The Effectiveness Of Manual Therapy Techniques In The Management Of Musculoskeletal Pain

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Abstract

Upper and lower extremity musculoskeletal disorders (MSDs) are prevalent among the general population and impose a substantial cost on the healthcare system. Clinical practice guidelines encourage the use of manual therapy for managing these injuries. However, there is insufficient data to fully support its usefulness. The objective of our study was to examine the efficacy of manual treatment in adults or kids with musculoskeletal disorders (MSDs) affecting the upper or lower extremities.

We conducted a comprehensive search of the CINAHL, EMBASE, MEDLINE, PsycINFO, and the Cochrane Database of Controlled Trials databases. The reviewers worked together to evaluate the studies for their relevance and conducted a thorough assessment of the relevant research following the criteria set by the Scottish Intercollegiate Recommendations Network. Studies that had a low risk of bias were combined using the criteria of best-evidence synthesis. When possible, we calculated the average differences between groups, the relative risks, and the 95% confidence intervals. In people with nonspecific shoulder discomfort of varying duration, the inclusion of cervicothoracic spinal adjustment and mobilization to normal therapy may enhance self-perceived healing in comparison to standard treatment alone. Adding neck mobilization to a multidisciplinary shoulder course of therapy does not give any additional benefit for persons with subacromial friction condition of varying duration. In conclusion, for adults who have grade I-II ankle ligament sprains of varying lengths, using lower extremity

mobilization together with home exercise and advice yields more significant short-term enhancements in activity and function compared to only relying on home exercise and advice. No research investigations were incorporated that assessed the efficacy of manual therapy for kids or for the treatment of various injuries in adults affecting the limbs. There is insufficient data about the efficacy of manual treatment for musculoskeletal disorders (MSDs) affecting the upper and lower limbs. The existing data substantiates the efficacy of manual therapy in treating non-specific shoulder discomfort and ankle sprains. However, it does not support the application of manual treatment for subacromial friction condition in adults. Further investigation is required to ascertain the efficacy of manual treatment and provide guidance for clinical use.

Keywords: musculoskeletal disorders (MSDs), Upper and lower extremity, pain, manual therapy.

1. Introduction

Upper and lower extremity musculoskeletal disorders (MSDs) are often seen. In the United States, 36% of injuries seen in emergency rooms are sprains of the lower limbs, whereas 16% are strains of the upper extremities [1, 2]. According to a study in Canada, over 75% of people who are wounded in a car accident have pain in their upper limbs, while 27.5% experience discomfort in their lower limbs [3]. The prevalence of upper and lower extremity pain in Dutch adults is 41% for shoulder, elbow, and wrist/hand pain, and 20% for knee and ankle pain [4].

Upper and lower extremity injuries contribute significantly to the overall burden of musculoskeletal disorders (MSDs) in the workplace. In the United States in 2013, the median duration of work absence for injuries to the upper and lower extremities was 10 and 12 days, respectively. Shoulder and knee injuries had the highest number of work days missed [5]. In Ontario in 2014, 22.4% and 19.3% of all workers' approved lost time compensation claims were attributed to upper extremity injuries and lower extremity injuries, respectively [6].

Patients often seek manual treatment, such as manipulation, mobilization, and traction, to treat

musculoskeletal disorders (MSDs) affecting the limbs [7–9]. Manual therapy is often advised as a part of rehabilitation programs to treat musculoskeletal disorders (MSDs) affecting the limbs [10–12]. As an example, the Workplace Safety and Insurance Board (WSIB) of Ontario suggests using manipulation and/or mobilization as a means of managing musculoskeletal disorders (MSDs) affecting the limbs [10]. Furthermore, the use of manual therapy is advised in the practice recommendations for the treatment of rotator cuff syndrome in Australia [11]. The Council for Chiropractic Guidelines and Practice Parameters (CCGPP) issued a recommendation in 2009 endorsing the use of manipulative treatment as a means of managing lower extremity injuries [12]. Nevertheless, it is essential to revise these guidelines, meaning that they should be presented prior to the last five years [10-12]. Prior systematic studies have shown conflicting findings on the efficacy of manual therapy in treating musculoskeletal disorders (MSDs) [13–21]. The reason for this might be ascribed to the release of fresh evidence and variations in technique, such as an inadequate search strategy that includes studies with tiny sample sizes.

Hence, it is essential to conduct a current and comprehensive systematic review to assess the efficacy of manual therapy in treating musculoskeletal disorders (MSDs) affecting the extremities. The objective of our systematic review was to examine the efficacy of manual therapy in comparison to other interventions, placebo/sham interventions, or no intervention in enhancing self-assessed recovery, functional recovery (such as resuming activities, work, or school), or clinical outcomes (such as pain, health-related quality of life, depression) in patients with musculoskeletal disorders (MSDs) of the upper or lower extremity.

2. Methods

We developed the search technique in collaboration with a health sciences librarian. Another librarian conducted a thorough evaluation of the search strategy's comprehensiveness and accuracy using the Peer Review of Electronic Search Strategies (PRESS) Checklist [22, 23]. We conducted a comprehensive search in the following databases: MEDLINE, EMBASE, CINAHL, PsycINFO, and the Cochrane Central Register of Controlled Trials. In addition, we manually

examined the reference lists of prior systematic reviews to identify any more relevant papers.

The search algorithms were first developed in MEDLINE and later modified for use in other bibliographic databases. The search phrases used a combination of restricted vocabulary unique to each resource (such as Medical Subject Headings [MeSH] for MEDLINE) and appropriate text words based on our research topic and selection criteria. We used EndNote X7 to construct a bibliographic database for the purpose of organizing and overseeing search outcomes.

3. Nonspecific shoulder pain with varied duration

One randomized controlled trial (RCT) indicates that including manual treatment, such as spinal manipulation and mobilization, with usual care may enhance self-perceived recovery in individuals with nonspecific shoulder pain and dysfunction of the cervicothoracic spine, as compared to receiving usual care alone [24]. Bergman et al. [25] conducted a research where persons with nonspecific shoulder pain and dysfunction, namely in the cervicothoracic spine and surrounding ribs, were divided into two groups. One group received manual therapy along with usual treatment, while the other group received just usual care. The manual treatment group participants had a maximum of six sessions over a period of 12 weeks, during which a physiotherapist performed manipulation and mobilization on the cervical spine, upper thoracic spine, and nearby ribs.

The provision of usual care followed the guidelines set by the Dutch College of General Practitioners, which included the dissemination of information, guidance, prescription of medicine, administration of corticosteroid injections, and provision of physiotherapy. The individuals in the manual therapy group were more inclined to indicate that they were 'fully recovered' or 'much better' right after the 12-week intervention [RR 2.0 (95% CI 1.2, 3.4)] and at the 52-week follow-up [RR 1.5 (95% CI 1.0, 2.2)], but not at the 26-week follow-up (Table 4). In addition, the group receiving manual treatment was more inclined to report that their symptoms had improved to the extent that they were no longer bothersome at the 52-week follow-up [Relative Risk (RR) 1.4 (95% Confidence Interval (CI) 1.0, 1.9)].

At the 12, 26, and 52 weeks follow-ups, the manual treatment group showed statistically significant changes in

pain (NRS) compared to other groups, however these differences were not clinically noteworthy. Additionally, there were statistically significant disparities in favor of the manual therapy group in terms of disability (SDQ) after 26 weeks of follow-up. However, no such disparities were seen immediately after the 12-week intervention or after 52 weeks of follow-up. The therapeutic significance of this discovery remains uncertain. There were no significant disparities seen across the groups in terms of health-related quality of life. The result may have been skewed in favor of the manual therapy group due to treatment choice, since there was a 12% higher proportion of individuals in the usual care group who initially preferred manual therapy.

4. Durability-varying subacromial impingement syndrome

One randomized controlled trial (RCT) has shown that including neck mobilization into a comprehensive shoulder program of therapy does not provide any additional advantages for individuals with shoulder impingement syndrome [26]. In a randomized controlled trial conducted by Cook et al. [27], persons diagnosed with subacromial impingement syndrome (with an average duration of 11.7 weeks) were randomly assigned to receive a standardized multimodal program of treatment, either with or without manual therapy targeting the cervical spine. The multimodal treatment included of both self-administered and externally administered stretching exercises, isotonic strengthening exercises, and the restoration of normal movement patterns. The manual treatment intervention consisted of applying grade III posterior-anterior mobilization to the cervical spine while the patient was lying face down. This entailed performing 30 oscillations, repeated three times. Both interventions were administered by physiotherapists.

5. Ankle sprains of Grade I-II severity with varying durations

One randomized controlled trial (RCT) indicates that incorporating mobilization together with home exercise and guidance may provide more short-term benefits compared to home exercise and advice alone for grade I-II ankle sprains of varying lengths [28]. Cleland et al. [29] conducted a randomized study on people who visited physical therapy clinics with grade I-II inversion ankle sprains. The participants were divided into two groups: 1) those who received lower extremity manual treatment along with home exercises and guidance; and 2) those who just received home exercise and

advice [28]. Physical therapists conducted manual treatment, which included grade I-IV mobilization targeting the proximal and distal tibiofibular joints, talocrural joint, and subtalar joint. The level of mobilization was chosen based on the physical therapist's judgment and taking into account the patient's ability to tolerate it. The home exercise regimen consisted of gradually increasing daily workouts to improve mobility and strength.

The manual therapy group showed significant and meaningful improvements compared to the control group in the activities of daily living subscale of the FAAM, with a mean change difference of 11.7/100 (95% CI 7.4, 16.1). Similarly, the manual therapy group had a mean change difference of 13.3/100 (95% CI 8.0, 18.6) in the sports subscale of the FAAM, and a mean change difference of 12.8/80 (95% CI 9.1, 16.5) in function as measured by the LEFS. At the six month follow-up, the manual treatment group showed statistically significant changes in both the FAAM and LEFS measures. However, these improvements were not clinically noteworthy. The pain (NRS) showed statistically significant differences in favor of the manual therapy group immediately after the four-week intervention and at the six-month follow-up, but these changes were not clinically meaningful. Ultimately, there were no disparities in the percentage of individuals who reported the reappearance of injury during the six month follow-up.

6. Discussion

There was a scarcity of rigorous research that provided information on the efficacy and safety of manual therapy in treating musculoskeletal disorders (MSDs) affecting the upper and lower limbs. We have found three studies that have a low risk of bias and have examined the efficacy of manual treatment in people with musculoskeletal disorders (MSDs) affecting the upper and lower limbs. Adding spine manipulation and mobilization to normal therapy may enhance self-perceived healing for those with nonspecific shoulder discomfort of varying duration, as compared to receiving usual care alone. Neck mobilization does not provide any additional advantage when paired with multimodal therapy for subacromial impingement symptoms of varying duration. In addition, lower extremity mobilization, when paired with home exercise and coaching, offers further short-term benefits in activity and function for grade I-II ankle sprains of varying length.

Prior systematic studies have shown conflicting findings about the efficacy of manual therapy in treating shoulder musculoskeletal disorders (MSDs) [16–21]. In the management of nonspecific shoulder pain, our findings align with two previous systematic reviews that investigated the effectiveness of manipulation and mobilization [16] or mobilization alone [18]. However, two other reviews reported inconclusive evidence regarding the effectiveness of mobilization [17] or manipulation [21]. Our finding that neck mobilization does not provide any extra advantage to a multimodal therapy program for treating subacromial impingement syndrome contradicts a prior comprehensive analysis that revealed equivocal data on the efficacy of mobilization [18]. Furthermore, our findings contradict three evaluations that indicated that manipulation and mobilization or manipulation are helpful for subacromial impingement syndrome [16,19,20].

Prior systematic evaluations have shown conflicting findings regarding the efficacy of manual treatment for ankle sprains [13–15]. The results of our study on the efficacy of manual therapy in treating ankle sprains are consistent with two prior systematic studies [13, 14], but contradict another [15]. Our findings indicate that Mobility yields temporary enhancements in activities and function, but does not result in a significant and substantial decrease in discomfort. Brantingham et al. and Loudon et al. determined that manipulation and mobilization or mobilization provide both immediate and lasting advantages, such as alleviating pain [13,14]. Terada et al. determined that mobilization is ineffective [15].

The divergent outcomes between our assessment and earlier systematic reviews might be related to disparities in technique and the dissemination of new evidence [13–21]. The previous evaluations' findings may have been influenced by the incorporation of research that used manual therapy as part of a multimodal treatment program [13, 16, 18]. The precise impact of a modality cannot be accurately determined when it is part of a multimodal treatment program. The efficacy of manual therapy cannot be separated from the effects of the other therapies in the program. Furthermore, with the exception of one earlier analysis [21], all other reviews [13–17, 19–21] considered small trials. It is important to note that small trials are more prone to Type II error and residual confounding. Furthermore, it is possible that a particular systematic review

used a distinct search method, resulting in the omission of pertinent papers [15]. Previously, all systematic reviews relied on a specific score to assess the internal validity of randomized controlled trials (RCTs) by employing a checklist to evaluate the studies [13–21]. This might potentially restrict the capacity to evaluate the influence of bias on the outcomes of the research.

7. Conclusion

There is insufficient data about the efficacy of manual therapy for musculoskeletal disorders (MSDs) affecting the upper and lower limbs. The existing data confirms that manual therapy is useful in treating non-specific shoulder discomfort and grade I-II ankle sprains in adults. However, there is no evidence supporting the efficacy of neck mobilization in adults for the treatment of subacromial impingement syndrome. No studies were found that assessed the efficacy of manual treatment in children with musculoskeletal disorders (MSDs) affecting the upper and lower limbs.

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