

**PREVALENCE AND SEVERITY OF TEMPOROMANDIBULAR JOINT DISORDERS IN STUDENTS OF B. P. KOIRALA INSTITUTE OF HEALTH SCIENCES**

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**Abstract**

**Background and Objective:** The growing public interest in oral health has increased the demand for treatment of temporomandibular disorders (TMD). It is therefore important to have epidemiological data to estimate the proportion and distribution of these disorders. To the best of our knowledge, there are no reports on Nepalese citizens. Thus a study was designed to evaluate the prevalence and severity of TMD in undiagnosed health science university students.

**Materials and Method:** The Fonseca questionnaire was administered to all undergraduate dental students at B.P. Koirala Institute Of Health Sciences willing to participate and fulfilling the inclusion criteria. Data entered in excel sheet and analyzed using SPSS. Results were analyzed using the frequency distribution of the questionnaire answers according to the Fonseca's anamnestic index.

**Results:** 160 students (95 females and 65 males) with an average age of 21.49 years enrolled in the study. 31.85% showed some level of TMD: 28.125% mild TMD, 3.75% moderate and 0% severe. Women were the most affected group, with 21.87% showing some level of TMD against 10% of men, though the presentation not being statistically significant. Students with any level of TMD showed marked characteristics: 41.25% considered themselves tense people, 39.37% reported a frequent headache, 28.75% reported TMJ clicking, 28.12% had muscular pain while chewing, 25% clenched their teeth and 22.5% reported neck pain. Within these characteristics, significant gender difference was observed for headaches with higher female predominance.

**Conclusion:** In contrast to other studies we observed a low prevalence and severity for TMD in the study population.

**Keywords:** temporomandibular disorders, prevalence, severity, fonseca questionnaire, students.

## Introduction

Temporomandibular disorders (TMD) is a collective term that defines a subgroup of painful orofacial disorders, involving complaints of pain on the temporomandibular joint (TMJ) region and fatigue of the craniocervicofacial muscles, especially mastication muscles, limitation of mandible movement and presence of articular clicking. The etiology of TMD remains a subject of controversy and is generally viewed as multifactorial related to emotional stress, occlusal interferences, mispositioning or loss of teeth, postural changes, dysfunctions of the masticatory musculature and adjacent structures, extrinsic and intrinsic changes on TMJ structure and/or a combination of such factors.<sup>1</sup> TMD is acknowledged as the main cause of non-dental orofacial pain. Pain is generally located on the masticatory muscles, in the pre-auricular area and TMJ.<sup>2</sup>

The growing public interest in oral health has increased the demand for treatment of TMD. It is therefore important and valuable to have epidemiological data to estimate the proportion and distribution of these disorders in the population. Due to the high prevalence and variability of the complaints, TMD is diagnosed by associating signs and symptoms, as some characteristics may be frequent even in a non-patient population.<sup>3,4</sup> Reports have revealed that signs and symptoms may be as high as 88% and 57% respectively.<sup>5</sup> A non-patient prevalence study indicates closely 75% of subjects with just one TMD sign, and 33% with at least one symptom.<sup>6</sup> TMD signs are present in 50-75% of the population at some moment in life, whereas an estimated 20-25% rate exhibit mild symptoms.<sup>7</sup>

Due to the need of simpler assessment procedures that could be widely applicable and standardize research samples involving TMD patients, questionnaires

have been created to address the main clinical TMD findings and assign clinical indexes for patient classification in terms of severity levels.<sup>8</sup> The anamnestic and clinical indexes proposed by Helkimo<sup>9</sup>(1974) were obtained from clinical observations. Based on Helkimo's<sup>9</sup> (1974) indexes, Fonseca<sup>10</sup> (1992) developed his anamnestic questionnaire that classifies TMD signs and symptoms as light, moderate or severe or non-TMD. The author obtained a reliability of 95% and a good correlation with Helkimo's index ( $r = 0.6169$ ,  $p < 0.05$ ). Other advantages of Fonseca's<sup>10</sup> (1992) questionnaire are self-administration, short time of application, and low cost.

Whilst literature abounds on TMD in developed and some developing countries very little have been reported from this part of the continent. To the best of our knowledge, there are no such reports on Nepali citizens.

## Materials and Methods

### Study Population

All the dental undergraduate students from College of Dental Surgery at B.P. Koirala Institute Of Health Sciences willing to participate in the study were included.

### Exclusion Criteria

Those who have/had a clinical diagnosis of TMD, with or without treatment and those who have a history of orthodontic treatment were excluded.

### Study Area

B.P. Koirala Institute Of Health Sciences, Dharan.

### Instrument/ Tool

The questionnaire proposed by Fonseca<sup>10</sup> was used to assess the prevalence and severity of TMD in the study population because it is highly efficient in obtaining epidemiological data.

### Procedure

The questionnaire proposed by Fonseca<sup>10</sup> was used to classify TMD severity in the study population because it is

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highly efficient in obtaining epidemiological data. Prior to that, the volunteers received proper instructions about the goals of the research, risks, and benefits, and signed an informed consent form. The Fonseca's questionnaire follows the characteristics of a multidimensional evaluation. It is composed of 10 questions, which include checking for the presence of pain in temporomandibular joint, head, back, and while chewing, parafunctional habits, movement limitations, joint clicking, the perception of malocclusion, and sensation of emotional stress. The volunteers were informed that the 10 questions should be answered with “yes”, “no” and “sometimes” and that only one answer should be marked for each question. There was no time limit for completion. That way, there were no reasons for the subjects to give induced answers.

#### Data Analysis

The Fonseca's questionnaire contains an anamnestic index, and the

volunteers have classified accordingly as having mild TMD, moderate TMD, severe TMD or no-TMD. The authors<sup>10</sup> obtained 95% reliability and good correlation with Helkimo's index ( $r=0.6169$ ;  $p<0.05$ ) (Annexure 1). For analysis, the answers “yes”, “no” and “sometimes” from each questionnaire were tallied and the total multiplied by the value attributed to each answer: ten, five, and zero, respectively. The final value was compared to the clinical index and the volunteers were classified *per* TMD degree, (table 1). Results were analyzed using the frequency distribution of the questionnaire answers according to the Fonseca's anamnestic index.<sup>10</sup> Positive answers ('yes' and 'sometimes') summed. The percent means will be compared between genders and severity degrees by the chi-square test. Significance level set at 5%.

**Table 1** - Clinical index classification - Fonseca (9).

Total between 0 and 15 points	No TMD
Total between 20 and 40 points	Mild TMD
Total between 45 and 65 points	Moderate TMD
Total between 70 and 100 points	Severe TMD

#### Results

A total of 160 students (95 females and 65 males with an average age of 21.49 years enrolled in the study. 31.85% showed some level of TMD: 28.125% mild TMD, 3.75% moderate and 0% severe (Fig: 1). Women were the most affected group, with 21.87% showing some level of TMD against 10% of men, though the presentation not being statistically significant(Fig:2). Students with any level of TMD showed marked characteristics: 41.25% considered themselves tense people, 39.37% reported a

frequent headache, 28.75% reported TMJ clicking, 28.12% had muscular pain while chewing, 25% clenched their teeth and 22.5% reported neck pain(Fig: 3). Out of these characteristics significant gender difference ( $p<0.05$ ) was observed for headaches with higher female predominance(Fig:4). No significant difference ( $p>0.05$ ) was found for TMD between clinical and basic year students.

#### Discussion

The Fonseca's questionnaire<sup>8</sup> allows collecting a large quantity of information in

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a relatively short period and at low cost, it is easy to understand and has almost no influence from the examiner.

In the present study, the volunteers classified with some degree of TMD severity were less than those with no TMD. Similar observations were made by Conti<sup>11</sup> (58%) and Shiau, Chang<sup>12</sup>(59%). However, there are studies by Pedroni *et al.*<sup>4</sup> (32%), Schiffman<sup>13</sup> (25%), Locker, Slade<sup>14</sup> (33%), and Grosfeld *et al.*<sup>15</sup> (28%) reporting a lower prevalence for non TMD.

According to our observations, there is a greater probability of finding some degree of TMD severity in female college students than in male college students. Women were the most affected group, showing some level of TMD against men, as also observed by Nomura *et al.*<sup>16</sup> and de Oliveira AS *et al.*<sup>17</sup>. The high prevalence of TMD in women may be related to their different physiological characteristics, such as regular hormonal variations, muscle structures and different characteristics of the connective tissue<sup>8,18,19</sup>. Some other causes as discussed in<sup>17</sup> Warren, Fried<sup>20</sup> related morphological changes in TMJs of women by means of tomographic studies. Sipila *et al.*<sup>21</sup> related that women had more depressive episodes than men. LeResche *et al.*<sup>1</sup> reported that women were more sensitive to pain. According to these authors, the TMJ estrogen receptors and the changes of hormonal levels caused by menstrual cycles influence the pain threshold in women. Other authors have related that women answer positively to a greater number of questions because they are more careful and attentive to their health status than men<sup>22</sup>.

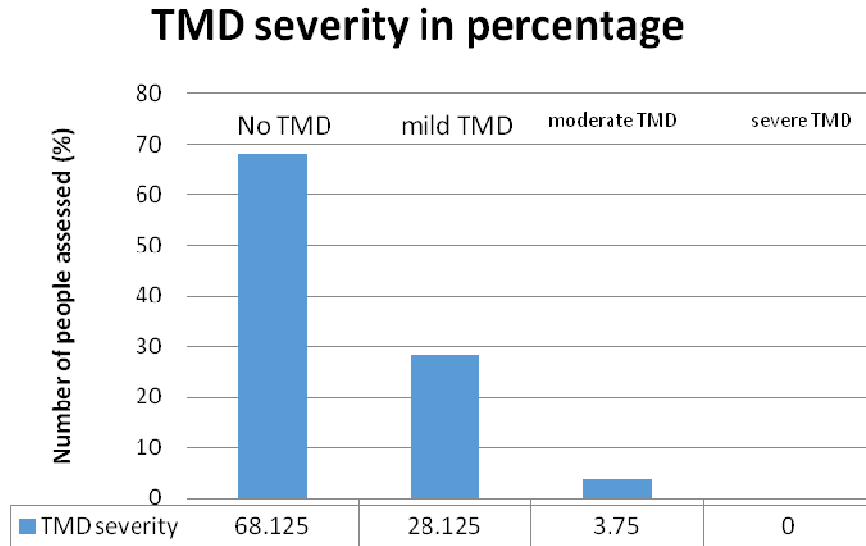
Fonseca<sup>10</sup> advocated that subjects classified as severe and moderate TMD must be referred to a specialized health care center or specialist. None of our volunteers

were classified as having severe TMD according to the Fonseca<sup>10</sup> (1992) anamnestic index though the rate is reported as 12 to 16% in non-patient population<sup>23, 24</sup>. Thus, according to our results, 3.75% of the volunteers must be referred to treat their TMD signs and symptoms. However, as Kuttilla *et al.*<sup>24</sup> point out, only 7% of subjects classified as having severe or moderate TMD will require health care attention in Sweden and 18.24 % Brazilian college students as reported by de Oliveira AS *et al.*<sup>17</sup>. Similar comments cannot be made for the Nepalese students as presents observations are drawn from a limited number of students representing just one region of Nepal.

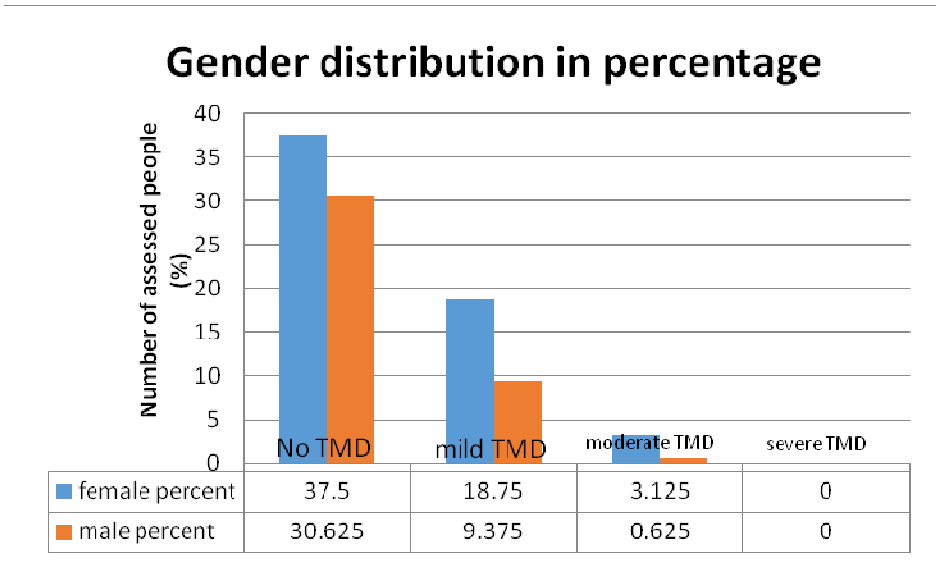
Students with any level of TMD showed marked characteristics: 41.25% considered themselves tense people, 39.37% reported a frequent headache, 28.75% reported TMJ clicking, 28.12% had muscular pain while chewing, 25% clenched their teeth and 22.5% reported neck pain. These data can be a tool for an early diagnosis of TMD. Significantly we observed that females reported more headaches than males when compared to any other characteristics. This can be attributed to the physiological hormonal changes within their body.

A simplified anamnestic index allows identifying a TMD patient and, simultaneously, classifies the patient according to disorder severity. Public health and screening services should adopt the questionnaire, as the anamnestic index may be obtained by technical personnel, in a relatively short period and at low cost, and it has wide population coverage. With proper diagnosis and treatment, this could manage orofacial pain in a large contingent of people.

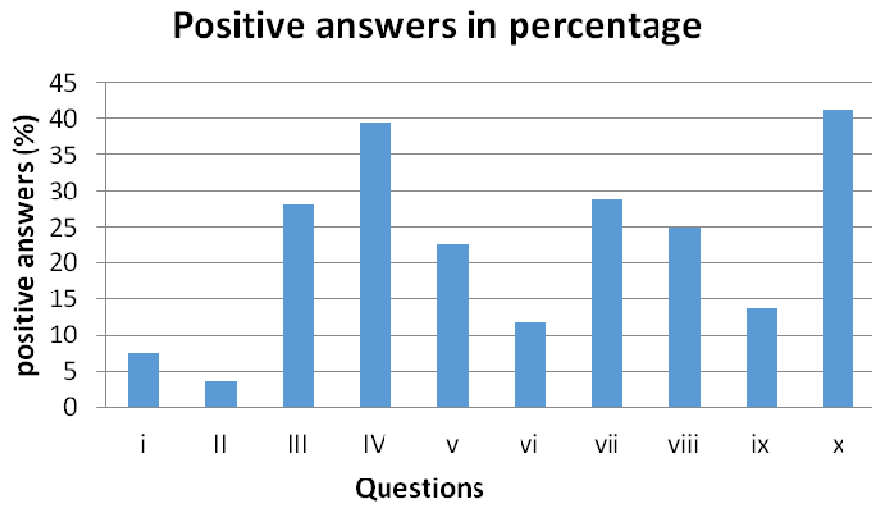
**FIGURES**



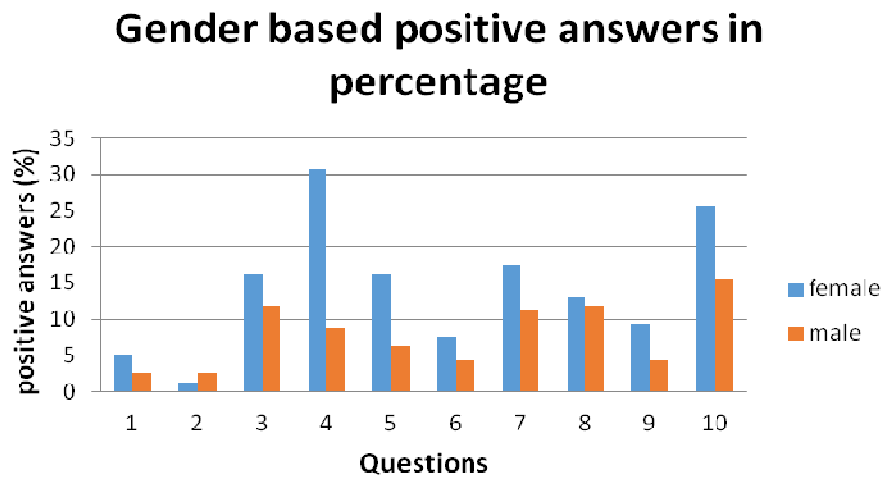
**Fig: 1** Total number of dental undergraduates evaluated and classified according to



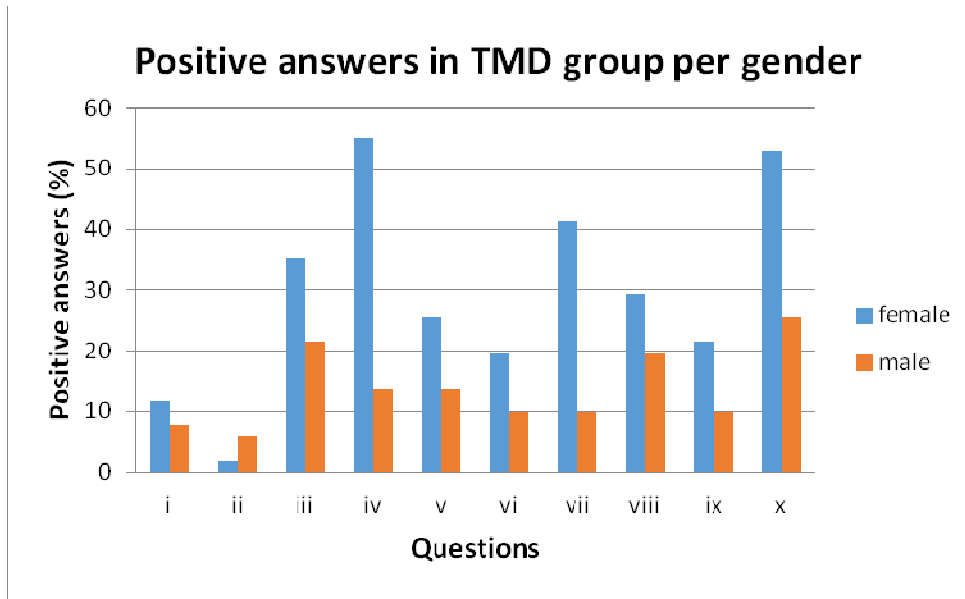
**Fig: 2** Gender distribution of the dental undergraduates evaluated and classified according to TMD severity (%).



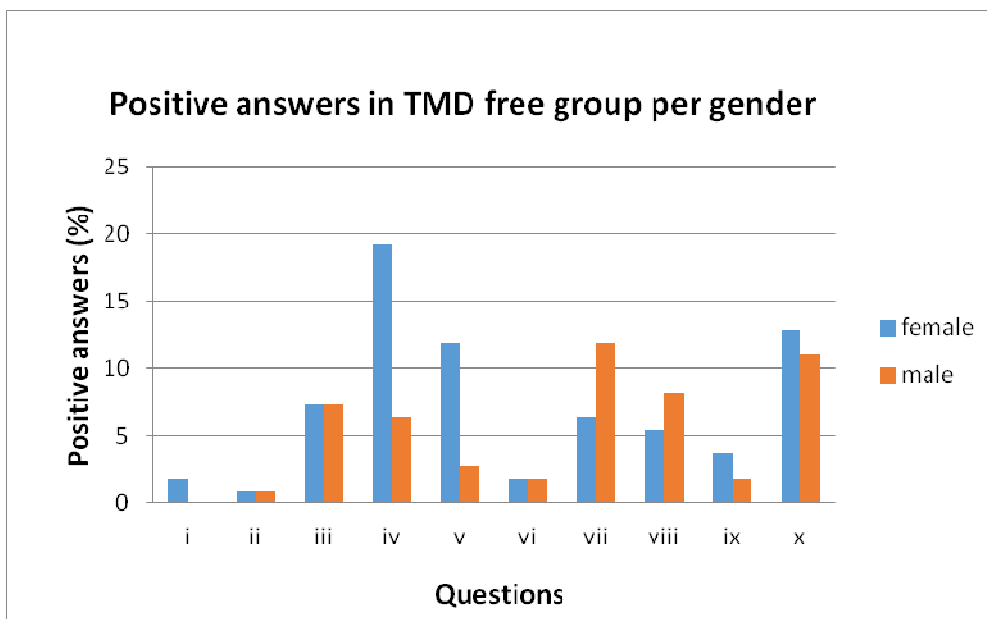
**Fig: 3** Positive answers (yes) to each of the 10 questions from the Fonseca’s questionnaire.



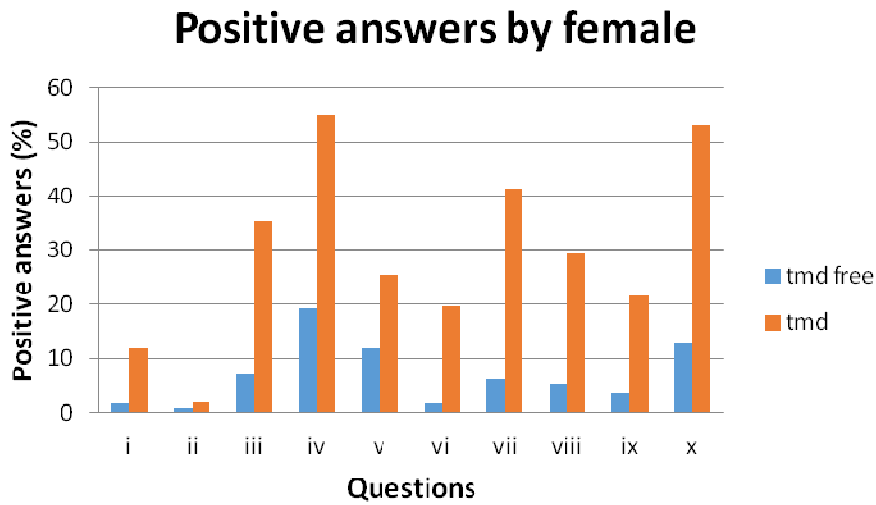
**Figure 4.** Positive answers (yes) to each of the 10 questions from the Fonseca’s questionnaire, *per gender.*



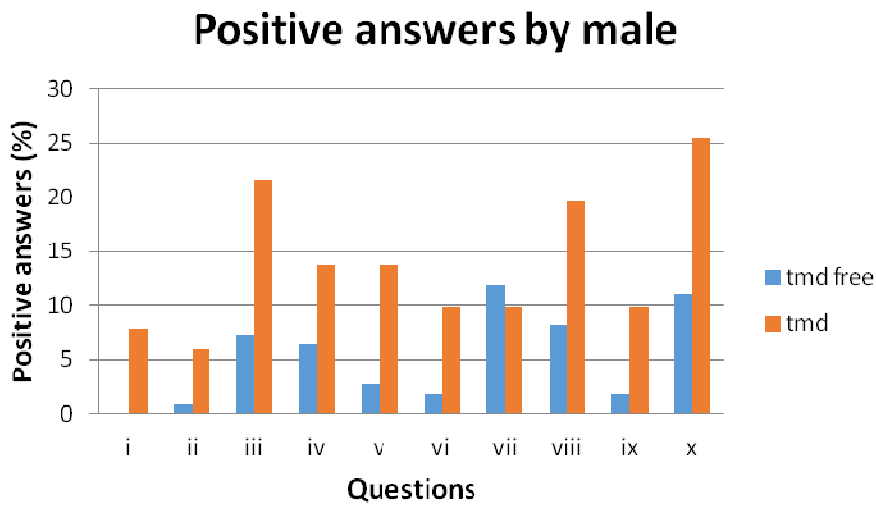
**Figure 5.** Positive answers (yes) to each of the 10 questions from the Fonseca’s questionnaire in TMD groups, *per gender*.



**Figure 6.** Positive answers (yes) to each of the 10 questions from the Fonseca’s questionnaire in both TMD-free groups, *per gender*.



**Figure 7.** Positive answers (yes) to each of the 10 questions from the Fonseca’s questionnaire by women with/without TMD.



**Figure 8.** Positive answers (yes) to each of the 10 questions from the Fonseca’s questionnaire by men with/without TMD.

#### Conclusion

This report contrasts with what obtains in western and other societies where a higher prevalence of TMD was reported.

A study on greater student population from different medical institutions can provide a better insight into

the prevalence and severity of TMD within these subjects.

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