Knowledge on Temporomandibular Disorders Pathophysiology among Dental Practitioners in Jakarta, Indonesia

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ABSTRACT

Background: Temporomandibular disorder (TMD) is a common term used to describe the problems related to masticatory muscles, joints, and supporting tissues. TMD commonly causes orofacial pain and has been the subject of considerable research in the field of dentistry. The treatment chosen for patients who have TMD is largely determined by the knowledge of general dental practitioners. Objectives: The purpose of this research was to assess the understanding of TMD pathophysiology by such practitioners. Methods: Questionnaires were distributed randomly to general dental practitioners in private offices and hospitals in the area of Jakarta, Indonesia. The answers on the returned questionnaires were compared to those of TMD experts. Results: Of the 117 questionnaires distributed to general dentists, 105 were returned (89.7% response rate). The results showed an overall level of knowledge of TMD pathophysiology of 25%.

Conclusion: The majority of general dental practitioners in Jakarta lack knowledge of TMD pathophysiology.

Keywords: general dental practitioners, TMD pathophysiology, temporomandibular disorders (TMD), temporomandibular joint

Background

Temporomandibular disorder (TMD) is a common term used to describe disorders related to masticatory muscles, joints, and supporting tissues. These disorders are also related to pain and dysfunctions around masticatory-muscle and the associated soft-tissue.¹ TMD has been the subject of considerable research in dentistry, since it commonly causes orofacial pain and has become the second most common disease, after chronic back pain. In addition, TMD must be treated because it affects general health.²³

One epidemiology study found that TMD had a prevalence of 4–15%. This considerable range of prevalence is likely to be caused by several factors, including differences in definitions of TMD, methodologies, populations, age ranges, and sample sizes...
among the studies included in the review. Among these studies, an observational study in Sweden found a 4.2% prevalence of TMD when participants were screened for TMD frequency (only once or more than once per week). However, in another study that also used a frequency measure, Hirsch et al. found that the prevalence of TMD in Germany ranged from 5–15%.

General dental practitioners play an important role in diagnosing and treating patients who have orofacial pain, including TMD. The lack of knowledge about TMD might cause confusion and limitation of TMD management. Researchers in many countries have observed the knowledge level of dental practitioners and yielded different outcomes. Tegelberg et al. concluded that the majority of general dental practitioners in Sweden lacked the skills needed to treat TMD, including those needed to examine patients, evaluate their condition, and choose a treatment for it.

Indonesia is a developing country in which 66.5% of the population is of productive age (15–64 years old), which is a time period with high TMD prevalence. The country has 29,112 general dental practitioners and 3,337 specialists, any of whom can encounter patients with TMD at any time. However, there have been no recent studies in Indonesia on dental practitioners’ knowledge of TMD pathophysiology. Therefore, the aim of the present study was to investigate the knowledge and perceptions of TMD pathophysiology among general dental practitioners in Jakarta’s dental clinics.

**Materials and Methods**

This research was an observational descriptive study that used a cross-sectional design. Validated questionnaires were answered by general dental practitioners in Jakarta. The study’s sample was obtained using the purposive sampling method. The minimum sample size was determined using the Estimating Population Proportion with Specified Absolute Precision formula using p: 0.5 and d: 0.1. This formula yielded 97 subjects as a minimum sample size. Table 1 shows the questionnaire’s 12 items categorized by the 6 research variables.

In compliance with the procedures of the World Health Organization (WHO), the questionnaire was translated using forward and backward translations. All questionnaire items appeared to have fair-to-good (0.4–0.75) test-retest reliability scores, as defined by Fleiss. The questionnaire was administered both online using social media applications and in person, with the respondents completing paper questionnaires. In either case, respondents were instructed to read the questionnaires thoroughly, complete the questionnaire, and return it to the researchers.

**Table 1. Questionnaire items categorized by research variable**

<table>
<thead>
<tr>
<th>Research Variable</th>
<th>Operational Definition</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occlusion as an etiology factor</td>
<td>Items 1, 2, 3, 4, 5</td>
<td>Nominal (Agree/Disagree)</td>
</tr>
<tr>
<td>Trauma</td>
<td>Item 6</td>
<td>Nominal (Agree/Disagree)</td>
</tr>
<tr>
<td>Arthritis</td>
<td>Item 7</td>
<td>Nominal (Agree/Disagree)</td>
</tr>
<tr>
<td>Internal joint disorder</td>
<td>Items 8, 9</td>
<td>Nominal (Agree/Disagree)</td>
</tr>
<tr>
<td>Muscle</td>
<td>Item 10</td>
<td>Nominal (Agree/Disagree)</td>
</tr>
<tr>
<td>Radiographic examination</td>
<td>Items 11, 12</td>
<td>Nominal (Agree/Disagree)</td>
</tr>
</tbody>
</table>
Data Analysis

The data used were primary data. The questionnaire was administered to respondents both directly and indirectly, and all respondents’ answers were compared with those of a consensus of experts in a previous study.\(^1\) The results were analyzed by placing the criteria into percentage categories, as follows: Good meant that the dental practitioner understood 76–100% of the total number of statements; Fair meant that the practitioner understood 56–75% of the statements; and Poor meant that the he or she understood < 56% of the statements.

Results

The study distributed 117 questionnaires to dental practitioners and received 105 completed, returned questionnaires. Many of the respondents disagreed with the TMD experts on most statements, with the exception of three statements. Table 2 shows the results.

**Table 2.** Dental practitioners’ rates of agreement with TMD experts on TMD pathophysiology

<table>
<thead>
<tr>
<th>Item</th>
<th>Statement</th>
<th>Experts’ consensus</th>
<th>Dental Practitioners’ Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Occlusion interference on balancing side generally is related to TMD</td>
<td>Disagree</td>
<td>Agree 87.6%  Disagree 7.6%  No knowledge 4.8%</td>
</tr>
<tr>
<td>2</td>
<td>Sleep bruxism is caused by occlusal contact interference</td>
<td>Disagree</td>
<td>Agree 25.7%  Disagree 70.5%  Fair 3.8%</td>
</tr>
<tr>
<td>3</td>
<td>Orthodontic treatment can prevent TMD</td>
<td>Disagree</td>
<td>Agree 71.4%  Disagree 23.8%  Fair 4.8%</td>
</tr>
<tr>
<td>4</td>
<td>Orthodontic treatment is the best choice to treat TMD in patients with skeletal malocclusion</td>
<td>Disagree</td>
<td>Agree 34.3%  Disagree 59%  Poor 6.7%</td>
</tr>
<tr>
<td>5</td>
<td>Occlusal equilibration is a useful preliminary treatment for TMD</td>
<td>Disagree</td>
<td>Agree 90.5%  Disagree 6.7%  Poor 2.9%</td>
</tr>
<tr>
<td>6</td>
<td>TMD caused by trauma is more difficult to treat and has a poor prognosis compared with other causes of TMD</td>
<td>Disagree</td>
<td>Agree 48.6%  Disagree 23.8%  Poor 27.6%</td>
</tr>
<tr>
<td>7</td>
<td>Arthritic changes on a tomogram with joint crepitus indicate a need for treatment</td>
<td>Disagree</td>
<td>Agree 75.2%  Disagree 6.7%  Poor 18.1%</td>
</tr>
<tr>
<td>8</td>
<td>Arthroscopic surgery is effective for disc repositioning in patients who have internal TMJ dysfunction</td>
<td>Disagree</td>
<td>Agree 46.7%  Disagree 19%  Poor 34.3%</td>
</tr>
<tr>
<td>9</td>
<td>Every individual with clicking sounds on TMJ needs treatment</td>
<td>Disagree</td>
<td>Agree 60%  Disagree 39%  No knowledge 1%</td>
</tr>
<tr>
<td>10</td>
<td>Cold and/or hot compresses and muscle stretches are good preliminary treatments for TMD</td>
<td>Agree</td>
<td>Agree 89.5%  Disagree 7.6%  Poor 2.9%</td>
</tr>
<tr>
<td>11</td>
<td>The condyle position in the fossa seen on a tomogram is an accurate indication of internal TMJ dysfunction</td>
<td>Disagree</td>
<td>Agree 52.4%  Disagree 17.1%  Poor 30.5%</td>
</tr>
<tr>
<td>12</td>
<td>Transcranial radiograph is an accurate method of seeing the temporomandibular joint</td>
<td>Disagree</td>
<td>Agree 51.4%  Disagree 14.3%  Poor 34.3%</td>
</tr>
</tbody>
</table>
Discussion

The data were collected using a 12-item questionnaire, and the results showed that the respondents’ knowledge of overall TMD pathophysiology was 25%. This result was far below the average result regarding knowledge found in previous studies, which was 63%.16 In the present study, many dental practitioners thought that occlusion was a TMD etiology factor, which is contrary to expert knowledge. The hypothesis that occlusion is an etiology factor of TMD has become controversial in the literature. However, studies from the last 10 years show that the assumed TMD etiology has changed from peripheral factors (occlusion and anatomy factors) to central factors (psychosocial and neurological).14,15

Trauma is one of the three main etiology factors of TMD.16 Trauma has a greater effect on intra-capsular disorders than on muscle disorders. In addition, trauma has been classified into two types: macro-trauma and micro-trauma.17 In the present study, 27.6% of respondents answered that they had “no knowledge” regarding the relationship between TMD and trauma. One respondent mentioned that one of the statements in the questionnaire was lacking of information on trauma condition. Many respondents said that they disagreed with or had no knowledge regarding this item.

Many respondents agreed with Item 3, which stated that orthodontic treatment can prevent TMD. Their agreement might have been caused by their existing knowledge of occlusion. According to the respondents, orthodontic treatment is one treatment for skeletal malocclusion patients who have TMD. However, orthodontic treatment cannot prevent or reverse TMD, orofacial pain, or functional dysfunction, including a clicking joint.17 Based on the consensus of Diagnostic Criteria for TMD (DC/TMD), the recommended treatments for TMD are non-definitive ones, including splints and physiotherapy. Therefore, orthodontic treatment, surgery, and definitive occlusion treatments are not recommended for TMD. In contrast, muscle-relaxation therapy using a thermal compress can be an effective TMD therapy, especially for myalgia or muscle spasms.16,17

The responses to the items addressing radiography indicated that respondents’ knowledge of the use of radiographic examination to detect TMD was low. Previous studies of the relationship between clinical and radiographic examination of internal TMJ found that radiographic imaging cannot be the main diagnostic tool.17 This was supported by the results of another study, which concluded that TMJ examination using MRI was clinically insignificant.18 Based on the literature, the appropriate methods for diagnosing TMD are anamnesis and clinical examination. Although radiographic examination can support TMD diagnosis, it is not always needed.18,19

The present study’s results showed that 34.3% of the respondents had no knowledge regarding the degree of effectiveness of transcranial radiography for diagnosing the temporomandibular joint. In fact, transcranial radiography shows only the overall bone from the articulation surface. A more accurate method of observing the hard tissue of the temporomandibular joint is a cone-beam CT-scan, which is commonly used to see arthritic condyle changes. Magnetic resonance imaging (MRI) scans have also been used to visualize soft-tissue disorders, including disc articulation repositioning in TMJ.19

Conclusion

The present study’s results showed that dental practitioners’ knowledge regarding TMD pathophysiology is low, which can lead to mistreatment by dental practitioners. Neither the paradigm changes in etiology nor the consensus of experts regarding TMD diagnosis and treatment is well understood by dental practitioners, particularly in Jakarta. The present study provides the broad picture regarding knowledge of TMD pathophysiology, but it did not identify the reason(s) for dental practitioners’ low levels of knowledge. More research is needed on the relationship between demographic factors and dental practitioners’ levels of knowledge of many factors involved in TMD.

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Conflict of Interest

Authors guarantee that there is no conflict of interest in collecting the data for this research.

References


