



## Mental health in patients with temporomandibular disorders referring to School of Dentistry, Tehran University of Medical Science

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### ABSTRACT

**Introduction:** The aim of this study was to evaluate mental health in temporomandibular disorders (TMD) patients considering: Gender, age, and grade of chronic pain scales (GCPS).

**Materials and Methods:** The data were collected using general health questionnaire (GHQ-28) for evaluating mental health and research diagnostic criteria for TMD for evaluating GCPS, age, and gender from 75 TMD patient seeking treatment at Dental School of Tehran University of Medical Science and Shariati Hospital during 13 months and 75 also non-patient group without TMD diagnosis.

**Result:** According to the results from GHQ questionnaire, total scores of the questionnaire which shows mental impairment and all subscales except for social dysfunction were significantly higher in patients in comparison with non-patients ( $P < 0.0500$ ). Patients with higher GCPS had higher scores in subscales of GHQ-28 and its total score ( $P < 0.0500$ ) except for "social dysfunction." Considering gender in the patient group except for social dysfunction TMD had greater impacts on women's mental health rather than men. Older individuals revealed the lower likelihood of being depressed.

**Conclusion:** TMD and chronic pain affect mental health negatively so that patients have the poorer mental health in comparison with non-patients.

**Keywords:** TMD; General Health Questionnaire (GHQ); Mental health; Chronic pain scales (GCPs)

### Introduction

Temporomandibular disorder (TMD) is the title given to several problems affecting temporomandibular joint (TMJ), masticatory muscles, and peripheral structures [1]. The TMJ, connect the lower jawbone (mandible) to the skull. This flexible joint is used more than any other joint in the body. It allows the mouth to open and close for talking, chewing, swallowing, yawning, and other movements [2]. Many people have problems with jaw movements and pain at some period during their lives. These joint and muscle problems are complex, so finding the right diagnosis and treatment of TMD may take some time [3].

TMD can affect the jaw joint, as well as muscles in the face, shoulder, head, and neck. Common symptoms are TMJ pain, muscle pain, headache, clicking, trouble with mouth opening, and jaw locking [4]. In most cases, TMD symptoms are mild and do not last long. They tend to come and go without getting worse and usually go away without doctor's care. Some people who have TMD develop chronic symptoms. Chronic pain or difficulty in moving the jaw may affect talking, eating, and swallowing. This can affect a person's overall sense of well-being [5]. The most common consequence of TMD is muscle tension, often triggered by stress. When you are under stress, you may have habit of clenching or grinding your teeth. These habits can tire the

jaw muscles and lead to a cycle of muscle spasm: Tissue damaging, pain, sore muscles, and more spasm [6]. TMD can start when there is a problem with the joint itself as well, such as: (1) An injury to the joint or surrounding tissue, (2) problems with how the joint is shaped, (3) joint diseases, such as osteoarthritis or rheumatoid arthritis, and (4) the articular disc that cushions the joint, shifts out of place [5]. Female reproductive hormones are shown to have an important effect on risk of TMD pain and in normal population women challenge 4 times more than men with TMD [7]. Biopsychosocial theory explains multifactorial nature of TMD and considers role of cognitive, social and mental health in TMD patients as important factors. There is consensus among researchers and clinicians about the importance of assessing and managing both physical and psychological factors [8]. One of the useful instruments in assessing mental aspects in TMD patients which is used in previous studies is general health questionnaire (GHQ-28) questionnaire with four different sub-scales: Anxiety, social dysfunction, depression, and somatization. The questionnaire also defines individual's suspicion of mental health disorders [9]. The aim of this study was to define role of mental health in TMD patients considering age, gender and grade of chronic pain scales (GCPS).

## Material and Methods

Total samples of study were consisted of 150 individuals of which 75 [mean age = 34.35, standard deviation (SD) = 13.00 with female to male ratio = 4/1] were TMD patients referring to TMJ clinic in Dental Faculty of Tehran University of Medical Science during 13 months from March 2013 to April 2014 for diagnosis and treatment of their disease and 75 non-patients (NP) (mean age = 37.31, SD = 13.20 with female to male ratio = 4/1) from individuals who came to dental faculty for their annual check-ups.

The inclusion criteria were as follows:

1. At least 17-year-old of age,
2. At least one diagnosis according to research diagnostic criteria (RDC)/TMD Axis I [10],
3. Lack of general disease which can affect TMD and masticatory muscles.

The exclusion criteria was:

1. Patients with previous history of treatment.

The data considering GCPS, gender, and age were assessed from RDC/TMD Axis II questionnaire.

GCPS were divided into five groups according to RDC/TMD guideline [10].

Grade 0 = No TMD pain in the previous 6 months,

Grade I = Low disability – Low-intensity pain.

Grade II = Low disability – High-intensity pain.

Grade III = High disability – Moderately limiting.

Grade IV = High disability – Severely limiting.

### GHQ-28

The GHQ was used to assess different types of mental disorders. It is well-accepted and used in the previous study in this field [6, 11]. It is a 28-item questionnaire which is divided into four different subscales: GHQ-Somatic symptoms, GHQ-Anxiety and insomnia, GHQ-Social dysfunction and GHQ-severe depression. GHQ-Total score of questionnaire shows individuals suspicion of mental impairment [12].

### Sample size

The size of the sample was calculated with power analysis based on the data from an earlier study [13, 14]. Variable (total score of Helkimo's clinical dysfunction index) differences with a mean of two-points (SD = 3.5, 5% alpha error level) between the groups could be achieved with 95% power with the sample size of 75 per group.

### Statistic analyze

Scores for depression, somatization, social dysfunction, and anxiety and total score of GHQ-28 were calculated for the patient and non-patient group and compared between two groups according to t-test. ANOVA test used to evaluate scores in each group stratified by GCPS. Pearson test used to define correlation between scores of mental health and age. Comparison between genders is analyzed using t-test. Statistical significance was set at  $P < 0.0500$ . All statistical analyses were performed using the SPSS software (version 22; SPSS Inc., Chicago, IL, USA).

## Results

The mean score for GHQ-T was 7.70 (SD = 4.70) in the patient group and 4.96 (SD = 4.06) in non-patient group ( $P < 0.0001$ , chi-square test). The complete results of each sub-scale are available in table 1. The mean score of GHQ sub-scales was associated with GCPS and patients with higher GCPS had higher GHQ score except for social dysfunction sub-scale which did not show significant changes (Table 2).

**Table 1.** Mean scores of GHQ-sub-scales according to 75 patients and 75 NP

Group	GHQ-S	GHQ-A	GHQ-SD	GHQ-D	GHQ-T
	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
Patient	2.31 $\pm$ 1.72	2.25 $\pm$ 1.64	1.15 $\pm$ 1.50	2.09 $\pm$ 1.69	7.70 $\pm$ 4.90
Non-patient	1.10 $\pm$ 1.21	1.09 $\pm$ 1.36	0.79 $\pm$ 1.03	1.31 $\pm$ 1.21	4.59 $\pm$ 4.06
P value	0.0001	0.0001	0.1010	0.0020	0.0001

GHQ: General health questionnaire; SD: Standard deviation, GHQ-S: General health questionnaire-Somatic symptoms; GHQ-A: General health questionnaire-Anxiety and insomnia; GHQ-SD: General health questionnaire-Social dysfunction; GHQ-D: General health questionnaire-Severe depression; GHQ-T: General health questionnaire-Total; NP: Non-patients

**Table 2.** Mean score of GHQ subscales according to GCPS in 75 patients

GCPS	Patient	GHQ-S	GHQ-A	GHQ-SD	GHQ-D	GHQ-T
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
0	13	0.69 ± 0.85	0.85 ± 1.07	1.00 ± 1.63	0.77 ± 1.01	3.30 ± 2.58
1	20	1.45 ± 1.00	1.70 ± 1.30	0.65 ± 1.09	1.55 ± 1.47	5.05 ± 3.21
2	29	2.83 ± 1.58	2.66 ± 1.49	1.34 ± 1.67	2.66 ± 1.26	9.37 ± 3.86
3	9	5.22 ± 1.56	3.89 ± 1.45	1.56 ± 1.51	2.44 ± 2.30	12.33 ± 5.17
4	4	3.75 ± 0.96	3.00 ± 1.83	1.75 ± 1.71	4.25 ± 2.06	12.75 ± 5.67
Total	75	2.31 ± 1.72	2.25 ± 1.64	1.15 ± 1.50	2.09 ± 1.69	4.90 ± 7.70
P value		0.0001	0.0001	0.3970	0.0001	0.0001

GHQ: General health questionnaire; SD: Standard deviation, GCPS: Grade of chronic pain scales; GHQ-S: General health questionnaire-Somatic symptoms; GHQ-A: General health questionnaire-Anxiety and insomnia; GHQ-SD: General health questionnaire-Social dysfunction; GHQ-D: General health questionnaire-Severe depression; GHQ-T: General health questionnaire-Total

**Table 3.** Mean score of GHQ sub-scales according to gender in 75 patients and 75 NP

Gender	GHQ-S (Mean ± SD)		GHQ-A (Mean ± SD)		GHQ-SD (Mean ± SD)		GHQ-D (Mean ± SD)		GHQ-T (Mean ± SD)	
	Patient	NP	Patient	NP	Patient	NP	Patient	NP	Patient	NP
Male	0.81 ± 1.16	1.16 ± 1.33	0.81 ± 1.07	0.88 ± 1.45	1.17 ± 1.46	0.72 ± 0.66	1.00 ± 1.00	2.11 ± 1.93	3.81 ± 3.12	4.83 ± 42.00
Female	2.56 ± 1.67	1.16 ± 1.26	2.50 ± 1.59	1.16 ± 1.33	1.17 ± 1.46	0.80 ± 1.25	2.28 ± 1.73	1.64 ± 1.52	8.37 ± 4.86	4.73 ± 4.46
P value	0.0010	1.0000	0.0010	0.5060	0.7290	0.7280	0.0190	0.3200	0.0040	0.9390

GHQ: General health questionnaire; SD: Standard deviation; GHQ-S: General health questionnaire-Somatic symptoms; GHQ-A: General health questionnaire-Anxiety and insomnia; GHQ-SD: General health questionnaire-Social dysfunction; GHQ-D: General health questionnaire-Severe depression; GHQ-T: General health questionnaire-Total, NP: Non-patients

The mean score of GHQ-sub-scales except for social dysfunction differed between women and men, and women had higher scores (Table 3). Age did not correlate with GHQ sub-scales (P > 0.0500, Pearson correlation test) except for depression which had an inverse linear correlation with age (P < 0.0500).

### Discussion

The result of the present study showed that patients with TMD have more mental disorders than their control group which highlight the mutual relationship of TMD and mental health. Furthermore, significant differences were seen in patient group between men and women as women had a poorer mental health compared with men. Only social dysfunction sub-scale did not show difference because the level of psychiatric distress which is needed to affect this aspect of mental health is higher than other aspects and TMD seems not to have such effect. Yap et al. [13] and Celic et al. [6] also explained role of gender in mental health and Deli et al. study [14] showed the same results, but he ignored the role of depression. The differences in pain mechanisms between genders have been explained by multiple factors, such as biological, hormonal, psychosocial and social factors, though such differences were not seen in NP (Table 3) [15, 16]; according to result of this study, patients with higher grade of chronic pain had poorer mental health so it can be concluded that pain has major role in patients with TMD and can define level of mental health. These results agree with Manfredinis et al. study [17] but Miettinen et al. study [7] did not show the same results. Manfredini et al. study seems to be more reliable because of higher sample size and multi-central nature of sampling. According to our results, the age of patients did not make significant changes in the state of mental health except for depression sub-scale which had

inverse linear correlation with age. Other sub-scales and total score of the questionnaire did not associate with age, whereas NP did not show any correlation in any sub-scales. The inverse linear correlation between age and depression agrees with Hiltunen et al. [18] and Osterberg et al. epidemiologic studies [19] indicating the elderly patients have a fewer symptoms of TMD.

### Conclusion

Patients with TMD problems have poorer mental health in comparison with NP. While GCPS and gender can have great impact on mental health of patients, age did not show such effect except for depression domain.

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*Conflict of Interest: 'None declared'.*

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