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From Symptoms to Diagnosis: Interpretation of Patient-Reported Orofacial Pain in Temporomandibular Disorders Among Dentists – A Cross-Sectional Study"

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Abstract

Background: Temporomandibular disorders (TMDs) represent a leading source of orofacial pain, yet their diagnosis remains inherently challenging due to the subjective nature of patient-reported symptoms. The translation of lay symptom descriptions into accurate clinical diagnoses is a critical step in care, but one that is susceptible to variability among dentists.

Objective: This study aimed to explore how dentists interpret patient-reported orofacial pain in TMDs and to identify key factors influencing diagnostic accuracy and clinical decision-making.

Methods: A cross-sectional, scenario-based survey was conducted among 466 practicing dentists. The instrument incorporated clinically relevant patient-reported symptom scenarios to evaluate diagnostic interpretation, alongside measures of professional background, diagnostic confidence, and use of standardized criteria. Statistical analysis included descriptive methods, Chi-square testing, and multivariate logistic regression to identify independent predictors of diagnostic accuracy.

Results: Marked variability was observed in the interpretation of patient-reported symptoms, particularly in ambiguous and non-specific presentations. Higher diagnostic accuracy was significantly associated with formal TMD training, greater clinical experience, and increased diagnostic confidence ($p < 0.05$). Dentists employing an integrative diagnostic approach—combining patient-reported symptoms with clinical examination—demonstrated superior performance ($p < 0.01$). Furthermore, consistent application of standardized diagnostic frameworks was strongly linked to improved interpretative accuracy ($p < 0.001$).

Conclusion: These findings highlight substantial heterogeneity in dentists' interpretation of patient-reported orofacial pain, underscoring the complexity of diagnostic decision-making in TMDs. Enhancing clinician training and reinforcing the use of structured diagnostic criteria are essential to improve diagnostic consistency, accuracy, and patient outcomes.

Keywords: Temporomandibular disorders, orofacial pain, diagnostic variability, clinical reasoning, dentists, cross-sectional study.

Introduction

Temporomandibular disorders (TMDs) are among the most prevalent causes of orofacial pain, encompassing a range of conditions affecting the temporomandibular joint, masticatory muscles, and associated structures [1,2]. These disorders are characterized by diverse clinical presentations, including localized pain, functional limitations, joint sounds, and referred symptoms [3]. Despite advances in diagnostic frameworks, TMDs remain challenging to diagnose accurately due to their multifactorial etiology and symptom overlap with other orofacial conditions [4,5].

A critical aspect of TMD diagnosis lies in the interpretation of patient-reported symptoms, which are often described using non-clinical and subjective language [6]. Patients frequently present with vague complaints such as "ear pain," "facial discomfort," or "jaw tightness," which may not directly correspond to specific diagnostic categories [7]. This gap between lay descriptions and clinical terminology requires dentists to engage in a complex cognitive process of interpretation, transforming subjective symptom narratives into structured clinical diagnoses [1,8].

Recent research has emphasized that this interpretative process is not uniform and may vary significantly among clinicians [9]. Differences in training, clinical experience, and familiarity with diagnostic criteria can influence how dentists interpret the same patient-reported symptoms [10]. As a result, variability in interpretation may lead to inconsistencies in diagnosis, treatment planning, and patient outcomes [2,6].

Moreover, the concept of diagnostic translation—the process of converting patient-reported symptoms into clinical diagnoses—has received increasing attention in contemporary healthcare research [11]. In the context of TMDs, this process is particularly complex due to the presence of referred pain, psychosocial factors, and overlapping symptomatology [5,9]. Misinterpretation at this stage may contribute to underdiagnosis, overdiagnosis, or inappropriate management [3,12].

Although previous studies have explored knowledge and diagnostic practices related to TMDs, limited research has specifically focused on how dentists interpret patient-reported orofacial pain descriptions [10,12]. Understanding this process is essential not only for improving diagnostic accuracy but also for enhancing communication between clinicians and patients.

Therefore, this study aims to investigate how dentists interpret patient-reported symptoms of orofacial pain in the context of TMDs. By focusing on the transition "from symptoms to diagnosis," this study seeks to provide insights into the cognitive and clinical factors influencing diagnostic interpretation and to identify potential areas for improving consistency in clinical practice.

Methods

Study Design and Setting

This study employed a **cross-sectional, scenario-based survey design** to investigate how dentists interpret patient-reported (lay) descriptions of orofacial pain related to temporomandibular disorders (TMDs). Unlike traditional knowledge-based surveys, this study specifically focused on the **cognitive process of diagnostic interpretation**, using clinically relevant patient narratives. The study was conducted over a period of 8 month at 2025, targeting practicing dentists across different clinical settings.

Participants and Sampling

A total of **466 dentists** participated in the study. Participants were recruited using a **convenience sampling strategy** through professional networks and online platforms. Eligible participants included general dentists and specialists actively involved in clinical practice. Dentists who were not currently practicing or who provided incomplete responses were excluded from the analysis.

Survey Instrument Development

A structured, self-administered questionnaire was developed based on current literature on TMD diagnosis and clinical reasoning. The questionnaire consisted of five sections:(1) demographic and professional characteristics,(2) self-reported diagnostic confidence,(3) interpretation of patient-reported symptom scenarios,(4) clinical reasoning and decision-making patterns, and(5) alignment with standardized diagnostic criteria.

The core component of the survey included **scenario-based questions**, where participants were presented with common patient-reported complaints (e.g., "ear pain during chewing," "jaw locking," "diffuse facial pain with stress"). Participants were asked to select the most likely diagnosis or clinical interpretation. This design allowed assessment of **diagnostic translation from lay descriptions to clinical reasoning**, distinguishing this study from conventional knowledge-based assessments.

Validity and Pilot Testing

The questionnaire was reviewed by experts in oral pathology and orofacial pain to ensure **content validity** and clinical relevance. A pilot test was conducted on a small group of dentists (n = 20) to assess clarity, comprehension, and response consistency. Minor modifications were made based on feedback, and pilot responses were excluded from the final analysis.

Data Collection

Data were collected electronically using an online survey platform. Participation was voluntary, and informed consent was obtained prior to questionnaire completion. All responses were anonymized to ensure confidentiality.

Outcome Measures

The primary outcome was **diagnostic interpretation accuracy**, defined as the selection of the most appropriate clinical interpretation for each scenario based on established TMD concepts. Secondary outcomes included **self-reported diagnostic confidence**, **decision-making strategies**, and **use of standardized diagnostic criteria (DC/TMD)**.

Statistical Analysis

Data were analyzed using **S**PSS version 22.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics (frequencies and percentages) were used to summarize participant characteristics and response patterns. Associations between categorical variables were assessed using the **Chi-square test**. A composite **interpretation accuracy score** was calculated based on correct responses to scenario-based questions.

Multivariate **logistic regression analysis** was performed to identify independent predictors of high diagnostic accuracy, including variables such as years of experience, specialty, formal TMD training, and diagnostic confidence. Statistical significance was set at $p < 0.05$.

Ethical Considerations

The study protocol was approved by the institutional ethical committee of Sirte University. Participation was voluntary, and all data were collected anonymously in accordance with ethical research standards.

Results

A total of **466 dentists** participated in this study, and all responses were complete and included in the final analysis. The findings demonstrated significant variability in the interpretation of patient-reported orofacial pain, with diagnostic accuracy influenced by training, clinical experience, and self-reported confidence levels.

Participant Characteristics

The study population included dentists with diverse clinical backgrounds. A majority were general practitioners (**298; 63.9%**), while specialists accounted for **168 (36.1%)**. Regarding clinical experience, **172 (36.9%)** had less than 5 years of experience, **149 (32.0%)** had

5–10 years, and **145 (31.1%)** had more than 10 years. Notably, **286 participants (61.4%)** reported no formal training in TMD diagnosis.

Variable	Category	n (%)
Years of Experience	<5 years	172 (36.9%)
	5–10 years	149 (32.0%)
	>10 years	145 (31.1%)
Specialty	General dentists	298 (63.9%)
	Specialists	168 (36.1%)
Formal TMD Training	Yes	180 (38.6%)
	No	286 (61.4%)

Table 1: Demographic Characteristics (n = 466)

Diagnostic Confidence

Participants reported varying levels of confidence in interpreting patient-reported symptoms. Moderate confidence was the most commonly reported level (**205; 44.0%**), followed by high confidence (**149; 32.0%**) and low confidence (**112; 24.0%**). Dentists with high confidence demonstrated significantly greater diagnostic accuracy compared to those with low confidence (**68.5% vs. 48.2%**, $\chi^2 = 12.87$, $p = 0.002$).

Level	n (%)
Low	112 (24.0%)
Moderate	205 (44.0%)
High	149 (32.0%)

Table 2: Diagnostic Confidence.

Interpretation of Patient-Reported Scenarios

Substantial variability was observed in the interpretation of clinical scenarios. Higher agreement was noted in clearly defined mechanical symptoms such as jaw locking (**312; 67.0% correct**), while lower accuracy was observed in non-specific presentations, including diffuse facial pain (**214; 45.9% correct**) and clicking without pain (**201; 43.1% correct**). These findings indicate significant inconsistency in translating patient-reported symptoms into clinical diagnoses.

Scenario	Correct n (%)	Incorrect n (%)
Ear pain during chewing	289 (62.0%)	177 (38.0%)
Jaw locking	312 (67.0%)	154 (33.0%)
Clicking without pain	201 (43.1%)	265 (56.9%)
Diffuse facial pain with stress	214 (45.9%)	252 (54.1%)
Referred pain (temple/neck)	238 (51.1%)	228 (48.9%)

Table 3: Scenario-Based Interpretation.

Clinical Reasoning Patterns

A combined diagnostic approach (integration of patient-reported symptoms and clinical examination) was the most commonly reported strategy (**243; 52.1%**), followed by reliance primarily on clinical examination (**149; 32.0%**) and symptom-based reasoning alone (**74; 15.9%**). Dentists using a combined approach demonstrated significantly higher diagnostic accuracy compared to those relying solely on symptoms (**64.2% vs. 49.5%**, $\chi^2 = 9.76$, $p = 0.008$).

Approach	n (%)
Symptoms-based	74 (15.9%)
Clinical examination	149 (32.0%)
Combined approach	243 (52.1%)

Table 4: Diagnostic Approach

Use of Standardized Diagnostic Criteria

Only **118 participants (25.3%)** reported consistent use of standardized diagnostic criteria (DC/TMD), while **211 (45.3%)** reported occasional use and **137 (29.4%)** reported no use. Regular use of DC/TMD was significantly associated with higher diagnostic accuracy (**69.5% vs. 52.3%**, $\chi^2 = 14.21$, $p < 0.001$).

Inferential Statistical Analysis

A significant association was observed between formal TMD training and diagnostic accuracy. Dentists with formal training demonstrated higher correct interpretation rates (**129/180; 71.7%**) compared to those without training (**161/286; 56.3%**) ($\chi^2 = 13.02$, $p < 0.001$).

Similarly, years of experience were significantly associated with diagnostic performance. Dentists with more than 10 years of experience showed higher accuracy (**103/145; 71.0%**) compared to those with less than 5 years (**92/172; 53.5%**) ($\chi^2 = 10.84$, $p = 0.004$).

Multivariate logistic regression analysis identified **formal training (OR = 2.18, 95% CI: 1.45–3.27, $p < 0.001$)**, **high diagnostic confidence (OR = 1.89, $p = 0.006$)**, and **>10 years of experience (OR = 1.76, $p = 0.011$)** as independent predictors of accurate interpretation.

Discussion

The present study investigated how dentists interpret patient-reported orofacial pain in the context of temporomandibular disorders (TMDs), with a particular focus on the transition from subjective symptom descriptions to clinical diagnosis. The findings revealed significant variability in interpretation, especially in non-specific and ambiguous clinical scenarios. This variability highlights the complexity of diagnostic translation and supports the notion that TMD diagnosis is not solely dependent on clinical knowledge but also on cognitive interpretation processes.

The observed inconsistency in interpreting patient-reported symptoms is consistent with previous literature emphasizing the subjective and multifactorial nature of TMDs. Studies have shown that patients often describe orofacial pain using vague and overlapping terms, which complicates diagnostic accuracy and may lead to divergent clinical conclusions [13,14]. Furthermore, the presence of referred pain and psychosocial influences has been identified as a key factor contributing to diagnostic ambiguity in TMD cases [15]. These findings align with the current study, where lower accuracy was observed in scenarios involving diffuse or referred pain.

A key finding of this study was the significant association between formal training and diagnostic accuracy. Dentists who had received TMD-specific training demonstrated higher correct interpretation rates, supporting previous evidence that structured education improves clinical reasoning and diagnostic consistency [16]. Similarly, continuing professional development has been shown to enhance clinicians' ability to differentiate between muscular and joint-related TMD conditions [17]. However, some studies have reported that even trained clinicians may exhibit variability in interpretation due to the inherently subjective nature of pain assessment [18]. This partially contrasts with the present findings, where training showed a strong and consistent positive effect.

Clinical experience was also identified as an important factor influencing diagnostic performance. Dentists with more than 10 years of experience demonstrated significantly higher accuracy compared to less experienced practitioners. This finding is supported by previous research suggesting that clinical exposure enhances pattern recognition and decision-making skills over time [19]. Nevertheless, other studies have argued that experience alone does not guarantee diagnostic accuracy,

particularly in complex conditions such as TMDs, where standardized approaches are essential [20]. This suggests that experience must be complemented by formal training and adherence to diagnostic guidelines.

An important contribution of this study is the role of **diagnostic confidence** in influencing interpretation accuracy. Dentists with higher self-reported confidence demonstrated significantly better performance. While this finding is supported by studies linking confidence with clinical competence [21], it is important to note that overconfidence may also lead to diagnostic errors in some contexts [22]. This highlights the need for balanced clinical judgment supported by evidence-based frameworks.

The findings also revealed that dentists who adopted a combined diagnostic approach—integrating patient-reported symptoms with clinical examination—achieved significantly higher accuracy. This is consistent with recommendations in the literature emphasizing a multidimensional approach to TMD diagnosis [23]. However, a proportion of clinicians in this study relied primarily on symptoms alone, which may increase the risk of misinterpretation. Previous research has similarly reported variability in diagnostic approaches among dentists, reflecting differences in training and clinical practice patterns [24].

Another critical observation was the limited use of standardized diagnostic criteria such as DC/TMD. Despite their established role in improving diagnostic reliability, only a minority of participants reported consistent use. This finding aligns with previous studies indicating a gap between evidence-based guidelines and routine clinical practice [25]. In contrast, some reports suggest increasing adoption of standardized criteria in specialized settings, indicating variability across different clinical environments [26].

From a broader perspective, the variability identified in this study has important implications for both clinical care and research. Inconsistent interpretation of patient-reported symptoms may lead to underdiagnosis or misdiagnosis, ultimately affecting treatment outcomes. Moreover, such variability can influence epidemiological data, particularly in studies that rely on clinician-based diagnosis. Previous research has highlighted that inconsistencies in diagnostic criteria and interpretation can significantly impact prevalence estimates and disease burden calculations [27].

Strengths and Limitations

This study has several strengths, including a relatively large sample size and the use of scenario-based questions that closely simulate real-world clinical decision-making. However, certain limitations should be acknowledged. The reliance on self-reported data may introduce response bias, and the cross-sectional design limits the ability to establish causality. Additionally, although the clinical scenarios were designed to reflect common presentations, they may not fully capture the complexity of real clinical encounters.

Conclusion

In conclusion, this study demonstrates substantial variability in dentists' interpretation of patient-reported orofacial pain associated with temporomandibular disorders. Diagnostic accuracy is significantly influenced by clinical training, experience, diagnostic confidence, and the use of structured diagnostic approaches. These findings highlight the need for targeted educational interventions and greater adoption of standardized diagnostic criteria to enhance consistency in clinical practice and improve patient outcomes.

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