



COMPARATIVE STUDY

# Effectiveness of manual therapy and home physical therapy in patients with temporomandibular disorders: A randomized controlled trial



Aysenur Besler Tuncer, PT, Ph.D. <sup>a,\*</sup>,  
Nevin Ergun, PT, Ph.D. <sup>a</sup>, Abidin Hakan Tuncer,  
DDS, M.P.H. <sup>b</sup>, Sevilay Karahan, M.Sc. <sup>c</sup>

<sup>a</sup> Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Hacettepe University, Ankara, Turkey

<sup>b</sup> Department of Developmental Biology, Harvard School of Medicine and Dentistry, Harvard University, Boston, USA

<sup>c</sup> Department of Biostatistics, Faculty of Medicine, Hacettepe University, Ankara, Turkey

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## KEYWORDS

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**Summary** The purpose of this study was to compare the short-term effectiveness of home physical therapy (HPT) alone with that of manual therapy (MT) in conjunction with home physical therapy (MT–HPT) performed for four weeks in patients with temporomandibular disorders (TMD). Forty subjects (nine males and 31 females; age, 18–72 years) with TMD were randomly divided into two groups: HPT ( $n = 20$ ; five males and 15 females; mean age,  $34.8 \pm 12.4$  years) and MT–HPT ( $n = 20$ ; four males and 16 females; mean age,  $37.0 \pm 14.6$  years). Pain intensity was evaluated at rest and with stress using a visual analogue scale (VAS). Pain-free maximum mouth opening (MMO) was also evaluated. Mean change score (MCS) in VAS and the smallest detectable difference (SDD) in pain-free MMO were measured over time. The results were analysed by MANOVA to evaluate the effects of treatment over time. At baseline, the groups did not differ from each other with respect to VAS scores and pain-free MMO ( $p > 0.05$ ). Within each group, VAS with stress decreased ( $p < 0.001$ ) and pain-free MMO increased ( $p < 0.001$ ) over time. Between groups, both time\*treatment effect and treatment effect were significant for VAS with stress ( $p < 0.001$ ); however, only time\*treatment effect was significant for pain-free MMO ( $p = 0.009$ ). In the MT–HPT group, MCS for VAS with stress was 91.3% and SDD for pain-free

\* Corresponding author. 1691 Beacon Street, Unit # 2, Brookline, MA 02445 USA.  
E-mail address: [tuncer.aysenur@gmail.com](mailto:tuncer.aysenur@gmail.com) (A.B. Tuncer).

MMO was 10 mm. Our results suggest that a four-week period of MT–HPT has a clinically significant effect on both pain and pain-free maximum mouth opening in patients with TMD.

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## Introduction

Temporomandibular disorder (TMD) is a collective term for structural and functional disorders involving the temporomandibular joint (TMJ) and/or the masticatory muscles, muscles of the head and neck and contiguous tissue components (Okeson, 1996). Biological, anatomical, biomechanical, behavioural, environmental and/or emotional factors affect the masticatory system, contributing to the development of signs and symptoms and/or perpetuation of TMD. Therefore, TMD can be considered a multifactorial disease entity (De Leeuw, 2008). It is mainly characterized by pain and restricted jaw movement, with pain being the most common symptom and the most frequent reason for seeking treatment (Dworkin et al., 1990).

In the literature, the treatments available for TMD include pharmacological management, oral appliances, occlusal equilibration, physical therapy, TMJ surgery, bi-behavioural treatments and patient education (Wright and Sluka, 2001; Okeson, 2003).

Home physical therapy (HPT) for TMD includes self-care treatment, patient education, lifestyle modification and self-awareness about the aggravating factors. Specifically, it involves active jaw movements, stretching exercises and correction of body and head posture. It is relatively simple, incurs little cost compared with other treatments and ensures the active involvement of patients (Michelotti et al., 2005). HPT has also been shown to provide relief of masticatory muscle and joint pain (Hanten et al., 2000; Michelotti et al., 2004).

Manual therapy (MT) is an area of specialization that has evolved within the field of physical therapy and is the most commonly used approach for the management of spinal symptoms (Gross et al., 2002; Aure et al., 2003). Manual therapy for TMD includes TMJ mobilization, soft tissue mobilization of painful muscles, active or passive muscle stretching exercises, gentle isometric tension exercises against resistance and guided opening and closing jaw movements (Rocabado and Iglarsh, 1991; Von Piekartz, 2005). These relatively reversible, non-invasive treatments are intended to decrease muscle spasm, alter jaw opening–closing patterns and improve coordination of the muscles of mastication. Various reports have suggested that MT is a viable and useful approach towards the management of TMD (Carmeli et al., 2001; Nicolakis et al., 2002; Kalamir et al., 2007).

A systematic review by Medicott and Harris (2006) evaluated the literature on the efficacy of physical therapy interventions for TMD patients and specifically reported the value of a combined approach of active exercises, MT and relaxation techniques. This review favoured the use of multifaceted TMD treatments. A second review on the efficacy of physical therapy for TMD patients found that postural training, MT and exercise demonstrated significant benefits. The authors concluded that active, passive and postural

exercises are effective interventions for decreasing the symptoms associated with TMD (McNeely et al., 2006).

Although a combination of MT and HPT, including patient education, may have been effective for TMD in the past, no reported studies have compared a MT treatment in conjunction with HPT treatment to HPT treatment alone in TMD patients. Therefore, this study aimed to determine the effectiveness of the treatments on pain intensity and pain-free maximum mouth opening in patients with TMD.

## Methods

This study was approved by the Ethics Committee of Hacettepe University, Faculty of Medicine, Ankara, Turkey. All subjects were provided with an explanation of the study and informed consent was obtained from the study subjects. Subjects with a chief complaint of pain in the TMJ region during mandibular movements participated in this study at Hacettepe University, Faculty of Dentistry. One dentist experienced in TMD diagnosed the subjects according to the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) (Dworkin and LeResche, 1992). RDC/TMD applies a dual-axis system to diagnose and classify patients with TMD. The first axis is divided into three groups of commonly occurring TMDs as follows:

- Group 1: Muscle disorders, including myofascial pain (Ia) and myofascial pain with limited mandibular opening (Ib)
- Group 2: Disc displacement with reduction (IIa) and disc displacement without reduction, with limited mandibular opening (IIb) or without limited mandibular opening (IIc)
- Group 3: Arthralgia, arthritis and arthrosis of the TMJ (III)

## Inclusion criteria

1. Subjects with a diagnosis of myogenous TMD according to categories Ia and Ib of the RDC/TMD (Dworkin and LeResche, 1992) were included. In addition to a diagnosis of myofascial pain, the presence of pain on palpation of at least three of 12 muscular points bilaterally was required; these points were present on the temporalis (anterior, medial and posterior bellies) and masseter muscles (deep belly and inferior and anterior portions of the superficial belly) (Friction and Schulman, 1987).
2. Subjects with a diagnosis of anterior disc displacement with reduction according to category IIa of the RDC/TMD (Dworkin and LeResche, 1992) were included. Painful clicking, crepitation or pain on opening and loaded closing with reproducibility in at least two of three consecutive trials, elimination of a clicking sound on opening–closing movements from a protruded jaw position and pain in the TMJ during the compression

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