over time and non-painful signs more common in younger groups.

Conclusion: Recent evidence reinforces persistent female predominance and age-specific peaks in orofacial pain/TMD prevalence, highlighting the need for gender-sensitive clinical approaches and further longitudinal research to address underlying mechanisms and disparities.

Keywords: Orofacial pain, Temporomandibular disorders, Prevalence, Gender differences, Age variations, Epidemiology

Introduction. Orofacial pain encompasses a diverse array of conditions affecting the face, mouth, temporomandibular joint (TMJ), and associated structures, including temporomandibular disorders (TMD), myofascial pain, arthralgia, and neuropathic pain.[1] It is one of the most prevalent chronic pain conditions globally, with population-based estimates ranging from 5% to 15% for clinically significant symptoms, though broader signs (e.g., joint sounds or mild pain) can affect up to 30-40% of adults depending on diagnostic criteria and geographic region.[2-4] Orofacial pain imposes a substantial burden, contributing to impaired quality of life, reduced functional capacity, increased healthcare utilization, and socioeconomic costs.[5]

Recent epidemiological research has reinforced marked demographic variations in orofacial pain and TMD prevalence. Gender emerges as a consistent and prominent factor, with females exhibiting substantially higher rates than males across most studies.[6-8] Meta-analyses and large-scale surveys indicate that women are approximately 1.5 to 2.5 times more likely to report orofacial pain or receive a TMD diagnosis, with this disparity often peaking during reproductive years and persisting or widening over time in some populations.[9,10] Age-related patterns are more variable but frequently show higher prevalence in young to middle adulthood (20-40 years), with specific symptoms such as joint clicking more common in younger groups and painful conditions increasing in certain cohorts.[11,12]

Heterogeneity across studies—arising from differences in diagnostic tools (e.g., DC/TMD criteria), sample types (population-based vs. clinical), and regions—complicates precise global estimates and direct comparisons.[13] Nonetheless, contemporary data highlight ongoing trends, including potential increases in prevalence linked to psychosocial factors and gender-specific vulnerabilities.[14]

The present narrative synthesis integrates findings from five key epidemiological studies published between 2024 and 2025 that explicitly examined orofacial pain or TMD prevalence with stratifications by gender and/or age.[15-19] These studies encompass large population-based longitudinal data, clinical cohorts, young adult samples, global meta-analyses, and umbrella reviews, providing a contemporary overview. By synthesizing these investigations, this review aims to clarify persistent patterns of female predominance and age-related variations, identify convergences and divergences in recent evidence, and outline implications for clinical management and future epidemiological research in orofacial pain.

Methods

This paper presents a narrative synthesis of contemporary epidemiological evidence on the prevalence of orofacial pain, with particular emphasis on variations by gender and age. No original primary data were collected, and the review was not prospectively registered as a systematic review due to its narrative scope and focus on a curated selection of recent high-quality studies.

Study Selection

Five key epidemiological studies published between 2024 and 2025 were selected for detailed synthesis based on the following inclusion criteria:

- Primary emphasis on the prevalence of orofacial pain or temporomandibular disorders (TMD), including painful TMD.

- Explicit stratification or analysis of prevalence by gender and/or age.

- Use of validated diagnostic tools (e.g., DC/TMD criteria) or standardized screening questionnaires.

- Diverse sample types, including population-based cohorts, young adults, and

clinical or longitudinal datasets, to capture contemporary trends.

- Quantitative reporting of prevalence rates, odds ratios, or statistical associations related to demographic factors.

The selected studies were:

1. Alqutaibi et al. (2025)[15]: A global systematic review and meta-analysis estimating TMD prevalence by gender, age, continent, and specific diagnostic categories.

2. Lövgren et al. (2025)[16]: A longitudinal population-based study highlighting gender disparities in the development and recovery from TMD symptoms.

3. Exposto et al. (2025)[17]: A large cross-sectional study of young adults assessing prevalence of painful TMD and overlapping primary headaches, with gender comparisons.

4. Zieliński et al. (2024)[18]: A retrospective clinical study examining TMD patient profiles in relation to age and gender.

5. Del Rossi et al. (2024)[19]: An umbrella review of systematic reviews on orofacial and head pain prevalence, providing integrated data across subgroups.

These studies were chosen from recent literature to reflect the most up-to-date evidence (2024–2025), identified through targeted searches in PubMed, Scopus, Web of Science, and manual reference checking. No formal PRISMA-guided systematic search was undertaken, as the goal was a focused narrative integration rather than exhaustive meta-analysis.

Data Extraction and Synthesis

Key data extracted from each study included:

- Study design, setting, and sample characteristics (e.g., size, age range, population vs. clinical).

- Definitions and assessment methods for orofacial pain/TMD (e.g., DC/TMD, self-report, clinical examination).

- Overall prevalence estimates and those stratified by gender and age.

- Statistical measures of association (e.g., odds ratios for gender differences, age-related trends).

- Additional contextual factors (e.g., psychosocial influences, overlapping conditions).

Extraction was conducted qualitatively, with findings summarized narratively and presented in tabular form for comparison (see Table 1 in Results). Due to methodological heterogeneity (e.g., varying diagnostic criteria, populations, and continents), no quantitative meta-analysis was performed. Instead, narrative synthesis focused on identifying convergent patterns—particularly persistent female predominance and age-specific variations—while noting divergences.

Analytical Approach

Demographic patterns were evaluated descriptively:

- Gender differences were examined for consistency in female predominance and any emerging nuances (e.g., interactions with psychosocial factors).

- Age variations were assessed across life stages (young adults, middle age, broader populations).

- Themes of convergence (e.g., higher rates in females) and divergence (e.g., regional or age-peak differences) were highlighted.

This approach provides a cohesive contemporary overview of demographic influences on orofacial pain prevalence, while acknowledging limitations from study heterogeneity and the narrative format.

Results

The five selected contemporary studies provide robust epidemiological data on the prevalence of orofacial pain and temporomandibular disorders (TMD), with consistent reporting of demographic variations.[15-19] Key findings are summarized below, focusing on overall prevalence, gender differences, and age-related patterns.

Overall Prevalence

Across the studies, the global prevalence of TMD ranged from approximately 26% to 38%, with painful TMD (p-TMD) estimates lower in specific populations.[15,17] One global meta-analysis reported an overall prevalence of around 30-34%, incorporating diverse diagnostic categories such as myalgia, arthralgia, disc displacement, and joint sounds.[15] In young adult cohorts, painful TMD affected up to 15-20% of participants, often overlapping with primary headaches.[17] Clinical retrospective data from large patient samples indicated that the majority seeking care were in young to middle adulthood.[18] An umbrella review integrated prevalence across subgroups, noting high variability.[19]

Gender Differences

All five studies demonstrated a marked female predominance in TMD prevalence and symptom severity.[15-19] Females exhibited rates 1.75 to 2.2 times higher than males, with odds ratios or prevalence ratios consistently favoring higher burden in women.[15,16,18] For instance, one longitudinal population study found women were significantly worse off in both developing and recovering from TMD symptoms.[16] In young adults, gender differences were evident in painful TMD and associated comorbidities.[17] Clinical profiles showed a female-to-male ratio of 2.2:1 among patients seeking treatment.[18]

Age-Related Variations

Age patterns varied but commonly showed peaks in young to middle adulthood.[15,18] Prevalence was higher in individuals aged 20-40 years, with some studies noting elevated rates in younger groups for non-painful signs like joint

sounds.[15] Clicking symptoms decreased with advancing age, while painful symptoms and jaw movement limitations increased.[18] Longitudinal data highlighted poorer recovery trajectories across age groups, particularly in females.[16]

Table 1. Summary of Prevalence and Demographic Patterns in Selected Studies

Study	Year	Sample Type/Size	Overall Prevalence	Gender Differences (Female:Male Ratio or OR)	Age Patterns
Alqutaibi et al.[15]	2025	Global meta-analysis	~30-34% (TMD overall)	Higher in females (e.g., ~1.75-fold)	Higher in 20-40 years; variations in younger groups
Lövgren et al.[16]	2025	Longitudinal population	Focus on course, not overall	Women worse in development/recovery	Variable across lifespan
Exposto et al.[17]	2025	Young adults/cross-sectional	15-20% (painful TMD)	Higher in females	Focused on young adults
Zieliński et al.[18]	2024	Retrospective clinical (n=3362)	High in seeking care	2.2:1 ratio	Peak 16-35 years; pain increases with age
Del Rossi et al.[19]	2024	Umbrella review	Variable (~1-80% by subgroup)	Consistent female predominance	Variable by subgroup

These results highlight convergent evidence of female predominance and age-specific peaks in young/middle adulthood, despite heterogeneity in study designs and populations. Divergences include regional variations and specific symptom trajectories.[15,19]

Discussion

The synthesis of these five contemporary epidemiological studies[15-19] confirms that orofacial pain and temporomandibular disorders (TMD) remain highly prevalent conditions, affecting approximately 30% of the global population when broad diagnostic criteria are applied, with consistent evidence of female predominance and age-related peaks in young to middle adulthood. These findings align with broader trends in recent literature, underscoring the persistent demographic disparities in TMD burden.

The most striking convergence across the reviewed studies is the marked female predominance. Global meta-analytic data indicate that women experience TMD at rates 1.75 to 2.2 times higher than men, with specific subgroups (e.g., painful TMD)

showing even greater disparities.[15,17,18] Longitudinal evidence further reveals that women not only develop symptoms more readily but also exhibit poorer recovery trajectories.[16] This pattern is echoed in umbrella reviews integrating systematic data.[19] Potential explanatory factors include hormonal influences during reproductive years, heightened psychosocial stress responses, and differences in pain processing or reporting, though biological and sociocultural mechanisms require further elucidation.

Age-related variations, while more heterogeneous, consistently point to higher prevalence in individuals aged 20-40 years, with some elevations in younger groups for non-painful signs like joint sounds.[15,18] Painful symptoms tend to increase with age within clinical cohorts, whereas clicking may decline.[18] These patterns suggest that TMD onset often coincides with periods of high psychosocial or biomechanical stress in early adulthood, with persistence into middle age.

Strengths of this synthesis include the recency of the included studies (2024-2025), incorporation of validated diagnostic criteria (e.g., DC/TMD), and diversity in study types—from global meta-analyses to targeted young adult and clinical samples—providing a multifaceted contemporary view. However, limitations are notable: methodological heterogeneity (e.g., varying definitions of "painful" vs. overall TMD) precluded quantitative meta-analysis; geographic representation remains uneven, with limited data from some regions; and most studies rely on cross-sectional designs, limiting causal inferences about age or gender effects.

Given its high prevalence and the strong sex- and age-related trends, TMD should be recognized as a priority condition for screening in primary care settings, particularly for young people and women. Multidisciplinary management (dental, medical, physical therapy) is warranted. The predominance of myalgia as a symptom subtype also supports the use of interventions targeting muscular pain, such as physical therapy, behavioral interventions, and appropriate pharmacotherapy. [20]

Clinically, these findings advocate for gender-sensitive approaches in screening and management, such as tailored psychosocial interventions for women and early detection in young adults. Public health implications include the need for increased resource allocation, given projections of rising prevalence amid aging populations and stress-related factors.

Future research should prioritize longitudinal studies to track trajectories by gender and age, explore biological mechanisms (e.g., hormonal or genetic moderators), and conduct inclusive global surveys to address regional gaps. Larger, standardized investigations could enable pooled meta-analyses for more precise prevalence estimates.

Conclusion

This narrative synthesis of five contemporary epidemiological studies published

between 2024 and 2025[15-19] provides clear and consistent evidence that orofacial pain and temporomandibular disorders remain highly prevalent conditions worldwide, affecting approximately one-third of the population when broad diagnostic criteria are applied. The most robust and unequivocal finding is the persistent female predominance, with women experiencing TMD and painful orofacial symptoms at rates 1.75 to 2.2 times higher than men across diverse populations, age groups, and study designs. Furthermore, recent longitudinal data indicate that women not only develop these conditions more frequently but also demonstrate poorer recovery trajectories.

Age-related patterns, although somewhat more variable, consistently identify young to middle adulthood (20–40 years) as the period of highest prevalence and clinical presentation, with certain non-painful signs appearing early and painful symptoms often persisting or increasing over time. These demographic patterns highlight the complex interplay of biological, psychosocial, and possibly sociocultural factors that continue to drive disparities in orofacial pain burden.

The implications of these findings are significant for both clinical practice and public health. Greater awareness of gender-specific vulnerabilities should inform screening protocols, risk stratification, and management strategies, including early psychosocial intervention for at-risk female populations. Targeted prevention efforts in young adults may help reduce the onset and chronicity of debilitating symptoms.

In summary, current evidence solidly reinforces the longstanding observation of marked gender and age influences on orofacial pain prevalence, with no indication that these disparities are diminishing. Future research should focus on longitudinal, globally representative studies using standardized diagnostic criteria to further refine prevalence estimates and elucidate underlying mechanisms, ultimately guiding more equitable and effective approaches to prevention and treatment.

References:

1. Ananthan S, Benoliel R. Chronic orofacial pain. J Neural Transm (Vienna). 2020;127(4):575-588.

2. Alqutaibi AY, Alhammadi MS, Hamadallah HH, et al. Global prevalence of temporomandibular disorders: a systematic review and meta-analysis. J Oral Facial Pain Headache. 2025;39(2):48-65.

3. Valesan LF, Da-Cas CD, Réus JC, et al. Prevalence of temporomandibular joint disorders: a systematic review and meta-analysis. Clin Oral Investig. 2021;25(2):441-453.

4. Wu S, Zhang W, Yan J, Noma N, Young A, Yan Z. Worldwide prevalence estimates of burning mouth syndrome: a systematic review and meta-analysis. Oral Dis. 2022;28(6):1431-1440.

5. Bäck K, Hakeberg M, Wide U, Hange D, Dahlström L. Orofacial pain and its relationship with oral health-related quality of life and psychological distress in middle-aged women. Acta Odontol Scand. 2020;78(1):74-80.

6. Häggman-Henrikson B, Liv P, Ilgunas A, et al. Increasing gender differences in the prevalence and chronification of orofacial pain in the population. Pain. 2020;161(8):1768-

1775.

7. Del Rossi A, Di Spirito F, Cannavale R, et al. Prevalence of orofacial and head pain: an umbrella review of systematic reviews. J Oral Facial Pain Headache. 2024;38(3):213-228.

8. Musella G, Canfora F, Caponio VCA, et al. Oral dysaesthetic and perceptual disorder, a distinct subset of chronic orofacial pain without burning symptoms: a case-control study. J Oral Rehabil. 2025;52(4):567-578.

9. Lövgren A, Vallin S, Häggman-Henrikson B, et al. Women are worse off in developing and recovering from temporomandibular disorder symptoms. Sci Rep. 2025;15(1):4732.

10. Song QX, Zhang YY, Li YL, et al. The crucial role of NR2A mediating the activation of satellite glial cells in the trigeminal ganglion contributes to orofacial inflammatory pain during TMJ inflammation. Mol Neurobiol. 2025;62(3):1247-1265.

11. Cebola PMT, Lourenço AS, Hoppe AM, et al. Prevalence and interplay of hypervigilance and kinesiophobia in TMD patients: implications in clinical outcomes. J Oral Rehabil. 2025;52(10):1549-1558.

12. Zieliński G, Byś A, Baszczowski G, et al. Clinical profile in relation to age and gender of patients with temporomandibular disorders: a retrospective study. BMC Oral Health. 2024;24(1):947.

13. Qin S, Liu J, Fan JX, Qin Z, Jia J. Advances in orofacial pain research: a bibliometric analysis. Front Neurol. 2025;16:1609437.

14. Feng Y, Yang YF, Feng YZ, Guo Y. Measurement invariance of the Manchester Orofacial Pain Disability Scale (MOPDS) for biopsychosocial factor among orofacial patients and nonclinical populations: an evidence for clinical investigations. J Oral Rehabil. 2025;52(11):2074-2083.

15. Alqutaibi AY, Alhammadi MS, Hamadallah HH, et al. Global prevalence of temporomandibular disorders: a systematic review and meta-analysis. J Oral Facial Pain Headache. 2025;39(2):48-65.

16. Lövgren A, Vallin S, Häggman-Henrikson B, et al. Women are worse off in developing and recovering from temporomandibular disorder symptoms. Sci Rep. 2025;15(1):4732.

17. Exposto FG, Castrillon EE, Exposto CR, et al. Prevalence of painful temporomandibular disorders and overlapping primary headaches among young adults. Eur J Pain. 2025;29(5):e70013.

18. Zieliński G, Byś A, Baszczowski G, et al. Clinical profile in relation to age and gender of patients with temporomandibular disorders: a retrospective study. BMC Oral Health. 2024;24(1):947.

19. Del Rossi A, Di Spirito F, Cannavale R, et al. Prevalence of orofacial and head pain: an umbrella review of systematic reviews. J Oral Facial Pain Headache. 2024;38(3):213-228.

20. de Souza, A. L., & Fonseca, R. B. (2023). Pharmacological therapy in the management of temporomandibular disorders and orofacial pain: A systematic review and meta-analysis. BMC Oral Health, 23(1), 1–13. https://doi.org/10.1186/s12903-023-03524-8