

# Assessment of Quality of Life in Patients with Temporomandibular Disorders- A Questionnaire Study

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## Abstract

The aim of the study is to assess the quality of life in Temporomandibular disorder (TMD) patients using modified questionnaire based cross sectional study. This study included 66 individuals aged between 18-60 years reported to our out-patient department with the chief complaint of pain and other temporomandibular joint related problems and recurrence of TMD after undergoing treatment. The Research Diagnostic Criteria for Temporomandibular Disorders (TMD RDC) was used for the diagnosis of the disease. A structured questionnaire of total 27 questions divided into categories like trauma, habits, physical evaluation and psychological evaluation were framed and given to the participants. Statistical evaluation was performed and the mean score was calculated. Among the questions, most of the participants gave negative response to the trauma, mixed responses to the parafunctional habits, positive responses to questions for joint related abnormalities and mixed response for the psychological evaluation. Statistically significant results ( $p < 0.01$ ) were obtained. It is possible to utilize this modified TMD questionnaire as an index to evaluate patients' quality of life (QOL) because of its significant correlation with the patient's subjective level of disturbance. Enhancing the effectiveness of diagnosis and treatment, it assesses the functional and psychological problems in TMD patients.

**Keywords:** Temporomandibular joint disorders, Research diagnostic criteria, Quality of life, Questionnaire

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## 1. Introduction

The articular surfaces of the temporal bone and the mandibular condyle combine to form the temporomandibular joint (TMJ). Since there is a fibro cartilaginous disc between the articular surfaces, it has a higher collagen content and is more rigid. It is one of the body's most complicated joints, capable of both rotational and translational movement. As a result, it is referred to as the "Ginglymo diarthrodial joint." [1]. A plethora of clinical diseases that impact the masticatory muscles, temporomandibular (TM) joints and related structures, or both, are together referred to as temporomandibular disorders (TMD). There are many different etiological variables that might contribute to its multifactorial etiology, including trauma, parafunctional habits, occlusal disturbances in cases of malocclusion, multiple missing teeth, etc. The aetiology of temporomandibular disorders includes psychological causes including stress, anxiety, and depression as well as systemic diseases like arthritis. Pain of varied intensity in the preauricular region and the masticatory muscles is the primary symptom. Other symptoms include headache, limited mouth opening, locking of the jaw during wide opening of the mouth, and

clicking or popping of the jaw when opening or closing the mouth. Behavioural counselling, physical therapy, painkillers, muscle relaxants, occlusal splints, and surgery are among the available treatments. etc. Though TMD is not a very serious disorder, it has a significant impact on people's quality of life, hence the primary goal of treatment is to lessen the symptoms of the patients associated with this disorder which is related to the individuals' quality of life [2]. Examining a person's daily routine, oral health, and psychological condition to evaluate their quality of life has become a crucial component of diagnosis and treatment. Numerous questionnaire studies have been conducted to evaluate quality of life in TMD patients using a variety of scales, including the oral hygiene impact profile (OHIP, OHIP-14), the Short-Form-36 (SF 36), the Helkimo's Modified Index, and others. The most commonly used scale for measuring oral health related quality of life is oral hygiene impact profile (OHIP-14). But for TMD, there is no any specific questionnaire which covers all the clinical and psychosocial aspects. We have formulated a modified questionnaire using previous questionnaires for TMD, So

the aim of the present study is to arrive at a correct diagnosis and formulate the treatment plan which reduces the recurrence using this modified TMD questionnaire.

## 2. Materials and methods

A cross-sectional survey was conducted in SRM dental college, Chennai. There were total 66 participants, among them 30 were male and 36 were female. All the patients were clinically diagnosed with temporomandibular disorder under the guidelines of research diagnostic criteria RDC/TMD. The inclusion criteria included: Individuals willing to participate in the study. Patients above 18 - 60 years of age. TMD Patients with symptoms of pain, clicking, deviation while opening and closing the mouth, locking of jaw while opening the mouth and the exclusion criteria included: Patients under 18 years of age, above 60 years, Mentally retarded persons. The study was approved by the ethical committee of the institutional review board (srmu/m&hs/srmdc/2022/pg/001), and the study was carried on. Questionnaire was validated by 5 experts in the field of oral medicine and radiology in Tamil Nadu and necessary corrections were made in the questions based on their comments. Internal validation of questionnaire was also performed by (n=30) using cronbach alpha was around 0.824 which had a good internal consistency. Consent form was obtained from all the participants. The survey was done using modified TMD questionnaire in google forms as well as printed forms and given to the individuals. The structured questionnaire with total of 23 questions, among them 3 are open ended questions and 20 are closed ended questions. This Questionnaire included following categories: (i) Personal details- name, age, sex, occupation, (ii) Trauma, (iii) Habits, (iv) Physical evaluation, (v) Psychological evaluation

The questionnaire has five-point numerical rating scale: 0= 'not at all'; 1= 'almost never'; 2= 'sometimes'; 3= 'often'; 4= 'always' . The responses were collected and tabulated.

### Statistical analysis

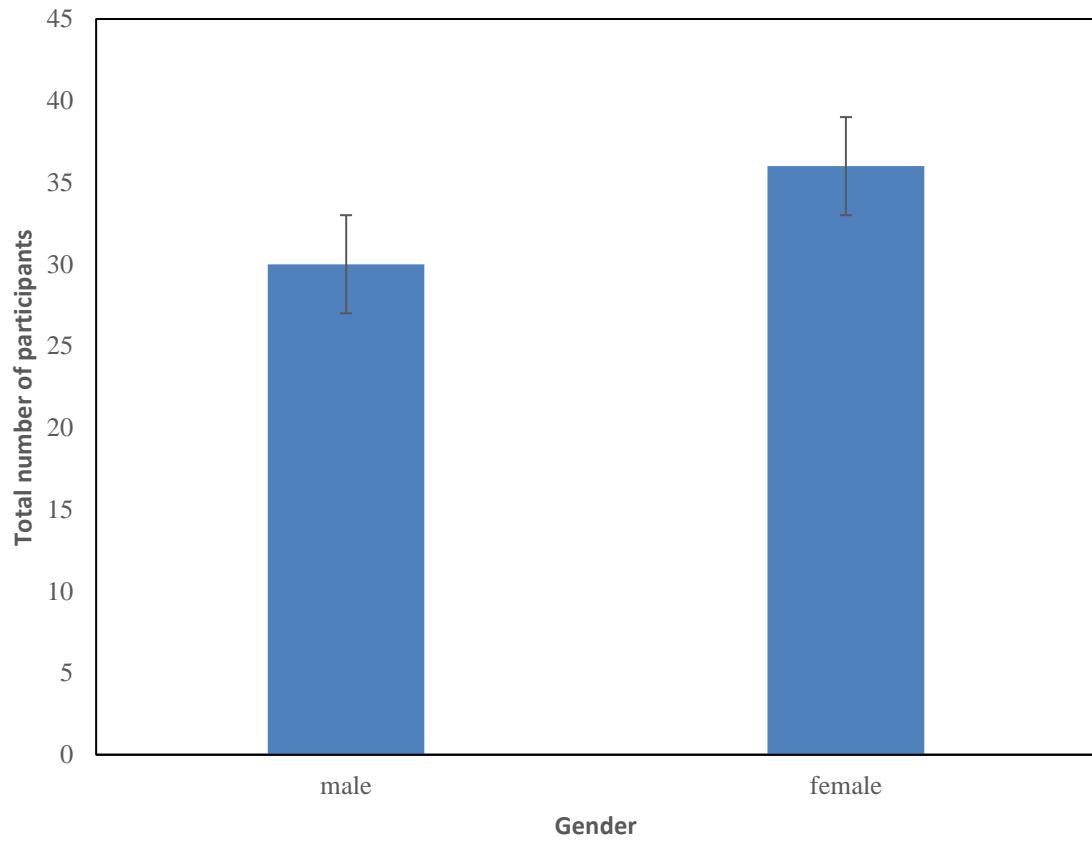
Statistical analysis was done by using SPSS (IBM SPSS Statistics for Windows, Version 26.0, Armonk, NY: IBM Corp. Released 2019). Descriptive statistics was done to assess the frequency and percentage and chi-square test was done to assess the association among the questionnaire. P-value <0.05 was considered to be statistically significant

## 3. Results and Discussions

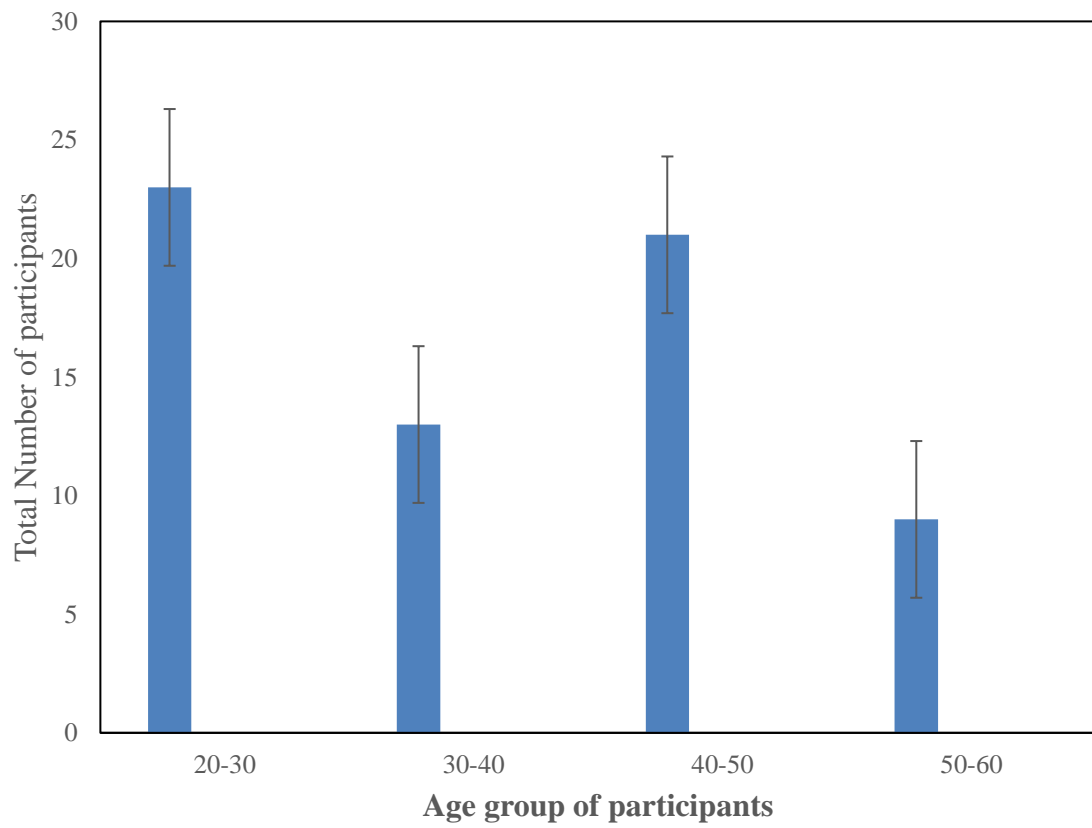
Temporomandibular disorders are important clinically and epidemiologically because of its complex aetiology, wide age range of manifestations. There are numerous epidemiological studies on TMD, assessing the quality of life of the individuals. In our study we created a modified questionnaire from Fonseca questionnaire, SF-36, OHIP-14, Helkimo's modified index and many other questionnaires for evaluating patients with TMD.

The results were tabulated individually according to the categories. This study was conducted in 1 month duration in our institution which had a total 66 participants, out of it there were 30 male (45.4%) and 36 were female (54.5%). Sex wise predilection is shown in figure 1. There is slight female predilection in our study with 54.5%. the previous other studies also showed female predilection by Nomura et al (63.11%) 2007 [1], Karthik et al 2017 [2], kim et al 2012 [3], Nayakama et al [4], Blanco et al (2013) [8]. The reason for female predilection is unknown, but suggested that they have less tolerance to pain due to estrogen hormones. Researches done in relation to women with arthritis in TMD suggested that the polymorphism of Estrogen receptor (ERα) gene is related to susceptibility of pain [kang et al 2007]. Age groups more commonly affected in our study were 20-30 years followed by 40-50 years, 20-30 years and 50-60 years. Some previous studies have divided the patient groups into various categories, osteoarthritis group (group 1), the internal derangement (group 2) and the myofascial pain dysfunction syndrome group (MPDS, group 3) by kim et al 2012 [3]. Other study has 3 categories- masticatory muscle disorders (MMD), isolated disorders of TMJ, combination of MMD and TMJ by Almoznino et al 2015 [5]. Muscle related TMD, joint related TMD, muscle and joint related TMD by Resende et al (2013) [6]. In our study we did not classify the individuals but all together diagnosed them under TMD RDC criteria. As temporomandibular disorders have a multifactorial origin we have divided the questionnaire into four subdivision- Personal details, Trauma, Habits, Physical evaluation, Psychological evaluation for formulating correct treatment plan. Under trauma, there were total 5 questions asked, 27.3% of the participants had traumatic event in the head and neck. 9.1% of them had fracture of the jaws, 12.1% of them had whiplash injury in the neck, only 3% of them underwent corrective surgeries in the childhood, and about 16.7% of them underwent treatment to the trauma. All the questions under the trauma category were statistically significant with p value less than 0.05. Only a few individuals gave the history of traumatic event. The results of the questions under trauma category was given in table 1. Previous other studies also revealed that history of trauma can develop TMD [2, 5].

In the habits, there were total 5 questions 19.7% of them often grind their teeth at the night., 10.6% of them some time had the habit of clenching their teeth at night, but 21.1% of them often had nail biting habit, 30.3% of the participants often chew their food on one side. 31.8% of them often had the habit of opening your mouth wide during yawning. and the results were statistically significant (p<0.01). The questions with habit of unilateral chewing, wide opening the mouth during yawning were not statistically significant. (table 2). Some authors reported that parafunctional habits like bruxism, nail biting etc. are one of the common etiologic factors for TMD. When the individual is under emotional stress, they may clench the teeth, which leads to circulatory changes in the muscles of mastication or compression on the pain receptors as a consequence of fluid increase in the muscle compartment [11]. There is a strong correlation between malocclusion and TMJ disorders.



**Figure 1:** Sex wise prevalence



**Figure 2:** Age wise prevalence

**Table 1:** The questionnaire related to trauma among the study participants.

S.NO	QUESTIONNAIRE	OPTIONS	STUDY PARTICIPANTS		P-value
			Number	Percentage (%)	
1.	Have you had any traumatic event in head or neck before	No	48	72.7	<0.01*
		Yes	18	27.3	
2.	Have you had fracture of jaws before	No	60	90.9	<0.01*
		Yes	6	9.1	
3.	Have you had whiplash injury in head and neck region (neck injury/ neck sprain)	No	58	87.9	<0.01*
		Yes	8	12.1	
4.	Did you undergo any corrective surgeries of jaw during childhood	No	64	97.0	<0.01*
		Yes	2	3.0	
5.	Did you undergo treatment for the trauma	No	55	83.3	<0.01*
		Yes	11	16.7	

**Table 2:** The questionnaire related to habits among the study participants.

S.NO	QUESTIONNAIRE	OPTIONS	STUDY PARTICIPANTS		P-value
			Number	Percentage (%)	
1.	Do you grind your teeth during the night times	Not at all	24	36.4	0.083
		Almost never	8	12.1	
		Sometimes	13	19.7	
		Often	13	19.7	
		Always	8	12.1	
2.	Do you clench your teeth during the night times	Not at all	37	56.1	0.019*
		Almost never	16	24.2	
		Sometimes	7	10.6	
		Often	4	6.1	
		Always	2	3.0	
3.	Do you have nail biting habit	Not at all	34	51.5	0.013*
		Almost never	3	4.5	
		Sometimes	8	12.1	
		Often	8	12.1	
		Always	13	19.7	
4.	Do you chew the food on one side	Not at all	15	22.7	0.069
		Almost never	9	13.6	
		Sometimes	14	21.2	
		Often	20	30.3	
		Always	8	12.1	
5.	Do you have the habit of opening your mouth wide during yawning	Not at all	8	12.1	0.052
		Almost never	11	16.7	
		Sometimes	20	30.3	
		Often	21	31.8	
		Always	6	9.1	

**Table 3:** The questionnaire related to physical evaluation among the study participants

S.NO	QUESTIONNAIRE	OPTIONS	STUDY PARTICIPANTS		P-value
			Number	Percentage (%)	
1.	Do you have any pain in the joint in front of your ears during opening or closing the mouth	Not at all	6	9.1	0.064
		Almost never	14	21.2	
		Sometimes	24	36.4	
		Often	15	22.7	
		Always	7	10.6	
2.	Have you noticed clicking noise in the Joint while opening or closing the mouth	Not at all	17	25.8	0.093
		Almost never	14	21.2	
		Sometimes	13	19.7	
		Often	14	21.2	
		Always	8	12.1	
3.	Do you find difficulty in talking or chewing for a long time	Not at all	28	42.4	0.046*
		Almost never	6	9.1	
		Sometimes	21	31.8	
		Often	8	12.1	
		Always	3	4.5	
4.	Do you feel your mouth deviates to one side on opening or closing your mouth?	Not at all	36	54.5	0.041*
		Almost never	13	19.7	
		Sometimes	14	21.2	
		Often	1	1.5	
		Always	2	3.0	
5.	Have you undergone orthodontic treatment before	No	53	80.3	<0.01*
		Yes	13	19.7	
6.	Do you feel that your crowns or dentures are not been fitting properly	Not at all	45	68.2	0.015*
		Almost never	6	9.1	
		Sometimes	3	4.5	
		Often	5	7.6	
		Always	7	10.6	
7.	Have you had problems with your bite or a feeling that your teeth doesn't come into contact	Not at all	14	21.2	0.098
		Almost never	18	27.3	
		Sometimes	18	27.3	
		Often	12	18.2	
		Always	4	6.1	
8.	Do you feel stiffness of your face or muscle tiredness in jaws after waking up	Not at all	43	65.2	0.026*
		Almost never	10	15.2	
		Sometimes	6	9.1	
		Often	3	4.5	
		Always	4	6.1	
9.	Do you have frequent headaches, earaches or pain in the neck	Not at all	12	18.2	0.138
		Almost never	17	25.8	
		Sometimes	17	25.8	
		Often	16	24.2	
		Always	4	6.1	
10.	Have you undergone treatment to the joint problems previously	No	54	81.8	<0.01*
		Yes	12	18.2	

**Table 4:** The questionnaire related to psychological evaluation among the study participants

S.NO	QUESTIONNAIRE	OPTIONS	STUDY PARTICIPANTS		P-value
			Number	Percentage (%)	
1.	Have you felt anxious, troubled and unable to concentrate in work due to the pain	Not at all	9	13.6	0.047*
		Almost never	24	36.4	
		Sometimes	23	34.8	
		Often	8	12.1	
		Always	2	3.0	
2.	Do you have difficulty in falling asleep or interrupted sleep in the night	Not at all	14	21.2	0.047*
		Almost never	13	19.7	
		Sometimes	29	43.9	
		Often	8	12.1	
		Always	2	3.0	
3.	Is the pain affecting your day- to- day activities in your life	Not at all	22	33.3	0.061
		Almost never	23	34.8	
		Sometimes	14	21.2	
		Often	6	9.1	
		Always	1	1.5	

As the severity of malocclusion increased (especially class III malocclusion), the participants' mean OHIP- 14 scores increased, while their oral health-related quality of life decreased [12]. Under the physical evaluation, there were total 10 questions asked about 36.4% of the participants sometimes had pain in the TMJ during opening or closing the mouth, 22.7% of them often had the pain. 21.2% of them often had clicking noise in the Joint while opening or closing the mouth. 31.8% of them sometimes found difficulty in talking or chewing for a long time. 21.2% of them sometimes felt that the mouth deviated to one side on opening or closing. Only 19.7% of the participants underwent orthodontic treatment before. About 10.6% of them always felt that their crowns or dentures was not fitting properly. 27.3% of them sometimes had problems with the bite or a feeling that their teeth doesn't come into contact. 9.1% of them sometimes felt stiffness of face or muscle tiredness in jaws after waking up. 25.8% of them sometimes had frequent headaches, earaches or pain in the neck. Only 18.2% of the participants underwent treatment to the joint problems previously.

The questions- difficulty in chewing for long time, deviation of mouth, history of orthodontic treatment and previous treatment to joint problems, ill-fitting crowns or dentures, stiffness of jaw muscles showed statistically significant result ( $p < 0.01$ ). The questions- history of pain, clicking in the joint, occlusal disturbances, frequent headaches, or earaches did not show statistically significant result ( $p > 0.001$ ) (table 3). Pain is the most characteristic feature in TMD. People present with varying intensity of pain in pre auricular, post auricular region, ear pain, headache, along the muscles of mastication, even in the neck, along with clicking in the TMJ during opening or closing the mouth, while speaking, chewing the food, yawning etc [2, 15]. They might also experience deviation of jaw to one side, frequent headache and ear ache, stiffness of facial muscles or muscle tiredness in jaws after waking up [14].

Under the psychological evaluation, there were total 3 questions about 34.8% of the participants sometimes felt

anxious, troubled and unable to concentrate in work due to the pain, 43.9% of them had difficulty in falling asleep or interrupted sleep in the night, 21.2% of them had the pain which is being affecting the day- to- day activities in their life. Those with anxiety, difficulty in concentration and interrupted sleep in the night showed statistically significant result ( $p < 0.001$ ). The individuals with pain affecting the day -to- day activities of life did not show statistically significance ( $p > 0.001$ ) (table 4). Some studies suggests that presence of psychological factors like stress, depression, anxiety are associated with TMD [1,2]. RDC TMD Axis II, allows evaluation of psychosocial status and pain-related disorders is based on a biopsychosocial pain model. Previous reports suggests that college students, medical and dental health professionals are at risk of developing temporomandibular disorders due to increased work pressure which can cause emotional disturbances like anxiety, stress etc [2]. The limitation of the study is less sample size, as it is conducted for short duration. Further studies based on larger sample sizes might be needed to enhance the generalizability of these findings.

**4. Conclusions**

TMD has a negative impact on quality of life, especially regarding its severity. Analysing the functional and psychosocial disturbances in TMD patients using the modified TMD questionnaire and increasing the efficiency of diagnosis and management. Because of its strong connection with the patient's subjective level of disturbance, this modified TMD questionnaire can be used as an index to assess patients' quality of life (QOL). It evaluates the functional and psychological issues that TMD patients may be undergoing in order to improve the effectiveness of diagnosis and to advice pharmacological and nonpharmacological treatment options to the patients according to the severity of their condition and improve the quality of life of the patients. The outcome of the present study can also be used in formulating various treatment

strategies for patients affected with temporomandibular disorders which can be the future prospective of the study

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