Review Study

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Evaluating the Impact of temporo-mandibular joint disorders on oral health related quality of life; A literature review

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Abstract

Quality of life (QoL) is a concept aims in order to define the well-being of a population or individual, encompassing both the positive and negative aspects of their existence at a particular moment in time. Temporomandibular joint disorder (TMJ) can significantly impact one's ability to live a normal, fulfilling life. The aim of this study is to gather information on the impact of TMJ disorder on quality of life. Three search engines (PubMed, Google Scholar and Web of Science) were used to gather clinical studies, RCTs, case series, and reports were included, while all review literature, meta-analysis, and letters to the editor were excluded. The keywords used were "quality of life," "temporomandibular joint pain," "TMPDS," "MPDS," and "oral health-related quality of life." A total of eleven studies were selected for critical analysis. Results show a strong correlation between TMJ disorders and quality of life which in turn affects the specific domain of oral health related quality of life. It has been observed that most of the patients are affected with TMJ disorders and in turns stress and anxiety. Furthermore, pain was the most frequent finding that hinders sleep quality, somatic health, leading to stress, anxiety, functional and psychological discomfort. The prevalence of this condition was most frequently encountered amongst professional students of medical sciences, health care college preparatory students or military cadets when compared to the general population.

Keywords: TMJ, temporomandibular joint, oral health, quality of live

Introduction:

TMPDS affects the TMJ and masticatory muscles, predominantly in women, with estrogen playing a role in its development. TMPDS is categorized by reduced mouth opening, , decreased jaw movements, and clicking sounds of the temporomandibular joint (TMJ) (1,2). Temporomandibular disorders (TMD) are a set of clinical issues affecting the masticatory musculature, temporomandibular joint, and the tissues that are related to them (3). Here, quality of life is most affected in oral health-related aspects, with pain eventually becoming chronic over time, impacting the patient's daily routine and every aspect of life, including psychological and social domains. The female-to-male ratio in TMDs is 4:1, with females being the most affected gender (4,5). An important clinical feature of TMPDS is pain, which leads to a deterioration in quality of life and dysfunction of the stomatognathic system. The multifactorial nature of TMD, influenced by various individual factors, complicates its diagnosis and treatment.

As the leading cause of non-dental orofacial pain, TMD significantly impacts quality of life, often assessed through specific questionnaires (6). Quality of Life (QoL) is a term that describes more than an individual's self-satisfaction level and encompasses more than just the physical or even psychological aspects of an individual. It is also used in the field of medicine to understand how well a disease, condition, or its treatment affects a patient's daily activities and the satisfaction derived from life (6,7). "The individual's perception of their standing in life, within the value systems, cultural context and also with reference to his or her aspirations, aims, concerns and standards" is how the World Health Organization defines quality of life (7).Dimensions of Quality of Life: Quality of Life typically contains several areas, among them are the following: Health (e.g., pain, energy levels), Psychological, Interpersonal domain, Autonomy, and Physical environment. A subset of QoL known as Oral Health-Related Quality of Life (OHRQoL) emphasizes how one's oral wellness affects their daily activities, general health, and level of life satisfaction(8) (9). It is especially pertinent to dental and medical practice and research. OHRQoL Domains: These often include the

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following: Oral functioning includes the ability to swallow, chew, and speak. Any pain, soreness, or discomfort in the mouth is called oral pain and discomfort. Psychosocial Impact: Modifications to one's self-perception, interactions with others, and certain behavioral traits (10). Appearance: Social acceptance and self-satisfaction with the way teeth and gums look. While research on TMDs has advanced over the years, there may still be gaps in our understanding of the specific ways these disorders affect quality of life. This literature review aims to identify and consolidate the existing knowledge in this area.

Objective

To critically appraise the existing literature on the effects of diseases of the temporo-mandibular joint (TMJ) on the Oral Health Related Quality of Life (OHRQoL). This review seeks to emphasize the gaps in the data, identify the major factors that lead to poor OHRQoL in people with TMJ problems, and offer recommendations for future study and clinical practice by combining findings from multiple studies.

Methodology

A systemic screening of records was conducted from three databases: PubMed, Web of Science and Google Scholar. The keywords used to identify relevant articles were TMPDS, Temporomandibular Joint Syndrome, Temporomandibular Disorders, Quality of Life, Oral Health-Related Quality of Life, OHIP, and OHRQoL. Articles published from 2015 onwards were selected, focusing on experimental and observational studies with available full-text PDFs, while all review publications were excluded. Articles that were not previous than 2015 were selected and primarily experimental, observational studies were included with availability of full text PDFs whilst all the review publications were excluded. A total of eleven articles were selected for critical appraisal.

Critical Analysis of Influence of TMJ Disorders on Oral Health-Related Quality of Life

A cross-sectional study took place over four months (January 16 to May 15, 2021) at the Oral and Maxillofacial Surgery departments of private dental institutes of Pakistan. A total of forty-six patients with diagnosed TMPDS were included. The study gathered data on demographics, major symptoms, causes, and histories of stress and depression, with a focus on age and gender. Key symptoms reported were pain, limited mouth opening, and clicking (11). Identified causes included facial trauma (such as accidents and falls), bruxism, unknown factors, and stress, assessed through questions about appetite, energy, and sleep quality. The study also carefully reviewed the patients' histories of clinical depression and psychiatric medication use. Concerning the chief complaint, pain was the most prevalent issue reported by 34 (73.9%) subjects. limited mouth opening was evident in 10.9% of the subjects, 15.2% patients reported clicking (10). Etiology was bruxism followed by facial trauma, whilst stress was found to be the independent cause behind TMJ issue in more than 20% of the subjects. It was inferred that, TMPDS was common in females aged around 25 years or above presenting with the complains of pronounces pain (8,11).

A second case-control study used the participants' general health questionnaire (GHQ-28) and Graded Chronic Pain Scale (GCPS) scores, to assess the OHRQoL of TMD patients. 150 adults made up the study population, 75 of whom were TMD sufferers and 75 of whom were not. The 75 patients (11 males and 64 females) were chosen in a sequential manner from those who were referred to the School of Dentistry's Temporomandibular Joint (TMJ) Clinic. The parameters used in the study included the following: Assessment and questionnaires, RDC/TMD questionnaires (grade zero to four indicating pain over 6 months), the GHQ-28 (to categorize mental stress) (11), and the OHIP-1. These parameters were used as questionnaires in cross sectional study. OHRQol is more effective in assessing TMD than recurrent periodontitis or the need for complete dentures (CD). The GHQ-28 measures and screens for psychological disorders, with the prevalence and severity of OHIP being higher in patients with anxiety, depression, and somatization. There was no significant age difference, but older patients tend to have more issues. GHQ-28 and GCPS scores, which classify people with chronic pain as having mild, moderate, or high-impact chronic pain, were significant predictors of how well TMDs would respond to treatment. Therefore, improving the quality of life for TMD patients necessitates putting a focus on managing chronic pain and upholding mental wellness (11).

A study conducted from September to December 2013 assessed 102 individuals having 68 female participants with age ranges from 19 to 86 years, who sought medical care at a university health clinic, regardless of whether it was for TMD-related issues. Exclusion criteria included neuropathic conditions, psychiatric disorders, anti-inflammatory drugs and continuous use of analgesics (12,13). Participants were evaluated for TMD signs and symptoms using the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) by a calibrated examiner, with those diagnosed being referred for treatment. Digital calipers and a mechanical algometer were used to obtain precise measurements at specific muscle points, adhering to RDC/TMD guidelines. Diagnoses were classified into three groups: Group I for muscle disorders such as myofascial pain, Group II for disc displacements, and Group III for joint degeneration, including conditions like arthralgia and osteoarthritis. This study investigated the impact of temporomandibular

disorders (TMD) on quality of life (QoL) using validated tools of fifty-one diagnosed TMD cases, 66.67% were women, reflecting a higher prevalence in females due to various factors. TMD was associated with symptoms such as TMJ clicking, teeth clenching, and ear noise, which are linked to decreased QoL. The study found that TMD significantly affects mental health and pain perception, with parafunctional habits and trauma exacerbating the condition. Overall, TMD's impact on pain and mental health underscores its negative effect on QoL (1,14). The quality of life of patients with temporomandibular disorders was impacted by the presence of pain and changes in mental health. These disorders were linked to a perceived decrease in quality of life.

Tae-Yoon Kim et al. (2015) sought to: (a) determine potential mediators in the link between chronic temporomandibular disorders (TMD) and EQ-5D scores; and (b) evaluate whether the prevalence of chronic TMD negatively affects quality of life (15). The study population and sample pain that lasts for three months or more are among them. Important components include an ethics statement, variables, statistical analysis, and the EQ-5D. Longer duration of TMD, age, gender, lower household income, lower education level, unemployment, single status, residing in rural regions, smoking, alcohol consumption, obesity, and irregular exercise were revealed to have a detrimental influence on EQ-5D scores (4). Interestingly, while TMD seemed to affect men's quality of life more than women's, factors like obesity, smoking and alcohol consumption were more considerably linked to reduced quality of life in women (16). After adjusting for age and sex, the impact of various factors on the relationship between TMD and EQ-5D was analyzed, with somatic health showing the greatest influence, reducing the negative association by 27%. Mental health, sociodemographic factors, and health behaviors also played roles, but to a lesser extent. Specifically, stress and depressive symptoms significantly affected the relationship, particularly in women, where somatic and mental health factors were the most impactful, further highlighting gender differences in how TMD affects quality of life. These results show that even when sociodemographic characteristics, age, sex, and health practices are taken into consideration, chronic TMD still has a detrimental impact on quality of life, with poor health behaviors and low sociodemographic status having an even greater negative effect. The most significant determinants of the association between chronic TMD and quality of life were somatic and mental health (17).

The prevalence and impact of chronic TMD were higher in women, who also showed stronger associations with osteoarthritis and mental health issues like stress, depression, and suicidal thoughts, while men were more affected by employment status. Given the same pathophysiological pathways between TMD and other musculoskeletal illnesses, osteoarthritis plays a noteworthy role in attenuating the connection between TMD and quality of life. In line with earlier studies demonstrating a higher frequency of specific pains in women, women also reported more comorbid symptoms, such as migraines, headaches, neck pain, and back pain. TMD is strongly associated with psychological variables such as stress, anxiety, and depression, with women being more affected by these factors (1,17). Research suggests that TMD treatment should incorporate psychological interventions, as they have proven more effective in alleviating pain than conventional dental care alone. Gender differences in TMD may be influenced by various factors, including treatment-seeking behaviors, pain sensitivity, and hormonal influences, particularly in women during menopause or those with childbirth experience(4).

Larissa et al (2015) conducted research at a medical hospital and include 160 nurses above the age of eighteen, each with a minimum of six months of hospital experience. The study used several validated questionnaires to assess TMD, anxiety, sleep quality, and quality of life. Fonseca's questionnaire evaluated TMD severity based on chewing-related pain, movement difficulties, parafunctional habits, and stress, scoring participants as having no, mild, moderate, or severe TMD (18). The IDATE index assessed anxiety with two parts: trait anxiety (personality) and state anxiety (current behavior), classifying anxiety levels as mild, moderate, or severe. The SAQ assessed sleep quality over the past 30 days, categorizing participants as having or lacking a sleep disorder and providing sub scores for insomnia, sleep timing disorders, sleep apnea, restlessness, non-restorative sleep, and excessive daytime sleepiness. Quality of life was evaluated using the SF-36 questionnaire. Results show that TMD was common in nursing professionals, with anxiety and depression being common traits (19).

George et al. conducted a study involving 135 dentistry students (58 males, 77 females) aged 18-25 from Federal University of Paraiba between September 2011 and May 2012. Exclusion criteria included having two or more missing teeth (excluding third molars), use of removable prosthetics, appliance use, and current treatment for TMD or other orofacial pain(20). TMD presence and severity were assessed using an adapted anamnesis questionnaire with ten questions scored to classify TMD levels as no, mild, moderate, or severe (3). Clinical evaluations were also performed to identify muscle pain, joint sensitivity, jaw movement changes, and joint sounds. The Oral Health Impact Profile (OHIP-14) measured oral health-related quality of life, with higher scores indicating greater negative impact (21,22). The study revealed that individuals with TMD had significantly elevated OHIP-14 scores, indicating worse oral health-related quality of life (QL), especially as TMD severity increased ($p<0.001$). Those needing treatment had higher scores than those not needing treatment. Clinical TMD signs, particularly when both muscle and joint issues were present, were associated with a greater negative impact on

QL, with significant effects seen in functional limitation, physical pain, and psychological discomfort ($p<0.05$). Oral health-related quality of life is hampered by the existence and severity of TMD. Better clinical outcomes can be achieved by using the OHIP-14, a rapid and flexible tool that can evaluate the effects of TMD symptoms and indicators on quality of life. It can also be used to track the effects of various TMD treatment. (10,11)

Results

The systemic analysis and critical review of the existing literature show a strong correlation between TMJ disorders and quality of life which in turn affects the specific domain of oral health related quality of life. It has been observed that most of the patients affected with TMJ disorders and in turns stress and anxiety as shown in figure 1.Furthermore, pain was the most frequent finding that hinders with sleep quality, somatic health, leading to stress, anxiety, functional and psychological discomfort. The prevalence of this condition was most frequently among female as compare to male as shown in figure 2.Figure 3 shows that this condition is also encountered amongst professional students of medical sciences, health care college preparatory students or military cadets when compared to the general population. Table 1 showed the OHRQoL association with TMDs in different studies

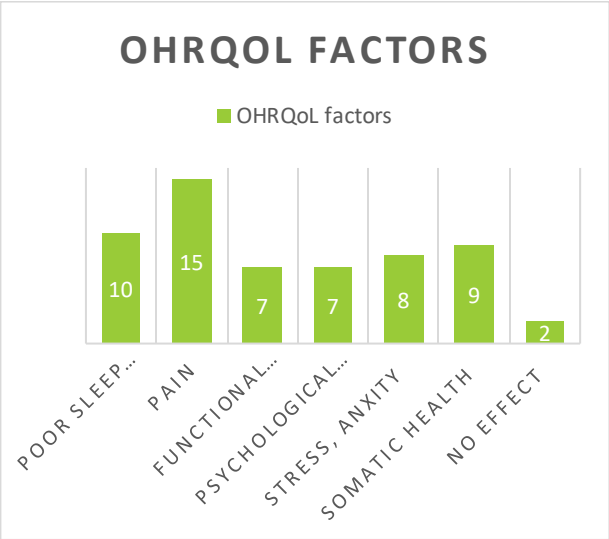


Figure1: TMPDs and quality of life

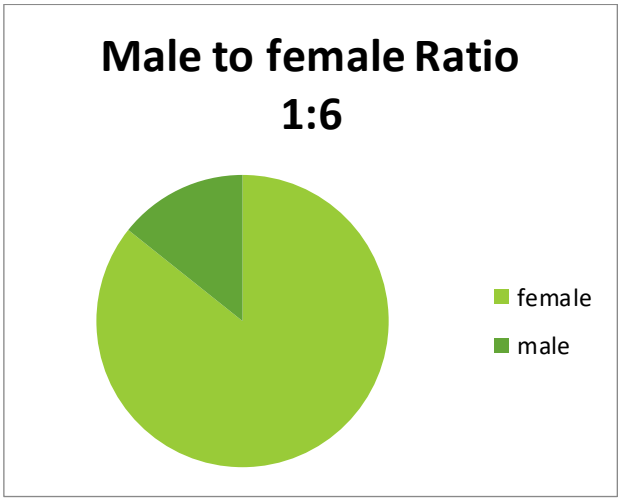


Figure2: Gender distribution in relation to TMPDs

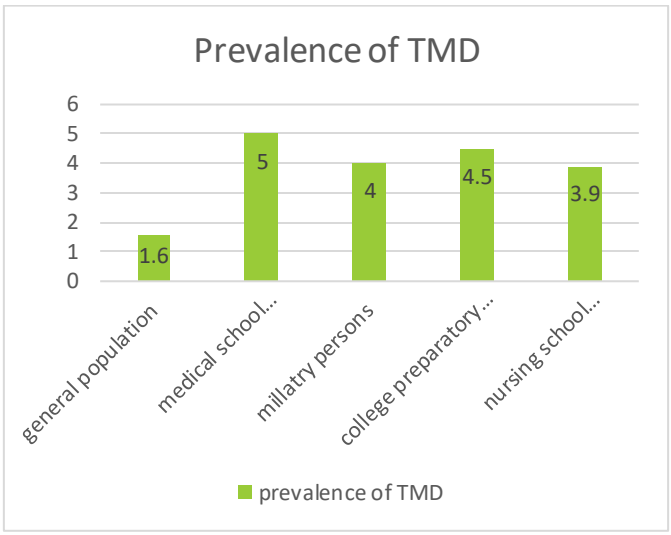
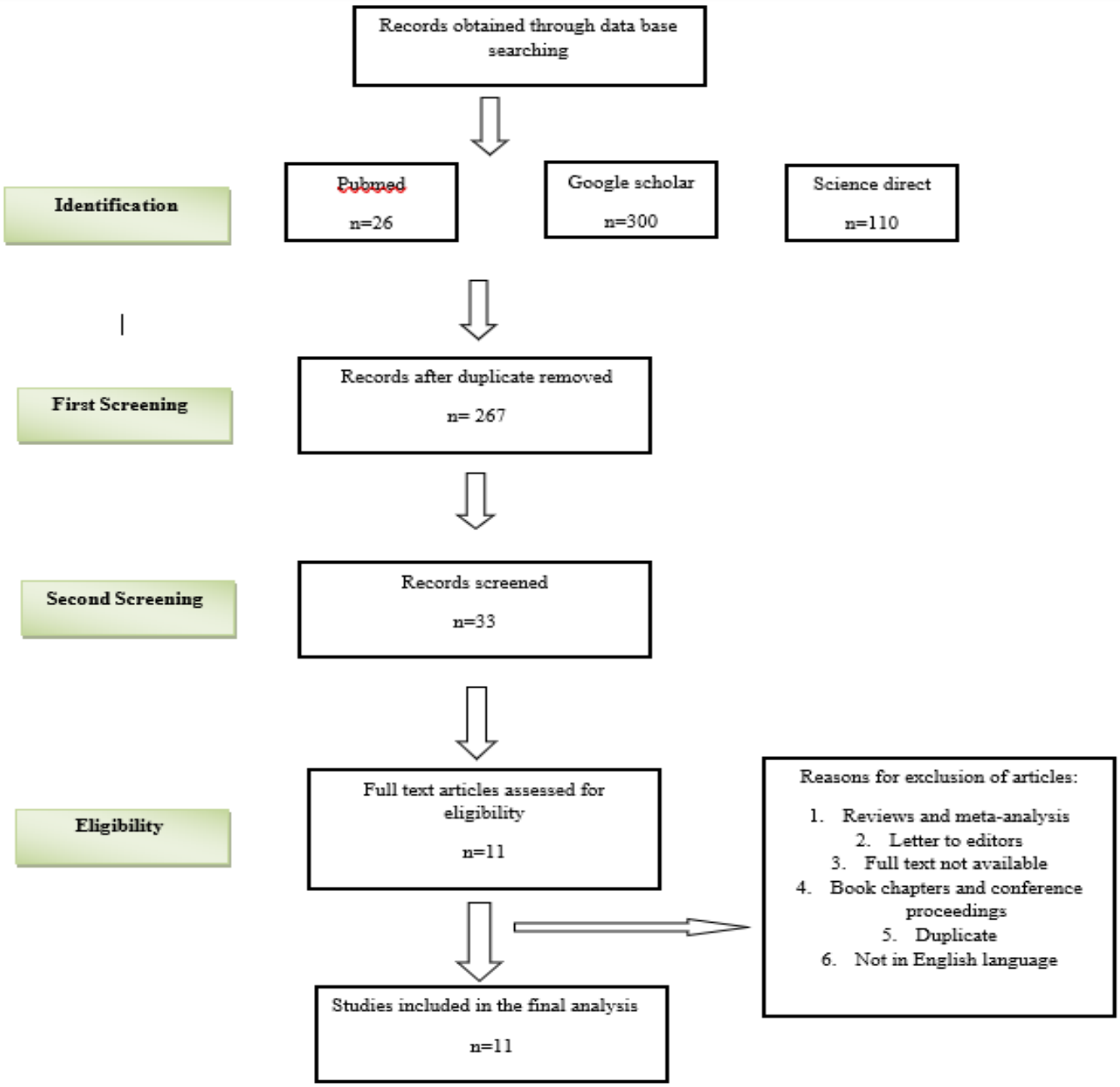


Figure3: Prevalence of TMPDs among different professionals

Table 1: Association of TMPDS with OHRQol

Year of Publication	Type of DMD	OHRQoL factors associated with TMJ disorders
2018	OHIP-14 elevated score had articular, muscular, or mixed TMD.	Volunteers experiencing TMD symptoms (as indicated by the DMF index) showed significantly higher OHIP-14 scores. Individuals with muscular, articular and mixed types of TMD also showed greater OHIP-14 scores.
2015	Limited mouth opening, hypermobility, deviation and deflection, clicking and crepitus sound and pain.	Volunteers with temporomandibular disorder (TMD) who required treatment and exhibited greater severity experienced a significantly greater impact on their oral health-related quality of life.
2015	Pain related to chewing involves the temporomandibular joint, neck, and head, along with difficulties in movement, habitual nonfunctional behaviors, and the perception of malocclusion.	TMD is linked with stress/anxiety, and its severity correlates with state anxiety and depression. As a result, the presence of TMD may lead to decreased sleep quality and overall quality of life.
2021	Two-thirds of the participants had symptoms related to TMD, and 20.3% of them experienced moderate to severe forms of the disorder.	A moderate yet intense type of correlation was observed between the TMD and OHIP-14 scores.
2017	Having experienced temporomandibular pain that lasted for three months or more at some point during the past year.	Chronic conditions had the greatest impact on both somatic and mental health. Regarding quality of life, women were more significantly affected by TMD compared to men. Specifically, women experienced greater impacts from osteoarthritis and mental health issues such as stress and depressive symptoms.
2018	TMPDS (Temporomandibular joint pain dysfunction syndrome).	The prevalence and severity of OHIP scores differed significantly between the TMD and control groups, with rates of 66.7% versus 12.0% and severity scores of 18.0 versus 9.2, respectively. Among the predictors of oral health-related quality of life (OHRQoL), pain duration and psychological impairment were the most significant.
2018	Fonseca's Anamnestic Index encompasses the presence of chewing-related pain affecting the TMJ, head, and neck, along with parafunctional habits, movement restrictions, joint clicking, perceptions of malocclusion, and experiences of emotional stress.	A significant majority of participants with TMD (69.6%; n = 71) reported poor sleep quality. Additionally, functional limitations, physical pain, disabilities, and psychological distress were all strongly associated with TMD.
2018	Medical records of headaches, joint sounds as well as closed/open jaw locking.	The significant correlations were noticed between the different type of TMD symptoms and factors including, depression, anxiety, stress and quality of life
2018	Presence of TMPDS (temporomandibular joint dysfunction pain), unpleasant bite, temporomandibular joint clicking and tooth grinding.	In pain domain the frequency 47.80% with $p<0.0001$ and in mental health domain (62.67% with $p<0.05$) were both strongly linked to temporomandibular disorders.
2021	TMPDS (Temporomandibular joint dysfunction syndrome).	Even with management, TMD-related symptoms persisted in impacting quality of life and sleep.
2021	Mild, moderate, severe.	The severity of TMD might impact the quality of life of affected patients, as assessed by the WHOQOL-BREF.

SEARCH STRATEGY



Discussion

The evaluation of the literature demonstrates the intricate and varied effects that diseases of the temporomandibular joint (TMJ) have on the impacted people's quality of life (QoL). Pain, functional restrictions, and psychological distress are the hallmarks of TMJ disorders, profoundly impacting the social, psychological, and physical aspects of quality of life (23).

TMJ disorders cause severe pain and suffering, affecting oral functions like speaking, eating, and swallowing. As a result, patients' everyday activities are significantly reduced. This impact is often exacerbated by the chronic nature of the pain, leading to fatigue, low energy, and disturbed sleep. A lower overall physical health-related quality of life results from this persistent discomfort and functional disability, which frequently makes everyday chores difficult (23,24).

TMJ problems have a major psychological impact; many patients report feeling depressed, anxious, or in emotional discomfort. Poor mental health outcomes result from the ongoing pain and functional constraints, which instill a sense of powerlessness and dissatisfaction. Furthermore,

the psychological toll—which includes diminished self-worth and social isolation—is also noteworthy. The outward symptoms of the illness and the stigma attached to chronic pain can worsen psychological discomfort, which can have an impact on relationships with others and general mental health. Additionally, TMJ issues impair social and professional functioning (25). Pain and suffering can interfere with social connections and cause people to retreat from social situations. The psychological strain and physical restrictions brought on by TMJ issues can hinder professional progression prospects, lower productivity, and increase absenteeism in the workplace (26).

The financial strain exacerbates the negative effects on quality of life by include indirect expenses like lost income as well as direct healthcare costs (27). The review emphasizes that although there are a variety of treatment options, their effectiveness in raising improving quality of life varies. Many patients find relief through non-surgical procedures such as physical therapy, medication, and occlusal splints; however, the degree of quality-of-life improvement is typically contingent upon the individual's unique condition and response to treatment. Although surgical procedures can provide significant long-term relief for some patients, they are more invasive and require careful consideration of the risks and recovery time. The overall efficacy of treatments in restoring quality of life highlights the importance of a customized, patient-centered approach to managing TMJ issues (28).

Conclusion and Recommendations

Patients with and without TMD symptoms showed notable differences in their psychological states and overall health-related quality of life. OHRQoL and psychological states were significantly impacted by the type and frequency of TMD symptoms. Significant correlations were found between the quantity of TMD symptoms and stress, anxiety, depression, and quality of life. To encourage early detection and prevention, instructors and students need to be made aware of the fact that TMJ-related problems are more common among professional students. Encouraging TMD patients to lead healthy lives requires a focus on managing chronic pain and mental well-being. The quality of life for people with TMJ disorders is negatively impacted by the presence of pain and mental health issues.

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Dr. Leena Siddiqui: Conception and Design of work
Dr. Hijab Fareed Khan: drafting and critical evaluation
Dr. Sadia Kanwal: Approval of version to be submitted
Dr. Kamal Muhammad Mustafa: Accountable for all aspects of the work