

# Assessing the Prevalence and Severity of Temporomandibular Joint Disorders among Subjects from Different Educational Backgrounds in the Marathwada Region Using Fonseca's Questionnaire: A Cross-Sectional Study

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## Abstract

**Background-** Temporomandibular joint disorders (TMDs) are musculoskeletal and neuromuscular conditions affecting the temporomandibular joint, masticatory muscles, and associated structures. They are often underdiagnosed due to their multifactorial origin, involving stress, bruxism, occlusal imbalances, and postural issues. These disorders can significantly affect quality of life and are often overlooked, especially in populations with limited health awareness. This study aimed to evaluate the prevalence and severity of TMDs among individuals from varying educational backgrounds in the Marathwada region using Fonseca's Anamnestic Index (FAI).

**Materials and Methods-** A cross-sectional study was conducted from February to March 2024 among 238 participants aged 18–60 years, selected through convenience sampling from community centers and educational institutions. The FAI questionnaire, consisting of 10 symptom-based questions, was used to assess TMD severity. Participants' educational status was also recorded. Data were analyzed using SPSS version 25.0, and Chi-square tests were applied to assess associations between educational background and TMD prevalence.

**Results-** Psychological stress (53.8%), headaches (50.9%), and bruxism (30.2%) were the most frequently reported symptoms. TMJ sounds, muscle fatigue, and neck stiffness were also common. Mild to moderate TMD was the most prevalent. A trend of higher symptom reporting was observed among those with lower educational levels.

**Conclusion-** TMDs are common in the Marathwada region, with psychological and parafunctional factors playing a significant role. The FAI proved to be an effective screening tool. Awareness campaigns and early interventions, especially in under-informed groups, are essential for reducing the burden of TMDs.

**Key Words-** Temporomandibular Joint Disorders (TMD), Severity, mastication, bruxism, occlusion.

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## I. Introduction

Temporomandibular joint disorders (TMDs) comprise a spectrum of functional disturbances involving the temporomandibular joint (TMJ), associated muscles, and surrounding structures. Common symptoms include joint noises (clicking or popping), restricted mandibular movements, facial pain, headaches, earaches, and muscular fatigue. The aetiology is considered multifactorial, with biological, behavioural, environmental, social, and emotional factors all playing contributory roles.<sup>1,2</sup>

Given their complex presentation, diagnosis often requires both clinical and subjective assessments. The Fonseca Anamnestic Index (FAI) is a widely used, efficient screening tool designed to evaluate the presence and severity of TMDs in large populations. It consists of ten questions that reflect common TMD symptoms and provides a severity score that categorizes cases as no TMD, mild, moderate, or severe.<sup>3</sup>

This study aimed to evaluate the prevalence and severity of TMDs in individuals from the Marathwada region, Maharashtra, using the Fonseca questionnaire, with special attention to psychological, functional, and parafunctional factors and their correlation with different educational backgrounds.

## II. Materials and Methods

### Study Design and Setting

This was a descriptive, cross-sectional study conducted between the months of February 2024 to March 2024 in the Marathwada region of Maharashtra, India. The study was carried out across multiple community centres, OPDs, and educational institutions to ensure the inclusion of a wide range of academic backgrounds.

### Study Population and Sampling

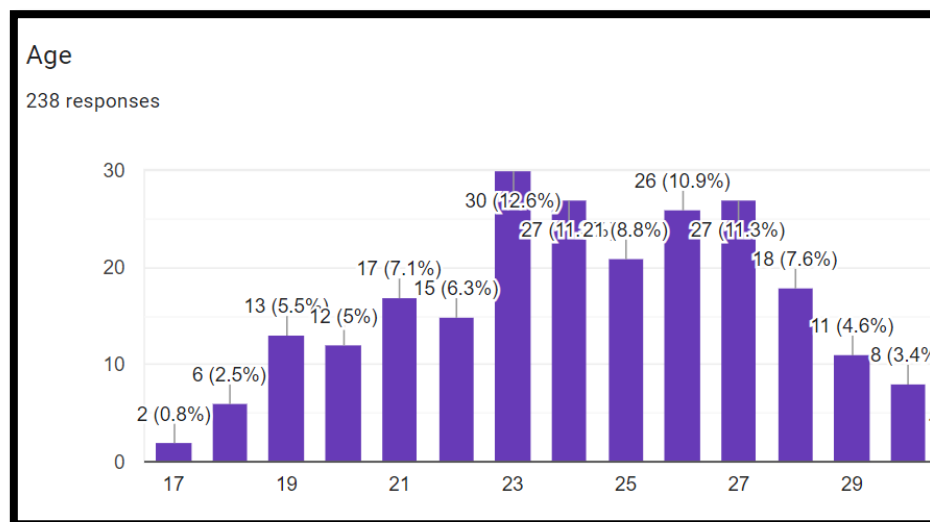
A total of **238 subjects** aged between **18 and 60 years** were recruited using **convenience sampling**. The participants were from varied educational strata including secondary school, higher secondary, graduates, and postgraduates. Participants were approached in person and through online platforms, and the study was explained before obtaining informed consent.

### Inclusion Criteria

- Individuals aged 18–60 years
- Residents of the Marathwada region for at least 5 years
- Individuals willing to participate voluntarily and provide informed consent
- Those with no previous diagnosis or ongoing treatment for TMD

### Exclusion Criteria

- Patients currently undergoing orthodontic or TMJ therapy
- Individuals with a history of maxillofacial trauma or surgery
- Subjects with neurological or systemic musculoskeletal disorders
- Incomplete or improperly filled questionnaires



**Figure 1** Participants according to age criteria

### Data Collection Tool

Data were collected using **Fonseca's Anamnestic Index (FAI)**, a validated self-administered questionnaire consisting of **10 close-ended questions** designed to assess common signs and symptoms associated with TMDs. Each question had three response options:

- **Yes** = 10 points
- **Sometimes** = 5 points
- **No** = 0 points

The questions covered areas such as:

- Pain in the jaw, head, or ears
- Joint sounds during mandibular movements
- Muscle fatigue while chewing

- Limited mandibular opening
- Parafunctional habits like bruxism or clenching
- Feelings of stress, anxiety, and neck stiffness

The cumulative score for each participant was calculated, and the severity of TMD was classified as:

- **No dysfunction** (0–15 points)
- **Mild dysfunction** (20–40 points)
- **Moderate dysfunction** (45–65 points)
- **Severe dysfunction** (70–100 points)

### Procedure

Participants were briefed about the purpose of the study. Those who consented filled out the questionnaire either physically or via a Google Forms link shared with them. Investigators were available to assist with any clarification without influencing the responses. Privacy and anonymity were strictly maintained.

The educational status of each participant was also recorded to examine its correlation with TMD severity.

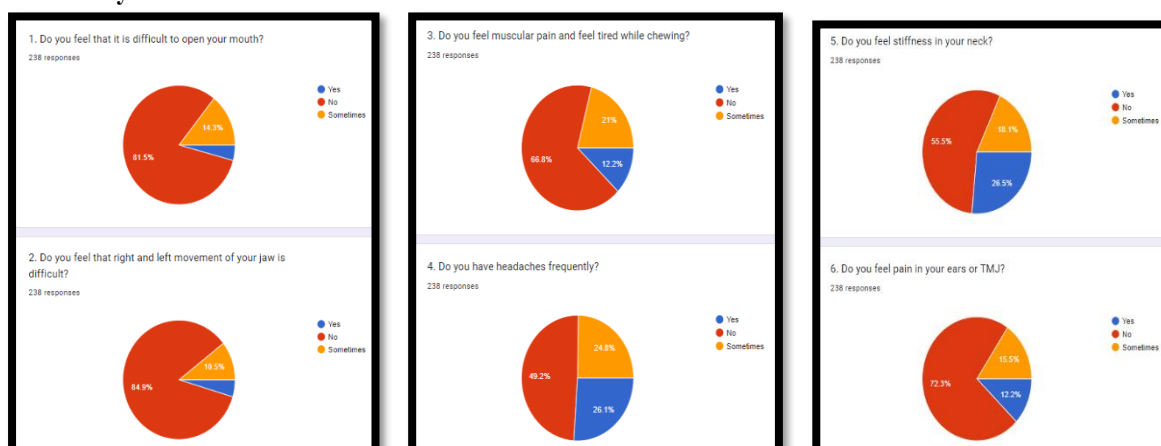
**Table 1** Fonseca's Questionnaire

Question	Yes (10)	Sometimes (5)	No (0)
1. Do you have difficulty opening your mouth wide?			
2. Do you feel discomfort when chewing or tiredness in facial muscles?			
3. Do you have frequent headaches?			
4. Do you feel stiffness in your neck?			
5. Do you feel pain in the TMJ or ears?			
6. Do you hear TMJ sounds (clicking) while chewing or speaking?			
7. Do you grind or clench your teeth?			
8. Do your teeth feel like they don't articulate properly?			
9. Do you feel nervous or tense?			
10. Do you have limitations in jaw movement?			

### Ethical Considerations

The study was conducted following the ethical standards of the 1964 Declaration of Helsinki and its later amendments. Written informed consent was obtained from all participants prior to data collection. Confidentiality of participants' data was maintained throughout.

### Data Analysis





The data were entered into **Microsoft Excel 2016** and analysed using **SPSS version 25.0 (IBM Corp., Armonk, NY, USA)**. Descriptive statistics were used to summarise the frequencies and percentages of responses for each question. The overall TMD score was computed, and participants were categorized based on the severity. Chi-square tests were used to assess the association between educational level and TMD prevalence. A p-value of  $<0.05$  was considered statistically significant.

The survey was completed by 238 participants. Responses were as follows:

**Table 2 Responses**

Question	Yes (%)	Sometimes (%)	No (%)
Difficulty opening mouth	4.2	14.3	81.5
Mandibular deviation	4.6	10.5	84.9
Muscle fatigue while chewing	12.2	21.0	66.8
Frequent headaches	26.1	24.8	49.1
Neck stiffness	26.5	18.1	55.5
Pain in ears/TMJ	12.2	15.5	72.3
TMJ clicking sounds	15.1	16.0	68.9
Bruxism/clenching	16.8	13.4	69.7
Occlusal discomfort	17.6	7.1	75.2
Psychological stress	26.1	27.7	46.2

### III. Results

The most commonly reported symptoms were:

- Psychological stress (Yes/Sometimes: 53.8%)
- Headaches (50.9%)
- Muscle fatigue during chewing (33.2%)
- Bruxism or clenching (30.2%)
- TMJ sounds (31.1%)
- Neck stiffness (44.6%)

### IV. Discussion

Temporomandibular joint disorders (TMDs) remain a prevalent yet often under-recognised condition within the general population. The results of this study indicate a high incidence of mild to moderate TMD symptoms among individuals in the Marathwada region, particularly among those reporting psychological stress and parafunctional habits. These findings are consistent with a growing body of evidence suggesting that TMD is a multifactorial condition with a significant biopsychosocial component.

#### Psychosocial Factors and TMD

The prominence of psychological stress (53.8%) and headaches (50.9%) among participants strongly implicates the role of mental health in TMD pathogenesis. As supported by Bertoli et al. and Gauer et al., psychological disturbances such as anxiety, depression, and daily life stress can exacerbate muscle tension and increase parafunctional behaviours like clenching and bruxism—further aggravating TMD symptoms<sup>4,5</sup>. This trend underscores the importance of adopting a holistic approach in TMD assessment, recognizing the interrelation between mental health and oral health.

### **Muscle Dysfunction and Functional Limitations**

Muscle fatigue while chewing (33.2%) and neck stiffness (44.6%) were also commonly reported, suggesting widespread myofascial involvement. These symptoms could be attributed to chronic muscular hyperactivity, poor posture (often associated with long hours of screen time and sedentary lifestyles), or persistent parafunctional habits. The findings align with the concept of Myofascial Pain Dysfunction Syndrome (MPDS), a primary subtype of TMD characterized by diffuse muscle tenderness and referred pain<sup>4</sup>.

### **Parafunctional Habits and TMJ Pathophysiology**

Bruxism and clenching, reported by 30.2% of subjects, not only act as aggravating factors for muscular strain but also contribute to intra-articular damage over time. Lobbezoo et al. emphasized the dual nature of bruxism—as both a protective and pathological phenomenon—depending on its intensity, frequency, and impact on the TMJ structures<sup>6</sup>. The moderate prevalence of TMJ sounds (31.1%) further suggests early internal derangement, possibly linked to disc displacement or condylar malposition.

### **Educational Status and TMD Awareness**

Though detailed subgroup analysis is beyond the scope of this brief report, the association between educational level and TMD symptomatology could be multifactorial. Higher educational levels may correlate with better health literacy and self-care behaviours, yet also with higher stress levels due to academic or professional pressures. Conversely, lower educational attainment may be associated with limited awareness of TMD symptoms and risk factors, leading to delayed recognition or reporting. This dual dynamic merits further exploration in future studies.

### **Comparisons with Previous Literature**

The prevalence figures in this study are comparable to those reported by Manfredini et al. and Yap et al., where mild to moderate TMD was found in approximately 40–60% of general and clinical populations<sup>7, 8</sup>. However, variation in diagnostic tools, population demographics, and cultural perception of symptoms can influence these rates. The use of the Fonseca Anamnestic Index in our study allows for a broad and efficient screening but may not capture the full clinical spectrum of TMDs, especially in asymptomatic or borderline cases<sup>3</sup>.

## **V. Limitations**

A few limitations of this study should be acknowledged. Firstly, the cross-sectional design restricts causal inference between educational background and TMD severity. Secondly, self-reported data may be subject to recall or reporting bias, particularly in populations with lower health literacy. Third, factors such as gender, occupation, socioeconomic status, and systemic comorbidities were not deeply explored, all of which could influence TMD presentation. Finally, the convenience sampling method may affect the generalizability of findings.

## **VI. Conclusion**

This study sheds light on the notable prevalence of TMDs among individuals from diverse educational backgrounds in the Marathwada region, with stress, bruxism, and muscle fatigue emerging as predominant contributing factors. The use of Fonseca's Anamnestic Index proved effective for rapid community-based screening, especially in resource-limited settings<sup>3</sup>.

Given the substantial burden of TMD-related symptoms, there is a clear need for integrative awareness programs focusing on the identification and management of psychological stress, posture correction, and parafunctional habits. Interdisciplinary collaboration involving dentists, physiotherapists, psychologists, and general physicians is essential for a comprehensive treatment approach<sup>1, 2</sup>.

From a public health perspective, incorporating TMD education into community oral health campaigns and school wellness programs could be a transformative step toward early detection and prevention. Moreover, training primary care dentists in the use of standardised TMD screening tools can enhance early diagnosis, reduce chronicity, and improve patients' quality of life<sup>4</sup>.

Future research should aim to explore the influence of demographic and lifestyle variables, as well as the impact of targeted interventions, such as stress management workshops, oral habit counselling, and ergonomic guidance, on reducing TMD incidence. A longitudinal or interventional study design may provide more conclusive insights into causality and treatment outcomes.

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