

**SYSTEMATIC REVIEW****CUPPING THERAPY: A PRUDENT APPROACH  
IN PAIN MANAGEMENT-A SYSTEMATIC  
REVIEW****ABSTRACT****BACKGROUND AND AIMS**

Cupping Therapy is an ancient form of alternative medicine for treating variety of musculoskeletal disorders. Number of studies indicated the efficacy of various cupping methods in decreasing neck or back pain intensity within short duration and improves quality of life.

**DATABASES AND ELIGIBILITY CRITERIA**

The experimental studies were searched on the electronic databases including Google Scholar, PEDro, PubMed and Cochrane Library from June 2015 to December 2019. It was ensured that all articles were full-text in English language whereas screening was executed on relevant titles and abstracts, evaluated on the basis of cupping therapy and its effects on musculoskeletal pain.

**RESULTS**

A total of eight out of ten experimental studies showed significant decrease ( $p < 0.05$ ) in spinal pain in result of cupping therapy except for the two studies that demonstrated no significant pre-post group differences ( $p > 0.05$ ).

**CONCLUSION**

It was concluded that cupping therapy is effective in the management of pain due to various musculoskeletal ailments. Despite, high heterogeneity and low quality evidence limit the study findings therefore, the techniques required validation for the future implication for better understanding of the treatment outcomes.

**KEYWORDS**

*Low back pain, Neck pain, Prevention, Rehabilitation, Spine, Disease, Therapeutic.*

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## INTRODUCTION

Cupping Therapy, commonly known as Hijama or Vacuum therapy is a pre-historic part of Chinese alternative treatment and practices for the management of a variety of musculoskeletal, neuromuscular, and visceral disorders<sup>1</sup>. Moreover, the roots of cupping therapy may originate from Oriental, Tibetan or Unani medicine, however; its particular origin remains unclear<sup>1,2</sup>. Cupping therapy officially came in the 1950s among hospitals in China considering it to be a pseudoscience<sup>3</sup>. The therapy is applied by the therapists using special cups onto some points over the skin to create suction that may help to reduce skin surface temperature, inflammation, and pain that may increase deep-tissue blood flow induces relaxation, and promotes healing<sup>3</sup>.

Cupping therapy has many types consisted of mainly four, in particular, wet, dry, massage, and flash cupping<sup>4</sup>. The term cupping is commonly known as Hijama, described by detoxification process by removing waste matter from the blood to bring vital energy within the body<sup>4,5</sup>. The dry cupping method involves a plastic or silicone cup that is placed on the skin and suctioned the drawn blood. However, in the wet cupping method, blood is drained from lacerated skin into the cup although; wet cupping is not applicable for people of all ages<sup>6</sup>. In addition to this, a variety of methods have been most commonly used in Asian and Middle Eastern Countries such as quick cupping, withholding, cupping with fire, moving or shaking etc<sup>7</sup>. The evidence stated that momentarily attaching rounded and inverted cups to definite parts of the body using a vacuum effect results in drawing of the skin inside the cups that increases blood flow and flexibility to the area<sup>8</sup>. This mechanism increases the lactate-pyruvate ratio after 160 minutes thereby leads to anaerobic metabolism in the surrounding tissue with instantly increased pressure pain thresholds<sup>9</sup>. Moreover, it leads to the detoxification of the blood and extracts it from the body that is beneficial to treat a variety of problems and enhance the immune system<sup>9</sup>. Therefore, cupping therapy has been widely used due to its beneficence as it is an inexpensive, non-invasive and low-risk modality compared to the other pharmacological treatments<sup>9</sup>.

Musculoskeletal disorders such as low back or neck pain have been increasing rapidly, affecting every third person worldwide affecting the quality of life<sup>10</sup>. According to World Health Organization (WHO), 70% to 80% of people suffers from spinal pain, most commonly with neck and low back pain in young and old aged people due to a variety of factors including varying workload, bad posture, incorrect ergonomics of the furniture, degenerative changes and trauma that may lead an individual to compro-

mised quality of life, social activities, emotional changes, and other problems<sup>11</sup>. People in chronic pain; tend to find different therapies to reduce pain and discomfort, even if those therapies have not enough scientific evidence<sup>12</sup>. Moreover, patients usually apply home remedies to reduce their pain and discomfort<sup>12</sup>. Despite the facts, several studies have shown the positive impact of cupping therapy on the neck, back or shoulder region in decreasing pain intensity within a short duration and improve the quality of life<sup>13</sup>. In addition to this, cupping therapy is further classified into light, medium, and strong cupping<sup>6</sup>. The therapist used light cupping for children in which pressure is very light or low<sup>6</sup>. In medium cupping, the pressure is medium or bearable for patients, commonly applied on adults whereas strong cupping is relatively solid, uncomfortable, and uncommonly used<sup>6</sup>. Furthermore, it has also evident that cupping therapy reduces muscle tenderness and swelling thereby decrease muscle pain, stimulates sleep, and promotes relaxation<sup>14</sup>.

However, the evidence-based rationale for use of cupping therapy is yet to be understood therefore, the present review is aimed to assess current trends of cupping therapy in musculoskeletal pain through the review of experimental studies.

## METHODOLOGY

The systematic review has followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

### DATA SOURCES AND SEARCHING STRATEGIES

The authors identified and searched studies on learning resource centers and electronic databases that included MEDLINE, PubMed, Google Scholar, and Physiotherapy Evidence Database (PEDro). The databases were searched from June 2015 to December 2019 by using keywords such as "Dry Cupping", "Wet Cupping", "Pulsatile Cupping", and "Musculoskeletal Pain." Titles or abstracts were thoroughly reviewed and were excluded if not relevant to specified terms.

### ELIGIBILITY CRITERIA OF STUDIES

The experimental studies included "Randomized Controlled Trials" considering Three-Armed, Parallel, Single-Blinded, Mono-Center, and Open-Label designs and "Quasi-experimental" that were selected from the tenure of 2015 to 2019 respectively. It was ensured that all articles were full-text in the English language; however, studies with a language barrier were excluded.

### DATA EXTRACTION

The screening was executed on relevant titles and/or abstracts were included in the systematic review. All studies were evaluated on the following

basis i.e. subjects with musculoskeletal pain, in particular neck or back pain, discriminate between acute and chronic phases. Also, dry or wet cupping methods, type of cupping whereas patients underwent usual care, traditional treatment, physical therapy, medicine, acupuncture, or no intervention were included as control groups.

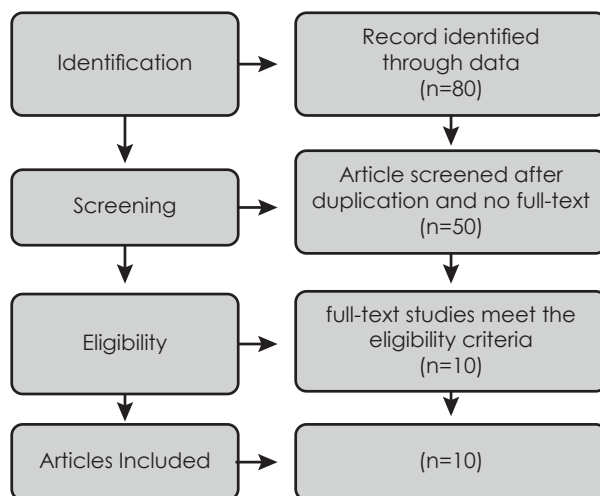
### RISK OF BIAS

The quality appraisal of the eligible studies was assessed and the risk of bias was measured on six domains comprised of random sequence, allocation concealment, participants blinding, outcome assessment blinding, incomplete outcome data, and selective reporting respectively.

## RESULTS

### SELECTION OF STUDIES

A total number of 80 records were analyzed from learning resource centers and databases. The articles relevant to the context of the objective were identified for screening based on eligibility. Only 10 full-text experimental studies conducted from 2015 to 2019 were included as shown in Figure-1.



**Figure-1** Flow diagram on identification and screening of eligible studies for inclusion

### STUDY CHARACTERISTICS

A total of 10 experimental studies were included in the study based on the number of designs in randomized controlled trials, however, only one study was quasi-experimental respectively. The type of cupping therapy was identified in each study considering sample size, target population, and intervention to determine the outcomes of the therapy.

### SYNTHESIS OF STUDIES

A total of 10 studies were analyzed in a direct comparison of the cupping therapy or comparing

with the cupping group with the control-only group. Although, the study of Gozubuyuk et al<sup>18</sup> and Sadek et al<sup>22</sup> conducted a trial on a relatively small sample size as compared to other studies<sup>15,16,17,19,20,21,23,24</sup> whereas Teut et al<sup>16</sup> and Yazdanpanahi et al<sup>19</sup> included a larger population. Several studies represented participants with chronic or non-specific low back pain for  $\geq 3$  months due to varying occupations and factors such as childbirth or pregnancy. However, limited studies represented patients with non-specific neck pain persisted for  $\geq 5$  weeks<sup>23</sup> or at least 3 months<sup>15,20</sup>. The region of administration was typically the upper shoulder and neck while cupping was primarily administered to acupoints such as SI 15, GB 21, and LI 1521 although only one study<sup>18</sup> included healthy volunteers without any presence of pain. Studies have demonstrated a variety of cupping therapies i.e. dry, pulsatile, massages, at acupuncture points, dry moving respectively for a single session or several times in a week in alliance with medicine or acupuncture and control group with usual care or no intervention. Moreover, studies showed a significant decrease in spinal pain as a result of cupping therapy except for the Gozubuyuk et al<sup>18</sup> and Sadek et al<sup>22</sup> that demonstrated insignificant pre-post group differences. The description of the included studies is depicted in Table-1.

### RISK OF BIAS IN STUDIES

The risk of bias was calculated through the Cochrane Risk of Bias Tool on the following domains is based on the author's perception as described in Table-2:

#### Random Sequence

All the studies<sup>15,16,17,19,20,21,22,23,24</sup> showed a low risk of bias except Gozubuyuk et al<sup>18</sup> that indicated unknown bias.

#### Allocation Concealment

A low risk of bias was demonstrated in all studies.

#### Participants Blinding

Among ten studies, four<sup>16,19,22,23,24</sup> cannot ensure bias; three<sup>17,18,20</sup> indicates a high risk of bias whereas only two showed low bias<sup>15,21</sup>.

#### Outcome Assessment Blinding

Out of 10 studies, six studies<sup>15,16,17,18,19,20</sup> revealed high bias whereas four,<sup>21,22,23,24</sup> showed unknown risk.

#### Incomplete Outcome Data

Five studies showed low<sup>16,19,20,21,23,24</sup> and high<sup>15,17,18,20,22</sup> risk respectively.

#### Selective Reporting

A low risk of bias is assumed in all studies.

**Table-1 Characteristics of included studies (n=10)**

AUTHOR (YEAR)	SAMPLE SIZE	STUDY DESIGN	TARGET POPULATION Age (Mean±S.D)	INTERVENTION	RESULTS	P-VALUE
Stephens et al <sup>15</sup> . (2019)	30	Single-Blinded Randomized Controlled Laboratory Study	Patients with self-reported non-specific neck pain (22±2.6)	Single session of dry and sham cupping intervention for 8 minutes while control group received no intervention	Decrease in subjective pain intensity while hemoglobin levels significantly increased within the dry cupping group	.049
Teut et al <sup>16</sup> . (2018)	110	Three-Armed, Parallel, Participant Blinded Mono-Center Randomized Controlled Clinical Trial	Patients with the clinical diagnosis of non-specific chronic low back pain of at least 3 months (49±13.7)	Regular pulsatile cupping with 8 treatments plus paracetamol or the control group with paracetamol only	Pulsatile cupping showed significant effects compared to control after 12 weeks	<0.05
Sharma et al <sup>17</sup> . (2018)	60	Randomized Controlled Trial	Female students with chronic low back pain for 3 months (19±1.5)	Tens and Cupping therapy was given for the duration of 5 mins and 10 mins respectively	Cupping therapy is equally effective as compared to Tens in decreasing pain	<0.05
Gozubuyuk et al <sup>18</sup> . (2018)	20	Quasi-Experimental Study	Healthy volunteers (Not Specified)	The cupping was applied to one side (suctioned) and the other side served as a control (non-suction)	Groups were not different significantly in terms of thickness and stiffness	>0.05
Yazdanpanahi et al <sup>19</sup> . (2017)	100	Randomized Clinical Trial	Mother suffering from low back pain due to lordosis resulting from pregnancy and childbirth (25±4.2)	Cupping therapy for 15-20 mins sessions a week, while acupressure was applied for 20 minutes	Significant variance in pain was found between the three follow-up periods	<0.05

Saha et al <sup>20</sup> . (2017)	45	Randomized Controlled Clinical Trial	Participants with non-specific neck pain for at least 3 months (52.6±10.3)	The intervention group received 5 cupping massages twice-weekly basis while the control patients continued their usual treatment	Cupping group reported significantly less neck pain post intervention	.047
Chi et al <sup>21</sup> . (2016)	60	Single-Blind Experimental Design	Subjects with diagnosed and self-perceived chronic non-specific pain (43.6±8)	The cupping group received therapy at SI 15, GB 21, and LI 15 acupuncture points whereas control group received no intervention	Skin surface temperature and neck pain differences between the groups were statistically significant	<0.001
Sadek et al <sup>22</sup> . (2016)	20	Randomized Control Trial	Athletes with low back pain for ≥3 months (23.45±2.4)	Cupping therapy was performed for two days in a week for one-week for experimental group while control group received no intervention	The experimental group showed improvement increase in lumbar spine flexion and extension but insignificant pre-post results	0.651
Arslan et al <sup>23</sup> . (2015)	40	Randomized Parallel-Group Trial	Office workers with neck pain for ≥ 5 weeks (44.6±1.9)	10 dry moving cupping therapy sessions over a 5 week period	Statistically significant reduction in pain in intervention group	0.002
AlBedah et al <sup>24</sup> . (2015)	80	Randomized, Controlled, Open-Label, Parallel Trial	Patients with non-specific low back pain for at least 3 months (36.48±9.3)	Six wet cupping sessions within 2 weeks done at two acupuncture points whereas only acetaminophen was allowed as a rescue treatment in both groups	Statistically significant differences in pain favoring the wet cupping group compared with the control group	0.0001

**Table-2 Cochrane Summary for Risk of Bias (n=10)**

<b>Studies</b>	<b>Random Allocation</b>	<b>Allocation Concealment</b>	<b>Participants Blinding</b>	<b>Outcome Assessment Blinding</b>	<b>Incomplete Outcome Data</b>	<b>Selective Reporting</b>
Stephens et al <sup>15</sup> . (2019)	+	+	+	-	-	+
Teut et al <sup>16</sup> . (2018)	+	+	?	-	+	+
Sharma et al <sup>17</sup> . (2018)	+	+	-	-	-	+
Gozubuyuk et al <sup>18</sup> . (2018)	?	+	-	-	-	+
Yazdanpanahi et al <sup>19</sup> . (2017)	+	+	?	-	+	+
Saha et al <sup>20</sup> . (2017)	+	+	-	-	+	+
Chi et al <sup>21</sup> . (2016)	+	+	+	?	+	+
Sadek et al <sup>22</sup> . (2016)	+	+	?	?	-	+
Arslan et al <sup>23</sup> . (2015)	+	+	?	?	+	+
AlBedah et al <sup>24</sup> . (2015)	+	+	?	?	+	+
<p>□, indicates high risk of bias</p> <p>+, indicates low risk of bias</p> <p>?, indicates that cannot ensure risk of bias.</p>						

## DISCUSSION

The results of this analysis demonstrated current trends of cupping therapy in the management of musculoskeletal pain, in the particular neck and low back pain. The analysis of ten randomized controlled trials evaluated in this study has shown positive results in decreasing neck and low back pain, in particular physiological parameters of pain in adults that contributed to the consolidation of the use of cupping treatment in the clinical condition of the targeted population thereby improving quality of life.

A review conducted by Aboushanab et al<sup>1</sup> demonstrated cupping therapy as old and reliable therapy in patients with neck and back pain in which it reduces inflammation, enhances blood flow, and leads to deep-tissue massage by creating a suction. Likewise, studies conducted by Stephen et al<sup>15</sup>, Saha et al<sup>20</sup>, and Arsalan et al<sup>23</sup> demonstrated a significant decrease in neck pain intensity post-intervention whereas another studies<sup>16,17,18,19,21,22,24</sup> was found to be significantly reducing low back pain after cupping sessions. Besides, another review indicated a positive effect of the mechanism of cupping therapy regime<sup>25</sup>. Furthermore, the hemodynamic mechanism facilitating muscle function was observed with elevated oxygen levels in surrounding tissues during cupping sessions<sup>25</sup>. Similarly, the study of Stephen et al<sup>15</sup> also revealed increased hemoglobin levels that were significantly increased within the dry cupping group. Despite this, it was also observed that however the most applied technique among all types is dry cupping, applied particularly on the cervical and lumbar regions, often used with the stimulation of the acupoints primarily on the urinary bladder, gallbladder, and small intestine. The stimulation also prevailed over the bladder meridian, similarly followed by trigger points as acupuncture techniques yet no standardization is available concerning the application of acupoints over the body for cupping therapy<sup>25-26</sup>. Several studies also suggested that wet cupping promotes nociceptive stimulus that leads to the activation of the descending pathways of pain regulation. Hence the technique is found to be beneficial for certain musculoskeletal disorders<sup>1,23</sup>. On the other hand, infection risk, scar formation, and a vasovagal attack may occur as the disadvantage of cupping<sup>24</sup>. Despite the facts, many authors have emphasized the greater analgesic effect of dry cupping as compared to any other techniques, as the usage of lubrication may decrease the friction between the cup edge and the skin. This mechanism is often termed cupping massage<sup>1-4</sup>. Despite the effectiveness of these, methods, no standardization is established for the management of spinal pain<sup>26</sup>. Therefore, it has been concluded that appropriate technique, number of sessions, suction points, strength, and duration of the session have not been

determined specifically in the studies. Further, limited variables were identified about the nature of the study and target population. However, variable suction strength was observed to be used in the studies whereas according to standardized protocols, light suction of 100 to 300 millibar with two manual pumpings, medium suction of 500 millibars with five or more pumping or pulsatile pressure between 100 to 200 millibar every 2 seconds<sup>20-25</sup>. Among these, medium, suction is indicated to be painful for musculoskeletal conditions. However, these methods did not sufficiently describe in the studies, despite considerable variation in the application of cupping type, specifically to the difference with the control group has been shown in several studies. Despite the varying application of cupping therapy, the average session was impossible to identify although, in one study, cupping session was applied for 5 sessions around 8 minutes for the interval of 3-4 days<sup>27</sup>. Moreover, some researchers concluded that at least 5 sessions are required to observe any significant changes of intervention to ensuring the feasibility of the study<sup>27,28</sup>. Moreover, it has also been suggested that interval periods between cupping sessions are crucial for the re-establishment of tissues<sup>29</sup>. The analysis further revealed that most of the studies showed a low quality of evidence. Furthermore, high heterogeneity was found between the studies, moreover, a significant decrease in pain was found in association with cupping therapy. However, these outcomes may be clinically relevant in experimental in comparison to control groups.

Moreover, only one variable was demonstrated in the extraction of data. Therefore, additional analysis is required for the clarity of the difference between the study groups attributed to different cupping techniques. Although, the effectiveness of these techniques are still needed to be confirmed based on subgroup analysis constitutes of different application techniques in intervention and control groups. Thus, meta-analysis should be performing to determine the heterogeneity of trials.

In recent decades, several clinical trials have been conducted to determine the role of cupping intervention on various neurological and infectious diseases<sup>30</sup>. A comprehensive systematic review was conducted to investigate cupping therapy is associated with diseases<sup>31</sup> however it included articles about musculoskeletal conditions only. Moreover, this review has several limitations as none of the studies reported safety issues and side effects from the treatment. Further studies are required to apprehend whether different kind of cupping is effective for musculoskeletal disorders or in overall diseases as an alternative medicine although, its wider acceptance and practice in holistic health care departments is crucial. Moreover, these protocols are needed to be validated for future trials to evaluate the health-related outcomes in clinical conditions

to determine the behavioral and physiological parameters.

### CONCLUSION

It was concluded that cupping therapy is effective in the management of pain due to various musculo-skeletal ailments. The qualitative analysis showed a significant decrease in pain intensity among participants, besides there is variation in applying various cupping methods and regimes. Despite, high heterogeneity and low-quality evidence limit the study findings therefore, the techniques required validation for the future implication.

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