



Sophia K. Smith
Exercise Science
Gardner-Webb University

Abstract

Previous literature has examined using dry needling as a treatment method for rehabilitation in shoulder injuries along with physical therapy.

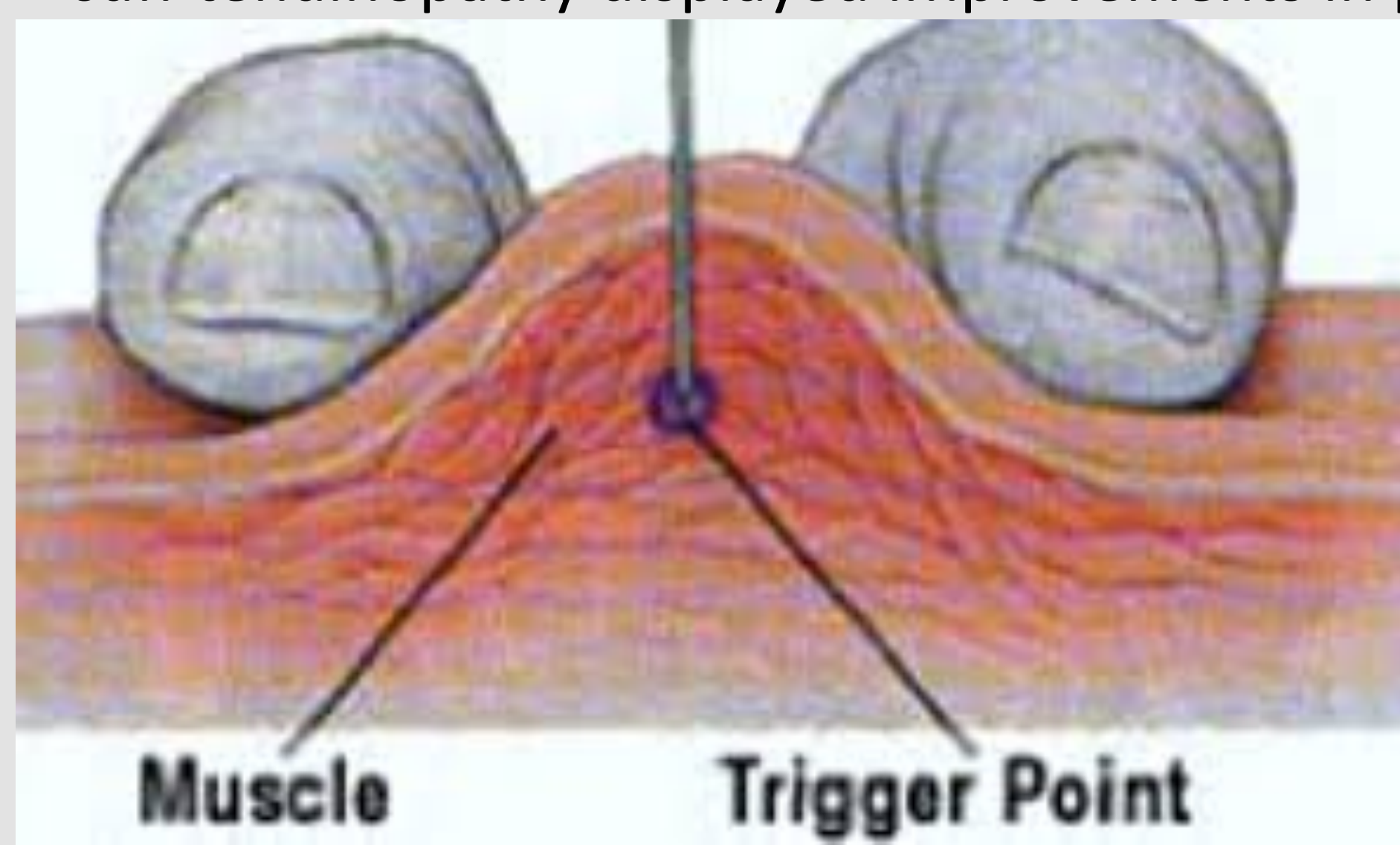
- Purpose- The purpose of this study was to observe the effects of dry needling on pain, range of motion, and shoulder strength in elite overhead athletes with shoulder injuries.
- Hypothesis- It was hypothesized that dry needling would decrease pain and increase range of motion and strength in elite overhead athletes with shoulder injuries.

Introduction

- Shoulder injuries are one of the most common injuries in elite overhead athletes.
 - Shoulder injuries can lead to the development of myofascial trigger points (MTrPs) (Kamali, Sinaei, & Morovati, 2019).
- MTrPs can be treated with dry needling (DN) to result in a local twitch response and inducing microtrauma to re-stimulate the inflammatory system to promote healing (Patrick, et al., 2016).
 - Pistoning is the most common DN technique that involves inserting the needled into MTrPs, withdrawing them, and re-inserting them in a fan or cone shape (Rossi, et al., 2017).

Review of Literature

- **Kamali, Sinaei, and Morovati (2019)** found indirect DN was as effective as direct DN in reducing shoulder pain and disability. Participants were semi-elite overhead athletes, age 18-60 years old.
- **Passigli, Plebani, and Poser (2016)** found that DN may be an effective treatment for subacromial impingement syndrome in improving pain and glenohumeral range of motion. The participant was a 46-year-old male dance instructor.
- **Morgan and colleagues (2019)** found that rapid improvements in range of motion could be due to the changes in rotator cuff guarding from the dry needling in patients with subacromial pain syndrome.
- **Saylor-Pavkovich (2016)** found that patients with chronic rotator cuff tendinopathy displayed improvements in pain and disability of



Dry Needling:
Subcuneous
Level View

<http://drthaihihoa.com/en/treatment-methods/physiotherapy/dry-needling-trigger-points-therapy/>

Methods

Participants: Thirty elite overhead athletes (15 men and 15 women).

Inclusion Criteria: Participants must actively engage in their respective sports' competitions, had a diagnosed shoulder injury in the last three months, at least a 3/10 VAS score, had been actively treated by their athletic trainer, and had active MTrPs present.

Research Design: This study was a quantitative experimental design. This study was quantitative because pain intensity, range of motion, and strength were measured objectively using the VAS, goniometry, and manual muscle testing, respectively.

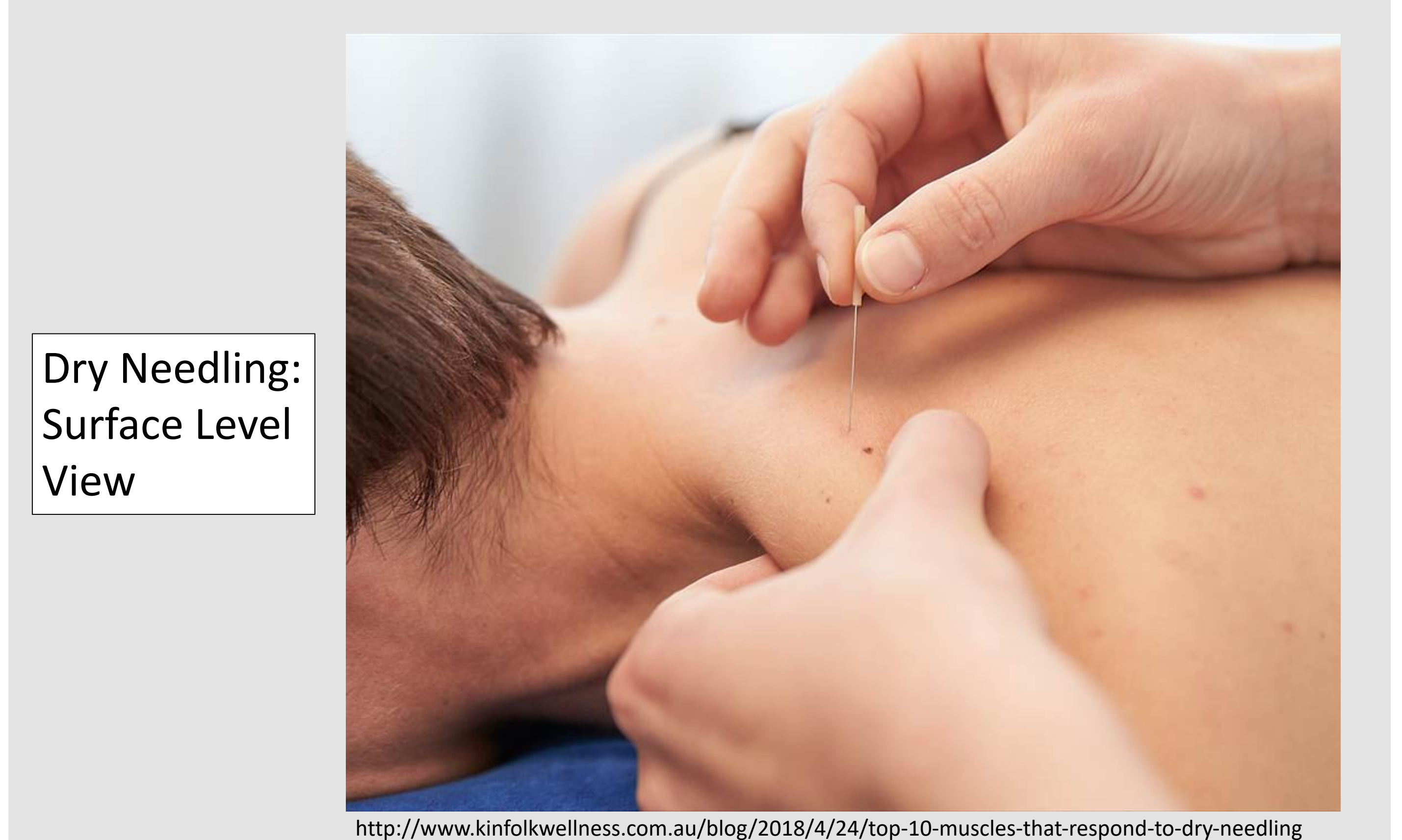
Instrumentation: Pain intensity, range of motion, and strength were measured objectively using the VAS, goniometry, and manual muscle testing, respectively.

Procedure: Participants were recruited from the athletic training department at Gardner-Webb University and randomly assigned to one of two groups. The DN group received intervention of a specific dry needling protocol and the control group did not. Each participant completed five testing sessions independently over the course of two weeks, with two testing sessions and three treatment sessions.

Data Analysis: An independent t-test was used to analyze averages and standard deviations of the differences between baseline and final scores for pain, range of motion, and strength for each testing group as well as each individual participant.

Operational Definitions

- **Elite Overhead Athlete:** individuals age 18 to 24 participating in NCAA Division I baseball, softball, swimming, and basketball (Patrick, et al., 2016; Kamali, Sinaei, & Morovati, 2019)
- **Pain:** measured using the Visual Analogue Scale (VAS), which is a ten-point scale with zero described as "no pain" and ten described as "the worst pain imaginable" (Hakim, et al., 2019).
- **Range of Motion:** measured in degrees using a goniometer. Measurements included adduction, abduction, external rotation, internal rotation, flexion, and extension.
- **Shoulder Injury:** superior labrum anterior to posterior tears, biceps tendinosis, biceps tendon tears, rotator cuff tendinosis, rotator cuff tears, glenohumeral internal rotation deficit, and shoulder impingement syndrome (Abrutyn, 2019).
- **Strength:** measured using manual muscle testing (MMT) on a scale from zero to five with zero being no function and five being normal function.



Dry Needling:
Surface Level
View

<http://www.kinfolkwellness.com.au/blog/2018/4/24/top-10-muscles-that-respond-to-dry-needling>

Discussion

- **Limitations:** Limitations in this study included the inability to be blinded to the participants due to the nature of the intervention. Another limitation would be a small sample size since not all elite overhead athletes experience shoulder injuries. Due to the small sample size and participants only being recruited from the same university, the results could not be generalized.
- **Future Application:** Further research to analyze the true effectiveness of dry needling on a large population of elite overhead athletes from various universities could be performed.

Acknowledgements

- I would like to thank Dr. Hartman for teaching and preparing us with the necessary information to complete this proposal and assisting us throughout the process.
- I would also like to thank Austin Reames for his assistance in the editing process and for answering any questions that arose.
- Lastly, I would like to thank my peers for their assistance in revising this work.

References

- Kamali, Fahimeh, Sinaei, Ehsan, Morovati, Maryam. (2019). Comparison of upper trapezius and infraspinatus myofascial trigger point therapy by dry needling in overhead athletes with unilateral shoulder impingement syndrome. *Journal of Sport Rehabilitation*, 28(3), 243-249. <https://doi.org/10.1123/jsr.2017-0207>
- Morgan, Brandon C., Deyle, Gail D., Petersen, Evan J., Allen, Christopher S., Koppenhaver, Shane L. (2019). Dry needling in the management of patients meeting clinical diagnostic criteria for subacromial pain syndrome: A case series. *The International Journal of Sports Physical Therapy* 14(4), 637-654. <https://doi.org/10.26603/ijsp20190637>
- Passigli, Samuele, Plebani, Giuseppe, Poser, Antonio. (2016). Acute effects of dry needling on posterior shoulder tightness. A case report. *The International Journal of Sports Physical Therapy*, 11(2), 254-263.
- Patrick, Rachael, McGinty, Josh, Lucado, Ann, Collier, Beth. (2016). Chronic UCL injury: A multimodal approach to correcting altered mechanics and improving healing in a college athlete—A case report. *The International Journal of Sports Physical Therapy*, 11(4), 614-626.
- Rossi, Ainsley, Blaustein, Sara, Brown, Joshua, Dieffenderfer, Kari, Ervin, Elaine, Griffin, Steven, Frierson, Elizabeth, Geist, Kathleen, Johanson, Marie. (2017). Spinal and peripheral dry needling versus peripheral dry needling alone among individuals with a history of lateral ankle sprain: A randomized controlled trial. *The International Journal of Sports Physical Therapy* 12(7), 1034-1047. <https://doi.org/10.16603/ijsp20171034>
- Saylor-Pavkovich, Estee. (2016). Strength exercises combined with dry needling with electrical stimulation improve pain and function in patients with chronic rotator cuff tendinopathy: A retrospective case series. *The International Journal of Sports Physical Therapy*, 11(3), 409-422.