THE VOID IN PHYSIOTHERAPY TREATMENT APPROACHES FOR TEMPOROMANDIBULAR JOINT DYSFUNCTION- A REVIEW

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Abstract

A group of illnesses affecting the temporomandibular joint (TMJ), the masticatory system, or both are together referred to as temporomandibular joint dysfunction. These disorders may also affect related structures that are nearby. It affects the head, neck, and surrounding areas, resulting in headache, twitching, fullness, or ringing in the ears as symptoms.

This review aimed to review the published research to find out the gap in the physiotherapy management of patients with temporomandibular joint dysfunction.

PubMed, PubMed Central, Google Scholar, and PEDro database and search engines were searched with the keyword of temporomandibular joint dysfunction, physiotherapy treatment, conservative treatment, prevalence, etiology, except dry needling, RCT, only free full text and articles in English language between 2018 to January, 2022 were included.

A comprehensive search of the specified database identified 272 studies. After eliminating duplicates and reviewing titles and abstracts, 16 studies were ultimately chosen for this review. All selected studies demonstrated a positive effect on pain reduction following a combined intervention. This review suggests that a specific physiotherapy management approach for temporomandibular joint dysfunction is missing, such as use of soft tissue manipulation and combination with other occlusive devices or exercise. Thus, future studies should be focused on a specific physiotherapy approach in the management of temporomandibular joint dysfunction.

Keywords: Temporomandibular joint dysfunction, Physiotherapy treatment, except dry needling, free full text articles.

Introduction

Temporomandibular joint (TMJ) disorders are defined by a distinct set of clinical signs and symptoms that impact the masticatory muscles and related structures responsible for TMJ movement [1]. With a prevalence exceeding 5% [2], Temporomandibular Dysfunction (TMD) is characterized by various symptoms, including pain in the TMJ or surrounding tissues,

generalized myofascial discomfort, joint clicking during movement, reduced range of motion, functional limitations, and jaw deviation upon opening [1,3].

The normal vertical mouth opening range is around 53-58mm; even children below 10 years also reach up to 40 mm mouth opening. However, a range of mouth opening less than 40 mm is considered to be restricted ROM. It is quite beneficial to check end feel, which explains the nature of restricted ROM; if the end feel is soft, it indicates muscle tightness, but if the end feel is hard, then restriction may be due to the intracapsular source. In addition, any change from the normal jaw opening must be recorded such as shift of the jaw during opening and closing [4].

The cause of TMD is multifactorial, stemming from a combination of structural, biomechanical, emotional, and psychological factors. [5]. Conditions that cause inappropriate stress to the masticatory system, such as micro or macro injury, are regarded as starting factors. TMD is thought to be perpetuated by oral habits as well as behavioural factors such as clenching of teeth, emotional disorder, and social issues. There are some predisposing factors such as psychological and pathophysiological factors since it creates an environment that is favourable for the development of TMD [6].

Several treatment options are available, including splint therapy, pharmacological interventions such as medications, and intra-articular injections [7,8]. Additionally, physical therapy techniques such as active and passive stretching, endurance exercises for affected muscles, postural correction exercises, and manual therapy have demonstrated effectiveness in TMD management [8]. In severe cases, surgical intervention may be considered [9]

These studies have shown satisfactory results in reducing pain, functional limitation, and psychological affection. The effects of the treatments concentrated on one particular symptom. We did not find a specific approach to manage all three components for the early recovery from the temporomandibular joint dysfunction. Thus, we aimed to identify a gap in physiotherapy management of temporomandibular joint dysfunction.

Methods

Search strategy

We conducted searches in various databases and search engines, such as PubMed Central, PEDro, Google Scholar, and open-access journals, using the keywords Temporomandibular joint dysfunction, physiotherapy treatment, conservative treatment, prevalence, aetiology, except dry needling, RCT, and full free text. For the review, we only included articles in English language only, free full-text articles, and studies from 2018 to January 2022.

We excluded the articles which was not relevant for our study such as, Study Protocol, articles in other languages, Paid articles, other management approaches, study before 2018, conference proceeding study, and published thesis.

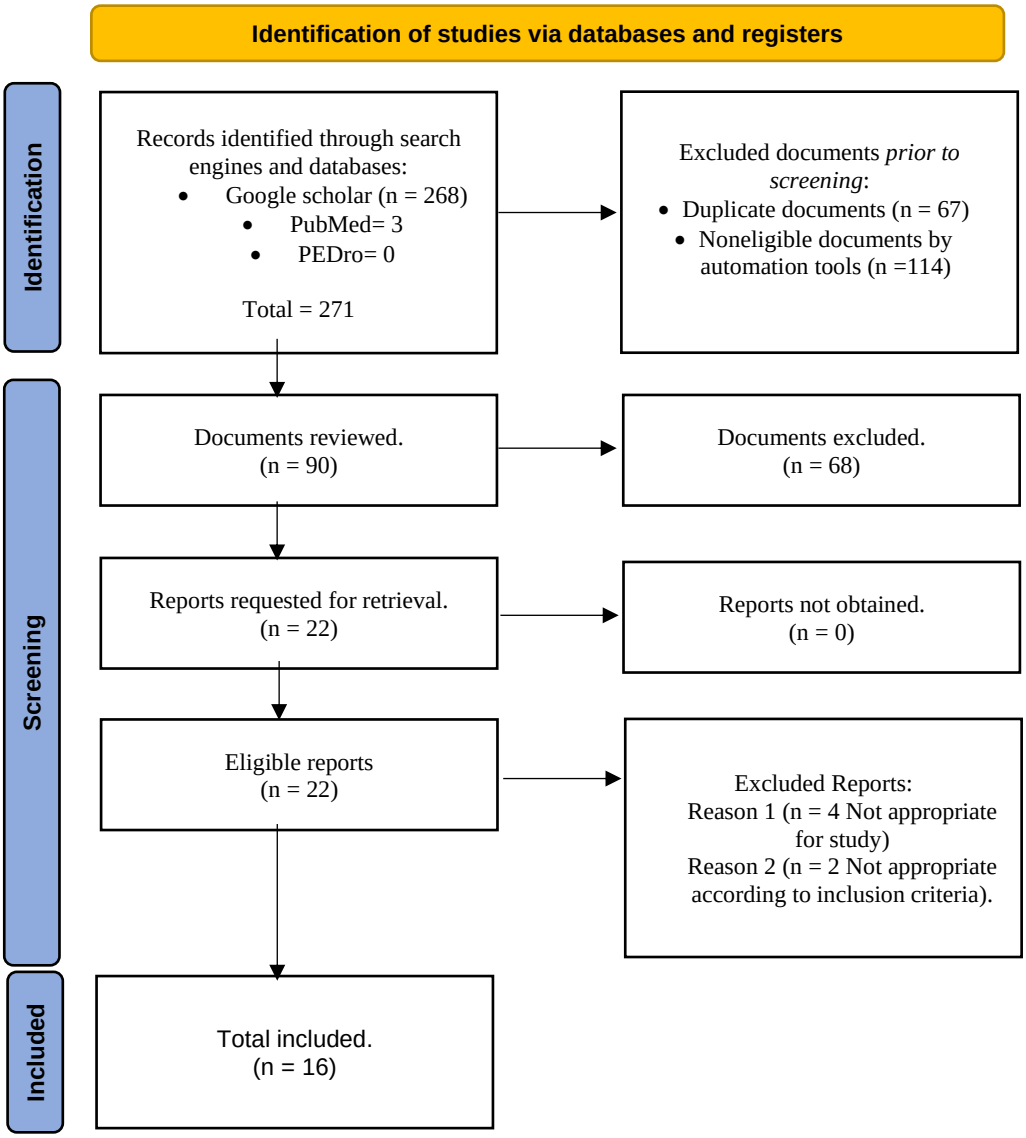

Figure 1: Flow Diagram

Result

The majority of the articles indicated physiotherapy as a better approach in case of TMJ dysfunction and some articles showed multidisciplinary approach is also a good treatment of choice whereas very few articles support the pharmacology approach in dealing with TMJ dysfunction.

S. NO.	Authors (year)	Design	No. of patients/Articles	Treatment applied	Outcome measure	No. of session	Follow up.	Result
1	Law et al., 2014	Systematic Review and Meta-analysis	2360	laser therapy acupuncture, needling, medication, exercise therapy & electrotherapy modalities.	VAS, algometry,	A total of 3 to 15 treatment sessions conducted over a duration of 1 to 12 weeks	12 weeks	laser therapy acupuncture at long term for treating musculoskeletal conditions
2	Shousha et al 2018	RCT	112	Conservative Physiotherapy, Occlusive splinting	VAS	2 Times Per Week For 6 Week	Six continuous weeks	In the case of myogenic temporomandibular joint dysfunction conservative physiotherapy management would be more effective initially than occlusive splints in enhancing the range of motion & decreasing pain.
3	López et al 2020	A Preliminary Study	16	Occlusal splint therapy, neck accessory mobilization at the C7 vertebra, neck mobilization with posterior-anterior mobilization at the C5 vertebra, suboccipital inhibition technique, suboccipital accessory mobilization with occipito-atlo-axoidea (OAA) thrust, trigger point therapy for the masseter, temporalis, and sternocleidomastoid muscles, myofascial release for the masseter, lateral and medial pterygoid muscles, TMJ	VAS, Pain pressure threshold, Helkimo Index	once a week for four weeks	one-month follow-up	A combined protocol incorporating manual therapy (MT) and splint therapy (ST) appears to enhance pain relief, reduce pain-induced disability, and improve patients' self-perception of change in individuals with TMD

				mobilization, and massage.				
4	Paco et al 2016	Systematic Review and Meta-analysis	329	Manual therapy, dry needling, exercise therapy, acupuncture, other electrical modalities, Passive ROM, polyethylene soft occlusal repositioning splint & mixed treatments	VAS, CPS, NPRS, McGill Pain Questionnaire, MFIQ & 7-point global reporting of changes	One to fifteen Session over the period of 1-6 weeks.	1-year post-treatment	Physiotherapy interventions are more effective than other treatment approaches and sham treatments in alleviating TMD pain
5	Steven Kraus & Janey Prodoehl 2017	A cross-sectional study	97	Patient education, behavioral modification, therapeutic exercises, neuromuscular reeducation, manual therapy, and therapeutic modalities.	Satisfaction Questionnaire, Numeric Pain Rating Scale	The average duration of each treatment session was 45 to 60 minutes, with a recommended frequency of once per week for six weeks.		Significant improvements in pain ratings and mouth opening were observed, with large effect sizes indicating the clinical relevance of the results.
6	Khairnar1, et al 2018	Prospective study	42	Ultrasound therapy, Low Level Laser therapy of 660-nm laser	VAS	Fifteen sessions of Low-Level Laser therapy and UST for 10 minutes	3 Months	Study recommends Low Level Laser therapy for treating TMD-related pain without any bony pathology
7	Pedron et al 2018	RCT	45	Group A - Home exercises, inhibition of suboccipital muscle, mobilization of cervical joint passively, flexor-extensor co-contraction, and resisted exercises. Group-B Bilateral longitudinal caudal technique for temporomandibular joint, other treatment approaches such as neuromuscular techniques and coordination exercises for masseter and frontal muscles and other masticatory muscles.	CF-PDI, HIT-6, VAS, & Analog algometer	Daily, five times per week. The total duration of treatment was for 6 weeks and a single session was for 30 minutes.	After 12 weeks	Treatment of cervical alone did not show better results than combined treatment of cervical as well as orofacial in improving Pain pressure thresholds in the trigeminal region and also showed better results in maximum jaw opening. Both (PPTs) in the trigeminal area and attaining maximum mouth opening (MMO) without pain. Both the therapies have significantly alleviated pain and disability in

								the craniofacial region
8	Deepika Chellappa, & Manigandan Thirupathy 2020	RCT	60	LLLT, TENS	Numeric pain distress scale,	LLLT and TENS Therapy done 2 session per week for 3 weeks. LLLT 120 second per tender point and TENS 15 minutes per session.		Both therapies significantly improved mandibular movement amplitude. It is advisable to administer these treatment prior to the initiation conventional dental treatment in patients diagnosed with TMD.
9	de Melo, et al 2020	A Systematic Review	279	Manual therapy with counselling, botulinum toxin injection, home physical therapy alone	TMJ Questionn aire.	Three sessions of 50 min/wk. Single session of injection.	Up to 1 year	One study found manual therapy to be more effective than no treatment, while another showed it was superior to counseling. However, combining manual therapy with counseling did not show a statistically significant advantage over counseling alone, and manual therapy alone was not more effective than botulinum toxin. Additionally, manual therapy combined with home therapy proved more beneficial than home therapy alone.
10	Gala, et al 2021	RCT	60	Self-Myofascial Release Therapy (SMRT) Transverse Friction Massage	Active Knee Extension Test (AKET), and V Sit and Reach test (V-SRT)	For 30 seconds per set, with three sets and a 10-second rest interval between sets.	12 months	By the use of anatomy trains to target the plantar fascia both intervention has successfully increased hamstring flexibility in male desk job workers However, when compared to

								deep transverse friction massage ,self- myofascial therapy showed better result.
11	Amanda carine packer, et al 2014	RCT	32	The technique of upper thoracic manipulation technique was used in conjunction with placebo	VAS,	Single session	3 days	Upper thoracic spinal manipulation did not resulted decrease in pain in women with TMD.
12	Philip la Fleur, Alison Adams 2020	Review	40	Fascial manipulation, saline injection, laser therapy, conservative treatment, lidocaine injection, dry needling, splints, physiotherapy, oral pharmacotherapy, placebo, acupuncture, psychological therapy, complementary therapy, and the bilateral lateral pterygoid muscles received botulinum toxin (25-150U) injected once intramuscularly.	AMSTAR 2, ISPOR questionnaire	Intra-muscular injection of Type A Botulinum Toxin, Intra-muscular injection with saline Occlusal devices such as splint, mouth guard, bite plane, Physiotherapy.	6 Months	On pain scores there is significant difference between botulinum toxin and placebo, also, between botulinum toxin and occlusal splint therapy.
13	Gemma Victoria Espí-López et al 2020	Preliminary Study	16	Accessory mobilization and myofascial manual therapy (MT) techniques, along with splint therapy (ST), were applied to one group, while the other group received splint therapy (ST) alone.	VAS and Pain pressure threshold (PPT)	Experimental group: Four 45-min session for four weeks. Control group received occlusion splint for 8 weeks and 12 hrs a day.	One month	A combined protocol involving manual therapy and splint therapy improved all the outcome measures.
14	Maria Paco et al 2016	Systematic Review and Meta-analysis	329	Manual therapy, dry needling, exercise therapy, acupuncture, other electrical modalities, Passive ROM, polyethylene soft occlusal repositioning splint & mixed treatments	VAS, CPS, NPRS, McGill Pain Questionnaire, MFIQ & 7-point global reporting of changes	One to fifteen Session over the period of 1-6 weeks.	6 weeks	Only Physiotherapy interventions are effective than other treatment modalities in lowering TMD pain
15	Khairnar1, et al 2018	RCT	2019	Ultrasound therapy and LLLT	VAS	Both groups received 15 sessions, one on alternate days. In group A, ultrasound therapy was applied at 1.8 w/cm² for 10 minutes per session, while in	One month	low-level laser therapy (LLLT) for treating TMD-related pain in the absence of underlying bony pathology.

						group B, low-level laser therapy (LLLT) using a 660-nm laser was applied directly to the TMJ region for three minutes at 2.2 Joules per minute		
16	Pedron et al 2018	RCT	45	CG Intervention group: Combined manual therapy (suboccipital muscle inhibition, cervical joint passive mobilization, co-contraction of flexor and extensor and nerve tissue technique). COG Intervention: longitudinal caudal bilateral technique in the TMJ, Neuromuscular technique over the masseter & frontal muscles, and coordination exercises of the masticatory muscles	Primary outcome: - CF-PDI, self-administered questionnaire and HIT -6. Secondary outcome: - TSK-11, VAS and an analog algometer	Treatment session was for 30 minutes for 3–6-week period. Three set of 10 repetition of each exercise	12 weeks	Both groups showed notable improvement in CF-PDI, HIT-6, and pain intensity. However, cervical and orofacial treatment was more successful than cervical treatment alone. Physiotherapy alone was not effective in increasing pressure pain thresholds (PPTs) in the extratrigeminal region or in reducing the TSK-11 scores.

Table 1: Summary of studies included in TMD management approach.

Discussion

The main finding of this review is to document the available physiotherapy treatment options for the management of temporomandibular joint dysfunction and to find the gap in the literature for future study. According to the available data, this literature review found that most of the RCT is indicating physiotherapy intervention and splint therapy as a mainstay in the management process of temporomandibular joint dysfunction. Also, not a single study is available that indicates a specific physiotherapy approach such as soft tissue mobilization. All the available interventions are trying to manage the some of the component of TMJ dysfunction such as pain, quality of life, decreased range of motion, and disability in TMJ dysfunction and the result shows that none of the interventions is superior to others. So, the requirement for the future research is to identify the most effective treatment approaches that address all the components in TMJ dysfunction like pain, rang of motion, quality of life and disability.

Conclusion

The review suggests that a specific physiotherapy management approach in temporomandibular joint dysfunction is missing, such as using soft tissue manipulation and combination with other occlusive devices or exercise. Thus, future studies should integrate the physiotherapy treatment approaches in managing temporomandibular joint dysfunction.

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