

**A critical appraisal of “Effect of Cupping Therapy on Range of Motion, Pain Threshold, and Muscle Activity of the Hamstring Muscle Compared to Passive Stretching”**

**By**

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## **Abstract**

Rehabilitation and recovery are some of the most important things following an injury or surgery. Proper recovery can come in a variety of forms and this critical appraisal assesses the quality and effectiveness of cupping therapy in regards to improved increase range of motion, decreased pain, and increased muscular activity compared to the traditional approach of passive stretching. The article titled “Effect of Cupping Therapy on Range of Motion, Pain Threshold, and Muscle Activity of the Hamstring Muscle Compared to Passive Stretching” was appraised for its introduction, methods, results, and discussion and proved to be a valid and reliable source.

The introduction discusses the background and importance of this critical appraisal and presents an important clinical question of whether or not cupping therapy helps to increase range of motion and decrease pain in patients with chronic joint or muscle pain. The methods reviews the search process, limitations, with inclusions/exclusions used in finding the article. The results of the appraisal examine the strengths and weaknesses found throughout the article for each of the articles sections. Although this article did have weaknesses throughout, overall it had more strengths and proved to be a trustworthy and credible source showing that cupping therapy is a smart alternative to passive stretching for rehabilitation purposes, especially for those who may not be able to passively stretch due to particular circumstances.

**Key words: Cupping, Therapy, Stretching, Range, Motion, Pain**

## **Introduction**

Cupping therapy may be an alternative method to stretching exercises for patients in regards to increasing range of motion, decreasing pain, and increasing muscular activity. This is important for people who are unable to perform stretching exercises and serves as a convenient alternative. The clinical question regarding this critical appraisal is, does cupping therapy help to increase range of motion and reduce pain in patients with chronic joint or muscle pain?

## **Methods**

The literature search process to answer the clinical question included using databases such as Google Scholar, Cumulative Index of Nursing and Allied Health Literature (CINAHL) Complete, U.S. National Library of Medicine: PubMed, and Physiotherapy Evidence Database (PEDro). Keywords used in the search process were Cupping, Therapy, Range of Motion, ROM, Pain, and surgery. Limits on the search process included showing only clinical trials, controlled clinical trials, and randomized controlled clinical trials to help narrow down the selection. Inclusions of the criteria were individuals of all age, race, ethnicity, and health to allow for larger populations. Exclusions were comparisons of cupping therapy to other modalities such as dry needling, acupuncture, and ultrasound as to allow for the focus of the experiment to be on cupping therapy. All these criteria allowed between 20-50 different articles.

The article I chose was published in the Journal of the Korean Society of Physical Medicine in the year 2017. The study was conducted within the Dept. of Physical Therapy at The Graduate School of Sahmyook University in Seoul, Korea and authors include Jae-Eun Kim, Ji-Eun Cho, Kwang-Sun Do, Seung-Yeop Lim, Hee-Joong Kim, and Jong-Eun Yim. I chose this

article because it addressed and answered all components of my clinical question and I believe there is credibility within this article. Subjects of the study were randomly assigned to groups, the testers were blinded to the intervention, and the clinicians that provided interventions were Physical Therapists with greater than three years of experience.

## **Results**

### Summary of the study

This article discussed the importance of flexibility/range of motion and how passive stretching is the most commonly used method to increase flexibility. However cupping therapy may be used as an alternative method without the potential for decreased muscular strength due to increased muscular length that occurs from passive stretching. They want to “compare the change in flexibility, muscle activity, and pain threshold in hamstring muscles with the application of cupping therapy and static stretching.” Participants in the study were young healthy males and females without pain, injury, or restricted flexibility. The subjects were randomly divided into two groups, a cupping therapy and passive stretching group, they were not blinded to the study, but the testers were. Cupping therapy with a glass cup and flame were used for the cupping technique, while straight leg raises were used for the passive stretching technique. Three tests were compared between the two groups: Range of motion test, Pain threshold test, and an EMG test. Participants showed improvements in all tests for the cupping group and the passive stretching group. However, there were no significant differences between the groups themselves. This study showed that cupping therapy has positive effects in regards to flexibility, pain thresholds, and muscular contractions. The positive effects are similar to those of

passive stretching, although cupping therapy may be more appropriate for certain populations who are unable to perform passive stretching on their own.

### Appraisal of the study introduction

Strengths of this introduction are that it gives background information about why they chose to test the hamstring muscles specifically, it discusses how cupping therapy has been used and to treat illnesses and its mechanical and chemical effects on the body. The author Jae-Eun also used many references in the introduction to help back-up and support their findings and of those references, most of them were recently published from 2010 onward and of a primary source.

A few weaknesses are that, although there have been studies to show the effects of cupping therapy, there has been a lack of studies in regards to changes in muscle length, muscle activity, and pain thresholds, so they primarily discussed cupping therapy and range of motion, but Pain threshold and muscle activity were briefly mentioned. Also, some of the references used to support their claims could not be found after searching the article and a few were over 20 years old with one being from 1989.

### Appraisal of the study methods

The methods section of this article had many strengths such as a randomized control trial and being a single blind study. There were 30 participants split into two groups, passive stretching and cupping therapy. Each group had similar sociodemographic, clinical, and prognostic characteristics at the start of the study and none of the participants left the study. Both groups were treated the same way during the study and comparisons were within and between

subjects design. The cupping therapy was clearly explained and had photos so it could be replicated, the same with the passive stretching. Range of motion, pain threshold, and EMG tests were discussed with enough detail to be replicated. Range of motion tests were measured by an electronic goniometer, muscle activity tests were measured by EMG electrodes and stated exactly where they were placed on the subjects, and pain threshold test was measured by an electronic algometer. They also used an independent t-test with a significant level alpha of .05 to identify the statistically significant data.

Although there were many strengths, some of the weaknesses were no reliability or validity of the tools to measure ROM, pain, or muscle activity were mentioned. In regards to the cupping and passive stretching intervention, they did not discuss exactly how much pressure was applied to the patient with cupping therapy with the flame heated cup, how long the cup was heated or to what amount of heat. Nor did they discuss how much force was used for passive stretching, only that it was raised to the point of “slight discomfort”.

### Appraisal of the study results

Strengths of the results included the research questions being addressed and whether or not they had significant differences between the cupping therapy vs passive stretching in regards to changes in flexibility, pain threshold, and muscle activity. They reported all outcome measures that were tested of the semitendinosus and biceps femoris for both passive stretching and cupping therapy. The tables used in the article were easy to read, understand, and presented in an organized fashion.

Weaknesses were that the results were presented in a different order than how they were presented in the introduction when stating the purpose of this study. There was no mention of

what the confidence interval was nor was there any mention of a minimal clinically important difference or the number need to treat.

### Appraisal of the study discussion

Strengths of the discussion were that the authors of the paper further indicated the meanings of the findings by comparing the results of this paper to other studies that were completed in the past and discussed the reasons as to why the results turned out as they did. They tied the study and their findings into other studies that had been completed with cupping therapy interventions along with foam rolling and heat pack interventions, and used these evidences from other studies to show why their results were positive. Most articles referenced in this paper were from 2005 to 2014 with many of them being from primary sources and credible journals. Authors of this study discussed the potential of a future study that focuses on different types of cupping techniques and range of motion evaluation that combines cupping therapy with exercise, instead of cupping therapy alone.

Some weaknesses from the discussion are that a few of the references listed were over 20 years old from before 1995 and were not of a credible journal or a primary source. A few limitations that were listed in this study were that it only examined the therapeutic effect for a single application. No assessment was performed regarding duration of application. Time for sufficient rest after pre-intervention is short due to the examination occurring in one day. Although cupping therapy was administered by experienced physical therapists, no qualitative or quantitative control was practiced to the negative pressure applied on the subjects. Lastly this was a small study with only 30 subjects.

## **Discussion**

This study was able to answer the question “Does cupping therapy help to increase range of motion and reduce pain in patients with chronic joint or muscle pain?” by showing the results of positive increases in range of motion and pain thresholds, there was even an increase in muscular strength as shown by EMG measurements. This is clinically significant because it shows cupping therapy may be a valid alternative to traditional passive stretching and may be used on patients who are unable to stretch without severe pain or due to other reasons.

Cupping therapy is a great alternative to passive stretching in the clinic and can be useful especially to those patients who are unable to be stretched due to an injury or excessive pain. More studies done that compared cupping therapy in conjunction with other modalities or exercise may even improve the quality of recovery or increase the range of motion more than just cupping therapy alone. In reference to this article there are no risks associated with the use of cupping therapy, but only positive results in regards to improved range of motion, decreased pain, and larger muscle EMG activity.

The research validity of this article provides enough confidence in cupping therapy to allow its use on future patients in the clinic. Based on the appraisal of the introduction, methods, results, and discussion the setup and implementation of this experiment are reliable, consistent, and dependable. Based upon this article and continued future learning, cupping therapy would be implemented in the intervention of future patients, specifically those who had recently undergone surgery and are limited in mobility and range of motion. Cupping therapy would allow for faster and earlier recovery, than would waiting until patients were well enough to stretch and move on their own.



In summary this treatment is reliable, credible, and a smart alternative to passive stretching for increasing range of motion, decreasing pain, and increasing muscular activity.