

Role Of Rehabilitation In The Treatment Of Temporomandibular Disorders: Scientific Evidence

A. Chafii, S.Laghzaoui, B.Maftouh, Y. Lahrichi, A.Andoh

Unit of Fixed Prosthodontics

Faculty of Dental Medicine-University Hassan II of Casablanca

ABSTRACT:

Objectif:: Evaluate the effectiveness of manual therapy and therapeutic exercises for temporomandibular disorders. **Methods :** Electronic searches were carried out in 3 databases :Pubmed, Google Scholar and Science Direct to find studies relating to the effectiveness of manual therapy on TMJ disorders. The inclusion criteria were as follow : Human studies, realized during these last 5 years, whose articles had been written in english, and with a high level of scientific proofs. Critical reading and the application of the reading grids allowed us to keep 14 articles. **Results :** The selected articles of our systematic review show that : manual therapy seems to decrease pain intensity and to increase mouth opening levels. As for mandibular function, the opinions were divided. **Conculsion :** Our study allowed us to conclude that manual therapy seems to be effective in TMD management. Yet, its effetiveness is highly dependent of the technics used, the frequency and the number of sessions per treatment, and the sessions' duration. Hence, conducting more clinical trials that are taking this parameter into consideration, remains necessary.

INTRODUCTION:

The temporomandibular joint (TMJ) is a joint that belongs on the one hand to the mandible (mandibular process) and on the other hand to the temporal (temporal process) and the mandibular fossa of the temporal. It is a complex joint, with clinical and functional particularities. The TMJ, according to the solicitations, is in charge of the remodeling of the temporal and condylar articular surfaces. This occurs as a result of a proliferation of cells of the deep mesenchymal layer.

Any imbalance in these adaptation modalities can result in temporomandibular dysfunction (TMD), which is a set of muscular (pain, trismus) and articular (pain, noise, dyskinesia) signs

that translate into a dysfunction or adaptation defect of the TMJ. Several therapies are used in the treatment of TMD, some of them are invasive (discectomy, disc restraint, condyloplasties, condylotomy...) others are conservative (medication, occlusal splints, psychotherapy, Reeducation...).

Dentists are much more oriented towards non-invasive treatments, such as reeducation, hence the interest in evaluating the latter. Reeducation, also called gymnotherapy, is considered as an adjuvant therapy for some, while for others it remains an essential primary treatment which proposes a kinesitherapy strategy bringing an etiological answer: by re-educating the function, it perpetuates the obtained results.

The main objective of our systematic review is to evaluate the effectiveness of rehabilitative therapy in the treatment of temporomandibular dysfunction.

MATERIALS AND METHODS:

Data collection was performed from three databases "PubMed", "Google Scholar" and "science direct".

The computational search strategy for this study was based on Boolean equations via the Anglo-Saxon keywords:

- Temporomandibular joint disorders and manual therapy
- Temporomandibular joint disorders and physical therapy
- Temporomandibular joint disorders and exercise therapy

We selected all clinical studies written in English, of interest to the human species and carried out during the last 5 years with a high level of scientific evidence.

Duplicate articles were removed using the ZOTERO software. This allowed us to select 81 articles (34 from Pubmed, 47 from Google Scholar, and 0 from Science Direct). After reading all the articles collected and applying the reading grids, we decided to keep 14 (Figure 1).

We used the R.L. SALMI scale as an evaluation tool during our critical reading of the articles, which is a critical analysis tool that allows us to classify studies according to their level of quality.

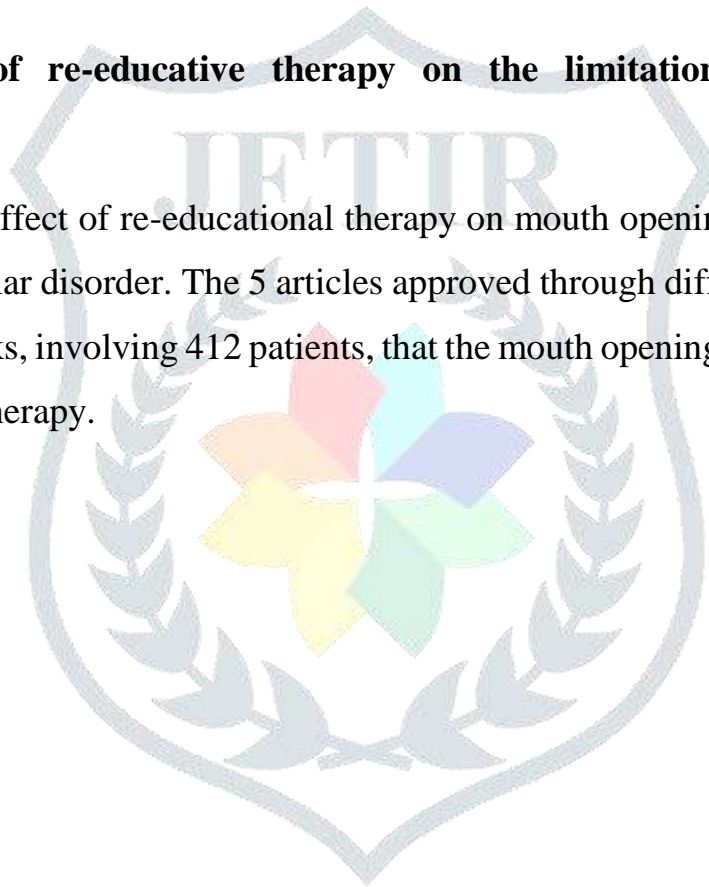
RESULTS:

-The effectiveness of re-educative therapy on pain

12 articles in our review were interested in the effect of re-educative therapy on pain intensity. 11 studies deduced through their interventions, which ranged from 5 to 24 weeks and involved a total of 558 patients, that rehabilitative therapy induces a significant decrease in pain in patients with temporomandibular dysfunction. A cohort study treated three levels of pain: immediate, moderate, and severe. After the intervention, no significant difference was observed between the two groups in the case of immediate pain; contrary to the other two types of pain.

-The effectiveness of re-educative therapy on the limitation of mouth opening (dyskinesia)

5 articles studied the effect of re-educational therapy on mouth opening limitation in patients with temporomandibular disorder. The 5 articles approved through different interventions that lasted from 2 to 6 weeks, involving 412 patients, that the mouth opening improves significantly with the reeducative therapy.



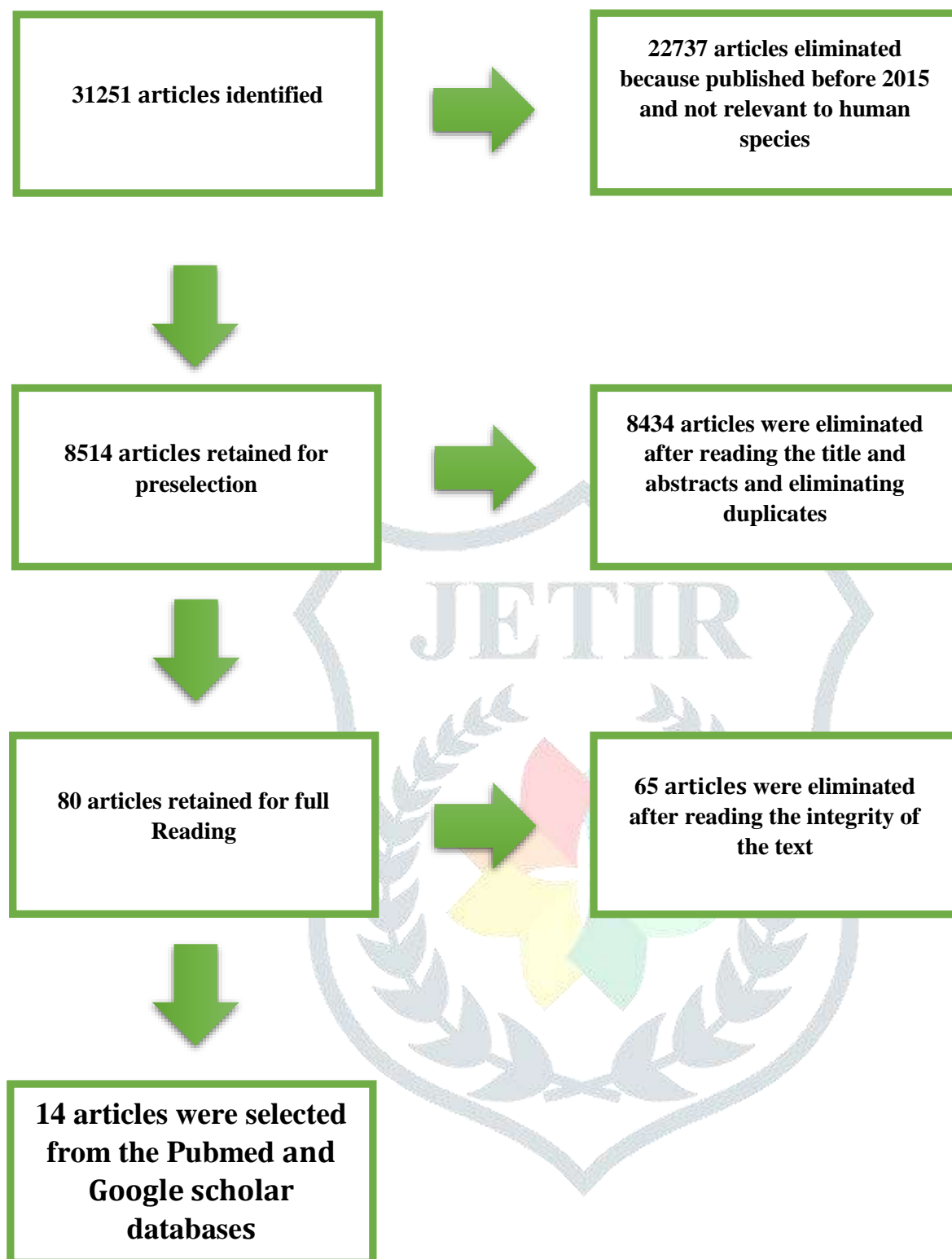


Figure 1: Diagram of the articles selection and identification process

The rate of increase in mouth opening, measured after surgery, varied between articles from 5.6 mm to 10.1 mm

-Re-educative therapy versus occlusal splint

Shousha TM et al compared in a randomized clinical trial the efficacy of the occlusal splint which is known to be the most popular and gold standard therapy for temporomandibular dysfunction and physiotherapy; They found a decrease in pain and an improvement in mouth opening in both groups, but more significantly in the group that received physiotherapy.

However, according to Walhund K et al in another randomized clinical trial, patients who were treated with the occlusal splint had better results than those treated with relaxation exercises.

DISCUSSION

Rehabilitation is a conservative therapy based on massage, movement, and medical gymnastics. These exercises can be performed either by the practitioner or at home by the patient. This type of therapy allows to decrease the intensity of pain, to restore mandibular kinetics, to recover the functions of the orofacial sphere (swallowing, mastication, phonation ...) and to re-capture the disc. [16]

-The effectiveness of rehabilitation therapy on pain:

According to the International Association for the Study of Pain (IASP), "pain is an unpleasant sensory and emotional experience, associated with an actual or potential tissue lesion, or described in terms that evoke such a lesion" [15]. It is a complex, multidimensional and subjective phenomenon frequently reported during the experience of an illness. Pain is one of the primary clinical signs of the temporomandibular dysfunction, and that's why it represents the main reason for the patient to consult. Our review includes 8 clinical trials [6,7,9,10,12,14,27,28] that evaluated the effectiveness of rehabilitation on pain intensity.

Despite the diversity of the rehabilitation techniques used by these authors in these clinical trials, we can see that rehabilitation therapy significantly decreases pain intensity. However, Khaled YA[17] who evaluated three levels of pain, found no significant difference between the two groups of the study in terms of immediate pain. Our study also included 4 systematic reviews [3,8,18,21] which demonstrated that rehabilitation have a positive effect on the pain parameter. This pain's reduction can be explained by central and peripheral mechanisms. [4]

We can conclude from all these results that rehabilitation therapy has an undeniable effectiveness concerning the intensity of pain.

-Regarding the effectiveness of treatment on mandibular function:

Our study includes 3 clinical trials[7,9,28] that evaluated the effect of rehabilitative treatment on mandibular function. These studies[7,28] estimate that this treatment significantly improves the different functions of the mandible. It should be noted that these authors used different techniques, namely the technique based on the use of Ultrasound BioSet + Physiotherapy, the technique based on the mobilization of the cervical part and muscle stretching. Only one of the systematic reviews [21] studied looked at the role of rehabilitation on mandibular function. No significant improvement regarding this parameter was observed in its results. The diversity of opinion between all these articles shows the need for further clinical trials to obtain more evidence regarding the effect of rehabilitation on mandibular function, taking into consideration the technique used, the duration of treatment and the number of sessions.

-Regarding the effectiveness of the treatment on the mouth opening:

Limited mouth opening is one of the main complaints reported by a patient with temporomandibular dysfunction, as it leads to limitation of daily functional abilities. Three clinical trials in our review investigated the effect of rehabilitation on mouth opening (FiorelliA 2016, DanishN 2017, C Lucas2017)[12,10,6]. The results of these studies have shown that rehabilitative therapy induces an increase in the amplitude of the oral opening. These authors have used different techniques that have been shown to be effective. Two systematic reviews[8,18] have demonstrated that reeducation acts favorably on oral opening. This result is similar to that of the clinical trials studied.

We conclude that rehabilitation therapy plays a very important role in increasing oral amplitude. There seems to be a functional integration between the jaw and the atlanto-occipital movements. Previous studies have shown that during mastication, there are movements on the upper cervical spine related to mouth opening and closing, and they depend on the coordination of the masticatory and cervical muscles [11,14]. Manual therapy applied to the cervical spine probably contributes to the amplitude of mandibular movements, thus facilitating and increasing oral opening. Thus, given this correlation, manual therapy techniques should be considered at the cervical spine in patients with temporomandibular disorder. However, other studies have shown that although rehabilitative therapy improves mouth opening in patients

with nonreduced disc displacement, disc reattachment remains limited[19,24]. Moreover, in some cases, even if the disc is re-captured, a recurrence of asymptomatic re-dislocation of the disc may be noted [20].

-Rehabilitation therapy versus other conservative treatments:

Temporomandibular dysfunction is generally a reversible disorder that can be treated by several means.

Apart from rehabilitation, there are other conservative therapies, among which we could mention: Drug treatment, occlusal splinting, injection of local anesthetics, cognitive-behavioral therapy, photobiomodulation, and nerve electrostimulation etc... Our review included two comparative studies between rehabilitation and the occlusal splint. According to the study by TM Shousha, who used two rehabilitation techniques based on mandibular relaxation and muscle stretching, rehabilitation is more effective than the occlusal splint. 27]

K.W. Wahlund, on the other hand, adopted a home exercise program and concluded that the occlusal splint was more effective than rehabilitation therapy. 29] Other comparative studies have been carried out, such as the clinical trial by Brochado, which compared photo biomodulation and manual therapy, which concluded that these two treatments have an equivalent effect in reducing pain intensity and restoring function in patients with temporomandibular dysfunction. The study done by Neto. A, compared rehabilitation with dry puncture and concluded that there was no significant difference in their effect. SR Patil, on the other hand, chose to compare transcutaneous electro-stimulation with rehabilitative treatment, and this study showed that once again these two therapies do not differ in their effect. [1,5,25]

CONCLUSION

Rehabilitation therapy has been shown to be effective in the treatment of temporomandibular dysfunction and plays an important role in the reduction of its symptoms (reduction of pain, increase of mouth opening amplitude, improvement of mandibular functions). However, its effectiveness may vary depending on the technique used and the number of sessions per treatment, and the time devoted to each session. The combination of rehabilitative treatment with other conservative treatments may also be considered as an interesting possibility in the treatment of TMJ disorders.

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