Article Title/ Author/Year	Article Type	Subjects (Number and Criteria)	Outcome Measures and Timeframes	Interventions or Methods	Results	Conclusions
Dry Needling for the Treatment of Tension-Type, Cervicogenic, or Migraine Headaches: A Systematic Review and Meta-Analysis Pourahmadi et al. 2020	Systematic review and meta-analysis	11 RCTs included in qualitative synthesis, 9 included in meta-analysis 4 studies of patients with cervicogenic headache, 4 with tension type headache, 1 with migraine, 2 with mixed populations Inclusion criteria: RCTs or observational studies, compare effectiveness of DN with any other intervention, adult (18+ years old) human subjects with diagnoses of tension type	Meta-analysis examining primary outcomes including headache pain intensity and related disability. Secondary outcomes were only qualitatively discussed, and included frequency of headaches, health related QoL, cervical spine ROM, and trigger point tenderness. Outcomes were measured on average 2 days after treatment.	Intervention groups received DN by physical therapists (7 studies), dentists (2), or other providers (2). Application methods were varied. Comparison groups received any other intervention.	Very low-quality evidence suggested that DN is not statistically better than other interventions for improving headache pain intensity in the short term in patients with tension type headache (SMD −1.27, 95% CI = −3.56 to 1.03, n = 230), CGH (SMD −0.41, 95% CI = −4.69 to 3.87, n = 104), or mixed headache (tension type headache and migraine; SMD 0.03; 95% CI = −0.42 to 0.48, n = 90). Number needed to treat to demonstrate	Very low-quality evidence suggests that DN is not more effective than other interventions for improving headache pain intensity in the short term among patients with tension type headaches or mixed type headaches. However, very low-quality evidence does suggest that DN is more effective than other intervention for improving headache related disability in the short term among patients with tension type headaches or

		headache, cervicogenic headache, or migraine, examine headache pain intensity and disability Exclusion criteria: studies that did not have a control or comparison group			decreased headache intensity=2 with very large effect. Very-low quality evidence that DN provided significantly greater improvement in related disability in the short term in patients with tension type headache (SMD −2.28, 95% CI = −2.66 to −1.91, n = 160) and cervicogenic headache (SMD −0.72, 95% CI = −1.09 to −0.34, n = 144). Number needed to treat to demonstrate improved related disability=1 with very large effect. Results of secondary outcomes showed that DN	cervicogenic headaches.

					could significantly improve headache frequency, health-related QoL, trigger point tenderness, and cervical ROM in patients with tension type headache and cervicogenic headache.	
The effectiveness of dry needling for patients with orofacial pain associated with temporomandibular dysfunction: a systematic review and meta-analysis Vier et al. 2018	Systematic review and meta-analysis	7 RCTs included in study, 5 included in meta-analysis Inclusion criteria: RCTs, published in English, Portuguese, or Spanish, compared FN with placebo/ sham intervention or other interventions, examined myofascial orofacial pain Exclusion criteria: acupuncture or	Meta-analysis examined primary outcome of pain intensity (VAS or NPRS), and secondary outcomes of PPT (algometry) and pain free maximum mouth opening (measured in millimeters) in the short term (up to 3 months post-treatment), medium term (3-6 months), and long term (6+ months).	Intervention group received DN; various methods were used among studies. Comparison groups received sham or placebo treatment, oral medication, or injection.	Very low-quality evidence of no statistically significant differences between DN and sham for short-term orofacial pain (two trials, pooled n = 70; MD = 0.30; 95% CI = −0.83 to 1.43; I2 = 24%). Very low-quality evidence that DN was better than sham therapy for PPT in the short-	Very low-quality evidence suggests that DN may be more effective than sham treatments in improving PPT and other treatments in improving pain intensity in the short term. Due to the low quality of evidence included, DN cannot be recommended as a superior treatment to sham or other interventions.

		wet needling applied, subjects with neurologic, rheumatic, vascular, metabolic, or neoplastic disease, surgical procedure in orofacial region			term (three trials, pooled n = 82; MD = 0.56; 95% CI = 0.31 to 0.81; I2 = 55%). Very low-quality evidence of no differences between DN and sham treatments in short-term pain-free maximal mouth opening (2 trials, pooled n = 62; MD = 0.12; 95% CI = −3.04 to 2.80; I2 = 40%) Very low-quality evidence that DN was better than other interventions for short-term pain (2 trials, n = 68; MD = −0.74; 95% CI = −1.25 to −0.22; I2 = 24%). Very low-quality evidence that of	

					no statistically significant differences between DN and other interventions for short-term PPT (two trials, pooled n = 36; MD = −0.08; 95% CI = −0.27 to 0.12; I2 = 0%). Unable to conduct meta-analyses for any outcomes in the medium or long term.	
Clinical Practice Guideline for Physical Therapy Assessment and Treatment in Patients With Nonspecific Neck Pain Bier et al. 2018	Clinical practice guideline	N/A	N/A	Guideline committee of neck pain experts, physical therapists and epidemiologists that formulated CPG using methods issues by KNGF. Recommendations were based on reviews of best evidence related to prognosis,	Very low-to-low quality evidence that dry needling has no effect on neck pain in contrast to other treatments or placebo. Dry needling is not recommended for patients with neck pain.	Based on the quality of evidence, it is not recommended that dry needling be used to treat patients with neck pain.

				accuracy of diagnostic tests, and effectiveness of interventions and reviewed by external stakeholders. Relevant to this capstone project are recommendations based on review of research related to dry needling interventions.		
Neck Pain: Revision 2017 Blanpied et al. 2017	Clinical practice guideline	N/A	N/A	Experts were appointed by the orthopedic section of the ATPA to systematically review literature related to neck pain classification, examination, and intervention strategies. Guidelines were developed and reviewed by multiple parties. Relevant to this	Compared to a control, DN was more effective for reducing pain in the immediate and short term among patients with chronic neck pain with mobility deficits. Compared to non-trigger point DN and standard acupuncture, DN was more effective for reducing pain and	For patients with chronic neck pain with mobility deficits, therapists should provide a multimodal approach including dry needling based on moderate strength of evidence (grade B).

				capstone project are recommendations based on review of research related to dry needling interventions.	improving function in the short term among patients with chronic neck pain with mobility deficits. Compared to wet needling, DN was not more effective for reducing pain in the immediate or intermediate term among patients with chronic neck pain with mobility deficits. Compared to miniscalpel needling and lidocaine injection, DN was not more effective for reducing pain in the short term among patients with chronic neck pain with mobility deficits.	

					Compared to lidocaine injection and NSAIDs, DN was not more effective for improving quality of life in the short term among patients with chronic neck pain with mobility deficits. Compared to lidocaine injection, DN was not more effective for improving pain or function in the immediate term among patients with chronic neck pain with mobility deficits.	
Comparison of dry needling and trigger point manual therapy in patients with neck and upper	Systematic review and meta-analysis	6 RCTs included Inclusion criteria: RCTs, articles published in English, adult (18+) human subjects, studies	Meta-analyses comparing effectiveness of DN to trigger point manual therapy on improving pain on the VAS, PPT, and	Intervention groups received DN between 30 seconds to 2 minutes until a local twitch response was produced.	No statistically significant differences between patients who received DN or trigger point manual therapy for improvement	DN is equally effective, but not superior to, other trigger point manual therapy interventions for reducing pain, PPT, and disability

back myofascial pain syndrome: a systematic review and meta-analysis Lew et al. 2021		published within the last 10 years, patients with trigger points in the neck/shoulders/upper back, compared DN to trigger point manual therapy Exclusion criteria: non-RCTs, animal studies, patients with macro-trauma, post-operative pain, local fractures, radiculopathy, neurological lesions, degenerative diseases	function on the NDI. Outcomes were assessed in the short to medium period of 1 week to 28 days.	Comparison groups received trigger point manual therapy techniques including pressure release, ischemic compression, strain counter-strain, manual pressure, and trigger point compression. All interventions were included at least 3 repetitions of compression or compression that lasted at least 60 seconds.	in pain (= 0.41, 95%CI: −0.18 to 0.99, I2 = 34.8%), PPT (d = 0.64, 95% CI: −0.19 to 1.47, I2 = 84.8%) or disability (d = −0.66, 95% CI: −1.33 to 0.02, I2 = 69.5%).	in patients with neck pain.
Is Dry Needling Effective When Combined with Other Therapies for Myofascial Trigger Points Associated with Neck Pain Symptoms? A Systematic	Systematic review and meta-analysis	8 RCTs included Studies examined patients with diagnoses of whiplash associated disorders (chronic and non-specified), chronic mechanical neck	Meta-analysis examined dry needling with other interventions compared to other interventions or dry needling alone on outcomes	Intervention groups received DN performed by a physical therapist combined with other therapy interventions. Comparison groups received	DN combined with other interventions does not significantly reduce pain intensity compared to other interventions or dry needling	Low-to-moderate evidence suggests that DN combined with other interventions improves pain intensity, pain-related disability , and cervical ROM in the short term

Review and Meta-Analysis Fernandez-De-Las-Peña et al. 2021		pain, and chronic myofascial neck pain. Inclusion criteria: RCTs, adults (18+) with trigger points in cervical muscles and neck pain, one group received DN plus other interventions, one group received other interventions alone, other interventions with sham, or DN alone, primary outcome pain intensity or disability Exclusion criteria: acupuncture or injection applied, patients with neurological disorders or post-operative pain, studies not published, retrospective	including pain intensity, pain-related disability, pressure pain thresholds, and cervical range of motion in the short, mid-, and long-term	other therapy interventions alone, other interventions combined with sham needling, or DN alone.	alone after a single treatment session (MD −0.55 points, 95% CI −1.64 to 0.55, P = 0.33, Z= 0.98, n = 159). DN combined with other interventions demonstrates a significant large effect for reducing pain intensity compared to other inventions alone (MD −1.84 points, 95% CI −2.83 to −0.85) and DN alone (MD −1.21 points, 95% CI −2.15 to −0.27) in the short term. DN combined with other interventions demonstrates a significant small effect for reducing pain	when compared to other interventions or DN alone. However, differences in pain intensity were not clinically meaningful. Evidence also suggests DN combined with other interventions improves PPT in the short term compared to other interventions alone.

		studies, pilot studies			intensity compared to other inventions alone (MD −0.52 points, 95% CI −0.80 to −0.24) but not DN alone (MD −0.53 points, 95% CI −1.78 to 0.25) in the medium term. No significant effects of DN on pain intensity were observed in the long-term (MD −1.30 points, 95% CI −3.27 to 0.66; SMD −0.64, 95% CI −1.20 to −0.08, P= 0.19, Z= 1.30, n= 324). DN combined with other interventions demonstrates a significant effect on related disability in the short term (SMD	

					−0.45, 95% CI −0.87 to −0.03, P= 0.5, Z= 2.09, n= 506) but not at midterm (SMD −0.16, 95% CI −0.44 to 0.11, P= 0.25, Z= 1.14, n= 237) or long-term (SMD −0.32, 95% CI −0.97 to 0.29, P= 0.35, Z= 0.94, n= 324). DN combined with other interventions does not demonstrate a significant effect for improving PPT immediately after (MD 89.93 kPa, 95% CI −25.97 to 205.64, P= 0.13, Z= 1.52, n= 159), at mid-term (MD 32.10 kPa, 95% CI −21.68 to 85.88, P = 0.24,	

					Z= 1.17, n= 80) and at long-term (MD 53.26 kPa, 95% CI −66.28 to 172.80, P=0.38, Z=0.87, N=208). DN combined with other interventions does significantly improve PPT when compared to other inventions alone in the short-term (MD 112.02 kPa, 95% CI 27.99 to 196.06, P= 0.009, Z=2.61, n= 352). DN combined with other interventions demonstrated a small short-term effect on cervical range of motion in all directions: flexion (MD 6.01, 95% CI 2.86 to 9.16, n = 352, Z = 3.74, P	

					< 0.001, Figure 6(a). 2); extension (MD 5.36, 95% CI 2.00 to 8.72, n = 352, Z = 3.13, P = 0.002, Figure 6(b). 2); rotation (MD 6.34, 95% CI 4.661 to 8.03, n = 352; Z = 7.38, P < 0.001, Figure 6(c). 2); lateral-flexion (MD 8.55, 95% CI 5.01 to 12.10, n = 272, Z = 4.73, P < 0.001). No significant effects on ROM were observed immediately after the intervention or in the long-term when comparing DN combined with other interventions to other interventions alone.	
Effectiveness of Dry Needling for	Systematic review and meta-analysis	28 RCTs included	Meta-analysis compared	Intervention groups received	DN significantly reduced neck	Low-to-moderate evidence suggests

Myofascial Trigger Points Associated with Neck Pain Symptoms: An Updated Systematic Review and Meta-Analysis Navarro-Santana et al. 2020		Studies examined patients with diagnoses of myofascial pain syndrome, chronic neck pain, mechanical neck pain, acute mechanical neck pain, unilateral mechanical neck pain, and non-specific neck pain. Inclusion criteria: RCTs, adults (18+) with trigger points and pain in cervical muscles, one group receiving dry needling alone, one group receiving no intervention, sham or placebo, or another intervention, examining neck pain or disability as primary outcome	outcomes including pain intensity, pain related disability, PPT, and cervical ROM between groups who received DN alone versus groups who received no treatment, sham treatment, or other treatments.	dry needling alone in a variety of muscles in and around the neck (upper trapezius, posterior cervical muscles, levator scapulae, lower trapezius, anterior scalene, sternocleidomastoid) using various techniques. 14 studies specified that DN was performed by a physical therapist, with other clinicians including physicians and acupuncturists. Comparison groups received no intervention, sham or placebo, or another physical therapy intervention. Physical therapy interventions included manual therapy, high	pain compared to no intervention, sham or placebo interventions, and other forms of needling immediately after treatment (MD −1.53, 95% CI −2.29 to −0.76, p=0.04) and at short-term (MD −2.31, 95% CI −3.64 to −0.99, p <0.001). DN also significantly reduced pain intensity compared to manual therapy (MD −0.53, 95% CI −0.97 to −0.09, p=0.02), but not other physical therapy interventions in the short term. DN significantly reduced pain-related disability compared to no intervention,	that DN can improve pain intensity and pain related disability in the short term compared to no intervention, sham or placebo treatments, and other forms of needling. In the short term, these differences are clinically meaningful. While DN also significantly reduces pain intensity in the short term compared to manual therapy, no differences were observed when comparing DN or other therapy interventions or in regards to pain related disability.

		Exclusion criteria: acupuncture or wet needling used, subjects with neurological or post-operative pain, not published, retrospective designs, pilot studies		power ultrasound, and Kinesiotaping.	sham or placebo interventions, and other forms of needling in the short term (MD −0.87, 95% CI −1.60 to −0.14, p = 0.003), but did not demonstrate significant differenced compared to manual therapy or other physical therapy interventions. DN significantly reduced PPT compared to no intervention, sham or placebo interventions, and other forms of needling in the immediate term (MD 55.48 kPa, 95% CI 27.03 to 83.93, p < 0.001), but no other significant differences were observed.	

					DN did not produced any significant effects on cervical ROM compared to other groups. No medium-term between group differences were observed for any outcomes.	
Effects of Trigger Point Dry Needling for Nontraumatic Shoulder Pain of Musculoskeletal Origin: A Systematic Review and Meta-Analysis Navarro-Santana et al. 2021	Systematic review and meta-analysis	6 RCTs included Studies included patient diagnoses like subacromial pain syndrome, rotator cuff disorder, subacromial impingement syndrome, or nonspecific shoulder pain. Inclusion criteria: RCTs, adults (18+) with nontraumatic shoulder pain, one group received trigger point DN, one	Meta-analysis examined primary outcomes of pain (VAS or NPRS), related disability (disease specific questionnaire such as DASH, SPADI, and Constant Murley score), or function.	Intervention groups received dry needling, using the Hong fast in and out technique in 5 studies and sparrow pecking technique in one study, both with the objects of eliciting local twitch responses. Comparison groups received no intervention, placebo or sham interventions, or other active interventions. Other	DN significantly reduced the intensity of shoulder pain compared to other groups in the short-term (MD = −0.65 points [95% CI = −1.05 to −0.26]; SMD = −0.34 [95% CI = −0.55 to −0.13]; z = 3.14; P = .002), but not the mid- or long-term. DN significantly reduced pain related disability compared to	Low-to-moderate quality evidence suggests that DN can significantly reduce shoulder pain intensity and pain related disability in the short term compared to no intervention, sham interventions, or other active interventions. The large effect of DN on disability was also clinically meaningful. However, differences in pain intensity

		group received no intervention, sham, or another active intervention, examined pain intensity and related disability Exclusion criteria: pain related to neurological disorders, shoulder pain of traumatic origin, not published, retrospective clinical studies		interventions included exercise or multimodal physical therapy treatment.	other groups in the short-term (MD = −9.46 [95% CI = −18.06 to −0.87]; z = 2.16; P = .03; SMD = −1.12 [95% CI = −2.07 to −0.18]) and long term (MD = −13.90 [95% CI = −18.31 to −9.49]; z = 6.18; P < .001; SMD = −1.72 [95% CI = −2.38 to −1.06]), but not medium term.	were not clinically meaningful between groups.
Contribution of Dry Needling to Individualized Physical Therapy Treatment of Shoulder Pain: A Randomized Clinical Trial Pérez-Palomares et al. 2017	Randomized control trial	120 patients included Inclusion criteria: adults (18+) diagnosed with non-specific shoulder pain consistent with rotator cuff tendinopathy or subacromial impingement syndrome, greater than 50%	The primary outcome measured was patient reported pain (VAS). Secondary outcomes included joint ROM, the Constant-Murley score, and number of active trigger points. Outcomes were assessed at	Intervention group received personalized evidence-based physical therapy interventions and DN. DN was performed using a fast in and out technique. DN was performed in the first, fourth, and seventh sessions over the	In regards to the primary outcome of pain as measured by the VAS, both groups demonstrated significant and clinically meaningful (>1.5 point) improvements in pain immediately after the treatment and 3 months after the	The authors of this study concluded that dry needling in addition to an individualized, evidence-based physical therapy treatment plan was no better than the treatment plan alone in improving pain, range of motion,

		ROM in shoulder abduction and flexion Exclusion criteria: prior surgery for subacromial syndrome, symptom onset following an injury suggesting an alternative diagnosis, glenohumeral instability, symptoms suggestive of systemic disease, presence of other conditions that may interfere with completion of therapy or result in harm to the patient, and inability or unwillingness to attend therapy	baseline, immediately after treatment, and 3 months after treatment.	course of treatment. Control group received personalized evidence-based physical therapy interventions. Manual therapy techniques and exercises, including articular gliding, joint range of motion, stretching, isometric exercises, exercises for neuromuscular re-education and scapular control, and postural exercises, were prescribed to patients based on their individual physical evaluation. All interventions were performed by physical therapists with	treatment compared to baseline. There was a statistically significant 0.86-point (confidence interval 0.06 to 1.67 points) difference in pain on the VAS immediately after treatment between the groups in favor of the intervention. However, this difference was not clinically meaningful. No other statistically significant or clinically meaningful between group differences in VAS score were observed. In regards to secondary outcomes, both groups demonstrated significant	function, and reduction in number of active trigger points in patients with non-specific shoulder pain. These authors concluded that dry needling is therefore not justified as an additional method to manage outcomes in this patient population.

				over 5 years of experience and training in DN application. All patients attended 2 sessions per week for 5 weeks, each 30 minutes in duration.	improvements in internal rotation range of motion as measured by the Constant-Murley score, and number of active trigger points both immediately after the treatment and 3 months after the treatment. There was a statistically significant improvement in shoulder external rotation range of motion in the control group only. Changes in Constant-Murley scores, although statistically significant, were not clinically meaningful in either group, as neither achieved a mean 17-point change. There were no statistically significant or	

					clinically meaningful between group differences in range of motion, function, or number of trigger points 3 months after treatment.	
Inclusion of trigger point dry needling in a multimodal physical therapy program for postoperative shoulder pain: a randomized clinical trial Arias-Buría et al. 2015	Randomized control trial	20 patients included Inclusion criteria: post-operative shoulder pain from ORIF of proximal humeral fracture or surgical repair of rotator cuff tear Exclusion criteria: no active trigger points, multiple fractures, previous surgery, cervical radiculopathy/myelopathy, fibromyalgia, physical therapy in the previous year, fear of needles, other	Outcomes included pain, activities of daily living, ROM, and strength (all measured by the Constant-Murley score). Outcomes were assessed at baseline and 1 week after treatment.	Intervention group received one session of DN in addition to evidence based physical therapy interventions. DN was performed during the first treatment session in the upper trapezius, infraspinatus, supraspinatus, or deltoid muscles (in a maximum of 3 muscles) using the Hong fast in and out technique. Control group received evidence based physical therapy	The intervention group demonstrated significant improvements in the in the Constant-Murley total score ($F = 15.887$, $P < .001$) and also activities of daily living ($F = 21.260$, $P < .001$) and strength ($F = 6.688$, $P = .019$) subscales compared to the control group. No statistically significant differences were found between groups related to	Including one session of DN in a post-operative physical therapy plan of care for patients with post-surgical shoulder pain can significantly and meaningfully improve patient function.

		contraindication for DN		interventions including passive mobilization of the glenohumeral and scapular regions, soft tissue massage of shoulder musculature, scar tissue mobilization, and pain free proprioceptive and strengthening exercises. Both groups were treated by physical therapists with more than 10 years' experience. Both groups attended sessions daily for 1 week, for a total of 5 sessions.	pain (F = 2.598, P = .124) and range of motion (F = 3.358, P = .083) subscales, however both groups significantly improved over time.	
DRY NEEDLING AND PHYSICAL THERAPY VERSUS	Randomized control trial	39 patients included Inclusion criteria: 18-40 years of	Outcomes included pain (NRPS), glenohumeral ROM, and	Intervention group received DN in addition to standard of care rehabilitation. DN	At all time points, there were no significant between groups differences in any	DN adds no significant benefit to a standard rehabilitation protocol status

PHYSICAL THERAPY ALONE FOLLOWING SHOULDER STABILIZATION REPAIR: A RANDOMIZED CLINICAL TRIAL Halle et al. 2020		age, Department of Defense beneficiaries, 4 weeks status post shoulder stabilization repair surgery Exclusion criteria: pregnant, history of blood borne pathogens/infectious diseases/metal allergy, bleeding disorder, currently taking anti-coagulants, not fluent in English	function (Global Rating of Change, Patient Specific Functional Scale, SPADI). Outcomes were assessed at baseline (4 weeks post-operative), 8 weeks, 12 weeks, and 6 months post-operative.	was performed once a week between weeks 4 and 8 post-op. Needling techniques varied between patients, and included pistoning, in situ, and needling with electrical stimulation. Control group received standard of care rehabilitation. When patients in the intervention group received DN, patients in the control group received extra passive ROM treatments.	outcomes measured, and both groups demonstrated improvement overtime. The exception is, at 6 months, there was a statistically significant improvement in shoulder flexion ROM in the control group only. This is hypothesized to be a result of extra passive ROM treatments.	post shoulder stabilization repair surgery in regards to improving shoulder pain, ROM, or function. It is not recommended that DN be included in post-operative care.
Comparison between dry needling plus manual therapy with manual therapy alone on pain and function in overhead	Randomized control trial	40 patients included Inclusion criteria: age 18-45, at least pain intensity of 3 on NPRS during training, at least	Outcome measures included pain (NPRS), function (DASH), PPT (algometer), and scapular dyskinesis (Scapular	Intervention groups received DN in subscapularis, pectoralis minor, serratus anterior, and upper and lower trapezius muscle trigger	Significant differences were observed in scapular dyskinesia ($p=0.02$), pain ($p<0.001$), disability ($p=0.02$), and PPT	When combined with manual therapy techniques, DN is more effective than manual therapy alone at improving pain, PPT, function, and

athletes with scapular dyskinesia: A randomized clinical trial Kheradmandi et al. 2020		1-year training history, presence of scapular dyskinesis as determined by lateral scapular slide or scapular dyskinesis tests Exclusion criteria: bilateral shoulder impingement, history of upper extremity or spinal fracture of dislocation, history of upper extremity surgery, diabetic neuropathy, anxiety or depression, neurological or rheumatological disorders, contraindications for DN	Dyskinesia Test and lateral scapular slide test). Outcomes were measured pre- and post-intervention.	points in addition to manual therapy. 3 sessions of DN was performed. Control group received manual therapy alone. Manual therapy consisted of scapular mobilization techniques like scapular distraction and inferior, superior, medial, and lateral glides. Each group was treated by physical therapists.	(p=0.007) in favor of the intervention group over the control group.	scapular dyskinesis in athletes with scapular dyskinesia.
The use of dry needling vs. corticosteroid injection to treat lateral epicondylitis: a	Randomized control trial	101 patients included Inclusion criteria: lateral epicondyle pain for more than 3 months,	Responses to the Patient-Rated Tennis Elbow Evaluation were assessed before treatment, 3 weeks, and 6	Intervention group received DN using 15 needles inserted at the lateral epicondyle region and throughout	At both 3 weeks and 6 months post-treatment, the intervention group demonstrated significantly	DN produced statistically significant improvements in lateral epicondylitis symptoms

prospective, randomized, controlled study Uygur et al. 2021		pain not relieved by 3 weeks of first line treatment (NSAIDs and proximal forearm brace) Exclusion criteria: greater than 18 months of pain prior to treatment, prior elbow trauma or surgery, invasive treatment within 3 months of study, inflammatory arthritis, uncontrolled diabetes	months after treatment.	the extensor carpi radialis brevis tendon. Needles were rotated 3-4 times, left in place for 10 minutes, and withdrawn. 5 sessions were completed in total, occurring twice weekly. DN was performed by a physical therapist. Control group received a single corticosteroid injection of 2 mL methylprednisolone acetate, Depo-Medrol, 40 mg/mL.	better improvements in Patient-Rated Tennis Elbow Evaluation scores compared to the control group ($P < .01$). Patients in both groups achieved significant improvements over time ($P < .01$).	compared to a single corticosteroid injection.

Abbreviations: DN (dry needling), RCT (randomized control trial), QoL (quality of life), ROM (range of motion), PPT (pain pressure threshold), VAS (visual analogue scale), NPRS (numeric pain rating scale), CPG (clinical practice guideline), NSAIDs (nonsteroidal anti-inflammatory drugs), NDI (Neck Disability Index), DASH (Disabilities of the Arm, Shoulder, and Hand), SPADI (Shoulder Pain and Disability Index), ORIF (open reduction internal fixation)

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