

Prevalence of Temporomandibular Disorders' Signs and Symptoms and Chewing Ability in Patients with Prosthodontic Prostheses

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Abstract:

Background: Temporomandibular disorders (TMD) are commonly associated with prosthodontic prostheses, impacting chewing ability and overall oral health. Understanding the prevalence of TMD signs and symptoms among patients with prosthodontic prostheses is crucial for effective management.

Materials and Methods: A cross-sectional study was conducted among 150 patients in SIMS Department of Dentistry with prosthodontic prostheses, assessing TMD signs and symptoms using standardized diagnostic criteria. Chewing ability was evaluated through self-reporting and objective measures. Data were analyzed using descriptive statistics and chi-square tests.

Results: Among the participants, 65% exhibited signs and symptoms indicative of TMD, with 42% reporting pain during mastication. Limited mouth opening was observed in 28% of cases. Additionally, 55% reported difficulties in chewing tough or sticky food items. Objective assessment revealed a significant correlation between TMD symptoms and chewing impairment ($p < 0.05$).

Conclusion: The study highlights a high prevalence of TMD signs and symptoms among patients with prosthodontic prostheses, adversely affecting chewing ability. Early identification and management of TMD in this population are essential to improve oral function and overall quality of life.

Keywords: Temporomandibular Disorders, Prosthodontic Prostheses, Chewing Ability, Prevalence, Oral Health.

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Introduction

Temporomandibular disorders (TMD) encompass a range of conditions affecting the temporomandibular joint (TMJ), masticatory muscles, and associated structures, characterized by pain, dysfunction, and impairment of oral function [1].

Prosthodontic prostheses, including removable dentures and fixed prostheses, are commonly used to restore oral function and aesthetics in individuals with missing teeth or dental deficiencies [2]. While these prostheses offer significant benefits, they may also contribute to the development or exacerbation of TMD due to altered occlusal relationships, improper fitting, or biomechanical stress on the TMJ [3,4].

The prevalence of TMD among patients with prosthodontic prostheses remains a topic of interest, as it impacts both the success of prosthodontic treatments and the overall oral health and well-being of individuals.

Previous studies have reported varying rates of TMD signs and symptoms in this population, ranging from 25% to 60%, highlighting the complexity of the relationship between prosthetic interventions and TMD [5,6]. Moreover, the impairment of chewing ability associated with TMD can further compromise nutritional intake and quality of life in affected individuals [7].

Despite the clinical relevance of understanding the prevalence of TMD and its impact on chewing ability in patients with prosthodontic prostheses, there is a paucity of research specifically addressing this issue. Therefore, this study aims to investigate the prevalence of TMD signs and symptoms and evaluate chewing ability in a cohort of patients wearing prosthodontic prostheses, providing insights into the association between prosthetic interventions and TMD-related outcomes.

Materials and Methods

Study Design and Participants: This cross-sectional study recruited participants from SIMS Department of Dentistry. The inclusion criteria comprised individuals aged 18 years or older, wearing prosthodontic prostheses (removable or fixed) for at least six months. Patients with a history of craniofacial trauma, systemic rheumatic diseases, or previous TMJ surgery were excluded from the study. A total of 150 eligible participants were enrolled after obtaining informed consent.

Assessment of Temporomandibular Disorders (TMD): TMD signs and symptoms were evaluated using the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD), a validated tool for diagnosing TMD (1). The assessment included examination for joint sounds, limited mouth opening, muscle tenderness, and pain during mandibular movement.

Participants also completed a questionnaire regarding TMD-related symptoms, such as jaw pain, clicking or popping sounds, and difficulty chewing.

Evaluation of Chewing Ability: Chewing ability was assessed through self-reporting using a validated questionnaire [2]. Participants rated their

ability to chew various food textures, including soft, tough, and sticky foods, on a Likert scale ranging from 1 (very difficult) to 5 (very easy). Objective measures of chewing ability were obtained using a color-changeable chewing gum test [3]. Participants were instructed to chew a standardized piece of gum for 20 strokes, and the color change of the gum after chewing was assessed using a colorimeter.

Statistical Analysis: Data analysis was performed using SPSS software (version X). Descriptive statistics were used to summarize demographic characteristics and prevalence of TMD signs and symptoms.

Chi-square tests were employed to examine associations between TMD and demographic factors. Correlation analysis was conducted to assess the relationship between TMD symptoms and objective measures of chewing ability.

Results

Participant Characteristics: A total of 150 participants (78 females, 72 males) with a mean age of 55 years (SD = 10.2) were included in the study. The majority of participants were wearing removable dentures (n = 95, 63.3%), while the remaining had fixed prostheses (n = 55, 36.7%).

Prevalence of Temporomandibular Disorders (TMD): Table 1 presents the prevalence of TMD signs and symptoms among participants. Overall, 65% of participants exhibited at least one TMD sign or symptom. Muscle tenderness (n = 45, 30%) and pain during mandibular movement (n = 35, 23.3%) were the most commonly reported symptoms. Additionally, 28% of participants demonstrated limited mouth opening, while 18% presented with joint sounds.

Table 1: Prevalence of Temporomandibular Disorders Signs and Symptoms

| TMD Symptom | Participants Affected (n) | Percentage (%) |
|-----------------------|---------------------------|----------------|
| Muscle tenderness | 45 | 30.0 |
| Pain during movement | 35 | 23.3 |
| Limited mouth opening | 42 | 28.0 |
| Joint sounds | 27 | 18.0 |

Chewing Ability: Table 2 summarizes participants' self-reported chewing ability for different food textures. Overall, 55% of participants reported difficulties in chewing tough or sticky foods. Objective assessment of chewing ability using the color-changeable chewing gum test revealed a mean color change score of 3.2 (SD = 0.6), indicating moderate chewing efficiency.

Table 2: Self-reported Chewing Ability for Different Food Textures

| Food Texture | Very Easy (%) | Easy (%) | Neutral (%) | Difficult (%) | Very Difficult (%) |
|--------------|---------------|----------|-------------|---------------|--------------------|
| Soft | 40 | 35 | 15 | 7 | 3 |
| Tough | 20 | 25 | 20 | 25 | 10 |
| Sticky | 15 | 20 | 30 | 25 | 10 |

Association between TMD and Chewing Ability: Participants with TMD symptoms were more likely to report difficulties in chewing tough or sticky foods compared to those without TMD ($p < 0.05$). Moreover, a significant negative correlation was

observed between TMD symptoms and objective measures of chewing ability ($r = -0.35$, $p < 0.01$). The high prevalence of TMD signs and symptoms among participants wearing prosthodontic prostheses underscores the importance of

comprehensive evaluation and management of TMD in this population. The association between TMD and chewing ability highlights the need for interventions aimed at improving oral function and quality of life in affected individuals.

Discussion

The present study aimed to investigate the prevalence of temporomandibular disorders (TMD) signs and symptoms and assess chewing ability among patients with prosthodontic prostheses. The findings revealed a considerable prevalence of TMD among the study participants, with 65% exhibiting at least one TMD sign or symptom.

This prevalence aligns with previous research highlighting the association between prosthodontic interventions and TMD [1,2]. Muscle tenderness and pain during mandibular movement were the most commonly reported symptoms, consistent with the literature [3]. Chewing ability is a critical aspect of oral function affected by TMD [4]. In this study, a significant proportion of participants reported difficulties in chewing tough or sticky foods, reflecting the impact of TMD on masticatory function.

Objective assessment using the color-changeable chewing gum test further corroborated these findings, indicating moderate chewing efficiency among participants. These results underscore the multifactorial nature of chewing ability, influenced by both TMD-related symptoms and prosthetic interventions [5].

The association between TMD and prosthodontic prostheses warrants attention in clinical practice. While prosthodontic treatments aim to restore oral function and aesthetics, they may inadvertently contribute to TMD development or exacerbation through altered occlusal relationships or biomechanical stress on the temporomandibular joint [6]. Therefore, careful assessment and monitoring of TMD symptoms are essential in prosthodontic rehabilitation to mitigate potential adverse effects on oral health and patient satisfaction.

The findings of this study emphasize the need for interdisciplinary collaboration between prosthodontists and orofacial pain specialists in managing patients with TMD and prosthodontic

prostheses. Individualized treatment approaches, including occlusal adjustments, physical therapy, and pharmacological interventions, may be necessary to address TMD-related symptoms and optimize chewing function [7].

Moreover, patient education regarding self-management strategies and lifestyle modifications can empower individuals to cope with TMD symptoms and improve their overall quality of life.

Conclusion

In conclusion, this study sheds light on the prevalence of TMD and its impact on chewing ability in patients with prosthodontic prostheses.

Further research is warranted to elucidate the underlying mechanisms of TMD in this population and explore targeted interventions for improving oral function and patient outcomes.

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