

**A critical appraisal of “Evaluation of Low-Level Laser Therapy in  
the Treatment of Temporomandibular Disorders”**

**By**

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## **Abstract**

*Objective:* The purpose of this paper was to critically appraise the article “Evaluation of Low-Level Laser Therapy in the Treatment of Temporomandibular Disorders” *Methods:* The article was chosen using PubMed Central open access with no inclusion/exclusion criteria. Each section (Introduction, Methods, Results, Conclusion) was critically appraised individually with strengths and weaknesses listed to evaluate their reliability. *Results:* Although weaknesses were pointed out in each section, the overall strength and reliability of the article was high. The methods and results sections had especially high overall strengths, both of which add to the reliability of the article. *Conclusion:* Based on the many strengths and small number of weaknesses in this article, one should be able to use the evidence in article to support their practice.

## **Key words**

Low Level Laser Therapy, TMJ, TMD, Temporomandibular Disorder

## **Introduction**

Temporomandibular Disorder (TMD) is a common pathology in patients that can cause jaw pain, joint sounds, limited mobility, and other symptoms. This could come from impaired function of the joint, as well as the musculature of the jaw. There are many ways to treat

Temporomandibular Disorders some are physical therapy, medications, altered diet. The study that is focused on in this paper takes a look at the effectiveness of Low-Level Laser Therapy (LLLT) in the treatment of TMD. Although LLLT has gained some popularity in the treatment of some musculoskeletal conditions, there is little information regarding the effectiveness. This is especially true when it comes to LLLT in the treatment of TMD. This paper serves to critically appraise the article “Evaluation of Low-Level Laser Therapy in the treatment of

Temporomandibular Disorders. Each section of the article (Introduction, Methods, Results, Discussion) will be appraised in order to evaluate their reliability and application to clinical practice. By reading this paper, the reader should have a good idea of the strengths and weaknesses of the study, and should be able to decide whether the article is useful to them.

## **Methods**

After deciding on a clinical question, PubMed Central was used because it had a lot of research articles on TMD paired with Low Level Laser Therapy (LLLT). The keywords used in this search were Low Level Laser Therapy, TMJ, TMD, and Temporomandibular Disorder. In terms of limits, open access was used to see if there were any relevant articles that were free and available to use. There was no inclusion or exclusion criteria used. Because of the extent of TMD research, 289 hits were found before reviewing the articles.

This article “Evaluation of Low-Level Laser Therapy in the Treatment of Temporomandibular Disorders” was written by Sedat Çetiner, D.D.S., Ph.D., Sevil A. Kahraman, D.D.S., Ph.D., and S, Ule Yüçetas, D.D.S., Ph.D. and was published in *Photomedicine and Laser Surgery* on November 5, 2006. This study was conducted in Ankara, Turkey, at the Department of Oral and Maxillofacial Surgery, School of Dentistry, Gazi University. I chose this article first and foremost because it had a placebo group. The articles that I had found previously did not have any groups that were blinded to the groups that they were in. I also found that the people assessing the groups were blinded as well to increase credibility. Finally, I saw that both groups were managed in the same way, except for the LLLT being real or placebo. These three things increased the credibility of this article.

## **Results**

### Summary of the study

This study is a double-blind study examining the effects of low level laser therapy on temporomandibular disorders. To be more specific, mouth opening, tender points, left and right lateral motion, pain, and chewing difficulties were the measured outcomes. The subjects of the study were chosen out of a pool of people with complaints of TMD, who were admitted to the Gazi University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery. In all 39 patients (4 male and 35 female) were included in the study. 24 of them were treated with low level laser therapy as a test group while 15 of them were treated as a control group. The control group was still given placebo “laser therapy” so that they were blinded. The treatments were applied for 10 sessions per day for two weeks, not including weekends. The results showed

improvements in mouth opening, pain, chewing difficulties, and tender points. The study concluded that the use of low level laser therapy is effective for treating TMD.

#### Appraisal of the study introduction

The introduction has some clear strengths. It was clear and concise and, gave a good background knowledge of the subjects of TMD and LLLT without giving too much information. It also described the fact that limited research exists regarding LLLT in relation to treating TMD. The final strength is that most of the articles cited are current and relevant.

Weaknesses were found in the introduction as well. Critical variables were not specifically addressed. They were vaguely referred to as the “effectiveness of LLLT”. Having these variables addressed in the introduction could help the reader decide if they want to keep reading the article.

#### Appraisal of the study methods

The methods section of this study was very strong. This research design was an experimental, prospective, longitudinal, and double blinded. Of the 39 participants, there was no subject attrition. There were two groups in a between-subjects design, and both the subjects and the assessors were blinded to the group assignments. All these things strengthen the study and allow it to be more reliable.

The weaknesses in this section were mainly due to the fact that the reliability of the instruments and the statistical analysis was not touched on in this section of the article. Without these key elements, it is not known whether or not the results are as accurate as they may seem.

#### Appraisal of the study results

Strong points were found in the results section. First, the results address the main point of this article, which is to evaluate the effectiveness of LLLT on the TMD. This was clearly written and included tables that were presented clearly and accurately. The p value that was considered statistically significant was  $p < 0.05$ , which was stated in the results section. Finally, the statistically significant results were stated as follows: maximum mouth opening, right lateral jaw movement, decreased tender points, decreased myofascial pain, and decreased chewing difficulties.

The results section of this article had some weaknesses as well. First, the parameter of confidence intervals (CI) was not listed. A Second weakness is that there was no concepts relating to the minimal clinically important difference (MCID) or the number needed to treat (NNT).

#### Appraisal of the study discussion

The discussion section of this study had many strengths to it. The authors further indicated the meaning of their findings by explaining a little more about other studies and the type of laser used. The authors also tied their findings to existing literature in order to show how they fit in with the current data. The article also addresses the limitations of the study which were as

follows: subjective evaluation, selection of only myogenic cases, and application of different laser protocols. Finally future studies were recommended to investigate improved parameters in larger series. This discussion was well written and will help the clinician to apply what was found to their practice.

The only weakness that stood out in the discussion was the fact that one of the cited literatures was from 1995. Although this does not necessarily discredit the citation, it is not very current, which can lessen its credibility.

## **Discussion**

This study is significant because LLLT is an easy, non-invasive way to treat TMD patients. Although there are other options out there for treating these patients, LLLT is an important “tool” to have in your bag. My guess is that a combination of LLLT with other techniques could possibly be even more effective. This study is important for patients as well. No-one wants to have surgery, and LLLT is a non-invasive form of therapy that, according to this study, is quite successful. The clinical question posed was, “How effective is low level laser therapy in treating pain in patients with TMJ disorders?” I wanted to do something having to do with TMJ disorders, as my family has a history of jaw issues. This study is relevant to the question posed because it seeks to answer that very question, and makes an effort to apply it to clinical practice. I feel that this study strongly supports the use of LLTT in the treatment of TMD. Because of this, I feel that LLLT is an effective way to treat TMD in the clinic. This study indicates that LLLT can improve maximum mouth opening and right lateral jaw movement, and decrease tender points, myofascial pain, and chewing difficulties. These parameters can improve a patient’s

overall quality of life immensely. LLLT is a cost effective, non-invasive form of therapy and, according to this study, can be quite effective. Although a relatively new form of therapy, especially regarding treatment of the TMJ, the potential benefits seem to outweigh the potential risks. There are a lot of studies regarding the TMJ, but not many combining TMD and LLLT. This argument could be improved if more studies come out supporting LLLT as an effective intervention in the treatment of TMD.

Because of the results of this study, I have confidence in the application of LLLT to treat future patients with TMD. I feel that although the paper was lacking in some areas (reliability of testing instruments, no MCID or NNT), it is a strongly supported paper overall. I would anticipate using this intervention in a clinical setting given future skills, because it is relatively safe, and it is non-invasive.

In conclusion, this article was well written, clear, and concise. The article stated the results and their application to other relevant research and to clinical practice. Although not perfect, the study was well designed and used techniques including double blinding, a control group, and many others to increase the reliability of the results. This study can be a great tool for the therapist to ensure that their practice is based on solid evidence.