

## Impact Of Education And Occupational Status On Temporomandibular Joint Disorders Among Dental Patients - A Retrospective Study

Research Article

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### Abstract

Temporomandibular joint disorders (TMD) are degenerative musculoskeletal conditions associated with morphological and functional deformities. The etiology of TMD is considered multifactorial in nature and has been related to trauma, malocclusion, parafunctional habits, socioeconomic status and dietary habits. Poor socioeconomic status which includes low literacy level and unemployment may lead to stress among those individuals which might lead to development of TMD in those individuals. The aim of the study was to evaluate the impact of education and occupational status of dental patients on temporomandibular joint disorders. In this retrospective study, a total of 49 patients who had temporomandibular disorders were included. Demographic details like age, gender and types of TMD was noted. Factors like education and occupation of the patients were assessed through case sheets and confirmed through phone calls, thus socioeconomic status was obtained. Excel tabulation and SPSS version 23 was used for statistical analysis. The statistical test used for the demographics was frequency distribution. Chi-square t test was used to test the association between education and occupation with types of TMD and results obtained. The age group most affected with TMD was 31-40 year (42.86%). The gender most affected with TMD was males (51.02%). Disc- condyle disorders (61.22%) was the predominant type of TMD present in the study population. Overall, 30% of those in higher secondary education and 32% of those pursuing engineering were mostly affected with TMD. However this association between education and TMD was statistically not significant ( $p > 0.05$ ). Overall, housewives (30%) and students (20%) were mostly affected with TMD. However this association between occupation and TMD was statistically not significant ( $p > 0.05$ ). Within the limits of the study, temporomandibular disorders were predominantly seen in the age group of 31-40 years with male predilection. Disc- condyle disorders was the predominant type of TMD. From our study it can be concluded that education and occupational status of dental patients are not associated with temporomandibular disorders.

**Keywords:** Degenerative Disorder; Dental Patients; Education; Occupation, Temporomandibular Disorders.

### Introduction

Temporomandibular disorders are degenerative musculoskeletal conditions associated with morphological and functional deformities [5]. The temporomandibular articulation is composed of bilateral, diarthrodial, temporomandibular joints (TMJs) [22]. Each joint is formed by a mandibular condyle and its corresponding temporal cavity (glenoid fossa and articular eminence) [34]. The TMJ and its associated structures play an essential role in providing mandibular motion and distributing stresses produced by everyday tasks such as chewing, swallowing and speaking [19].

The American academy of paediatric Dentistry (AAPD) has recognised that disorders of the temporomandibular joint (TMJ), masticatory muscles and associated structures occasionally occur within infants, children and adolescents [25].

Temporomandibular disorders (TMD) is a collective term for a group of musculoskeletal and neuromuscular conditions that include several clinical signs and symptoms such as pain, headache, TMJ sounds, TMJ locking and ear pain [7]. In addition to this pain on mastication, with restricted mandibular movements associated with joint sounds is observed. TMD include abnormalities of the

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intra-articular distal position and/or structure as well as dysfunction of the associated musculature [3]. About 60-70% of the general population has at least one sign of Temporomandibular joint dysfunction (TMD), but only one out of 4 individuals is aware of these symptoms and reports them to a specialist [18].

There are various factors associated with the occurrence of TMD which includes dietary habits, parafunctional habits, stress, socioeconomic status (education and occupation) etc. The etiology and pathogenesis of this condition is poorly understood, therefore treatment of Temporomandibular joint diseases is sometimes difficult [15]. Poor socioeconomic status like low literacy level and unemployment may lead to stress among those individuals which might lead to development of TMD in those individuals [11]. But this was not statistically significant in the majority of the studies conducted [21]. While 25% of the population may experience symptoms of TMD [32], only a small percentage of afflicted individuals seek treatment. Recent studies have shown that rural schools, low parental education levels, poverty, living outside the home, poor general and oral health showed positive correlation with TMD [8].

Several other factors other than occlusal, hormonal, trauma, parafunctions to be involved in the occurrence of TMD like socioeconomic status which has very little literature relating to it [8]. Thus understanding the etiology of Temporomandibular joint disorders is extremely important in identifying and avoiding potential pathological factors.

Previously our team had conducted numerous clinical trials [13, 27, 16, 30, 6, 1, 12, 29, 17, 29, 33, 28], *in vitro* studies [20] and systematic reviews [26, 24] regarding TMD over the past 5 years. Now we are focussing on epidemiological surveys on TMD. The idea for this survey stemmed from the current interest in the community.

So this study aims to evaluate the impact of education and occupational status of dental patients on temporomandibular joint disorders, which would help in patient motivation, early intervention and better prognosis.

## Materials And Methods

### Study design and Study setting

This retrospective cross-sectional study was conducted in Saveetha dental college and hospital, Saveetha university, Chennai, to evaluate the association between education, and occupational status with temporomandibular joint disorders among dental patients reporting from June 2019 to March 2020. The study was initiated after approval from the institutional review board and it was covered by the following ethical approval number ; SDC/SIHEC/2020/DIASDATA/0619-0320.

### Study population and sampling

Inclusion criteria for the study were adult dental patients with TMD. Exclusion criteria included history of trauma to the TMJ, immunocompromised patients, history of orthodontic treatment, having dental prostheses, dental anomalies, systemic diseases with cognitive problems and speech problems, missing or incomplete

data. After assessment in the university patient data registry, consecutive case records of 49 patients who were diagnosed with TMD and were eligible for the study were included in the study. Cross verification of data for errors was done with the help of an external examiner.

### Data collection and tabulation

Data regarding patients having TMD were retrieved after analyzing 86000 case sheets. The following parameters were evaluated based on the dental records; age, gender and types of TMD. Chief complaints, medical and dental history and treatment report of the patients were examined for the data collection. Occupation and education details of the patients were also recorded from patients case sheets and confirmed with phone calls to the patients. Patients diagnosed with TMD were further classified into disc-condyle disorder, degenerative disorder and myofascial pain and dysfunction syndrome (MPDS). Data was entered in excel and was imported to SPSS. The variables were defined.

### Statistical Analysis

The collected data was validated, tabulated and analysed with Statistical Package for Social Sciences for Windows, version 23.0 (SPSS Inc., Chicago, IL, USA) and results were obtained. Descriptive analysis was used to describe age, gender and types of TMD among the study population. Categorical variables were expressed in frequency and percentage; and continuous variables in mean and standard deviation. Chi-square test was used to test associations between categorical variables (age, gender and types of TMD). P value < 0.05 was considered statistically significant.

## Results And Discussion

In our study sample of 49 patients with TMD, the most affected age group by TMD is 31-40 years (42.86%) and the least affected age group is 51-60 years (4.08%). 14.29% of patients in the age group of 11-20 years were affected by TMD, followed by 22.45% in the 21-30 years age group and 16.33% in the 41-50 years age group [Figure 1].

In relation to the gender distribution of the patients with temporomandibular disorders it was found that the males (51.02%) were most affected than females (48.98%) [Figure 2]. Distribution of TMD among the study population revealed that disc-condyle disorder was present predominantly (61.22%), followed by MPDS (34.69%) and with least occurrence of degenerative disorders (4.08%) [Figure 3].

On comparing the association between education and TMD, it was seen that disc-condyle disorders were mostly seen in patients who were in higher secondary education (20.41%) and engineering students (20.41%). In the middle school category, 2.04% of the study population had degenerative disorders and 2.04% had MPDS. In the High secondary category, 2.04% had degenerative disorders, 20.41% had disc-condyle disorders and 8.16% had MPDS. In the B.com category, 8.16% of the study population had disc-condyle disorders and 6.12% had MPDS. In the engineering category, 20.41% had disc-condyle disorders and 12.24% had MPDS. In the MBA category, 4.06% had disc-condyle disorder and 2.04% had MPDS. In the uneducated category, 8.16%

Figure 1. Bar chart shows age wise distribution of the patients with temporomandibular disorders. X axis denotes the age group and Y axis denotes the number of patients with TMD in each age group. The most affected age group by TMD is 31-40 years (42.86%) and the least affected age group is 51-60 years (4.08%).

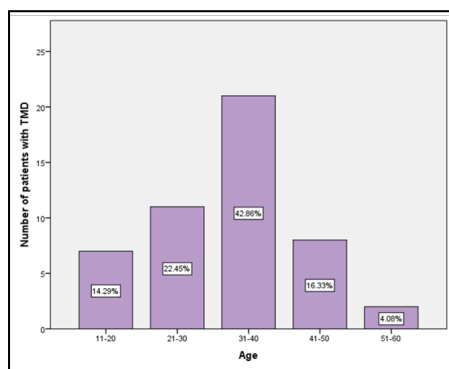


Figure 2. Bar chart shows gender wise distribution of the patients with temporomandibular disorders. X axis denotes the gender (Male and Female) and Y axis denotes the number of patients with TMD in each gender. Out of 49 patients, males (51.02%) are most affected than females (48.98%).

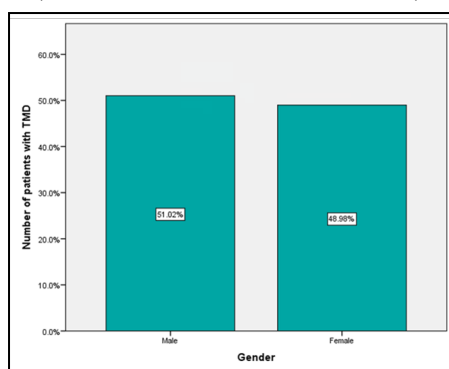


Figure 3. Bar chart shows distribution of types of TMD of the study population. X axis denotes the types of TMD and Y axis denotes the number of patients with TMD in each group. Disc-condyle disorder is the predominant type of TMD (61.22%), followed by MPDS (34.69%) and degenerative disorders (4.08%).

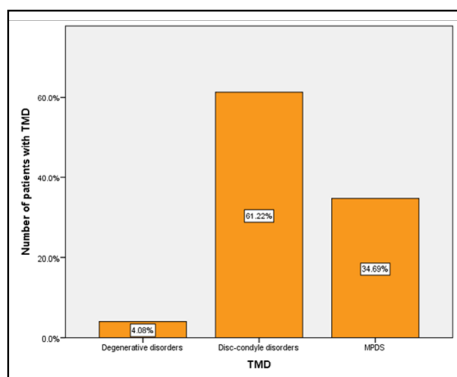
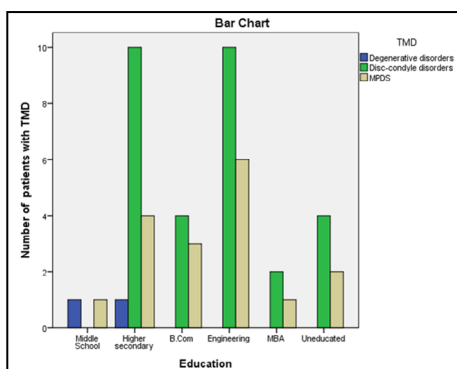


Figure 4. Bar chart showing association between Education and TMD. X axis denotes Education status of the patients and Y axis denotes number of patients with different types of TMD. (Pearson Chi square = 0.725, p = 0.394 (>0.05), hence statistically not significant). Disc-condyle disorders were mostly seen in patients who were in higher secondary education (20.41%) and engineering students (20.41%). Overall, 30% of those in higher secondary education and 32% of those pursuing engineering were mostly affected with TMD. However this association between education and TMD was statistically not significant.



**Table 1.** Table shows association between education and TMD. (Pearson Chi square = 0.725 , p = 0.394 (>0.05), hence statistically not significant). Disc-condyle disorders were mostly seen in patients who were in higher secondary education (20.41%) and engineering students (20.41%). Overall, 30% of those in higher secondary education and 32% of those pursuing engineering were mostly affected with TMD. However this association between education and TMD was statistically not significant.

Temporomandibular disorder					Total
		Degenerative disorders	Disc-condyle disorders	MPDS	
Education	Middle school	1	0	1	2
	Higher secondary	1	10	4	15
	B.com	0	4	3	7
	Engineering	0	10	6	16
	MBA	0	2	1	3
	uneducated	0	4	2	6
Total		2	30	17	49
Chi Square Test					
		Value	df	Asymptotic Significance (2-sided)	
Pearson Chi-Square		0.725	10	0.394	

**Table 2.** Table shows association between occupation and TMD. (Pearson Chi square = 0.938 , p = 0.333 (>0.05), hence statistically not significant). Disc-condyle disorders were predominantly present in students (14.29%) and housewives (22.45%). MPDS was seen mostly in patients working in IT sectors (12.24%). Overall, housewives (30%) and students (20%) were mostly affected with TMD. However this association between Occupation and TMD was statistically not significant.

Temporomandibular disorders					Total
		Degenerative disorders	Disc-condyle disorders	MPDS	
Occupation	Accountant	0	1	0	1
	Beautician	0	1	0	1
	Businessman	0	2	0	2
	Daily wage worker	0	1	1	2
	Driver	0	2	0	2
	Housewife	2	11	4	17
	IT Professional	0	2	6	8
	Salesman	0	0	2	2
	Security	0	2	1	3
	Servant	0	1	0	1
	Student	0	7	3	10
Total		2	30	17	49
Chi Square Test					
		Value	df	Asymptotic Significance (2-sided)	
Pearson Chi-Square		0.938	20	0.333	

of the study population had disc-condyle disorders and 4.08% had MPDS. Overall, 30% of those in higher secondary education and 32% of those pursuing engineering were mostly affected with TMD. However this association between education and TMD was statistically not significant (p = 0.394) [Figure 4 and Table 1].

On comparing the association between occupation and TMD, it was seen that Disc-condyle disorders were predominantly present in students (14.29%) and housewives (22.45%). MPDS was seen

mostly in patients working in IT sectors (12.24%). In the accountant category, 2.04% of the study population had disc-condyle disorder. In the beautician category, 2.04% had disc-condyle disorder. In the businessman category, 4.08% of the study population had disc-condyle disorder. In the case of the daily wage worker group 2.04% of the study population had disc-condyle disorder and 2.04% had MPDS. In the driver category, 4.08% had disc-condyle disorder. In the housewives group, it was observed that 4.08% had degenerative disorder, 22.45% had disc-condyle disorder





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Third author Revathi Duraisamy contributed to review the manuscript.

All the authors have discussed the results and contributed to the final manuscript.

## References

- Abhinav RP, Selvarasu K, Maheswari GU, Taltia AA. The Patterns and Etiology of Maxillofacial Trauma in South India. *Ann Maxillofac Surg.* 2019 Jan-Jun;9(1):114-117. Pubmed PMID: 31293938.
- Akhter R, Hassan NM, Nameki H, Nakamura K, Honda O, Morita M. Association of dietary habits with symptoms of temporomandibular disorders in Bangladeshi adolescents. *J Oral Rehabil.* 2004 Aug;31(8):746-53. Pubmed PMID: 15265209.
- American Academy of Craniomandibular Disorders (1990) Craniomandibular Disorders: Guidelines for Evaluation, Diagnosis, and Management. Quintessence Publ.
- Anastassaki Köhler A, Hugoson A, Magnusson T. Prevalence of symptoms indicative of temporomandibular disorders in adults: cross-sectional epidemiological investigations covering two decades. *Acta Odontol Scand.* 2012 May;70(3):213-23. Pubmed PMID: 22126531.
- Carlsson GE. Epidemiology and treatment need for temporomandibular disorders. *J Orofac Pain.* 1999 Oct 1;13(4):232-237.
- Christabel A, Anantanarayanan P, Subash P, Soh CL, Ramanathan M, Muthusekhar MR, et al. Comparison of pterygomaxillary dysjunction with tuberosity separation in isolated Le Fort I osteotomies: a prospective, multi-centre, triple-blind, randomized controlled trial. *Int J Oral Maxillofac Surg.* 2016 Feb;45(2):180-5. Pubmed PMID: 26338075.
- Dimitroulis G. Temporomandibular disorders: a clinical update. *Bmj.* 1998 Jul 18;317(7152):190-4.
- Guo H, Yang W, Cao Y, Li J, Siegrist J. Effort-reward imbalance at school and depressive symptoms in Chinese adolescents: the role of family socioeconomic status. *Int J Environ Res Public Health.* 2014 Jun 10;11(6):6085-98. Pubmed PMID: 24919130.
- Hongxing L, Aström AN, List T, Nilsson IM, Johansson A. Prevalence of temporomandibular disorder pain in Chinese adolescents compared to an age-matched Swedish population. *J Oral Rehabil.* 2016 Apr;43(4):241-8. Pubmed PMID: 26538188.
- Hongxing L, Aström AN, List T, Nilsson IM, Johansson A. Prevalence of temporomandibular disorder pain in Chinese adolescents compared to an age-matched Swedish population. *J Oral Rehabil.* 2016 Apr;43(4):241-8. Pubmed PMID: 26538188.
- Inglehart MR, Patel MH, Widmalm SE, Briskie DM. Self-reported temporomandibular joint disorder symptoms, oral health, and quality of life of children in kindergarten through grade 5: Do sex, race, and socioeconomic background matter? *J Am Dent Assoc.* 2016 Feb;147(2):131-41. Pubmed PMID: 26809694.
- Vijayakumar Jain S, Muthusekhar MR, Baig MF, Senthilnathan P, Loganathan S, Abdul Wahab PU, et al. Evaluation of Three-Dimensional Changes in Pharyngeal Airway Following Isolated Lefort One Osteotomy for the Correction of Vertical Maxillary Excess: A Prospective Study. *J Maxillofac Oral Surg.* 2019 Mar;18(1):139-146. Pubmed PMID: 30728705.
- Jesudasan JS, Wahab PU, Sekhar MR. Effectiveness of 0.2% chlorhexidine gel and a eugenol-based paste on postoperative alveolar osteitis in patients having third molars extracted: a randomised controlled clinical trial. *Br J Oral Maxillofac Surg.* 2015 Nov;53(9):826-30. Pubmed PMID: 26188932.
- Jussila P, Knuutila J, Salmela S, Näpänkangas R, Pääkilä J, Pirttiniemi P et al. Association of risk factors with temporomandibular disorders in the Northern Finland Birth Cohort 1966. *Acta Odontol Scand.* 2018 Oct 3;76(7):525-9.
- Karan A. General evaluation of temporomandibular joint disorders with symptoms and signs. *Türkiye Fiziksel Tıp ve Rehabilitasyon Dergisi.* 2010 Apr 1;56:11-14.
- Kumar S, Rahman RE. Knowledge, awareness, and practices regarding biomedical waste management among undergraduate dental students. *Asian J. Pharm. Clin. Res.* 2017;10(8):341.
- Kumar S, Snea S. 'Knowledge and awareness regarding antibiotic prophylaxis for infective endocarditis among undergraduate dental students', *Asian J Pharm Clin Res.* 2016; 9:154-159.
- List T, Stenström B, Lundström I, Dworkin SF. TMD in patients with primary Sjögren syndrome: a comparison with temporomandibular clinic cases and controls. *J Orofac Pain.* 1999 Winter;13(1):21-8. Pubmed PMID: 10425965.
- Magnusson T, Egermark I, Carlsson GE. Treatment received, treatment demand, and treatment need for temporomandibular disorders in 35-year-old subjects. *Cranio.* 2002 Jan;20(1):883. Pubmed PMID: 11831338.
- Marimuthu M, Andiappan M, Wahab A, Muthusekhar MR, Balakrishnan A, Shanmugam S. Canonical Wnt pathway gene expression and their clinical correlation in oral squamous cell carcinoma. *Indian J Dent Res.* 2018 May 1;29(3):291-297.
- Martins-RJ, Garcia AR, Garbin CA, Sundefeld ML. The relation between socio-economic class and demographic factors in the occurrence of temporomandibular joint dysfunction. *Ciencia & saude coletiva.* 2008 Dec;13:2089-96.
- Mercuri LG, Olson RE, Laskin DM. The specificity of response to experimental stress in patients with myofascial pain dysfunction syndrome. *J. Dent. Res.* 1979 Sep;58(9):1866-71.
- Kumar S. Relationship between dental anxiety and pain experience during dental extractions. *Asian J. Pharm. Clin. Res.* 2017;10(3):458-461.
- Kumar S. The emerging role of botulinum toxin in the treatment of orofacial disorders: Literature update. *Asian J. Pharm. Clin. Res.* 2017;10(9):21-9.
- Navi F, Motamedi MH, Talesh KT, Lasemi E, Nematollahi Z. Diagnosis and management of temporomandibular disorders. In *A textbook of advanced oral and maxillofacial surgery* 2013 Jun 26.
- Packiri S, Gurunathan D, Selvarasu K. Management of paediatric oral ranula: a systematic review. *J Clin Diagn Res.* 2017 Sep;11(9):ZE06-ZE09.
- Patil SB, Durairaj D, Suresh Kumar G, Karthikeyan D, Pradeep D. Comparison of Extended Nasolabial Flap Versus Buccal Fat Pad Graft in the Surgical Management of Oral Submucous Fibrosis: A Prospective Pilot Study. *J Maxillofac Oral Surg.* 2017 Sep;16(3):312-321. Pubmed PMID: 28717289.
- Patturaja K, Pradeep D. Awareness of Basic Dental Procedure among General Population. *Research J. Pharm. and Tech.* 2016 Sep 1;9(9):1349.
- Rahman RE, Mp SK. Knowledge, attitude, and awareness of dental undergraduate students regarding human immunodeficiency virus/acquired immunodeficiency syndrome patients. *Asian J Pharm Clin Res.* 2017;10(5):175-80.
- Rao TD, Kumar MS. Analgesic efficacy of paracetamol vs ketorolac after dental extractions. *Research J. Pharm. and Tech.* 2018 Aug 1;11(8):3375-9.
- Shet RG, Rao S, Patel R, Suvvati P, Sadar LR, Yadav RD. Prevalence of temporomandibular joint dysfunction and its signs among the partially edentulous patients in a village of North Gujarat. *J Contemp Dent Pract.* 2013 Nov 1;14(6):1151-5. Pubmed PMID: 24858766.
- Solberg WK, Woo MW, Houston JB. Prevalence of mandibular dysfunction in young adults. *J Am Dent Assoc.* 1979 Jan 1;98(1):25-34.
- Sweta VR, Abhinav RP, Ramesh A. Role of Virtual Reality in Pain Perception of Patients Following the Administration of Local Anesthesia. *Ann Maxillofac Surg.* 2019 Jan-Jun;9(1):110-113. Pubmed PMID: 31293937.
- Tanaka E, Detamore MS, Mercuri LG. Degenerative disorders of the temporomandibular joint: etiology, diagnosis, and treatment. *J. Dent. Res.* 2008 Apr;87(4):296-307.