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Original Research Article

Analysing prevalence of temporomandibular joint disorder and it's impact on oral health related quality of life in Delhi NCR

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Abstract

Objective: To determine the prevalence of Temporomandibular joint disorders (TMD) in dental patients in North India and to examine oral health-related quality of life of TMD patients.
Materials and Methods: This multicentric study was carried out on 1151 dental patients between 18–65 years of age. Diagnostic Criteria for Temporomandibular Disorders (DC/TMD), and Oral Health Impact Profile-14 (OHIP-14) forms were used. Descriptive analysis and Chi-square test were used to analyze the factors associated with OHIP-14 scores.
Results: 64.3% of population exhibited sign of TMD symptoms. Females have shown 34.23% prevalence of TMD more than that of males (30.06%). The age group 18-35 years (43.87%), 36-50 years (10.86%) and 50 years and above (9.56%) showed prevalence for TMD. There was a significant association of TMD as demonstrated by higher OHIP-14 scores for functional disability, physical pain, social disability ($p<0.05$), However Psychological discomfort, physical disability and psychological disability showed no significant difference when compared within TMD population.
Conclusion: TMD symptoms are more common in females and younger individuals. TMD is often associated with negative impact on oral health related quality of life (OHRQoL).

Keywords: Temporomandibular joint disorders, Oral health related quality of life (OHRQoL), Oral health impact profile-14 (OHIP-14), Diagnostic criteria for temporomandibular disorders.

1. Introduction

Temporomandibular joint disorders (TMD) are the second most common type of pain-related musculoskeletal disorder. TMD can affect a person's daily life, social well-being, and overall quality of life.[1] TMDs affect individual's of all ages, however they are more prevalent in females and individuals aged 20-45. While many people experience signs or symptoms of TMD at some point in their lives, only a small percentage (around 5%) require treatment and are a common problem that can cause pain and discomfort.[2]

The Diagnostic Criteria for Temporomandibular Disorders (DC/TMD), classifies TMDs into two main categories: muscle origin and joint origin. There are 12 common diagnoses within these categories. The DC/TMD classifies TMDs into two main categories: muscular TMD (TMDM) and joint TMD (TMDJ). Muscular TMD includes conditions like muscle pain, myofascial pain, and headaches related to TMD. Joint TMD includes conditions like joint pain, disc displacement (with or without reduction), and degenerative joint disease.[1] The current understanding of TMD is a combination of physical, psychological, and social factors. As a result, treatment for TMD often involves both physical and psychological approaches. Common treatments include self-care instructions, occlusal splints, occlusal adjustments, and mandibular manipulation.[3,4]

The best way to evaluate the effectiveness of TMD treatment is by considering both clinical factors and the patient's own experience.[5] The clinical characteristics include

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the clinician's assessment of a patient's jaw movement, function, and muscle pain. The patient-reported outcomes often include pain intensity, psychological problems, and oral health-related quality of life.[6] The OHRQoL measures how dental problems affect a person's daily life, mental health, and social interactions.[7]

The Oral Health Impact Profile (OHIP) is a questionnaire that measures how dental problems affect a person's daily life, mental health, and social interactions. It is one of the most commonly used questionnaires for this purpose. The OHIP-14 is a shorter version of the OHIP that has the same validity and reliability. It includes 14 questions, covering seven dimensions of oral health: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap.[8]

Several studies have examined the quality of life of people with TMD and the factors that may affect it.[9,10] Individuals with TMD often have a lower quality of life than people without TMD.4 The quality of life of people with TMD is influenced by factors such as age, gender, pain level, jaw function, and mental health. [9,10] While some studies have examined the quality of life of TMD patients before treatment, fewer studies have investigated individual's characteristics and clinical improvement affect their quality of life after treatment.[11]

The study aimed to determine the prevalence of TMD in dental patients in Delhi, NCR in North India and to examine the quality of life of TMD patients, as well as the factors that may affect it.

2. Materials and Methods

This is a cross-sectional multicentric questionnaire study which was conducted from January 2024 to July 2024. Adult patients between the ages of 18 and 60 who received dental care in Delhi NCR were invited to participate in a study. The study was approved by institutional ethics committee (Ref No- MRDC/IEC/2024/95), and informed consent was obtained from all participants. Both male and female dental patients were eligible for participation between age18-60years. Individuals with systemic diseases, a history of facial trauma or surgery related to the temporomandibular joint, severe cognitive impairment, pregnancy, or other severe oral health conditions that could interfere with the study were excluded.

2.1. Sampling and sample size

The study determined a minimum of 1100 participants were required to with 5% margin of error and 95% confidence level, assuming that half of the dental patients in Delhi NCR($\approx$ 1,00,000) would respond.[12] The study included 1152 participants considering margin of error from different groups within the population to ensure a stratified sampling.

2.2. Survey design

Questionnaire consisted of two sections measuring the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) and Oral Health Impact Profile-14 items(OHIP-14).

2.3. Diagnostic criteria for temporomandibular disorders (DC/TMD)

The first part of the questionnaire gathered information about the participants' background, such as their demographic details. The second part used DC/TMD questionnaire to identify or assess any symptoms related to TMD and further evaluated by clinical examination.[13] The questionnaire asked participants about 10 specific symptoms related to TMD, including difficulty opening the mouth, limited jaw movement, pain during headaches, neck pain, chewing, pain in the jaw joint, ear, or shoulder, and emotional stress. Participants answered "yes," "no," or "sometimes" to each question, with no time limit to ensure honest and thoughtful responses.

2.4. Oral health impact profile-14 (OHIP-14)

The OHIP-14 questionnaire assesses the impact of oral health problems on a person's quality of life. It uses a 5-point Likert scale, ranging from 0 (never) to 4 (always), to measure the frequency of various oral health issues. A higher total score indicates more frequent and severe problems, suggesting a greater negative impact on overall well-being.[8]

2.5. Development of a translated version of DC/TMD and OHIP-14

2.5.1. Translation

To ensure accurate translation, the DC/TMD and OHIP-14 questionnaires were translated into Hindi by two individuals who were fluent in both English and Hindi. Both translators had expertise in dental and quality of life terminology, ensuring the accuracy of the translated questionnaires.

2.5.2. Back translation

To verify the accuracy of the Hindi translation, an English teacher who was unfamiliar with the original English questionnaires translated the Hindi versions back into English.

2.5.3. Committee review

To ensure the accuracy of the translated questionnaires, a double-blind evaluation was conducted involving the translator and a back-translator. A committee of specialists in orthodontics, dentofacial orthopedics, periodontology, and public health dentistry, all individuals are proficient in English having understanding of quality of life tools, compared the original and translated versions. The committee assessed whether the words in both versions

conveyed the same meaning. Based on their consensus, adjustments were made to the questionnaires. After assessing semantic and conceptual equivalence, the first Hindi versions of the DC/TMD and OHIP-14 were produced, followed by a pilot study.

The translated questionnaires of pilot test was conducted on 50 patients at a university dental clinic in Delhi NCR to see if they were easy to understand. The results showed that people could understand the questions well, so the translated questionnaires were ready to be used in the main study.

2.6. Validity of questionnaire

The experts carefully reviewed the questionnaire to determine its content validity. Their evaluation resulted in a scale-level CVI of 0.9, based on a proportion relevance of 0.8. This indicates good content validity. The experts agreed that all the questions in the questionnaire were highly relevant to the topic being studied.

The questionnaire included questions on TMD symptoms including pain, headache, jaw joint noises, closed locking of the jaw, open locking of the jaw and further assessed by clinical examination if the participant answered any of the above questions as positive the next part included OHIP-14 with 7 domains: functional disability, physical pain, psychological discomfort, physical disability, psychological disability, social disability, handicap.

2.7. Reliability of questionnaire

The questionnaire's internal consistency was assessed using Cronbach's alpha. The overall questionnaire and each individual part demonstrated acceptable to excellent internal consistency, with Cronbach's alpha more than 0.7.Specifically, the Cronbach's alpha for the entire questionnaire was 0.86, while the DC/TMD and OHIP-14 questionnaires had values of 0.82 and 0.91, respectively. Removing any individual item from either questionnaire did not significantly improve the Cronbach's alpha, further reinforcing the strong internal consistency of the instrument.

2.8. Questionnaire distribution

The final questionnaire was distributed online through official social media groups. A cover letter was also sent to participants, explaining the study's purpose and ensuring confidentiality. Participation was voluntary and participants could withdraw at any time from the study.

2.9. Statistical analysis

The collected data was analysed using SPSS software (version 29.0, 2023) at the significance level of 5%. Descriptive statistics were performed to evaluate prevalence of TMD symptoms and the frequency distribution. OHIP-14 scores and DC/TMD variables were determined using chi-square test. The independent questions of TMD assessment were compared to assess OHRQL using chi-square test.

3. Results

The study samples consisted of 1151 patients aged between 18 and 65 years with males (n=476), females (n=670) and others (n=5). The study population is divided into three age groups, majority of the study participants belonged to 18–35 years of age group (n=805) followed by 36-50 years of age group (n=200) and 50 years and above age group (n=146).

In the present study population, there is 64.3% of TMD prevalence associated within the population. Females showed high prevalence within all age groups having total of 34.23%. Age group 18-35 years(43.87%) followed by 36-50 years age group(10.86%) and 50 years and above age group (9.56%).(**Table 1**)

The association of TMD with OHIP-14 showed significant impact of TMD symptoms on OHRQoL with respect to functional disability, physical pain, social disability ($p<0.05$). However Psychological discomfort, physical disability and psychological disability showed no significant difference when compared within TMD population.($p>0.05$).

The comparison of "pain" a TMD symptoms and its assessment with OHIP-14 has shown significant impact on OHRQoL($p<0.05$), however physical disability has shown no significant difference($p>0.05$).(**Table 2**) When comparing other clinical factors such as headache and jaw joint clinical factors it exhibits significant difference for TMD symptoms and OHIP-14.($p<0.05$) (**Table 3**, **Table 4**)

4. Discussion

The study aimed to determine prevalence of TMD signs and symptoms in adults aged 18 to 65 years living in Delhi NCR. The study utilized DC/TMD questionnaire and OHIP-14 to gather information. The DC/TMD is a short questionnaire that can effectively identify the severity of TMD and has been used successfully by other researchers.[13] Based on studies comparing the DC/TMD tool's reliability among different research groups, its high reliability led to the conclusion that it is an appropriate tool for the diagnosis of temporomandibular disorders.[14]

Table 1: Descriptive statistics for TMD prevalence

TMD Prevalence	Female	%	male	%	Grand Total	%
Age Group						
18 – 35years	266	23.11%	239	20.76%	505	43.87%
36 – 50years	70	6.08%	55	4.78%	125	10.86%
50 & above years	58	5.04%	52	4.52%	110	9.56%
Grand Total	394	34.23%	346	30.06%	740	64.29%

TMD: Temporomandibular Disorder

Table 2: Assessment and comparing of (Pain) clinical factors influence on the prevalence of TMD and its impact on OHRQoL.

OHIP	Pain present	p-value	Pain duration					p-value	Last 30 days, pain exist or not			p-value
			<1 day N (%)	1-3 days N (%)	3-6 days	6-9 days	>9 days		1(No pain)	2(Pain comes and goes)	3(Pain is always present)	
Had trouble pronouncing any words	100(13.9%)	0.098	90(12.2%)	20(2.7%)	5 (0.7%)	10(1.4%)	5(0.7%)	**0.001**	55(7.4%)	70(9.5%)	5(0.7%)	**0.000**
Felt sense of taste has worsened	60(8.1%)	**0.001**	70(9.5%)	20(2.7%)	0(0%)	10(1.4%)	5(0.7%)	**0.000**	65(8.8%)	30(4.1%)	10(1.4%)	**0.000**
Had painful aching	235(35.8%)	**0.000**	155(20.9%)	130(17.6%)	15(2%)	10(1.4%)	5(0.7%)	**0.000**	100(13.5%)	205(27.7%)	10(1.4%)	**0.000**
Found it uncomfortable to eat any foods	235(35.8%)	**0.000**	150(20.3%)	128(18.2%)	5(0.7%)	15(2%)	5(0.7%)	**0.000**	95(12.8%)	205(27.7%)	10(1.4%)	**0.000**
Been self-conscious	230(31.1%)	0.068	150(20.3%)	125(16.9%)	10(1.4%)	5(0.7%)	0(0%)	**0.000**	95(12.8%)	190(25.7%)	10(1.4%)	**0.000**
Felt tense	280(37.8%)	**0.005**	206(27.8%)	125(17.6%)	10(1.4%)	15(2%)	9(1.2%)	**0.000**	145(19.6%)	215(29.1%)	10(1.4%)	**0.000**
Felt diet has been unsatisfactory	155(20.9%)	0.660	141(19.1%)	30(4.1%)	15(2%)	20(2.7%)	9(1.2%)	**0.000**	120(16.2%)	85(11.5%)	10(1.4%)	**0.005**
Had to interrupt meals	205(27.7%)	0.097	181(24.5%)	50(6.8%)	20(2.7%)	15(2%)	9(1.2%)	**0.000**	160(21.6%)	110(14.9%)	5(0.7%)	0.953
Found it difficult to relax	195(26.4%)	0.231	215(29.1%)	45(6.1%)	15 (2%)	5(0.7%)	5(0.7%)	**0.000**	155(20.9%)	125(16.9%)	5(0.7%)	0.209
Been a bit embarrassed	225(30.4%)	**0.000**	116(15.7%)	115(15.5%)	10(1.4%)	0(0%)	9(1.2%)	**0.000**	60(8.1%)	180(24.3%)	10(1.4%)	**0.000**
Been a bit irritable	230(31.1%)	0.068	257(34.7%)	40(5.4%)	20(2.7%)	14(1.9%)	9(1.2%)	**0.000**	195(26.4%)	135(18.2%)	10(1.4%)	0.265
Had difficulty doing usual jobs	250(33.8%)	**0.000**	156(21.1%)	120(16.2%)	15(2%)	10(1.4%)	9(1.2%)	**0.000**	85(11.5%)	215(29.1%)	10(1.4%)	**0.000**
Felt life less satisfying	210(28.4%)	**0.000**	97(13.1%)	120(16.2%)	10(1.4%)	4(0.5%)	9(1.2%)	**0.000**	65(8.8%)	175(23.6%)	0(0%)	**0.000**
Been totally unable to function	70(9.5%)	0.529	75 (10.1%)	15(2%)	5(0.7%)	0(0%)	0(0%)	**0.011**	35(4.7%)	60(8.1%)	0(0%)	**0.000**

Table 3: Assessment and comparing of (Headache) clinical factors influence on the prevalence of TMD and its impact on OHRQoL.

OHIP	Headache present from past 30 days	p-value	Headache Duration				p-value
			<1 day	1-3 days	3-6 days	6-9 days	
Had trouble pronouncing any words	115 (15.5%)	**0.000**	105 (14.2%)	5 (0.7%)	20 (2.7%)	0 (0%)	**0.000**
Felt sense of taste has worsened	85 (11.5%)	**0.000**	80 (10.8%)	10 (1.4%)	10 (1.4%)	5 (0.7%)	0.153
Had painful aching	160 (21.6%)	**0.002**	258 (34.9%)	32 (4.3%)	25 (3.4%)	0 (0%)	**0.000**
Found it uncomfortable to eat any foods	145 (19.6%)	**0.000**	265 (35.8%)	25 (3.4%)	20 (2.7%)	0 (0%)	**0.000**
Been self-conscious	150 (20.3%)	**0.003**	248 (33.5%)	27 (3.6%)	15 (2%)	5 (0.7%)	**0.001**
Felt tense	207 (27.7%)	0.265	303 (40.9%)	42 (5.7%)	20 (2.7%)	5 (0.7%)	**0.002**
Felt diet has been unsatisfactory	170 (23%)	**0.000**	155 (20.9%)	30 (4.1%)	20 (2.7%)	10 (1.4%)	**0.049**
Had to interrupt meals	225 (30.4%)	**0.000**	190 (25.7%)	50 (6.8%)	30 (4.1%)	5 (0.7%)	**0.000**
Found it difficult to relax	240 (32.4%)	**0.000**	184 (24.9%)	61 (8.2%)	30 (4.1%)	10 (1.4%)	**0.000**
Been a bit embarrassed	130 (17.6%)	**0.033**	220 (29.7%)	20 (2.7%)	10 (1.4%)	0 (0%)	**0.000**
Been a bit irritable	275 (37.2%)	**0.000**	238 (32.2%)	62 (8.4%)	30 (4.1%)	10 (1.4%)	**0.000**
Had difficulty doing usual jobs	185 (25%)	0.294	238 (32.2%)	32 (4.3%)	30 (4.1%)	10 (1.4%)	**0.004**
Felt life less satisfying	105 (14.2%)	**0.000**	199 (26.9%)	16 (2.2%)	20 (2.7%)	5 (0.7%)	**0.000**
Been totally unable to function	90 (12.2%)	**0.000**	70 (9.5%)	20 (2.7%)	5 (0.7%)	0 (0%)	0.077

Table 4: Assessment and comparing of (jaw joint) clinical factors influence on the prevalence of TMD and its impact on OHRQoL.

OHIP		Q1	Q2	Q3	Q4	Q5	p-value Q6	Headache Duration Q7	Q8	Q9	Q10	p-value Q11	Q12	Q13	Q14
Jaw joint noises in past 30 days	Yes	39(5.3%)	60(8.1%)	88(11.9%)	93(12.6%)	89(12%)	128(17.3%)	100(13.5%)	135(18.2%)	134(12%)	58(7.8%)	158(21.4%)	69(9.3%)	59(8%)	10(1.4%)
	No	15(2%)	15(2%)	31(4.2%)	22(3%)	31(4.2%)	37(5%)	15(2%)	30(4.1%)	35(4.7%)	21(2.8%)	52 (7%)	41(5.5%)	15(2%)	15(2%)
	R	60(8.1%)	25(3.4%)	175(23.6%)	169(22.8%)	155(20.9%)	179(24.4%)	85(11.5%)	90(12.2%)	90(12.2%)	165(22.3%)	104(14.1%)	174(23.5%)	160(21.6%)	55(7.4%)
	L	11(1.5%)	0(0%)	21(2.8%)	16(2.2%)	15(2%)	21 (2.8%)	10(1.4%)	15(2%)	21(2.8%)	6(0.8%)	26(3.5%)	26(3.5%)	6(0.8%)	15(2%)
	Donot Know	5(0.7%)	5(0.7%)	0(0%)	10(1.4%)	5(0.7%)	5(0.7%)	5(0.7%)	5(0.7%)	5(0.7%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
p-value		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	0.666	0.264	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Have you ever had your jaw	Yes	45(6.1%)	60 (8.1%)	120(16.2%)	120(16.2%)	90(12.2%)	165(22.3%)	130(17.6%)	180(24.3%)	180(24.3%)	80(10.8%)	205(27.7%)	105(14.2%)	75(10.1%)	40(5.4%)
	No	0 (0%)	5(0.7%)	10(1.4%)	0(0%)	5(0.7%)	5(0.7%)	0(0%)	5(0.7%)	15(2%)	0(0%)	10(1.4%)	15(2%)	5(0.7%)	0(0%)

lock or catch	R	60(8.1%)	30(4.1%)	175(23.6%)	170(23%)	180(24.3%)	175(23.6%)	65(8.8%)	70(9.5%)	75(10.1%)	155(20.9%)	95(12.8%)	165(22.3%)	155(20.9%)	50(6.8%)
	L	10(1.4%)	10(1.4%)	5(0.7%)	15(2%)	10(1.4%)	15(2%)	10(1.4%)	10(1.4%)	5(0.7%)	0(0%)	17(2.3%)	13(1.8%)	0(0%)	0(0%)
	Donot Know	15(2%)	0(0%)	5(0.7%)	5(0.7%)	10(1.4%)	10(1.4%)	10(1.4%)	10(1.4%)	10(1.4%)	15(2%)	13(1.8%)	12(1.6%)	5(0.7%)	5(0.7%)
p-value		**0.000**	**0.001**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.054**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Was your jaw lock or catch severe enough to limit your jaw opening and interfere with your ablity to eat?	Yes	50(6.8%)	60(8.1%)	215(29.1%)	215(29.1%)	205(27.7%)	260(35.1%)	125(16.9%)	190(25.7%)	190(25.7%)	165(22.5%)	225(30.4%)	210(28.4%)	165(22.5%)	45(6.1%)
	No	5(0.7%)	10(1.4%)	15(2%)	15(2%)	5(0.7%)	10(1.4%)	10(4.1%)	10(1.4%)	10(1.4%)	10(1.4%)	15(2%)	10(1.4%)	10(1.4%)	0(0%)
	R	65(8.8%)	25(3.4%)	75(10.1%)	75(10.1%)	65(8.8%)	75(10.1%)	65(8.8%)	60(8.1%)	70(9.5%)	65(8.8%)	80(10.8%)	70(9.5%)	65(8.8%)	50(6.8%)
	L	10(1.4%)	5(0.7%)	0(0%)	0(0%)	10(1.4%)	10(1.4%)	10(1.4%)	10(1.4%)	10(1.4%)	5(0.7%)	5(0.7%)	5(0.7%)	0(0%)	0(0%)
	Donot Know	0(0%)	5(0.7%)	10(1.4%)	10(1.4%)	10(1.4%)	15(2%)	5(0.7%)	0(0%)	0(0%)	5(0.7%)	15(2%)	15(2%)	0(0%)	0(0%)
p-value		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
In last 30 days, did lock jaw happened	Yes	60(8.1%)	55(7.4%)	120(16.2%)	130(17.6%)	115(15.5%)	175(23.6%)	135(18.2%)	200(27%)	195(26.4%)	85(11.5%)	235(31.8%)	120(16.2%)	75(10.1%)	35(4.7%)
	No	10(1.4%)	20(2.7%)	25(3.4%)	5(0.7%)	15(2%)	20(2.7%)	20(2.7%)	15(2%)	15(2%)	10(1.4%)	25(3.4%)	25(3.4%)	15(2%)	5(0.7%)
	R	55(7.4%)	25(3.4%)	160(21.6%)	155(20.9%)	155(20.9%)	160(21.6%)	55(7.4%)	55(7.4%)	60(8.1%)	150(20.3%)	70(9.5%)	150(20.3%)	150(20.3%)	50(6.8%)
	L	5(0.7%)	5(0.7%)	5(0.7%)	15(2%)	10(1.4%)	15(2%)	5(0.7%)	5(0.7%)	8(1.1%)	5(0.7%)	10(1.4%)	8(1.1%)	0(0%)	0(0%)
	Donot Know	0(0%)	0(0%)	5(0.7%)	5(0.7%)	0(0%)	0(0%)	0(0%)	0(0%)	7(0.9%)	0(0%)	0(0%)	7(0.9%)	0(0%)	5(0.7%)
p-value		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	0.091	**0.000**	0.091	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Is your jaw currently locked or limited	Yes	60(8.1%)	62(8.4%)	135(18.2%)	135(18.2%)	120(16.2%)	180(24.3%)	140(18.9%)	195(26.4%)	205(27.7%)	85(11.5%)	245(33.1%)	135(18.2%)	85(11.5%)	45(6.1%)
	No	5(0.7%)	13(1.8%)	10(1.4%)	5(0.7%)	5(0.7%)	10(1.4%)	10(1.4%)	5(0.7%)	10(1.4%)	5(0.7%)	15(2%)	15(2%)	5(0.7%)	0(0%)
	R	60(8.1%)	25(3.4%)	155(20.9%)	155(20.9%)	155(20.9%)	165(22.3%)	60(8.1%)	65(8.8%)	65(8.8%)	155(20.9%)	70(9.5%)	155(20.9%)	150(20.3%)	50(6.8%)
	L	5(0.7%)	5(0.7%)	10(1.4%)	10(1.4%)	10(1.4%)	10(1.4%)	5(0.7%)	10(1.4%)	5(0.7%)	0(0%)	5(0.7%)	5(0.7%)	0(0%)	0(0%)
	Donot Know	0(0%)	0(0%)	5(0.7%)	5(0.7%)	5(0.7%)	5(0.7%)	0(0%)	0(0%)	0(0%)	5(0.7%)	5(0.7%)	0(0%)	0(0%)	0(0%)
p-value		**0.000**	**0.047**	**0.000**	**0.000**	**0.000**	**0.000**	0.052	**0.000**	**0.002**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

In the last 30 days, when you opened your mouth wide	Yes	55(7.4%)	60(8.1%)	115(15.5%)	120(16.2%)	100(13.5%)	165(22.3%)	140(18.9%)	190(25.7%)	195(26.4%)	75(10.1%)	225(30.4%)	120(16.2%)	75(10.1%)	45(6.1%)
	No	5(0.7%)	10(1.4%)	30 (4.1%)	20(2.7%)	25(3.4%)	25(3.4%)	5(0.7%)	20(2.7%)	20(2.7%)	10(1.4%)	30 (4.1%)	15(2%)	5(0.7%)	0(0%)
	R	70(9.5%)	30(4.1%)	165(22.3%)	170(23%)	165(22.3%)	175(23.6%)	65(8.8%)	65(8.8%)	70(9.5%)	165(22.3%)	80 (10.8%)	165(22.3%)	160(21.6%)	50(6.8%)
	L	0(0%)	5(0.7%)	5(0.7%)	0(0%)	5(0.7%)	5(0.7%)	5(0.7%)	0(0%)	0(0%)	0(0%)	5(0.7%)	10(1.4%)	0(0%)	0(0%)
p-value		**0.000**	**0.136**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.002**	**0.002**	**0.000**	**0.324**	**0.000**	**0.000**	**0.000**
In the last 30 days, when you jaw locked or caught wide open , you did something to close it	Yes	55(7.4%)	55(7.4%)	115(15.5%)	120(16.2%)	110(14.9%)	180(24.3%)	150(20.3%)	195(26.4%)	195(26.4%)	75(10.1%)	240(32.4%)	120(16.2%)	75(10.1%)	40(5.4%)
	No	5(0.7%)	15(2%)	30(4.1%)	20(2.7%)	20(2.7%)	20 (2.7%)	0(0%)	10(1.4%)	10(1.4%)	10(1.4%)	20 (2.7%)	10(1.4%)	5(0.7%)	0(0%)
	R	70(9.5%)	30(4.1%)	165(22.3%)	165(22.3%)	165(22.3%)	170(23%)	60(8.1%)	70(9.5%)	75(10.1%)	165(22.3%)	8 (10.8%)	170(23%)	165(22.3%)	50(6.8%)
	L	0(0%)	5(0.7%)	0(0%)	0(0%)	0(0%)	0(0%)	5(0.7%)	0(0%)	0(0%)	0(0%)	0(0%)	5(0.7%)	0(0%)	0(0%)
	Donot Know	0(0%)	0(0%)	5(0.7%)	5(0.7%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	5(0.7%)	0(0%)	5(0.7%)
p-value		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.002**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

The current study revealed 64.3% prevalence of TMD, however the study also noticed the string association of TMD symptoms with oral health related quality of life. A significant associations of TMD with difficulty in tasks like pronouncing words, eating comfortably, maintaining a satisfying diet, and performing regular activities due to TMD pain or discomfort. Also TMD had negative psychological effects. Individuals experiencing TMD symptoms reported feeling of self-conscious, tense, stressed, irritable, and having difficulty relaxing or enjoying life. Hence, suggesting a potential negative impact on social interactions due to TMD.

High stress levels can contribute to TMD by causing bruxism and affecting the jaw muscles. This can lead to pain and discomfort due to changes in blood flow and the accumulation of pyruvic and lactic acids in the muscles. These psychosocial factors, such as anxiety, stress, and depression, may play a significant role in the development of TMD.[15] Winocur et al in 2009, found a significant gender-related difference in somatization values, with women exhibiting higher scores compared to men. Conversely, no significant relationship was observed between depression values and gender.[16] Komiyama et al. in 2014, no association found between somatization scores and age groups. Nonetheless, it revealed a notable disparity in somatization scores between sexes, with women exhibiting significantly higher levels than men.[17] However, in this study female (34.23%) showed more prevalence to TMD symptoms, which is coincident with findings of previous evidence. Minghelli et al. in 2014 found that the sex and age group of individuals were significantly associated with anxiety and depression. They reported that anxiety and depression increased with increased age. Moreover, they found the anxiety and depression levels of women to be higher than those of men.[15] Lei et al. in 2016, found that teenagers aged 16-18 are more likely to experience depression, anxiety, and stress compared to those aged.[12,13,14,15,18]

The study by Gatz and Hurwicz, found that older patients with depression, or disabilities and severe physical symptoms were more likely to be diagnosed with depression compared to younger patients with normal or moderate levels.[19] This suggests that the prevalence of depression may be higher in older populations. While some studies have found a connection between temporomandibular disorders and parafunctional habits, others have not.[20] Michelotti et al. in 2010, found a connection between parafunctional habits and temporomandibular disorders.[21]

Pedroni et al. in 2003, found that 68% of Brazilian university students had at least one sign or symptom of TMD. Of those with TMD, 42% had mild symptoms, 20% had moderate symptoms, and 6% had severe symptoms.[22] Nomura et al. in 2007 found that 35.78% of dentistry students had mild TMD, 11.93% had moderate TMD, and 5.5% had severe TMD.[23] Chandak et al in 2017 and Ayalı and Ramoglu in 2014, found that 38.6% of participants had mild TMD, 13.4% had moderate TMD, and 4.4% had severe TMD.[24,25] Ayalı and Ramoglu, also found that TMD is more common in females than in males. The researchers suggest that factors such as ethnicity, sample size, and gender distribution may all contribute to the varying prevalence of TMD.[25] This suggests that females may experience more severe TMD symptoms. Studies also suggests that the higher prevalence of TMD in females may be associated to their physiological characteristics, such as hormone levels and the structure of connective tissues and muscles. Estrogen may cause these tissues to relax more, making them less able to withstand pressure and potentially leading to TMD.[2,23]

The study by de Oliveira and Sheiham in 2004, found that there is a significant relationship between sex and OHIP-14 scores among adolescents, with females scoring higher than males. Additionally, there is a positive correlation between age and OHIP-14 scores, indicating that older adolescents tend to have higher scores.[26] Malocclusions and dentofacial deformities are common problems that can affect people's physical, social, and mental well-being. The concept of oral health-related quality of life measures how dental problems can impact a person's daily life, health, and overall quality of life.[27] Investigations revealed a stronger association between the severity of malocclusion and the quality of life of individuals. Furthermore, malocclusion was found to exert a detrimental influence on oral health-related quality of life in patients with temporomandibular joint disorders.[26,27]

Overall, the data strongly supports a connection between TMD and a decrease in OHRQL. Individuals experiencing TMD symptoms may face limitations in daily activities, experience negative emotions, and potentially have difficulties in social interactions.

5. Limitations

The study included, multiple centres, an imbalanced male-to-female ratio, and a diverse age group. These factors may have influenced the generalizability of the findings and could limit the extent to which the results can be applied to the broader population. Future research is required exploring factors like socioeconomic status, lifestyle, ongoing treatments, and treatment expectations could provide a more comprehensive understanding.

6. Conclusion

The study found a notably higher prevalence of Temporomandibular Joint Disorders (TMD) symptoms among females and younger individuals, particularly those in the 18-35 age group. This demographic showed a significant association between TMD symptoms and impaired oral health, as evidenced by responses to the DC/TMD

questionnaire and the OHIP-14. The data revealed that TMD not only affects the temporomandibular joint but also significantly impacts various aspects of oral health-related quality of life (OHRQoL). Specifically, participants with TMD exhibited greater functional disability, increased physical pain, and social limitations when compared to those without TMD symptoms. These findings suggest that TMD can result in a substantial negative impact on individuals' overall well-being, including their ability to perform everyday tasks, maintain social interactions, and manage pain. The study underscores the need for a more comprehensive approach to diagnosing and treating TMD, considering its broader effects on both physical health and quality of life.

7. Data Availability

Data related to this article are available from the corresponding author upon reasonable request.

8. Sources of Funding

9. Conflict of Interest

The authors have no conflicts of interests directly relevant to the content of this article.

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