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To cite this article: Paul Koole, Adriaan J. J. Zonnenberg & Jan Mulder (2018): A patient’s view on the location of the temporomandibular joint, CRANIO®, DOI: 10.1080/08869634.2018.1450012

To link to this article: https://doi.org/10.1080/08869634.2018.1450012

Published online: 25 Mar 2018.
A patient's view on the location of the temporomandibular joint

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Objective: A survey was held to establish whether laypeople knew the location of their temporomandibular joint.

Methods: A sample of 61 participants, visiting their dental office for a routine check-up, was given a three-question survey of whether they knew the location of their temporomandibular joint and could point to this location.

Results: Thirty-eight participants answered the question affirmatively. Only 13 pointed to the correct location. Of these, six participants received consultation for TMD in the past, three participants were healthcare providers, and four participants actually had knowledge of the exact location. Out of 23 participants who did not know the location, one accidentally designated the correct position.

Conclusion: The location of the temporomandibular joint is not a well-known site for many patients. In the presence of orofacial pain, it seems advisable to let the patient designate and record the site of the pain on a drawing on the patient chart.

Introduction

Most people know the position of their articulations quite well, such as their ankle-, knee- and hip joint, their wrist, elbow, and shoulder articulation. The metaphorical use of the articulations is well known. Weak at the knees; weight off your shoulders; elbow grease; and a moment on the lips, a lifetime on the hips are good examples. In the case of pain in these articulations, they are correctly indicated. By contrast, the only exception seems to be the temporomandibular joint; apparently, this articulation appears to be unknown to many patients.

Patients with pulpitis or the breakthrough of a wisdom tooth in the lower jaw may claim they suffer from an earache instead of temporomandibular joint (TMJ) pain. In the case of temporomandibular dysfunction (TMD) with a limited range of mandibular motion, clicking or crepitation and pain in and/or around the temporomandibular joint, patients will often complain about an earache, as well. Accordingly, these patients are often treated with antibiotics and/or ear drops; however, an ENT physician usually cannot definitively diagnose any ear disorder. Pain before and inside the ear clearly presents a diagnostic challenge [1].

During the history-taking of TMD, a patient is questioned as to whether or not he or she suffers from pain in the temporomandibular joint. To assist with the differential diagnosis between odontogenic and TMD pain, questionnaires can be used [2] just like in an epidemiological study, in which questionnaires are used on a regular basis [3]. However, some of those questionnaires lack the necessary specificity in the presence of adequate sensitivity [2]. Adding the words “in” or “in front of” the ear would be an advisable improvement of the history taking.

Definition of the problem

In an effort to determine representative knowledge about the location of the temporomandibular joint in a layperson population, all patients visiting their general dental office for a routine check-up were asked whether they were aware of and, consequently, could designate the location of their temporomandibular joint.

Materials and methods

The sample comprised 28 women (mean age 46.4 ± 19.8, range 13–81) and 33 men (mean age 50.8 ± 15.2, range...
18–78), who were given a three-question survey at their visit for a regular dental check-up. Participants in this study, who were all regular patients at a dental office that provides general dentistry care for 2000 people, made an appointment for a check-up by telephone. As this study was a pilot study out of curiosity, a selection of approximately 60 men and women seemed sufficient, and a power analysis in advance, not mandatory. The authors simply had no idea what to expect. Inclusion criteria covered any visitor of the general dental office who presented for a regular check-up. No specific exclusion criteria were applied. First, subjects were asked if they were aware of the location of their temporomandibular joint. Second, they were asked to point to the location of their jaw joint with their index finger, and third, all participants were asked whether they had ever experienced any pain at that site before (Table 1). Figures 1 and 2 were not shown to the participants of this survey.

To test differences between men and women for the first two questions of the survey, a Chi-square test was performed. The level of significance was set at 0.05. Subjects signed informed consent forms, and approval for the study was obtained from the Medical Ethical Committee of the Medical Center in Leeuwarden (Netherlands).

### Results

Out of 28 women, 18 thought they knew where their temporomandibular joint was. Only seven of them pointed to the correct site (Table 1). Three of these seven participants received consultation for a differential diagnosis between ear and joint pain. Two women were health care providers and knew where the joint was located. Two women knew the position through acquired knowledge of the subject matter.

Besides the seven women who located the temporomandibular joint correctly, the angle of the mandible was pointed to 10 times; to the cheek, i.e. the masseter muscle, seven times, and the zygomatic bone four times. Two participants had experienced occasional pain at the indicated site. In one participant, this happened to be the angle of the mandible, the other underneath the zygomatic bone, possibly indicating chronic sinusitis. Both participants were of the opinion they experienced their pain in the temporomandibular joint (Table 2).

Out of 33 men, 20 claimed to know the position of the temporomandibular joint. Only 6 of them pointed to the correct site. Three of these six participants knew the site of their joint as a result of previous examination to exclude ear and joint pain; one was a health care provider; and two men knew the position through acquired knowledge of the subject matter. Besides the six men who located the temporomandibular joint correctly, the angle of the mandible was pointed to 17 times; to the cheek, i.e. the masseter muscle, eight times, and the zygomatic bone two times.

Out of 33 men, 7 participants had experienced occasional pain at the indicated site: 1 subject in the joint (probably arthralgia that did not lead to treatment), 3 at the angle of the mandible, 2 in the cheek, i.e. the masseter muscle, and 1 underneath the zygomatic bone (Table 2).

The Chi-square test did not reveal any statistical differences between men and women for the first two questions of the survey (Table 1).

### Discussion

The use of a questionnaire as part of a sound anamnestic and diagnostic examination may encompass some questioning about the site(s) of the pain. It seems desirable to include in the patient questionnaire recognizable, visual pain sites. These drawings can be discussed in the anamnestic interview with the patient suffering from orofacial pain.

The addition of “in” or “in front of” the ear to a questionnaire would be desirable to make the orientation easier for the patient. Adding the word “ear” could be a reason for confusion and the exchange of arthralgia for any ENT pain. To be certain of a pain-related TMD, the temporomandibular joint pain of joint origin is affected by palpation, jaw movement in opening/closing, as well as in mandibular excursions [4]. Another method to determine joint pain is the Krough-Poulsen’s test [5]. In a questionnaire, usually several pain sites are given to a patient to be filled out. If, during an anamnestic interview over the questionnaire, the patient is asked to point to the pain site on his/her face or can indicate the pain point or site on a drawing, possible mistakes can be prevented. The patient can also indicate referred pain on a drawing by means of arrows.

The Chi-square test did not reveal any significant differences between men and women regarding their knowledge.

### Table 1. Mean age and standard deviation (SD) of healthy participants who claim to know the location of their temporomandibular joint (TMJ) and mentioned pain occasionally at the indicated site. X² test is provided for differences between gender about the knowledge of the location and the correct answer to the question, and whether the choice was correct.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>I know the location of my TMJ</th>
<th>Was this choice correct?</th>
<th>Occasional pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Male</td>
<td>50.8</td>
<td>15.2</td>
<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>46.4</td>
<td>19.8</td>
<td>18</td>
</tr>
<tr>
<td>X² test</td>
<td>p = 0.77</td>
<td>p = 0.83</td>
<td></td>
</tr>
</tbody>
</table>
about the exact location of their temporomandibular joint in either all 61 participants, or the 38 who pointed with one finger correctly to the site of the joint.

**Figure 1.** Example of an illustration on which the patient can indicate the site, the extent, and the intensity of the pain on a visual analog scale (VAS). Frontal and dorsal view; diagrams developed after Travell and Simons [6–8].

**Figure 2.** Example of an illustration on which the patient can indicate the site, the extent, and the intensity of the pain on a visual analog scale (VAS). Left and right side view; diagrams developed after Travell and Simons [6–8].

**Table 2.** The choice of 33 men and 28 women in response to the question in which location their temporomandibular (TM) joint was located.

<table>
<thead>
<tr>
<th></th>
<th>Mandibular angle</th>
<th>Cheek</th>
<th>Masseter muscle</th>
<th>TM joint</th>
<th>Infraorbital</th>
<th>Zygomatic bone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>17</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>5</td>
<td>10</td>
<td>13</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

**Conclusion**

1. The location of the jaw joint is probably not a well-known site for any layman visitor in the dental office.
2. In the presence of orofacial pain, it seems advisable to point to the site of the pain on the face and on a sheet with a drawing and record this in the anamnesis and/or examination charts for a correct diagnosis.
3. When a questionnaire, used for epidemiologic research, is missing the addition of “in” or “in front of” the ear, the outcome may be dubious.
Contributors
PK is an orofacial pain specialist at the Department of Oro-maxillofacial Pain of the Koningin Wilhelmina Ziekenhuis in Assen, NL was responsible for the research data acquisition (the 3-question survey). AZ is a senior lecturer at the Department of Rekonstruktive Zahnmedizin of Bern University, Bern, Switzerland and was responsible for writing the manuscript, the text translation and contributed to the statistical analysis. JM is a retired statistician from the Radboud University, Nijmegen, NL was responsible for the study design and the statistical analysis.

Acknowledgment
The authors wish to thank Dr. Martin F. Land for his assistance preparing this manuscript.

Disclosure statement
No potential conflict of interest was reported by the authors.

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