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MYOFASCIAL PAIN AND TREATMENT: Mentored Research: Narrative Review

A systematic review of manual therapy techniques, dry cupping and dry needling in the reduction of myofascial pain and myofascial trigger points

Derek Charles*, Trey Hudgins, Josh MacNaughton, Eric Newman, Joanne Tan, Michael Wigger

Department of Physical Therapy, Tennessee State University, Nashville, TN, USA

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ABSTRACT

Introduction: Myofascial pain with myofascial triggers are common musculoskeletal complaints. Popular treatments include manual therapy, dry needling, and dry cupping. The purpose of this systematic review was to compare the efficacy of each treatment in the short-term relief of myofascial pain and myofascial trigger points.

Methods: Search engines included Google Scholar, EBSCO Host, and PubMed. Searches were performed for each modality using the keywords myofascial pain syndrome and myofascial trigger points. The inclusion criteria included English-language, peer-reviewed journals; a diagnosis of myofascial pain syndrome or trigger points; manual therapy, dry needling, or dry cupping treatments; retrospective studies or prospective methodology; and inclusion of outcome measures.

Results: Eight studies on manual therapy, twenty-three studies on dry needling, and two studies on dry cupping met the inclusion criteria. The Physiotherapy Evidence Database (PEDro) was utilized to assess the quality of all articles.

Discussion: While there was a moderate number of randomized controlled trials supporting the use of manual therapy, the evidence for dry needling ranged from very low to moderate compared to control groups, sham interventions, or other treatments and there was a paucity of data on dry cupping. Limitations included unclear methodologies, high risk for bias, inadequate blinding, no control group, and small sample sizes.

Conclusion: While there is moderate evidence for manual therapy in myofascial pain treatment, the evidence for dry needling and cupping is not greater than placebo. Future studies should address the limitations of small sample sizes, unclear methodologies, poor blinding, and lack of control groups.

1. Introduction

Myofascial pain is one of the most common musculoskeletal complaints and the diagnosis of myofascial pain syndrome is often assigned due to the lack of understanding of the pathophysiology of the complaints, even if approximately one-third of individuals seeking treatment meet the criteria for myofascial pain syndrome (International Association for the Study of Pain, 2010). Myofascial pain syndrome (MPS) is defined as a regional pain syndrome and the most common feature is the presence of myofascial trigger points (Kuan, 2009). Although definitions vary depending on the source, myofascial trigger points (MTrPs) are commonly described as 'localized areas of taut, band-like hardness in skeletal muscle that typically contain hyperalgesia zones' (Kietrys et al., 2013).

There is an assortment of hypothesized causes for MTrPs, including trauma and overuse (Rubin, 1981), joint dysfunction (Kuan et al., 1997), and psychological factors such as stress (McNulty et al., 1994). Recent research suggests the pathophysiology of MPS and sequelae of MTrPs begins with excessive stress or injury to muscle fibers (Simons, 2001; Simons et al., 2002; Shah et al., 2003). This results in a diminished amount of nutrients and available oxygen, which in turn leads to protective and involuntary muscle shortening, and finally an increase in tissue metabolic

* Corresponding author. Department of Physical Therapy, Tennessee State University, 3500 John A Merritt Boulevard, Nashville, TN, 37209, USA.
E-mail address: dcharles@tnstate.edu (D. Charles).

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demands (Han and Harrison, 1997; Hong and Simons, 1998). Other potential causes of myofascial pain include adaptive lengthening and eccentric muscle strains (Simons et al., 1999).

Physical examination findings of MTrPs includes a palpable, hypertonic portion of skeletal muscle; hypersensitive tender spot in the same skeletal muscle; palpable or visual twitch often known as a jump sign; pain with elongation of the affected muscle; restricted range of motion; muscle fatigue; distinctive referral patterns; and autonomic changes (Simons et al., 1999). But it should be noted there is evidence disputing the reliability of these signs and symptoms (Nice et al., 1992; Wolfe et al., 1992; Hua and Van der Does, 1994).

Several forms of "hands-on", manual techniques exist for myofascial pain associated with MTrPs, including ischemic compression, spray and stretch, strain/counterstrain techniques, muscle energy techniques, trigger point pressure release, transverse friction massage, joint mobilization or manipulation, and other soft tissue mobilization techniques (Aguilera et al., 2009; Dardzinski et al., 2000; de las Peñas et al., 2005; Cotchett et al., 2014; De Meulemeester et al., 2017). The potential effectiveness of these manual therapy techniques is theorized to occur because of increased oxygen and nutrient intake to muscle tissue.

Other popular interventions for MPS include dry needling and dry cupping (Kalichman and Vulfsons, 2010). Dry needling is defined as an intramuscular process where a needle is inserted into a myofascial trigger point (Dunning et al., 2014). Recent studies have focused on dry needling related to the management of myofascial pain in all regions of the body, including the cervical spine (Cotchett et al., 2014; Kietry et al., 2013; Mejuto-Vázquez et al., 2014), knee (Dunning et al., 2014), shoulder, foot, and lumbar spine (Cotchett et al., 2014).

Dry needling reportedly creates an analgesic effect in the musculature around MTrPs through descending inhibition of the CNS. Alpha-delta nerve fibers are stimulated which facilitates the release of endogenous endorphins and enkephalins. This leads to an increase in pain pressure thresholds and decrease in muscle tone (Gattie et al., 2017). The analgesic effects of dry needling MTrPs is also linked with increased blood flow and changes to the biochemical environment around the treatment area (Cotchett et al., 2014). Srbely and colleagues (2010) demonstrated that dry needling reduces short-term myofascial pain in MTrPs by activating large myelinated fibers in a trigger point. This hypo-analgesic cascade results in decreased metabolic mediators, increased local microcirculation, and decreased chemical mediators (Mejuto-Vazquez et al., 2014). Other research indicates that dry needling balances the chemical substances associated with pain such as bradykinin, calcitonin gene-related peptide, and substance P (Kietrys et al., 2013).

Dry cupping originated in Middle Eastern and Asian countries but gained popularity in the United States and other countries in part after receiving attention during the 2016 Summer Olympics (Kim et al., 2011). There are two main forms, wet and dry cupping, and the various materials used to make the cups includes glass, plastic, and silicone (Huang et al., 2013). Wet cupping is a method by which the skin is lacerated prior to the application, causing blood to be pulled into the cup (Kim et al., 2011). In dry cupping, cups are applied to the skin through a means of negative pressure by mechanical suction or heat, thereby pulling the skin into the cup (Markowski et al., 2014).

Although cupping has historically been used to treat a number of pathologies such as herpes zoster, acne and neuritis, the most common use is for the reduction of musculoskeletal or myofascial pain (Kim et al., 2011; Cao et al., 2010). There are multiple proposed mechanisms for cupping and although there is no consensus, the most accepted theory is that cupping produces localized hyperemia to the applied area. The dilation of capillaries improves microcirculation which decreases muscle tone and promotes healing via metabolic changes similar to the effects of dry needling (Markowski et al., 2014).

The purpose of this review was to evaluate the literature to compare the overall efficacy of manual therapy techniques, dry needling and dry cupping in the short-term treatment of myofascial pain associated with myofascial trigger points.

2. Methods

2.1. Data sources

Separate searches were conducted for manual therapy techniques, dry needling, and dry cupping using Google Scholar, EBSCO Host, PubMed, and PMC electronic search engines. Search terms and keywords included manual therapy; ischemic compression; strain/counterstrain techniques; muscle energy techniques; trigger point pressure release; transverse friction massage; joint mobilization or manipulation, and soft tissue mobilization; myofascial pain syndrome, and myofascial trigger points; dry needling, myofascial pain syndrome, and myofascial trigger points; and dry cupping, myofascial pain syndrome, and myofascial trigger points. Articles were gathered and reviewed from conception of the topic until December 2017.

2.2. Inclusion criteria

The inclusion criteria included English-language; peer-reviewed journals; adults with a diagnosis of myofascial pain syndrome or myofascial trigger points; treatment including some form of manual therapy; dry needling; or dry cupping; retrospective or prospective studies that described clinical or randomized controls trials; and use of an outcome measure to quantify or qualify the change in symptoms pre- and post-treatment. Studies were not excluded based on publication data to allow for the largest possible number of articles to be included in the initial literature review. All articles were read and reviewed by one of the authors for quality of methodology, assessing bias, sample sizes, as well as reliability and validity. The exclusion criteria included non-English language publications, studies without control groups, or insufficient data to evaluate the methodology.

2.3. Quality assessment

The Physiotherapy Evidence Database (PEDro) quality score method was utilized to assess the quality of all manual therapy, dry needling, and dry cupping articles. The PEDro scale was developed to assess the quality of clinical trials and is comprised of 10 scored yes-or-no questions related to a study's internal validity and statistical rigor. The PEDro scale has been authenticated as a valid measure of the methodological quality of clinical trials (de Morton, 2009). The highest point value given to a paper was 10 points and the scoring system consisted of:

- Random allocation: 1 point
- Concealed allocation: 1 point
- Baseline comparability: 1 point
- Blinded assessors: 1 point
- Blinded subjects: 1 point
- Blinded therapist: 1 point
- Adequate follow-up: 1 point
- Intention to treat analysis: 1 point
- Between-group comparisons: 1 point
- Points estimates and variability: 1 point

3. Results

3.1. Manual therapy

A total of eight studies met the inclusion criteria and were reviewed regarding the effects of manual therapy techniques on myofascial pain syndrome and MTrPs. Numerous types of techniques were described, including deep pressure and soft tissue massage, a combination of massage and exercise, ischemic compression, strain/counterstrain, myofascial release, sub-occipital release, and spray-and-stretch. Except for one study which concentrated on the gastrocnemius, all articles described treatment of either the cervical spine, shoulder, or scapular muscles. Some studies focused on one technique while others employed a combination. A mixture of manual therapy with other modalities was also included in the evaluation. Table 1 provides information related to the studies involving manual therapy.

3.2. Dry needling

A total of 23 studies met the inclusion criteria and were reviewed regarding the effectiveness of dry needling on myofascial trigger points. Multiple areas of the body were assessed, but the most common included the cervical spine, lumbar spine, and shoulder. Table 2 includes information related to the studies involving dry needling.

3.3. Dry cupping

Two studies pertained to dry cupping regarding the effects on MPS and MTrPs, and met the inclusion criteria. Two methods of cupping were used in the studies. One study involved the static placement of cups heated with combusting alcohol on a cotton swab and the other involved the use of a cupping glass and arnica massage oil. The only areas of treatment in the both studies were the cervical spine and both were for chronic, non-specific pain. Table 3 includes information related to the studies involving dry cupping for the treatment of MTrPs.

4. Discussion

4.1. Manual therapy

The results of this review indicate there are a moderate number of randomized controlled trials in the literature regarding the use of manual therapy for the treatment of myofascial pain and trigger points. A significant decrease in pain pressure threshold or visual analog scale scores was found in multiple studies. Although some studies demonstrate that manual therapy can decrease myofascial related pain, there is a limited number of high quality, randomized controlled trials, and there are various issues with the methodologies. Some of these include bias, unclear randomization and concealment procedures, inappropriate blinding, imbalanced baseline characteristics, unreliable outcome measures, and high attrition rates that compromised internal validity (Southerst et al., 2015). There was also not a standard definition of manual therapy

Table 1
Manual therapy in the treatment of myofascial trigger points.

Author	PEDRO Score	Treatment Area	Number of Subjects	Treatment	Outcome Measure	Key Findings
Hong et al. (1993)	6	Upper trapezius	98	A. spray and stretch B. deep pressure massage C. other	PPT	Deep pressure massage was more effective than other treatments immediately after use.
Hanten et al. (1997)	3	Cervical and scapular	60	A. occipital release B. exercise C. control	PPT	There was no significant difference in the immediate effect between treatments.
Gam et al. (1998)	6	Cervical and shoulder	58	A. ultrasound + massage + exercise B. sham US + massage + exercise C. control	VAS, PPT, analgesic use	At 6 months, there was no significant decrease in the VAS or analgesic use between groups. Groups A and B had significantly less tenderness than controls.
Hanten et al. (2000)	5	cervical and scapular	40	A. ischemic compression + stretch B. exercise	VAS, PPT, % of time in pain over 24 h	Group A had greater reduction in VAS and PPT immediately after treatment. There were no differences for % of time in pain.
Hou et al. (2002)	5	Upper trapezius	119	A. ischemic compression B. ischemic compression + myofascial release + interferential current C. other treatments	VAS, PPT, cervical ROM	Hot pack plus active ROM, ischemic compression, and TENS therapies provided immediate pain relief.
Fryer and Hodgson (2005)	6	upper trapezius	37	A. manual pressure release B. control group	PPT	There was an immediate increase in PPT and decrease in perceived pain in treatment vs. control group.
Renan-Ordine et al. (2011)	6	gastrocnemius	60	A. self-stretching B. self-stretching + soft tissue mobilization	SF-36, PPT	The self-stretching and manual therapy group had a greater improvement in physical function and pain reduction compared to the self-stretching group.
Sarrafzadeh et al. (2012)	5	Upper trapezius	60	A. pressure release (PR) B. phono-phoresis (PhH) C. ultrasound (US) D. control	VAS, PPT, cervical ROM	All 3 treatment groups showed short term decreases in pain and PPT and an increase in cervical ROM compared to controls.

Table 2
Dry needling in the treatment of myofascial trigger points.

Author	PEDRO Score	Treatment Area	Number of Subjects	Treatment	Outcome Measure	Key Findings
Hong et al. (1993)	6	not specified	58	A. DN B. Lidocaine injection • Both groups received spray and stretch and HEP	NPRS, PPT, ROM	Improvement in pain, PPT, and ROM immediately and at 2 weeks in both groups but lidocaine injection group had greater changes at 2 weeks.
Chu (1997)	4	cervical, shoulder	164	A. DN B. Control: DN to random points	VAS, ROM	Greater percentage of subjects with pain relief in DN group compared to controls immediately after treatment.
Irnich et al. (2002)	6	cervical	36	A. DN B. Acupuncture C. Sham laser acupuncture	VAS, ROM, Change of general complaints (−5 to +5 scale)	Acupuncture group had significant decrease in pain and rating of complaints while ROM was significantly increased in DN and acupuncture groups.
Edwards and Knowles (2003)	7	not specified	40	A. DN B. Stretching C. Control	McGill Pain Questionnaire, PPT	DN group had greater improvement in McGill and PPT scores after 3 weeks but there was no difference between groups at 6 weeks.
Ilbuldu et al. (2004)	5	upper trapezius	60	A. DN B. Laser C. Sham laser • All groups performed stretching exercises	VAS, PPT, Analgesic use, ROM, Nottingham Health Profile	Improved cervical ROM in DN and laser groups at 1 month compared to sham group; Decreased pain, improved PPT and health profile score in laser group compared to DN group or sham laser at 1 month.
DiLorenzo et al. (2004)	3	shoulder, secondary to CVA	101	A. DN B. Rehabilitation (external support, positioning, exercise)	VAS, Rivermead Mobility Index	Decreased shoulder pain in both groups at day 9, 15, and 21; Greater decrease in pain in DN group at day 9 and 21.
Kamanli et al. (2005)	3	cervical, scapula, shoulder	29	A. DN B. Lidocaine injection C. Botox injection	VAS, NPRS, PPT, ROM, Nottingham Health Profile, Hamilton Anxiety Scale, Hamilton Depression Inventory	Improved VAS and PPT in all groups with greatest decrease in lidocaine injection group. Improved fatigue and health profile scores in lidocaine and botulinum groups. Improved anxiety and depression scale score in botulinum group. Improved cervical ROM in all groups.
Itoh et al. (2007)	7	cervical	40	A. DN B. DN on nontender points C. Acupuncture D. Sham acupuncture	VAS, NDI	Decreased pain and improved NDI score in DN group at 3, 9, and 12 weeks.
Ga et al. (2007)	6	upper trapezius	40	A. DN with paraspinal needling B. Control (DN without paraspinal needling)	VAS, Wong-Baker FACES scale, PPT, Geriatric Depression Scale, ROM	Decreased pain and PPT and increased cervical ROM in both groups at 28 days. Improved depression scale score at 28 days in DN group.
Hsieh et al. (2007)	3	infraspinatus	14	A. DN B. Control (contralateral side of same subjects)	Shoulder internal rotation ROM, VAS, PPT	Improved shoulder ROM, decreased pain, and improved PPT compared to untreated side.
Ay et al. (2010)	5	upper trapezius	80	A. DN B. Lidocaine injection Both groups performed stretching exercises	VAS, ROM, Beck Depression Inventory	No significant differences between groups at 4 and 12 weeks.
Tsai et al. (2010)	8	upper trapezius	35	A. DN B. Sham DN	NPRS, PPT, ROM	Decreased pain, increased cervical ROM and PPT in DN group compared to sham needling.

Table 2 (*continued*)

Author	PEDRO Score	Treatment Area	Number of Subjects	Treatment	Outcome Measure	Key Findings
Tekin et al. (2013)	9	not specified	39	A. DN B. Sham DN	VAS, SF-36	Decreased pain and improved SF-36 and less medication use at 4 weeks in DN group.
Mayoral et al. (2013)	7	knee	40	A. DN B. Sham DN	VAS, WOMAC, ROM, Analgesic use, Peak isometric strength	No statistically significant between groups with WOMAC scores; Decreased pain reported in DN group at 1 month.
Casanueva et al. (2014)	4	not specified	120	A. DN B. Control	VAS, PPT, SF-36	DN was favored at 6 and 12 weeks over control group for all measures.
Llamas-Ramos et al. (2014)	8	cervical	94	A. DN B. ICT	NPRS, PPT, NPQ, ROM	No statistically significant between groups except for increase in PPT for DN group.
Mejuto-Vázquez (2014)	8	cervical	17	A. DN B. Control	NPRS, PPT, ROM	Significant differences in pain and PPT with DN group over control group.
Santos et al. (2014)	5	not specified	22	A. DN B. ICT C. Control	VAS, WHOQOL-BREF	Greater change in VAS for ICT groups compared to DN and control group; No significant difference among groups in WHOQOL-BREF.
Ziaeifar et al. (2014)	4	upper trapezius	33	A. DN B. ICT	VAS, PPT, DASH	There were greater decreases in pain with DN; No difference in PPT and DASH between groups.
Arias-Buría et al. (2015)	7	shoulder	20	A. PT + DN B. PT	Pain, ROM, Strength	There was no difference between groups with decreases in pain; The PT + DN group noted a greater improvement in ADLs.
Campa-Moran et al. (2015)	6	cervical	36	A. DN B. Manual therapy C. ICT	VAS, PPT, NDI, ROM	No statistical significance between groups with VAS; Based on PPT, manual therapy was favorable over DN and ICT; Based on NDI, DN and manual therapy is favorable to ICT.
Pecos-Martín et al. (2015)	9	cervical, lower trapezius	72	A. DN B. Sham DN	VAS, PPT, NPQ	Pain, PPT, and NPQ were lower in DN group compared to controls.
Salom-Moreno et al. (2015)	7	ankle	27	A. DN and exercise B. Exercise	NPRS, FAAM	Pain and functional outcomes were improved in group that had exercise plus DN.

DASH, Disabilities of the Arm, Shoulder and Hand questionnaire; DN, dry needling; FAAM, Foot and Ankle Ability Measure; ICT, ischemic compression technique; NDI, Neck Disability Index; NPQ, Neck Pain Questionnaire; NPRS, numeric pain-rating scale; ODI, Oswestry Disability Index; PEDro, Physiotherapy Evidence Database; PPT, pressure pain threshold; PT, physical therapy; ROM, range of motion; SF-36, Medical Outcomes Study 36-Item Short-Form Health Survey; TKA, total knee arthroplasty; UT, upper trapezius; VAS, visual analog scale; WHOQOL-BREF, short form of the World Health Organization Quality of Life Questionnaire; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index.

Table 3
Dry cupping in the treatment of myofascial trigger points.

Author	PEDro Score	Treatment Area	Number of Subjects	Treatment	Outcome Measure	Key Findings
Lauche et al., 2012	7/10	trapezius	50	A. Dry cupping B. Control	VAS, PPT, NDI, SF-36	Five cupping treatments reduced pain, improved NDI, improved pain with movement, and improved pain at rest compared to control group.
Lauche et al., 2016	8/10	upper trapezius	84	A. Dry cupping + massage B. Progressive muscle relaxation	VAS, PPT, NDI, SF-36	No difference in PPT, VAS, NDI, or SF-36 between groups at 12.

and the application of techniques varied from study to study. Since some studies utilized one technique while others used multiple techniques, sometimes in conjunction with modalities, it is challenging to definitively conclude the source of improvement or if there was an actual improvement. The results also did not find strong efficacy for certain interventions outside a placebo effect such as active cervical exercise (Hanten et al., 1997), or ultrasound with exercise and massage (Gam et al., 1998). The focus of research in future should be to determine if manual therapy has positive effects beyond placebo.

4.2. Dry needling

The quality of evidence for dry needling in the management of myofascial pain and trigger points ranges from very low to moderate compared to control groups, sham interventions, or other treatments (Kietrys et al., 2013; Gattie et al., 2017; Venere and Ridgeway, 2016). A lack of standardized guidelines in the location of trigger points affected the reliability of the physical examination and subsequent treatment results (Bron et al., 2007; Dunning et al., 2014; Sanz et al., 2016). Lew et al. (1997) demonstrated only 21% of inter-examiner agreement on trigger point location, while Sciotti et al. (2001) showed that the error rate of finding upper trapezius trigger points was 3.3–3.6 cm. Due to these findings, it is challenging to stay consistent with the definition of dry needling (Dunning et al., 2014). In addition, sample sizes in current research are too small to effectively conclude generalizability of dry needling as a treatment (Mejuto-Vázquez et al., 2014). A systematic review and meta-analysis including thirteen studies by Gattie et al. (2017) concluded dry needling performed by physical therapists is more effective than sham interventions or no treatment for reducing pain immediately after application up to 12 weeks. Additionally, there were no significant differences in functional outcomes when dry needling was matched to other treatments commonly used in physical therapy (Gattie et al., 2017). The potential benefits of dry needling beyond the short term are currently unknown and is an area for future research.

No restrictions were placed on the type of outcome measure, with some being more objective than others. For instance, the Neck Disability Index (MacDermid et al., 2009) and Pain Pressure Threshold (Park et al., 2011) demonstrate good reliability, while the Visual Analog Scale and Numeric Pain Rating Scale demonstrate overall good psychometric properties. However, they have not been specifically studied in myofascial pain or trigger points (Kahl and Cleland, 2005). The reliability of patient-reported outcome measures has also come into question (Chiarotto et al., 2018). A 2018 systematic review by Chiarotto found patient-reported outcome measures for physical functioning in patients with low back pain had issues with content and structural validity. Despite this, the authors chose not to exclude articles based on type of outcome tool because this could have limited the pool of articles in the review. It is possible the results of the manual therapy, dry needling, and dry cupping portions of this review were affected by the inclusion of all types of outcome measurement tools.

4.3. Dry cupping

Although dry cupping is advocated for the treatment of numerous types of pain, there is an extremely limited amount of data on the use of dry cupping in the treatment of myofascial trigger points related to myofascial pain syndrome. This accounts for why only two studies met the criteria for inclusion in this review. Several studies lack the necessary information for replication and others are at highrisk of bias. The systematic review by Cao in 2014 found 85% of randomized controlled trials were at high risk of bias due to insufficient reporting of randomization methods. Other issues include inadequate blinding, small sample sizes, and unknown long-term treatment effects (Cao et al., 2014; Lauche et al., 2012; Teut et al., 2012).

In multiple studies the sample sizes and total number of trials were too limited to distinguish any specific benefits of cupping, and the lack of sham methods made it hard to determine the true efficacy of treatment (Lisi et al., 2015; Rozenfeld and Kalichman, 2016). However, it should be noted that creating sham procedures is difficult to conduct. In one study where a sham method was compared to dry cupping, 30 out of 41 blinded and randomized participants were able to successfully identify their group allocation without having ever received cupping therapy (Lauche et al., 2016). In the same study, a higher number of participants preferred and requested the sham method of cupping over the standard dry cupping treatment.

The results of the systematic review by Cao in 2014 did conclude that cupping therapy was beneficial for pain reduction of chronic or acute pain compared to no treatment, or other treatments such as heat, usual care, or conventional medicine. However, ten out of the sixteen trials reviewed were at risk for bias, there was a lack of standardization in methodology or data analysis and evidence, cupping was used for heterogeneous populations, and there was no consensus on what constituted “conventional medicine” or “usual care” (Cao et al., 2014).

4.4. Limitations

To summarize, limitations within the articles included include bias, small sample sizes, unclear randomization and concealment procedures, inappropriate blinding, imbalanced baseline characteristics, lack of standardized methodologies, unreliable outcome measures, high attrition rates, unknown long-term treatment effects, lack of effective sham methods, non-standardized definition of manual therapy, variation in application and number of techniques, lack of standardized guidelines in the location of trigger points, and paucity of data on the use of dry cupping. Limitations to consider on the part of the authors responsible for the synthesis of this review include keyword selection, limitations posed by the quality of the research under discussion, risk-of-bias, the inclusive search, or any other methodological parameters.

5. Conclusion

Despite its current popularity and use, there are inconsistencies in the literature with the use of manual therapy, dry needling, and dry cupping for myofascial pain reduction associated with myofascial trigger points. While the quality of evidence is moderate for manual therapy, there is a lack of high quality randomized controlled trials showing the effectiveness of manual therapy, due in part to the heterogeneity of techniques described in the literature. More research is needed to conclusively substantiate the use of manual therapy and its efficacy beyond placebo effect in myofascial pain management. Additionally, the level of evidence for dry needling ranges from very low to moderate in quality when compared to control/sham/other treatments for changes in pain, pressure point threshold, and functional outcomes. Dry needling appears to be at least as effective as other treatments and more effective than sham or no treatment for reducing pain and increasing pain pressure threshold in the short term. The efficacy of dry needling beyond the short term has not been proven at this time. Further exploration of the quality of patient-reported outcome measurement tools is also warranted due to issues with content and structural validity.

Declaration of interest

None.

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