



The Effectiveness of Cupping in Iranian Researches: A Systematic Review of Animal and Human Studies

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Abstract

Cupping has a long history in Iran which is one of the most widely used methods in prevention and treatment of diseases in Persian medicine. However, it still has many opponents in the Iranian conventional medical community. So, this systematic review study was conducted to survey the scientific and authoritative articles related to wet and dry cupping that have been done in Iran and the diseases for which Iranian researchers have suggested cupping. In general, the effect of wet and dry cupping on various kinds of pain (e.g. headache, musculoskeletal pain, postpartum pain, etc.), as well as the effect of wet cupping on hematological and biochemical factors of blood were among the most common studies. Also, persistence of therapeutic effects of wet and dry cupping on various diseases was satisfactory. The results of this study showed that wet and dry cupping, even alone, are effective in the treatment of many diseases, and if the objections to the use of these two treatments are reduced, more extensive and high-quality researches in this regard will be done.

Keywords: Wet cupping; Dry cupping; Persian medicine; Systematic review; Clinical trial

Introduction

Cupping is one of the ancient therapeutic methods used in traditional medicine of different countries such as India, China, Greece and also Iran. The use of complementary medicine, especially cupping, has been increasing in recent

years and welcomed in many American, European and African countries due to its positive results [1-2].

Cupping has a long history in Iran and was used before Islam, as taught at *Jundishapur* University. After Islam, according to Islamic teachings,

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cupping has been considered and is one of the most widely used methods in prevention and treatment of diseases in Persian medicine [3]. Cupping is suctioning the skin that can be done with or without bloodletting. Cupping accompanied by bloodletting is known as “*Hijamat*” or wet cupping; while cupping without bloodletting is called “*Badkesh*” or dry cupping [4]. Many studies about the therapeutic effects of this method in some diseases such as acne, constipation, pain, cough, asthma, allergies, urticaria and headache have been done and published in different countries [5-7]. Also, in different studies, blood drawn from the cupping site and the venous blood were compared and their differences were reported [8-9] and the results are consistent with the concepts of Persian medicine.

Although today cupping is accepted as a valid therapeutic method in most scientific societies in the world and its indications and applications are discussed and also, many articles are published every year about the applications of cupping in various diseases in important databases such as PubMed and Web of science, in Iran, discussions about the usefulness or harmfulness of cupping is still the hot topic of scientific associations. Indeed, cupping still has many opponents in the Iranian conventional medical community, which makes it difficult to research in this field. Therefore, in this systematic review, we tried to survey the scientific and authoritative articles related to cupping that have been done in Iran and the diseases for which Iranian researchers have suggested cupping.

Materials and Methods

This study systematically reviewed the articles about wet and dry cupping in Iran. In order to obtain the relevant documents, Iranmedex, SID, Magiran, Pubmed, Scopus, Google Scholar, databases of IRCT and student thesis were searched. The keywords to search for articles in Persian sources were: *Hejamat*, *Badkesh*, *Kar Azmaei balini*; and the keywords to search for articles in English sources were: cupping, bloodletting, al-hijama, hijama, clinical trial, Iran. No time limits were set for the search, and all articles published as of August 2020 were reviewed. Also, in order not to miss relevant articles, the references of the obtained articles were searched manually. The study flowchart is shown in Diagram 1.

Inclusion criteria

Clinical trial studies conducted by Iranian researchers in which cupping was performed on human or animal samples and published in Persian or English valid journals.

Exclusion criteria

- Articles without full text
- Semi-experimental studies
- Observational studies
- Review articles
- Conference Abstracts
- Studies that did not receive the quorum score in quality assessment
- Studies that examined cupping along with other treatments

Quality assessment of studies

After completing the search and saving the obtained articles, the titles of all articles were reviewed by two colleagues of the research and duplicated and irrelevant items were removed. Then, the titles and abstracts of the remaining articles were carefully reviewed and articles that did not meet the inclusion criteria were removed. Finally, the full-texts of related articles were reviewed and evaluated qualitatively using the AXFORD checklist. This checklist includes 5 general items to evaluate the quality of articles. Scoring the questions is on a two-level scale; lack of the criterion: negative; and presence of the criterion: positive.

The first question of the checklist has two parts:

1. Are the results of the trial valid? (Internal Validity)

a) Was the assignment of patients to treatments randomized? (1a)

b) Were the groups similar at the start of the trial? (1b)

The second question of the checklist also has 2 parts:

a) Aside from the allocated treatment, were groups treated equally? (2a)

b) Were all patients who entered the trial accounted for? And were they analyzed in the groups to which they were randomized? (2b)

3. Were measures objective or were the patients and clinicians kept “blind” to which treatment was being received?

4. How large was the treatment effect?

5. How precise was the estimate of the treatment effect?

Finally, in this study, articles that received at

least 5 + points were included as high-quality articles.

To prevent bias, the quality of the articles was evaluated independently by two researchers, and if the articles were not included in the study, the reason was mentioned. In cases where there was disagreement between the two researchers, the article was reviewed by the third one. In the next step, the information about the articles was recorded in a pre-designed form. This information included the name of the first author, article title, year of publication, place of study, sample size, study population, type of intervention, control group, final outcome and reported complications. The studies could not be summarized in terms of intervention, assessment tools and outcomes due to differences between target groups and type of intervention; so, conclusions could not be meta-analyzed, therefore the results were presented as systematic review.

Also, due to the fact that many of the studies which did not have acceptable quality based on the Oxford checklist, were clinically significant and could answer a part of the research questions, they were listed in a separate table.

Results

After the initial search, 3347 articles were found in English databases and 165 articles in Persian databases. After reviewing duplicate titles, irrelevant articles and exclusion criteria, 31 articles received an acceptable score in quality evaluation and were included in the study (Table 1).

Characteristics of articles included in the research:

Among the 31 main articles included in the re-

search, 23 were human studies and 8 were animal studies. In human studies, 15 articles were related to wet cupping and 8 articles were related to dry cupping (Table 2). In animal studies, 6 articles were related to wet cupping and 2 articles were related to dry cupping (Table 3).

The oldest study was a quasi-experimental before and after trial about the effect of wet cupping on migraine and tension headache, conducted in Kermanshah 2008 [10]. Among the randomized clinical trials, the oldest study was conducted in 2009 about the effect of wet cupping on low back pain in Kermanshah [11]. The most recent article included in the study was a randomized clinical trial in 2020, conducted in Kermanshah about the effect of wet cupping on liver enzymes in fatty liver [12]. Most studies were performed in Shiraz (8 studies), Tehran (7 studies), Mashhad (6 studies) and Kermanshah (5 studies), respectively.

Human studies of cupping

Among the human articles of wet cupping, 3 studies were performed on healthy individuals and 12 were on the effect of wet cupping on various diseases. The age of participants of these studies was between 16 and 68 years. The study population consisted of only men in 4 studies and both sexes in 11 studies. In general, most human studies in the field of wet cupping have been published in 2018. Most human wet cupping studies were performed on joint diseases (26.6%) and metabolic syndrome (46.6%). In terms of study results, in 10 cases (66.6%), the effect of wet cupping on at least one of the considered factors was statistically significant.

Human studies of dry cupping

In all human studies, the effect of dry cupping was investigated on the diseases and there were no studies about dry cupping in healthy individuals. In terms of age, a study was performed on children aged 4-18 years, and in other cases, the age of the participants was between 18-50. The study population consisted of children of both sexes in one study and women in seven studies. Most human studies in the field of dry cupping were published between 2013-2016. Most human dry cupping studies were performed on gynecological diseases (75%). In reviewing the study results, in all articles (100%), the effect of dry cupping on at least one of the considered factors was statistically significant.

Animal studies of wet cupping

In animal studies, 3 cases of wet cupping were performed on healthy animals and 3 cases on sick animals. The study population consisted of mice in 4 cases and sheep in 2 cases. Most animal studies in the field of wet cupping were published in 2013. In terms of study results, in 5 of the articles (83.3%), the effect of wet cupping on at least one of the considered factors was statistically significant.

Animal studies of dry cupping

Dry cupping animal studies were performed on healthy animals in one case and sick animals (addiction cessation) in the other. The study population consisted of mice in both studies. In reviewing the study results, in both articles (100%), the effect of dry cupping on at least one of the considered factors was statistically significant.

Characteristics of other experimental articles that scored less than 5 in quality evaluation (low quality literature)

A total of 10 articles with a score less than 5 in quality assessment are listed in Table 4 as low-quality literature; 7 of which were quasi-experimental before and after trials, one was a cohort and another was a nonrandomized clinical trial. Case report articles were not included in this table due to less importance. The low-quality articles were all human studies, of which 9 were about wet cupping and one was on comparing the effects of dry cupping and wet cupping. Of these, 4 studies were performed on healthy individuals and 6 studies were on the effect of wet cupping on the disease. The age of the subjects in these studies was 12-76 years, and in one study the age range of the participants was not mentioned. The study participants consisted of only men in 3 studies and both sexes in 6 studies. In one study, the gender of the participants was not mentioned. In reviewing the study results, in all articles (100%), the effect of wet cupping on at

least one of the considered factors was statistically significant.

In general, the effect of wet and dry cupping on various kinds of pain (e.g. headache, musculo-skeletal pain, postpartum pain, etc.) as well as the effect of wet cupping on hematological and biochemical factors of blood were among the most common studies. In seven RCTs, the effect of wet/dry cupping on pain was investigated. In all cases, both wet and dry cupping were statistically significant in reducing pain. In 7 of these articles, the effect of wet cupping on blood biochemical factors was investigated, in 6 of them (85.7%), wet cupping caused a significant change in the factor. In 4 cases, the effect of wet cupping on hematological factors was investigated, in 3 of them (75%), wet cupping caused a significant change in the factor. Also, in 5 cases of low-quality articles the effect of wet cupping on blood biochemical factors and in 3 cases the effect of wet cupping on pain were studied, all of which were statistically significant.

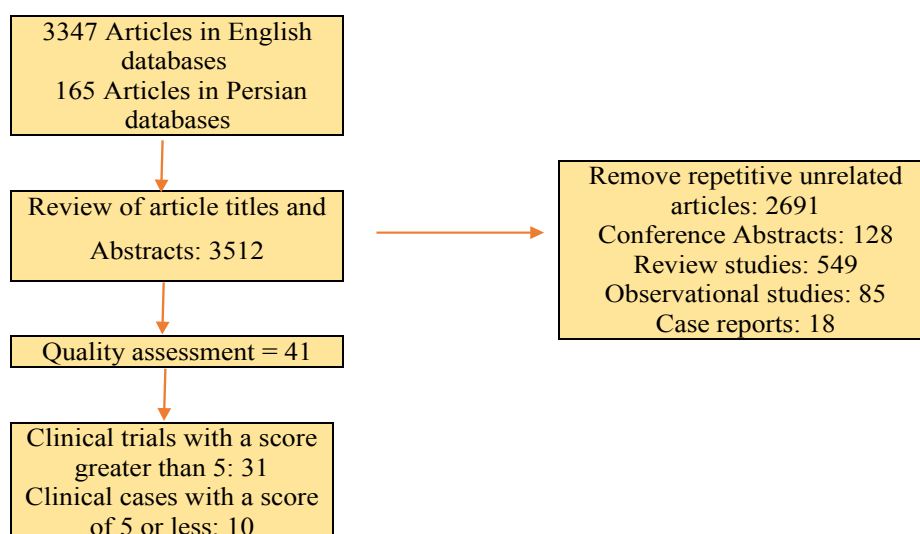


Diagram 1. The study flowchart

Table 1. Methodological evaluation of articles based on the Oxford checklist

No	Studies	Criteria for methodological assessment of study quality						
		5	4	3	2b	2a	1b	1a
1.	Abolahrari 2018 [13]	+	+	+	+	+	+	+
2.	Bashiri 2020 [12]	+	+	+	+	+	+	+
3.	Bahram 2018 [14]	+	+	+	+	-	+	+
4.	Hekmat pou 2013 [15]	+	+	-	+	-	+	+
5.	Zarifkar 2010 [16]	+	+	+	-	-	+	+
6.	Tabatabaee 2014 [17]	+	+	-	+	-	+	+
7.	Fazel 2009 [18]	+	+	-	+	-	+	+
8.	Farhadi 2009 [11]	+	+	-	+	+	+	+
9.	Mardani 2018 [19]	+	+	-	+	-	+	+
10.	Mohammadi 2018 [20]	+	+	+	+	+	+	+
11.	Zarei 2012 [21]	+	+	-	+	-	+	+
12.	Soleimani 2019 [22]	+	+	-	+	-	+	+
13.	Farahmand 2014 [23]	+	+	+	+	-	+	+
14.	Farahmand 2012 [24]	+	+	+	+	-	+	+
15.	Farahmand 2014 [25]	+	+	+	+	-	+	+
16.	Shahamat 2016 [26]	+	+	-	+	+	+	+
17.	Aziz khani 2018 [27]	+	+	-	+	-	+	+
18.	Ghaem maghami 2014 [28]	+	+	-	+	-	+	+
19.	Akbarzade 2016 [29]	+	+	-	+	-	+	+
20.	Akbarzade 2015 [30]	+	+	-	+	-	+	+
21.	Akbarzade 2013 [31]	+	+	-	+	-	+	+
22.	Akbarzade 2013 [32]	+	+	-	+	-	+	+
23.	Farhadi 2016 [33]	+	+	+	+	+	+	+
24.	Gorjin 2015 [34]	+	+	+	+	-	+	+
25.	Afsahi 2013 [35]	+	+	+	+	-	+	+
26.	Basiri 2019 [36]	+	+	+	+	-	+	+
27.	Molavi 2017 [37]	+	+	+	+	-	+	+
28.	shekar foroush 2012 [38]	+	+	+	+	-	+	+
29.	Roostayi 2016 [39]	+	+	-	+	-	+	+
30.	Aieeni 2013 [40]	+	+	+	+	-	+	+
31.	Khosravi 2017 [41]	+	+	+	+	-	+	+

Table 2. Human randomized clinical trial studies (wet cupping and dry cupping)

NO	First author	Location & year	Disease	Sample size & participants	Intervention group	Control group	Results	Complication
1.	Abolahrari [13]	Shiraz 2018	Knee pain	17 Women and 9 men 45-65 years old	Wet cupping + Physiotherapy	Physiotherapy	Both cupping and physiotherapy are effective in reducing the symptoms of knee osteoarthritis, but the difference was not statistically significant.	Not reported
2.	Bashiri [12]	Kermanshah 2020	Fatty liver	61 men and 59 women 18 years and older (mean age 39 years)	Wet cupping + diet therapy and exercise	Diet therapy and exercise	Wet cupping has significantly reduced liver enzymes and improved ultrasound changes in patients.	No complication

3.	Bahram [14]	Zahedan 2018	Serum lipoproteins in healthy participants	24 Men 15-45 years old	Wet cupping	Exercise	High-intensity aerobic exercise and wet cupping both significantly reduced LDL, but the effect of exercise was greater. The increase in HDL was not significant in any group.	Not reported
4.	Hekmat pou [15]	Mahalat 2013	Chronic obstructive pulmonary disease (COPD)	110 Smoker men	Wet cupping	Venesection (Fasd)	Both wet cupping and Venesection significantly increased arterial O ₂ saturation, but duration of wet cupping effect was longer.	Not reported
5.	Zarifkar [16]	Shiraz 2010	Hepatitis B virus surface antibody (HBS ab)	50 Men 18-25 years old	Wet cupping + vaccine	Vaccine	There was no significant difference in the level of HBS antibody in the two groups.	Not reported
6.	Tabatabaee [17]	Gochan 2014	Migraine	198 Men and women 65-30 years old	Wet cupping	Temperament modification/sedative	Pain intensity in the two groups of wet cupping and temperament modification were significantly lower than the group that was given sedatives.	No complication
7.	Fazel [18]	Mashhad 2009	Serum lipoproteins: High density lipoprotein (HDL) and Low density lipoprotein (LDL)	74 Men and women 65-30 years old	Wet cupping	Diet therapy	Wet cupping significantly reduced LDL and LDL / HDL levels compared to diet but had no effect on HDL	Not reported
8.	Farhadi [11]	Kermanshah 2009	Low back pain	48 Participants in the intervention group and 50 in the control group (17-68 years old)	Wet cupping	Routine care	Wet cupping significantly reduced pain intensity, disability due to pain and drug use in patients.	Vasovagal shock in 7% of cases
9.	Mardani [19]	Gilan 2018	Chronic low back pain	98 Women and 82 men aged 16-65 (Average age 45 years)	Wet cupping	Conventional medical treatment and rest	Wet cupping has significantly reduced the severity of pain and disability index in patients with low back pain and its therapeutic effect has a longer duration than conventional treatment.	No complication
10.	Mohammadi [20]	Tehran 2018	Carpal tunnel syndrome (CTS)	56 Men and women 18-60 years	Wet cupping + physiotherapy	Physiotherapy	Wet cupping significantly reduces the severity of pain and distal sensory delay in carpal tunnel syndrome.	Not reported

11.	Zarei [21]	Gochan 2012	Hypertension	22 Men and 20 women aged 39-60 (mean age 51 years)	Wet cupping	Medical treatment	Wet cupping causes a significant change in systolic blood pressure.	Not reported
12.	Soleimani [22]	Mashhad 2019	Complete blood count (CBC) in healthy participants	86 Men aged 25-40	Wet cupping	No intervention	Wet cupping has positive effects on blood concentration and quality of life.	No complication
13.	Farahmand [23]	Mashhad 2014	Depression and anxiety in patients with metabolic syndrome	58 Men and 78 women aged 18-65	Wet cupping + diet therapy	Diet therapy	Wet cupping does not significantly change depression and anxiety in patients with metabolic syndrome.	Not reported
14.	Farahmand [24]	Mashhad 2012	Metabolic syndrome	126 Men and women aged 18-65	Wet cupping	Diet therapy	Wet cupping does not cause a significant change in the biochemical factors of patients with metabolic syndrome compared to diet therapy.	Not reported
15.	Farahmand [25]	Mashhad 2014	Serum high-sensitivity C-reactive protein and heat shock protein 27 antibody titers in patients with metabolic syndrome	126 Men and women aged 18-65	Wet cupping + diet therapy	Diet therapy	Wet cupping has no effect on serum hs-CRP and Hsp27 in patients with metabolic syndrome.	No complication
16.	Shahamat [26]	Shiraz 2016	Constipation	120 Children aged 4-18	Dry cupping	Oral laxative (PEG)	Abdominal dry cupping is as useful as a standard oral medicine in treating functional constipation in children.	Not reported
17.	Azizkhani [27]	Tehran 2018	Menstruation	162 Women aged 20-50	Dry cupping	Medroxyprogesterone	Dry cupping significantly reduces the volume of bleeding and the number of menstrual bleeding days.	Not reported
18.	Ghaemmaghami [28]	Shiraz 2014	Postpartum low back pain	150 Women aged 18-40	A dry cupping group and an acupuncture group	No intervention	Dry cupping and acupuncture significantly reduce postpartum low back pain.	No complication
19.	Akbarzade [30]	Shiraz 2016	Postpartum perineal pain	150 Women aged 18-40	A dry cupping group and an acupuncture group	No intervention	Dry cupping significantly reduces postpartum perineal pain, but in the case of acupuncture, this decrease is not statistically significant.	No complication

20.	Akbarzade [29]	Shiraz 2015	Postpartum perineal pain	150 Women aged 18-40	A dry cupping group and an acupressure group	No intervention	Dry cupping and acupressure are effective in reducing postpartum perineal pain.	Not reported
21.	Akbarzade [31]	Shiraz 2013	Postpartum low back pain	100 Women aged 18-40	Dry cupping	No intervention	Dry cupping is effective in reducing low back pain and can be a useful treatment to reduce postpartum low back pain.	Not reported
22.	Akbarzade [32]	Shiraz 2013	Postpartum anxiety	150 Women aged 18-40	A dry cupping group and an acupressure group	No intervention	Dry cupping significantly reduces postpartum anxiety, but in the case of acupressure, this decrease is not statistically significant.	Not reported
23.	Farhadi [33]	Kermanshah 2016	Nausea after surgery	206 women with an average age of 46 years	Dry cupping	Sham cupping	Dry cupping in the operating room significantly reduced nausea and vomiting after laparoscopic cholecystectomy.	No complication

COPD: Chronic obstructive pulmonary disease/ LDL: Low density lipoprotein/ HDL: High density lipoprotein/ HBS ab: Hepatitis B virus surface antibody/ CBC: Complete blood count/ CTS: Carpal tunnel syndrome

Table 3. Animal randomized clinical trial studies (wet cupping and dry cupping)

NO	First author	Location & year	Disease	Sample size & participants	Intervention group	Control group	Result	Complication
1.	Gorjin [34]	Kermanshah 2015	leishmaniasis	12 Mice BALB/C	Wet cupping	No cupping	Wet cupping had no significant effect on the treatment of cutaneous leishmaniasis.	Not reported
2.	Afsahi [35]	Hamadan 2013	Healthy sheep	16 Ewe (race: Mehraban)	Wet cupping	No cupping	Wet cupping caused a significant increase in C3 level but there was no significant difference in other factors.	Not reported
3.	Basiri [36]	Sarab 2019	Healthy sheep	10 Male lamb (race: Mehraban)	Wet cupping	No cupping	Many of the excretory compounds in wet cupping blood were more than venous blood, and this difference was significant in Chol, TG, HDL, SGPT, and uric acid.	Not reported
4.	Molavi [37]	Hamadan 2017	Brucellosis	48 Rats	Wet cupping	No cupping	Wet cupping increased serum levels of gamma interferon and activated T lymphocytes, macrophages, and NK cells. Histopathological examination of liver tissue showed improvement of tissue lesions.	Not reported
5.	Shekar foroush [38]	Tehran 2012	Myocardial Infarction (MI)	30 Male Wistar rats	Wet cupping	Dry cupping	Wet cupping is cardioprotective in ischemic reperfusion injury.	Not reported

6.	Roostayi [39]	Tehran 2016	Skin firmness in healthy mice	20 Male Wistar rats	Dry cupping	No intervention	Dry cupping significantly reduces the firmness and tensile strength of the skin	Not reported
7.	Aieeni [40]	Hamadan 2013	Health mice	24 Mice BALB/C	Wet cupping	No cupping	Wet cupping caused a significant increase in RBC and HCT indices. It also increased white blood cells and lymphocytes, but was not statistically significant.	No complication
8.	Khosravi [41]	Kordestan 2017	Quit addiction	80 Male Wistar rats	Dry cupping	Sham cupping	Dry cupping before quit significantly reduces the incidence of withdrawal symptoms but has no significant effect after the onset of symptoms.	Not reported

NK cells: Natural killer cells/ TG: triglyceride/ HDL: High density lipoprotein/ SGPT: Serum glutamic pyruvic transaminase/ MI: Myocardial Infarction/ RBC: Red Blood Cells/ HCT: Hematocrit

Table 4. Other experimental articles that scored less than 5 in quality evaluation (low quality literature):

NO	First author	Location & year	Disease	Sample size & participants	Intervention group	Control group	Result	Complication
1.	Golabi [42]	Esfahan 2017	Hypertension	25 Men and women 40-49 years old	Wet cupping	No group	Wet cupping significantly reduced systolic and diastolic pressure and pulse.	Not reported
2.	Shaikhi [43]	Dezfoul 2018	Transforming growth factor beta 1 (TGF-β1) levels in migraine sufferers and healthy individuals	32 Patients and 22 healthy participants with a mean age of 31-32 years	Wet cupping in migraine sufferers	Wet cupping in healthy participants	Wet cupping significantly reduced TGF-β1 in the serum of migraine sufferers but did not cause a significant change in healthy individuals. The rate of this factor was higher in migraine sufferers than in healthy people.	Not reported
3.	Ramezani [44]	Arak 2012	Diabetes	30 Patients with type2 diabetes	Wet cupping	No group	Wet cupping significantly decreased cholesterol, HbA1C, FBS, 2hpp, TG, LDL, AST and increased HDL.	Not reported
4.	Tabatabaee [45]	Gochan 2014	Migraine	47 Female and male over 20 years (average age 34 years)	Wet cupping	No group	Wet cupping significantly reduced pain intensity in migraine sufferers.	No complication
5.	Ahmadi [10]	Kerman-shah 2008	Migraine and tension headaches	70 Females and males 12-76 years old (mean age 38 years)	Wet cupping	No group	Wet cupping reduced the severity of pain, the number of days involved and the drug use in patients with migraine and tension headaches	Not reported

6.	Mashhadi Akbar Bojar [46]	Tehran 2011	Athletes and Non-Athletes healthy men	40 Athletes and Non-Athletes healthy men (20-45 years old)	Wet cupping	No group	Wet cupping and exercise together increase the levels of antioxidant enzymes in the blood.	Not reported
7.	Kordafshari [47]	Tehran 2017	Healthy participants	178 Women and men with an average age of 36 years	Wet cupping	No group	Wet cupping significantly increased the quality of life in 88% of participants	About 10% of participants reported transient itching, pain, and weakness after wet cupping.
8.	Soleimani [48]	Mashhad 2019	Healthy participants	41 Men with an average age of 31 years in the wet cupping group and 40 men with an average age of 33 years in the dry cupping group	Wet cupping	Dry cupping	Wet cupping caused a significant change in the expression of some factors that can control inflammatory reactions.	Not reported
9.	Shahraki Vahed [49]	Tehran 2014	Migraine	40 Men and women 30-39 years	Wet cupping	No group	Wet cupping significantly reduced the severity of pain	Not reported
10.	Kargar shoraghi [50]	Zahedan 2016	Liver enzymes	22 Men 17-32 years	Wet cupping	Exercise	Wet cupping, like exercise, increases CK and LDH	Not reported

TGF- β 1: Transforming growth factor beta 1/ HbA1c: Glycated Hemoglobin/ FBS: fasting blood sugar/ 2hpp: 2 hours post prandial/ TG: triglyceride/ HDL: High density lipoprotein/ LDL: Low density lipoprotein/ AST: Aspartate Aminotransferase/ CK: Creatine kinase/ LDH: Lactate dehydrogenase

Discussion

In this study, all articles related to wet and dry cupping in Persian and English, which have been done by Iranian researchers, were reviewed. As mentioned in the results, in 75% of the RCTs and in 100% of other studies, the effect of wet cupping on at least one of the studied factors was statistically significant. This rate was 100% for dry cupping. The point that should be mentioned here is that in Persian medicine, wet and dry cupping are used along with other therapeutic measures, and its effect alone has not been considered by the scholars of Persian medicine. It may be stated that the reason for the insignifi-

cance of the effect of wet cupping in some studies is its use alone and wet cupping along with other treatments of Persian medicine in these studies may have different results.

Persian medicine scholars have introduced different types of wet cupping in different parts of the body according to the type of disease, the patient's physical condition and the purpose of treatment. One of the most widely used wet cuppings is *Hijamat-e- Aam* which is performed in the interscapular area. Based on this, it can be seen that in most of the studies that have been included in this systematic review, *Hijamat-e- Am* has been used alone or in combination with oth-

er forms of cupping, which confirms the greater use of this type of cupping, especially in general diseases. In some diseases that affect a specific organ, such as carpal tunnel syndrome, wet cupping of the wrist area, called *Hijamat-e- Rosoq* in Persian medicine, is used [20]. In diseases such as low back pain, cupping of the sacrum is recommended [19]. In the study of Qods et al., it was stated that the place of *Hijamat-e- Am* is very close to the sympathetic ganglion, the thoracic duct passage and the vascular branches that supply blood to the brain and heart, so this cupping not only cleanses the body from waste material but also improves the metabolism and the immune system and regulates blood biochemical factors [51].

Of course, the applications of wet and dry cupping are not limited to the cases observed in the studies reviewed in this article, but in the resources of Persian medicine these two treatment methods have been mentioned in the treatment of many diseases, which are reviewed in some review studies [4].

In a study conducted by the Center for Complementary Medicine Research, University of Western Sydney entitled “An Updated Review of the Efficacy of Cupping Therapy”, 135 RCTs published over 18 years were reviewed. Of these, 57.8% (about 78 studies) were in the field of wet cupping [52]. Although it is mentioned in the text that many of these articles were not of good quality, the number of studies conducted during the 18 years seems satisfactory. However, only 30 high quality RCTs in the field of wet/dry cupping have been performed in Iran over a period of 12 years - which, even if we add

other cases, totals 41 articles. Due to the strong treasure of Persian medicine resources and the wide range of applications that Persian medical scholars have mentioned for these two treatments, this number is very small. Therefore, more studies on the effect of these two methods in different diseases should be designed. Another important point was existence of low-quality articles or many quasi-experimental studies, which requires designing high quality studies to prove the effectiveness of wet and dry cupping. However, the poor quality of some articles in other studies in various specialized fields were similar to our study [53-55]. This is one of the limitations of such studies. In general, unclear descriptions of randomization procedures, lack of blinding and problems of matching the case and control groups are mentioned in the majority of trials as limitations [56]. Therefore, the poor quality of articles is not limited to Iranian articles. In addition, in studies related to wet cupping, performing the wet cupping, placebo design, and obtaining a license of the ethics committee are also among the limitations, especially the latter one in Iran is difficult to do due to many objections. Another limitation of this study was lack of attention of researchers to the standards of Persian medicine regarding the time, place and methods of wet cupping in various diseases.

In general, seven studies reported the results of relatively long follow up. In the study of Mardani and colleagues, the effect of wet cupping on reducing low back pain was followed up in the third and sixth months. The results showed that the effect of wet cupping had a longer du-

ration than conventional treatment [19]. Also, in the study of Farhadi et al., persistence of the effect of wet cupping on improvement of low back pain was reported during 3 months of follow-up [11]. The results of Farahmand et al.'s study on the effect of wet cupping on risk factors in patients with metabolic syndrome were not statistically significant in the initial 3-month follow-up and the 12-month follow-up results were similar [24]. In another study of Farahmand et al., about the metabolic syndrome, there was no change in the initial results of the study during long-term follow-up [25]. In the study of Shahamat et al., about comparing the effects of dry cupping and polyethylene glycol (PEG) on childhood constipation, PEG had a good short-term effect (2 weeks) but was not lasting; while in the long term (12 weeks), the effect of dry cupping was persistent [26]. Ahmadi and colleagues, after 3-month follow up said that wet cupping has a lasting effect on reducing pain and drug use in patients with migraine and tension headache [10]. In the study of Soleimani et al., the effect of wet and dry cupping on the changes of blood inflammatory factors was evaluated 1 and 4 weeks after the intervention, and the effect of wet cupping was persistent for 4 weeks [48]. Zarifkar et al. examined the effect of wet cupping on HBS antibodies 1 and 3 months after hepatitis B vaccination, neither of which was statistically significant [16].

In general, the results of this study showed that wet and dry cupping, even alone, are effective in treatment of many diseases, and if the objections to the use of these two treatments are reduced, more extensive and high-quality re-

searches in this regard will be done. Thus, these treatment methods can be used alongside conventional treatments.

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