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Evaluating the Comprehension of Bruxism and TMD Amongst Dental Students in Pune City

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Abstract

Introduction: Temporomandibular disorders (TMDs) and bruxism are prevalent conditions among dental students, impacting their clinical practice and overall well-being. This study aims to evaluate the knowledge, awareness, and diagnostic capabilities regarding TMDs and bruxism among dental students in Pune, India, and to identify potential gaps in their knowledge.

Methodology: A cross-sectional survey was conducted involving dental students from various institutions in Pune. A structured questionnaire was developed to assess knowledge about the etiology, symptoms, diagnostic methods, and management strategies for TMDs and bruxism. The questionnaire was pre-tested and refined based on feedback from a pilot study. Data were collected through digital media, and statistical analyses were performed to evaluate the responses.

Results: The study included 175 dental students, predominantly final-year students (96.57%), with a mean age of 22.37 years. A significant majority (98.29%) recognized the connection between bruxism and TMDs. However, 28% incorrectly associated occlusal wear with TMD diagnosis, indicating a gap in clinical understanding. Treatment preferences showed that 46.29% favored occlusal splints, while 32% preferred a multi-modal approach. Additionally, 54.86% expressed a strong interest in further training on TMD management.

Conclusion: The findings reveal a generally strong theoretical understanding of TMDs and bruxism among dental students, but also highlight significant gaps in diagnostic accuracy and treatment approaches. There is a clear need for enhanced educational frameworks that integrate practical skills and interdisciplinary collaboration to better prepare dental students for managing these complex conditions effectively.

Keywords: Bruxism, Temporomandibular Disorders (TMD), Dental Students, Interdisciplinary Collaboration, Knowledge Assessment, Diagnostic Capabilities, Treatment Approaches, Patient Education, Physical Therapy, Orofacial Pain, Clinical Practice, Awareness Levels, Risk Factors, Management Strategies, Dental Education.

Introduction

Temporomandibular disorders (TMDs) are a group of musculoskeletal and neuromuscular conditions that involve the temporomandibular joint (TMJ), the jaw muscles, and the surrounding tissues. These disorders can cause significant pain and dysfunction and are a common source of orofacial pain [1,2]. Appropriate

determination and administration of TMDs are significant, as they can essentially affect a patient's quality of life

Dental students play a crucial role in the identification and management of TMDs, as they are often the first healthcare providers to encounter patients with these conditions [3]. However, studies have suggested that there may be gaps in knowledge and awareness about TMDs among dental students in India seen by Sharma in 2019[4]. Understanding the current level of knowledge and awareness about TMDs among Indian dental students is important for developing effective educational and training programs to improve their ability to diagnose and manage these disorders.

The etiology of TMDs Is multifactorial, including a complex exchange of organic, mental, and social variables [5]. Biological factors, such as injury, age, and hormonal changes, have been identified as risk factors for the development of TMDs. Psychological factors, including stress, anxiety, and depression, have also been associated with the onset and progression of TMDs [6,7]. Additionally, social factors, such as lifestyle and socioeconomic status, can contribute to the development and management of these disorders [8].

The prevalence of TMDs Is higher among females compared to males, with the highest risk being between the ages of 18 and 24 years reported by Furquim in 2015. This gender difference may be attributed to various factors, including hormonal influences, pain sensitivity, and sociocultural factors. Furthermore, the presence of comorbidities, such as sleep disorders and chronic pain conditions, can also impact the development and management of TMDs.

Accurate diagnosis and effective management of TMDs require a comprehensive understanding of the underlying mechanisms and risk factors. Dental students, as the primary healthcare providers for patients with orofacial pain, play a crucial role in the early identification and appropriate referral of individuals with TMDs. By enhancing the knowledge and awareness of dental students, we can improve the overall quality of care and patient outcomes.

Moreover, the assessment of knowledge and awareness among dental students can provide valuable insights into the current state of TMD education in the country. This information can guide the development of targeted educational programs and resources to address the identified gaps, ensuring that future dental professionals are well-equipped to manage these complex disorders effectively.

In the context of the Indian healthcare system, where access to specialized care for TMDs may be limited, the role of general dental practitioners becomes even more crucial. Empowering dental students with the necessary knowledge and skills can significantly improve the early recognition and appropriate management of TMDs, ultimately leading to better patient outcomes and quality of life.

In summary, the assessment of knowledge and awareness of TMDs among dental students in India is a critical step in improving the diagnosis and management of these complex and multifactorial disorders. Understanding the current state of knowledge and identifying gaps will inform the development of targeted educational and training programs to enhance the competence of dental students in this field.

Methods & Methodology

This was a cross-sectional study conducted among dental institutions residing in Pune city, Maharashtra India. The questionnaire was designed to assess the participants' knowledge and awareness regarding the etiology, signs and symptoms, investigations, and management of bruxism and temporomandibular disorders (TMDs). The questionnaire consisted of multiple-choice and true/false questions covering various domains, including the definition, causes, risk factors, clinical features, diagnostic methods, and

management of bruxism and TMDs. A pilot study was first carried out among 30 dental students to pre-test the questionnaire and make necessary adjustments. Based on the input from the pilot study, the study was refined and finalized. The study sample was calculated using the formula 175 number of participants were required. The data was collected from various dental colleges such as M.A Rangoonwala dental college and hospital, Bharati Vidyapeeth Dental College & Hospital, Dr. D. Y. Patil Dental College & Hospital, approximately 60 participants were selected from each college for a equalised distribution. The data was collected using a self-administered, structured questionnaire distributed via digital media through a Google Form.

The collected data was analysed using legitimate statistical methods. Descriptive statistics, such as frequencies, percentages, means, and standard deviations, were calculated to summarize the participants' demographic characteristics and their responses to the questionnaire items. Inferential statistics, such as chi-square tests and one-way ANOVA, were used to assess the differences in knowledge and awareness levels among the participants based on their year of study and other demographic variables.

Results

Demographics

The study included final year dental students (96.57%) and interns (3.43%). The mean age of participants was 22.37 ±0.87years. The gender distribution showed 52.6% female students and 47.4% male students.

Knowledge and Diagnostic Capabilities

Dental students demonstrated varying levels of diagnostic capabilities. Clinical examination was the primary diagnostic tool chosen by 68% of respondents, while 26.86% relied on patient self-reports, and only 5.14% emphasized sleep studies(fig1.1). This distribution suggests a strong preference for direct clinical assessment methods over auxiliary diagnostic tools. The findings indicate a need for broader exposure to comprehensive diagnostic approaches, particularly in utilizing sleep studies and other advanced diagnostic modalities.

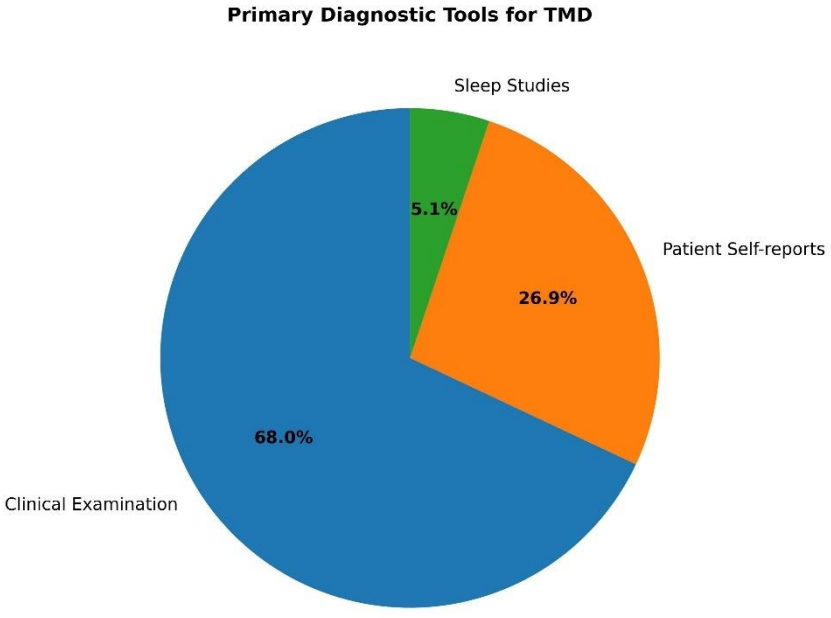

Fig 1.1: Primary Diagnostic Tools for TMD Among Study Participants

Understanding of Etiology and Risk Factors

Students showed a strong understanding of the relationship between bruxism and TMD, with 98.29% correctly acknowledging their connection. Furthermore, 94.86% recognized bruxism as a primary cause of TMD, demonstrating solid theoretical knowledge. However, there was some confusion regarding diagnostic indicators, as 28% incorrectly associated occlusal wear with confirming TMD presence, highlighting an area requiring additional educational focus.

Treatment Preferences and Therapeutic Modalities

In terms of treatment approaches, 46.29% of students identified occlusal splints as the primary treatment for bruxism, while 32% favored a comprehensive approach incorporating multiple interventions. Relaxation techniques were specifically chosen by 19.43% of respondents, and 2.29% preferred pharmacological interventions(fig1.2). This distribution suggests a good understanding of the multi-modal nature of bruxism treatment, though there might be room for increasing awareness about the benefits of combined therapeutic approaches.

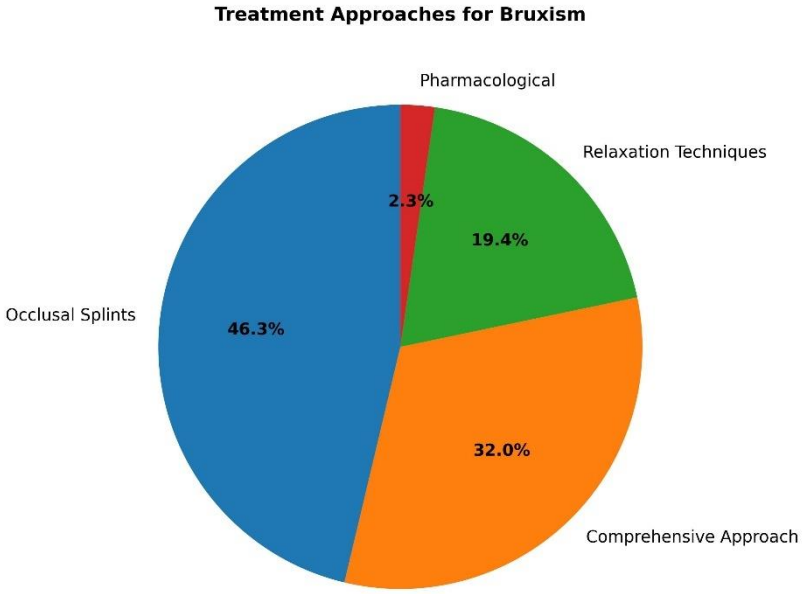

Fig 1.2: Treatment Approaches for Bruxism Among Study Participants

Documentation and Patient Education

The survey revealed strong commitment to patient education and documentation practices. 56.57% of respondents always incorporated patient education and self-care strategies into their treatment plans, while 34.86% did so frequently. Only a small percentage (5.71%) reported occasional implementation, and 2.86% rarely included these aspects. This indicates a positive trend in recognizing the importance of patient education in treatment success.

Professional Development and Continuing Education

Interest in professional development was notably high, with 54.86% expressing strong interest in additional training and workshops. 35.43% were somewhat interested, while 8% showed minimal interest, and only 1.71% expressed no interest(1.3). This distribution reflects a positive attitude toward continuing

education and skill enhancement in TMD and bruxism management.

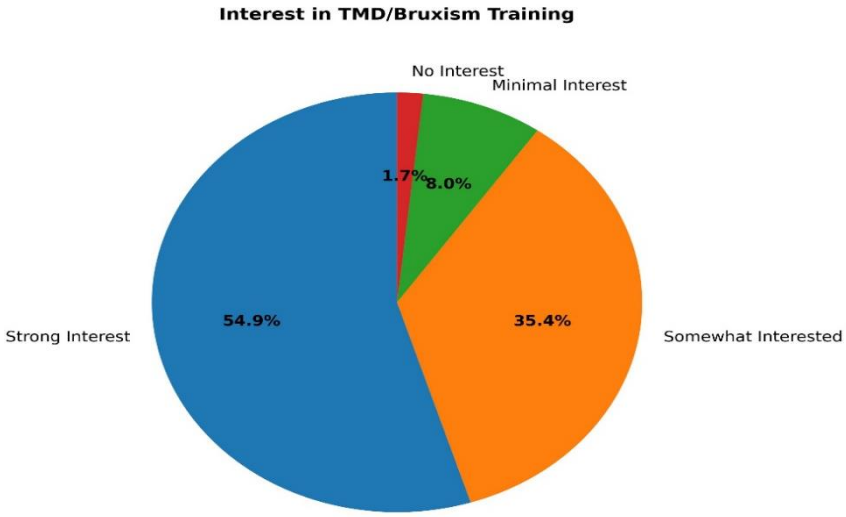

Fig 1.3: Interest in TMD/Bruxism Training Among Study Participants

Quality Assurance and Treatment Outcomes

The analysis of treatment outcomes revealed varied approaches and effectiveness measures. Regarding occlusal splint therapy, 67.43% of respondents found them very effective in managing bruxism symptoms, while 22.86% reported little effectiveness, and 9.14% found them somewhat effective. Only 0.57% considered them not effective. In terms of comprehensive patient assessment, 56.57% of practitioners always conducted routine evaluations for related conditions such as TMD or sleep apnea, 34.29% did so often, 6.29% sometimes, and 2.86% rarely. The referral patterns to specialists (including sleep physicians and TMD specialists) showed that 57.14% always made referrals, 30.29% often referred, 10.86% sometimes referred, and only 1.71% rarely made specialist referrals(fig1.4). These findings highlight a strong emphasis on both direct treatment effectiveness and the importance of interdisciplinary care in managing complex cases.

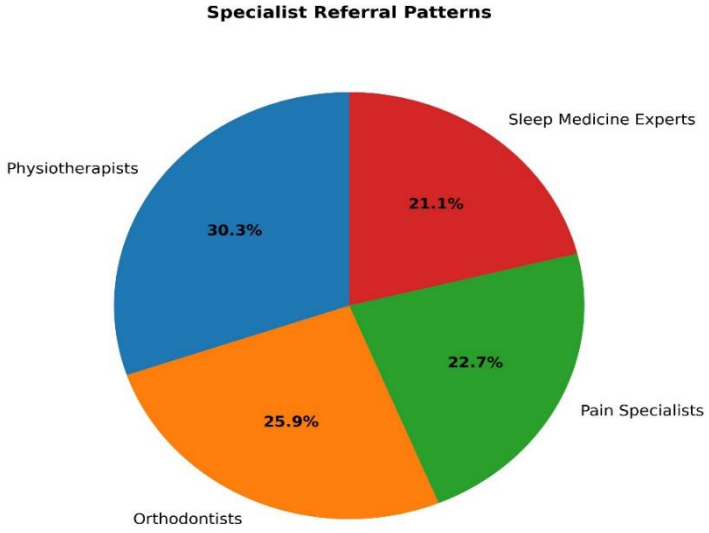

Fig 1.4: Specialist Referral Patterns Among Study Participants

Research Understanding and Clinical Application

The analysis revealed strong interest in research and continuing education in TMD and bruxism management. A significant majority (57.14%) considered learning about TMD in dental school very important, while 29.14% viewed it as somewhat important. Only 13.71% considered it not very important or not important at all. This academic interest translated into clinical practice, with 56.57% of respondents always conducting routine assessments for related conditions such as TMD or sleep apnea, and 34.29% doing so often. Regarding professional development, 54.86% expressed strong interest in additional workshops on bruxism and TMD management, 35.43% were somewhat interested, while only 9.71% showed minimal or no interest. These findings indicate a robust enthusiasm for evidence-based practice and continuous professional development in TMD and bruxism management.

Long-term Management Strategies

The survey revealed a strong emphasis on long-term management strategies among respondents. Regarding education on the risks and long-term effects of bruxism, 53.71% always provided this information, 34.86% did so frequently, 8.57% sometimes, and 2.86% never provided it. Incorporating patient education and self-care strategies into treatment plans was always practiced by 56.57% of respondents, frequently by 34.86%, sometimes by 5.71%, and rarely by 2.86%. Routine assessments for related conditions, such as TMD or sleep apnea, were always conducted by 56.57% of respondents, often by 34.29%, sometimes by 6.29%, and rarely by 2.86%. Referrals to specialists (e.g., sleep physicians or TMD specialists) were always made by 57.14% of respondents, often by 30.29%, sometimes by 10.86%, and rarely by 1.71%. These findings highlight the critical role of patient education, routine assessments, and interdisciplinary collaboration in ensuring effective long-term care.

Interdisciplinary Collaboration and Referral Patterns

The study revealed varied referral patterns, with 57.14% regularly referring complex cases to specialists. Referrals were distributed among physiotherapists (56%), orthodontists (48%), pain specialists (42%), and sleep medicine experts (39%). This pattern indicates recognition of the multidisciplinary nature of TMD and bruxism management.

Relationship Between Bruxism and TMD

The survey revealed a strong consensus regarding the relationship between bruxism and TMD. A significant majority of respondents acknowledged this relationship, with 50.29% strongly agreeing and 48% agreeing that there is a connection between the two conditions, while only 1.71% disagreed. Furthermore, 54.86% strongly agreed and 40% agreed that bruxism is a primary cause of TMD, with just 5.14% expressing disagreement(fig1.5). When asked about the therapeutic relationship, 64.57% felt very strongly and 30.86% somewhat strongly that addressing TMD can reduce bruxism symptoms, while only 4.57% did not perceive a strong connection in treatment outcomes. These findings underscore the strong bidirectional relationship perceived between bruxism and TMD in both etiology and treatment approaches.

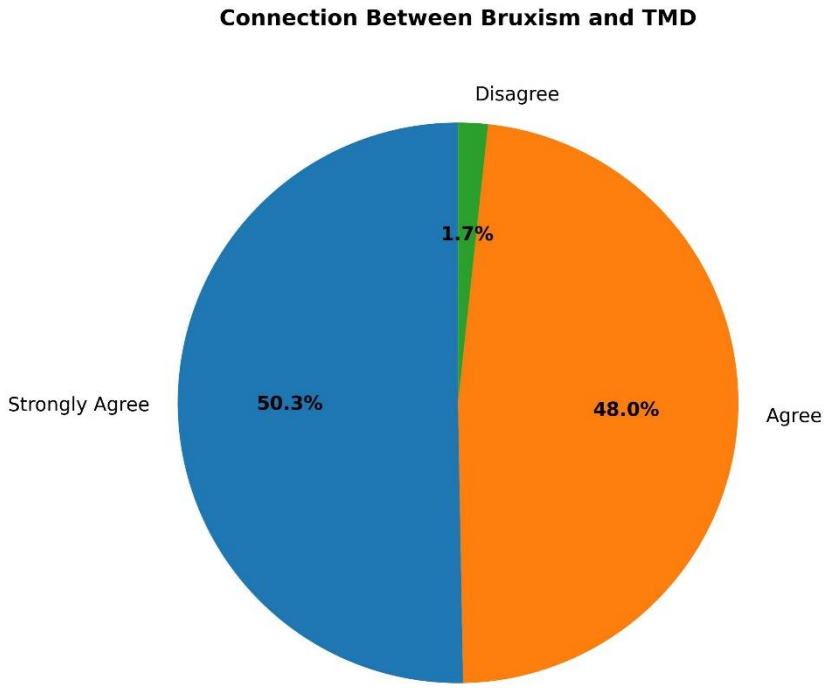

Fig 1.5: Connection Between Bruxism and TMD Among Study Participants

Discussion

The findings from the study on dental students' knowledge, diagnostic capabilities, treatment preferences, and professional development in relation to bruxism and temporomandibular disorders (TMD) reveal several important trends that align with and contrast against existing literature. A significant majority of participants demonstrated a strong understanding of the relationship between bruxism and TMD, with 98.29% acknowledging their connection. This is consistent with previous research indicating that dental students generally possess a solid theoretical foundation regarding common dental conditions [9,10]. However, the confusion surrounding diagnostic indicators, particularly the incorrect association of occlusal wear with TMD presence by 28% of respondents, highlights a gap in clinical training that has been noted in other studies as well as seen by Rhoades in 2020 . This suggests a need for enhanced educational strategies focusing on comprehensive diagnostic approaches, particularly in the context of TMD and bruxism management.

In terms of treatment preferences, the study found that 46.29% of students favored occlusal splints as the primary treatment for bruxism, while 32% preferred a multi-modal approach. This aligns with findings from other studies that emphasize the importance of a comprehensive treatment strategy for bruxism, which often includes both mechanical and behavioral interventions [11]. However, the relatively low percentage (2.29%) of students who preferred pharmacological interventions indicates a potential underutilization of available therapeutic options, which has been echoed in the literature regarding dental students' attitudes towards pharmacological treatments [12]. The strong commitment to patient education and documentation practices, with 56.57% of respondents consistently incorporating these elements into their treatment plans, reflects a positive trend towards recognizing the importance of patient engagement in treatment success, a finding supported by various studies [13].

Moreover, the high interest in professional development, with 54.86% of students expressing a strong desire for additional training, is indicative of a proactive approach to learning and skill enhancement in TMD and bruxism management. This enthusiasm for continuing education is corroborated by other research that highlights the importance of ongoing professional development in the dental field [14]. The study's findings on referral patterns emphasize the importance of collaboration among various disciplines., with 57.14% of respondents regularly referring complex cases to specialists. This is consistent with the literature that advocates for a team-based approach to managing complex dental conditions, including TMD and bruxism [15].

The study on dental students' understanding of bruxism and temporomandibular disorders (TMD) has several limitations that warrant attention. One significant limitation is the reliance on self-reported data for assessing bruxism, which may introduce recall bias and affect the accuracy of the findings. Additionally, the study's cross-sectional design limits the ability to establish causal relationships between knowledge and clinical practice, as it captures a single point in time rather than longitudinal changes in understanding [16]. Furthermore, the sample was predominantly composed of final-year students, which may not fully represent the knowledge and attitudes of students at earlier stages of their education [17]. To enhance the educational framework, it is recommended that future studies incorporate standardized diagnostic tools and methodologies to assess bruxism more accurately [18]. Additionally, implementing comprehensive training programs that focus on both theoretical knowledge and practical skills related to TMD management could better prepare dental students for clinical practice. Emphasizing interdisciplinary collaboration through workshops and seminars involving various healthcare professionals may also improve students' understanding of the multifaceted nature of TMD and bruxism management [19].

Conclusion

In conclusion, while the study reveals a generally strong understanding and commitment among dental students towards managing bruxism and TMD, it also highlights areas for improvement, particularly in diagnostic accuracy and the integration of pharmacological treatments. The findings suggest a need for enhanced educational frameworks that not only address theoretical knowledge but also emphasize practical skills and interdisciplinary collaboration, aligning with the evolving demands of dental practice.

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