A Literature Review on Manual Therapy in Temporomandibular Joint Dysfunction

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ABSTRACT

BACKGROUND : The term temporomandibular dysfunction (TMD) applies to functional changes related to temporomandibular joint (TMJ) and it is associated to masticatory structures. The main symptoms are pain in the TMJ region and / or the masticatory musculature. AIM : The aim of this study was to summarize evidence from and evaluate the methodological quality of randomized controlled trials that examined the effectiveness of MT and therapeutic exercise interventions compared with other active interventions or standard care for treatment of TMD.Objective: to perform a systematic review on the effects of manual therapy in the treatment of TMD. METHOD: The databases use for searching articles were Research gate,MedLine, PEDro, Pubmed and, Scielo. We collected 54 articles from the past 3 years. SELECTION CRITERIA: Selection criteria includes patient with temporomandibular joint dysfunction and articles in which the effectiveness of physiotherapy management were found out in terms of visual analogue scale, pain relief and increase in range of motion. RESULTS: These five studies are based upon the inclusion criteria and were included for the review. The method used in these studies include therapeutic exercise such as mobilization exercise, muscle strengthening exercises, coordination exercises and postural exercises, physical therapy such as exercise management and education on self-management, supervised exercises which included relaxation and coordination and resistance training of the jaw and neck/shoulders, physical therapy manual therapy, CONCLUSION:Manual therapy has also been shown to bemore cost effective and less prone to side effects than dental treatment. Somemanipulative techniques for the TMJ are describe. KEY WORDS: Physiotherapy management, temporomandibular joint dysfunction.

INTRODUCTION:

The temporomandibular dysfunction (TMD) term refers tofunctional alterations concerning Temporomandibular Joint (TMJ)and is related to masticatory structures(1,2). The higher prevalenceis in women compared to men and it is noted in the agegroup of 20 to 40 years(3,4). TMD is due to hyperfunctionor muscle dysfunction, traumatic lesions, hormonal effectsand joint alterations. The primary signs found are reduced mandibular range of movement, joint muscle tenderness, joint click/hiss, functional

limitation and/or deviation of the opening of themandible. The primary symptoms found are pain in the TMJ areaand / or the masticatory musculature(3,4). Approximately 39% of thepopulation present with a sign or symptom of TMD.The joint and its surrounding tissues play a critical role in directing mandibular motion and distributing stress to generate the activities of daily life like chewing, swallowing and speaking. The disorder appears extremely common in routine dental practice but appears to be quite frequently undiagnosed3. There are different kinds of classification of temporomandibular disorder like Intra-articular disorders; it is due to congenital or developmental disorders. Degenerative joint disorders may be due to inflammatory disorders like capsulitis, rheumatoid arthritis, ankylosing spondylitis. Most common syndromes of Temporomandibular joint are myofascial pain disorder, disk derangement disorder, osteoarthritis and autoimmune disorder. The etiology of temporomandibular disorder is multifactorial and involves biologic, environmental, social, emotional and cognitive causes. Temporomandibular disorder is an repetitive disorder of the masticatory apparatus. It is similar to the musculoskeletal disorder of other body regions. Similar to musculoskeletal disorders, the patient's symptoms of pain on function or at rest. The treatment of the temporomandibular disorder is like that of other musculoskeletal disorder, the patient seek treatment for the alleviation of pain as the main aim. Temporomandibular disorder is often self-treatment, such as resting their masticatory muscles by voluntarily restricting their use and also promotes awareness and discontinuation of parafunctional habits. Avoid hard and chewy foods and excessive activity of the masticatory muscles. Hold teeth apart and relax masticatory muscles Temporomandibular disorder patients complaint of adventitious jaw sounds like clicking, popping, grating, crepitus,

The function of sleep dysfunction and depression separately or collectively can cause the temporomandibular disorder. The perpetuating factors of Temporomandibular disorder are:

behavioural factors like clenching, grinding and abnormal postures of the head, social factors which may influence perception and learned response to pain, emotional factors like anxiety and depression and cognitive factors which incorporates negative thoughts and attitudes that can complicate resolution of the illness. Pathophysiologic, psychological or structural process which change the masticatory system adequately to raise the risk of development of Temporomandibular disorder and adds to the predisposing factors occlusion factors of Temporomandibular disorder are open bite, five or more missing posterior teeth, unilateral lingual cross-bite. Symptoms of temporomandibular disorder are pain, joint sounds and reduced mandibular movements. The symptoms are not limited to the Temporomandibular joint but it is referred to as craniomandibular disorders5. The temporomandibular disorder signs include popping, clicking, tenderness of muscle, joint tenderness and reduced jaw opening. The Temporomandibular joint has also been implicated as an important propagating factor in oral and cervical disorders. Temporomandibular joint is also seen to occur with capsulitis, synovitis, meniscal derangement tendonitis, degenerative joint disease and infection. Temporomandibular joint is involved in both mouth opening as well as closing of the mouth. Proper Temporomandibular joint opening involves mandible depression and retrusion of chin, alternatively mouth closing involves mandible elevation and protrusion of chin. Temporomandibular disorder primarily can be treated in non-surgical way that is around 90-95%. Temporomandibular disorder requires surgery only in 10%. The diagnosis of temporomandibular disorder is made on the basis of patient's history, clinical examination and relevant investigations. Visual Analogic Scale (VAS) was applied to measure the degree of pain of the patient at the baseline of the study and proven to be a highly plausible and valid tool for assessing the intensity of acute pain, Pressure Pain Threshold (PPT) is the degree of pressure at which the pressure perception starts to change into pain. The application of pressure algometry can be regarded as a plausible alternative to pain measurement.

METHODOLOGY:

STUDY DESIGN:

The present study is a review of literature on manual therapy in temporomandibular joint dysfunction (TMD) various studies designs to evaluate the intervention's effectiveness.

SEARCH METHOD AND ELIGIBILITY CRITERIA:

The present study is a review of literature, which used the Lilacs, MEDLINE, PEDro, PubMed and Scielo databases. EMBASE, Cochrane review. The searches from the inception from the last 3 years. The search consists of keywords such as physiotherapy management, temporomandibular joint dysfunction.

SAMPLE SIZE:

Sample size of 54 was obtained after searching in databases using following keywords: physiotherapy management, temporomandibular joint dysfunction. Based on inclusion and exclusion criteria and year of publication, further articles were scrutinized and finally 5 appropriate articles were obtained for this systemic review.

INCLUSION CRITERIA:

Articles which included temporomandibular joint disorder.

Articles which included patients above 10 years.

Articles in which range of motion and visual analog scale used as outcome measures were found out.

Articles published between the years of 2011-2014

EXCLUSION CRITERIA:

Articles which were published before 2011

Articles which are mentioned about surgical interventions.

Articles which included patients below 10 years were excluded

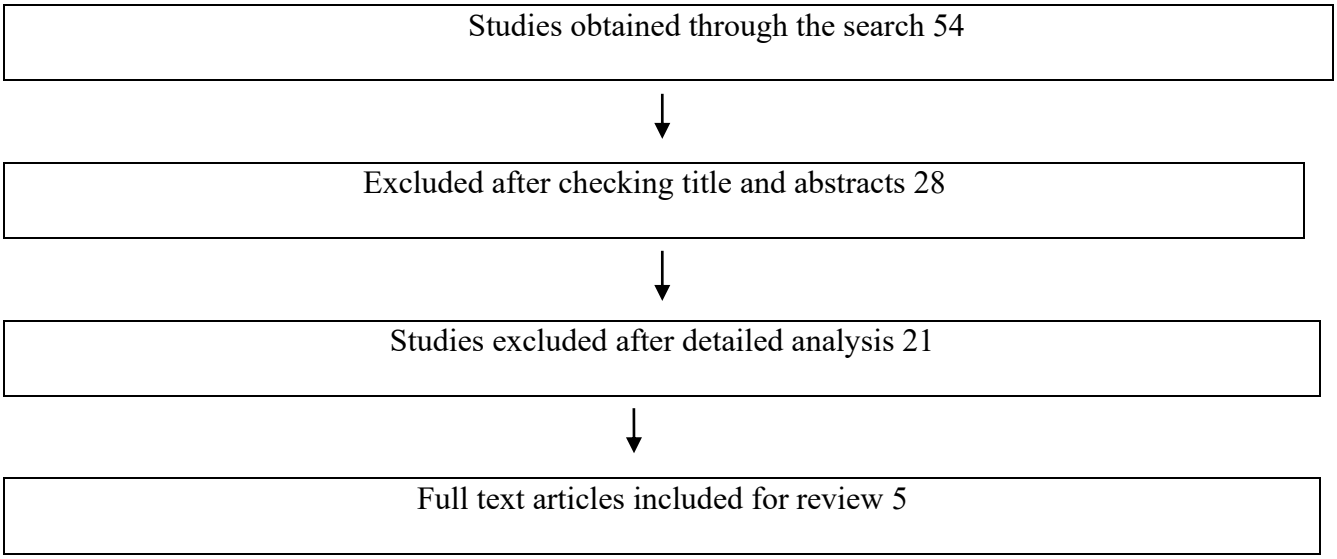
Articles in which are not included range of motion and visual analog scale

SELECTION OF INCLUSION AND EXCLUSION CRITERIA:

5 articles were chosen based on inclusion and exclusion criteria. Study design of all 6 articles were cross sectional study design.Articles with English language were chosen so that proper analyses of articles can be performed.Articles published between years 2011-2014 were chosen for this review, so that situation of temporomandibular joint dysfunction patients for last one decade regarding pain and limited range of motion which are managed through physiotherapy management can be known.Articles prior to2011 were not chosen.

Full-text articles were chosen so that based on information from these articles information can be accumulated. Articles without the outcome measures like visual analog scale and range of motion were not chosen. The scope of this study is the physiotherapy management for temporomandibular joint dysfunction and thus articles with no relevant information about the above-stated scope of this study were not included.

FLOW CHART:



PROCEDURE:

Manual Therapy: Manual therapy includes both soft tissue and joint mobilization techniques. With the evidence provided that these manual techniques applied to the upper cervical spine can help reduce temporomandibular joint (TMJ) disorder pain and increase the range of motion in the mandible, it is suggested that this effect could be due to the union between these two–the trigeminal cervical complex (TCC).

Physical Therapy: Related to the temporal relationship of the evidence provided, flexibility of the TMJ and cervical spine, and exercises on flexibility (e.g. opening stretch, lateral stretch, protrusion stretch, retrusion stretch, upper trapezius stretch, scalene stretch, myofascial stripping for masseter, temporalis, lateral and medial pterygoid) to flexibility/strength/stability/proprioception such as isometric strengthening (e.g., both side-lying and supine) in neutral, isometric strengthening in mid-range, isometric strengthening in end-range, isotonic strengthening for restoration of flexibility/prevention of fisher's distortion/proprioception for the TMJ (e.g., as prior), and returning to function (e.g. controlled opening, end-range opening), and finally, educational meaning also in active procedur assessment for postural correction for one full week prior to plate-rich plasma injection including the practice of appropriate health benefits, nutrition, positioning of the TMJ, moist heat or ice application for the side of the face and providing them every possible moment to relax was given to patients who had anterior disc derangement.

Therapeutic Exercises: These therapeutic exercises included the exercises of jaw relaxation, stretching, coordination, postural control and resistance training were included by patients in their 10 session program, a structured exercise program which would progress in length of time over the course of 10 - 20 weeks.

RESULTS:

Out of 54 articles, only 5 articles were retrieved which fulfilled the eligibility criteria using above mentioned selection strategy. Many articles were excluded for not meeting the requirements, not fulfilling the inclusion and exclusion criteria and many because they were duplicate. Findings of these 5 articles are summarized in table below.

)	NAME OF THE AUTHOR	YEAR OF PUBLICATION	MODE OF INTERVENTION	RESULT
1.	Arif Rashid	2012	Physiotherapy in the management of disorders of the temporomandibular joint .	Exercises for temporomandibular joint disorder appeared to be the promising option for the management of pain and helps to increase the range of motion of the mouth opening as the pain decreases, so the pain intensity and range of motion were focused as outcome parameter
2.	Shalendar sharma	2011	Etiology factors of temporomandibular joint	These interventions help to reduce pain on daily activities due to increase in the endurance training. It also reduces the pain and increase capacity in patients with temporomandibular joint disorder.
3.	Kalamir A, Graham PL,	2013	self-care in the treatment of chronic, myogenous temporomandibular disorder: a randomized, clinical trail. Chiropractic Manual therapies.	All these interventions such as physical therapy, exercise management, education on self-management helps in restoring the mechanics of temporomandibular joint, reduction in the intensity of pain and increase in range of motion
4.	Calixtre LLB, Moreira RFC	2015	Manual therapy for the management of pain and limited range of motion in subjects with signs and symptoms of	Manual therapy helps to reduce the pain intensity and improves the function of temporomandibular joint. Therapeutic exercises focuses on motor control, so the exercises should be focused on motor control exercises, which is effective in alleviating symptoms of temporomandibular joint disorder patients.

			temperomandibular disorder: a systematic review of randomized controlled trails.	
5.	Packer AC, Pires PF,	2014	Effects of upper thoracic manipulation on pressure pain sensitivity in women with temporomandibular disorder: a randomized.	It also reduces the pain and increase capacity in patients with temporomandibular joint disorder. It suggested that activation of jaw motor system has a positive effect in patients with both localized and generalized pain

ASSESSMENT OF OUTCOME MEASURES

There are number of articles consisting of many different outcome measures. But we have selected 5 articles that had standard outcome measures. And from those 5 articles, VAS and Range of motion were reported in majority of them.

1. VISUAL ANALOG SCALE (VAS) is a pain measurement scale in which the patient places a mark on 10cm horizontal line to indicate how much severe the pain is. The left end represents no pain, and the right end represents severe, unbearable pain.

2. RANGE OF MOTION (ROM) was measured by Millimeter Ruler. The subject was preferably in a sitting position with their cervical spine in neutral position and stabilized. The patient was asked to open his mouth as wide as possible even with the presence of pain. With millimeter ruler, the vertical distance between the edge of the upper incisor and the corresponding edge of the lower incisor was measured. The intertaster and intratester reliability for mouth opening measurement by millimeter ruler was found to be good.

DISCUSSION:

Temporomandibular joint dysfunction is a term that encompasses pain, dysfunction or disorders that involving pain in and around the temporomandibular joint. There are many treatment options available for temporomandibular disorders or dysfunction. The non-surgical treatment also includes jaw relaxation techniques, jaw mobilization exercises, goldfish exercises and physiotherapy modalities such as transcutaneous electrical nerve stimulation, laser and ultrasound. This study discusses various physiotherapeutic treatment modalities for temporomandibular joint disorders.

There are a variety of treatment modalities mentioned above for temporomandibular disorders. While all of the above treatment modalities have been shown through research to be effective there are some treatment

modalities that have modality requirements that may not be consistently accessible in a clinical setting. Some studies simply reviewed conservative treatment alone and provided satisfactory outcome measures. Goldfish exercises and jaw mobilization exercises have been shown to be effective and having modalities which can be performed in clinical practice in an efficient and cost effective manner.

LIMITATIONS:

1. We were only able to screen 54 articles and this is the only number of relevant articles in these databases. The appropriate articles obtained were 5 out of 54. This demonstrates that only very limited studies had demonstrated physiotherapy management for temporomandibular joint dysfunction.

2. In addition, it must be noted that the review searched for articles written in English only.

3. Non-availability of articles that were cohort study design.

STRENGTH:

1. We were able to provide accurate information about the physiotherapy management for temporomandibular joint dysfunction and the risk of bias was very minimal due to less number of articles being included for this review.

2. This systematic review has shown more scope of research to analyze physiotherapy management for temporomandibular joint dysfunction.

CONCLUSION:

After reviewing the studies, we conclude that physiotherapists may have a possible tool for the individual treatment of patients depending on the symptoms, with a significant improvement and efficacy in the range of motion of the mouth in the management of joint mobilization and/or joint manipulation. There are various forms of physiotherapy management have a variety of techniques, such as joint mobilization and soft tissue mobilization, therapeutic exercises, such as co-ordination exercises, postural exercises, stretching, goldfish exercises that can be done by the patient with little discomfort and assist in returning to normal life in a short time. Therefore physiotherapy management should be more effective than any other interventions in the management of temporomandibular disorders.

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