



# The Effects of Dry Needling at Pain Reduction in Patients with Myofascial Trigger Points in the Upper Trapezius: A Systematic Review

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## Introduction

Due to the growing sedentary lifestyles in society and workplaces, musculoskeletal complications of the neck and shoulder region are more commonly seen in the healthcare setting. This is believed to be, in part, due to the prolonged low-level static activities taking place during common sedentary postures.<sup>1</sup> It is known that prolonged postural activity of this nature creates muscle imbalances, along with local metabolic and physiological changes, resulting in myofascial trigger point formation.<sup>1</sup> The upper trapezius is a specific muscular area which is prone for such trigger point formation.

Physical therapy is a popular management option for insidious onset mechanical neck pain.<sup>2</sup> As a result, new and upcoming interventions for myofascial trigger points have been developing in recent years. Today, dry needling intervention has the potential to become part of the clinical science foundation in physical therapist education programs.<sup>3</sup> It is predicted that a decade from now instruction of dry needling in Doctor of Physical Therapy (DPT) programs will be a part of the certification criteria by the Commission of Accreditation in Physical Therapy Education.<sup>3</sup> Since this new and upcoming technique is becoming more popular, physical therapists need to know now how effective is dry needling at pain reduction in patients with myofascial trigger points in the upper trapezius?



## Methods

**Search Strategy**-- Databases searched: CINAHL complete, MEDLINE, SPORTDiscus, Science Reference Center, Cochrane Central Register of Controlled Trials, and OVID. Search terms used: "dry needling" and "upper trapezius." Initial searches resulted in 103 studies with a reduction to 53 studies after duplicates were removed. Screening by title and abstract resulted in 41 of the 53 records being excluded due to additional treatments being used in conjunction with dry needling or non-relevant studies associated with the topic. Following full text analysis, a further 6 of the remaining 12 studies were removed resulting in 6 viable studies. See [Diagram 1](#) for a visualization of this process.

## Methods (cont'd)

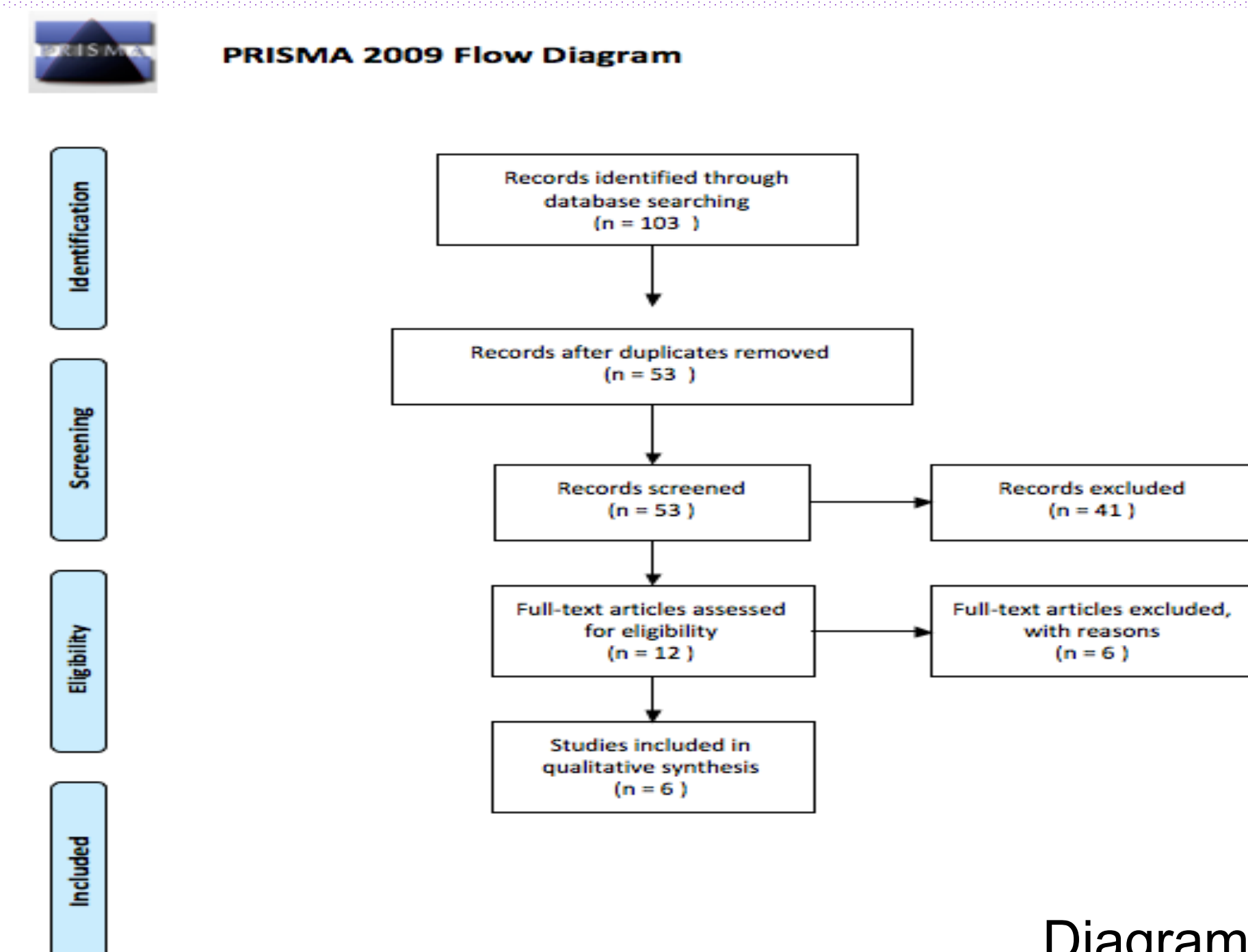
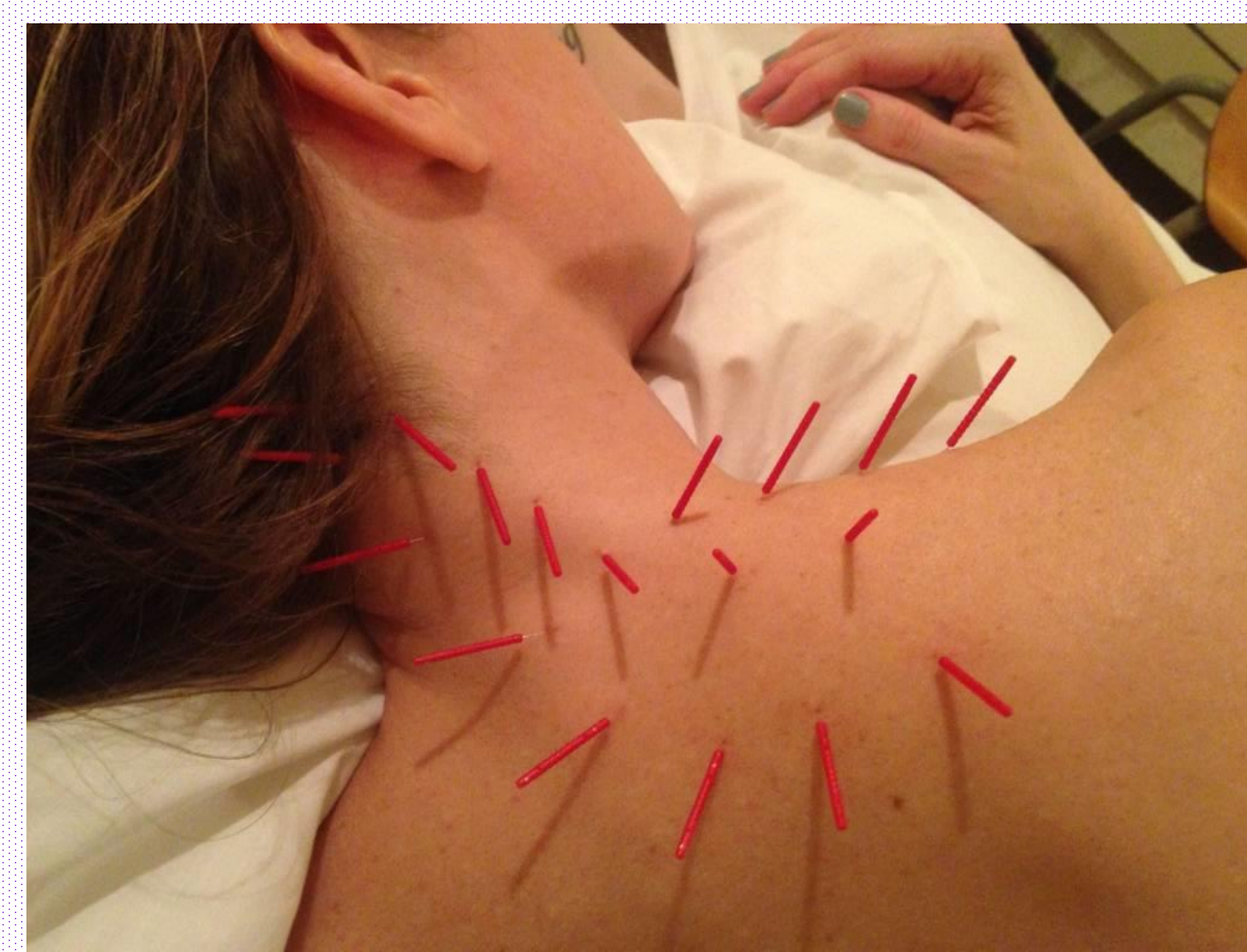


Diagram 1

**Methodology**-- The remaining six studies' level of research and quality were further investigated using the American Academy for Cerebral Palsy and Developmental Medicine (AAPDM) assessment tool.<sup>4</sup> The AAPDM uses a series of 7 yes or no response questions resulting in a scoring system out of a possible 7. Scores of 6-7 yes responses are considered **strong**. Scores of 4-5 yes responses are considered **moderately strong**. Scores of 3 or less yes responses are considered **weak**. See [Table 1](#) for results.

Study	Level/Quality	1	2	3	4	5	6	7
Gerber 2015	IV Strong (6/7)	Yes	Yes	Yes	No	Yes	Yes	Yes
Mejuto-Vazquez 2014	II Strong (7/7)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ziaefar 2014	II Moderate (4/7)	Yes	Yes	Yes	No	No	No	Yes
Rayegani 2014	II Moderate (4/7)	Yes	Yes	Yes	No	No	No	Yes
Cagnie 2012	IV Moderate (5/7)	Yes	Yes	Yes	No	No	Yes	Yes
Myburgh 2012	II Strong (7/7)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 1



## Results

From using the AACPD, four out of six studies (Zaifer 2014, Mejuto-Vazquez 2014, Rayegani 2014, Myburgh 2012) were deemed Level II randomized controlled trials, while the remaining two (Gerber 2015, Cagnie 2012) were classified Level IV case series. Overall, the quality of research was found to be moderate to strong overall. All four Level II RCTs revealed that dry needling decreases pain via the visual analog scale (VAS)<sup>1,2,5,6</sup> and Numeric Pain Rating Scale (NPRS)<sup>7,8</sup> as well as decreases the subjects' perceived level of disability via Pressure Pain Threshold (PPT)<sup>1</sup> and Disabilities of the Arm, Shoulder, and Hand (DASH).<sup>1</sup> The studies (Rayegani 2014, Gerber 2015) also revealed an overall improvement in mood and quality of life when treated with dry needling. One of the case studies (Cagnie et al.) shows potential rationale for these results by finding increased oxygen saturation and blood flow to tissues for healing following dry needling.

## Discussion

After examining these six reviewed studies, there is moderately strong evidence that dry needling is an effective intervention in reducing pain in patients with upper trapezius pain. When comparing VAS and NPRS scores, dry needling therapy applied to the upper trapezius has been found to have effective pain diminishing results when compared to physical agents with stretching<sup>5</sup>, trigger point compression therapy<sup>1</sup>, superficial versus deep dry needling<sup>7</sup>, and controls.<sup>2</sup> The Gerber study found that the majority of subjects' active trigger point status after being treated with dry needling was reduced to non-existent or latent in addition to pain being significantly decreased. In some studies, dry needling appears to be more effective compared to other interventions<sup>5</sup>, yet in other studies outcomes are essentially equal.<sup>1</sup> However, even if dry needling had equal results to other interventions, it is more time efficient<sup>5</sup>, requiring only ten seconds to perform or administer on top of being less costly.<sup>8</sup> Dry needling treatment can require only one treatment session compared to ten sessions when treating with physical agents and stretching. It is possible to have reduced pain with only one treatment because of the changes taking place at the cellular level. The Myburgh study found that dry needling results in greater oxygen supply to tissues causing increased blood flow, which in turn promotes healing. This could provide a partial explanation for the pain reduction benefit found in the other studies.

## Conclusions/ Recommendations

Overall, it is clearly evident that dry needling is beneficial at reducing pain in the upper trapezius muscle. Each study reviewed used some type of patient reported pain rating scale. The results of each study showed that pain ratings decreased, proving reliability of dry needling treatment for reducing pain. Although patient reports of pain are reliable, validation can be difficult due to the variety of ways to express pain by individual patients, the sensitivity to change, and other objective measures. In the future, research needs to include symptomatic subjects. The inclusion of symptomatic trapezius muscles in addition to non-symptomatic ones would increase the strength and reliability of findings. After critically analyzing multiple studies, it was surprising to not find any that compare dry needling alone to dry needling plus exercise. Further research on this comparison could provide more insight for clinical use of dry needling in physical therapy practice.

## References

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