

## THE EFFECT OF CUPPING THERAPY ON LOW BACK PAIN LITERATURE REVIEW

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### ABSTRACT

The World Health Organisation (WHO) defined low back pain (LBP) as pain or discomfort that is localized between the costal margin and above the inferior gluteal folds, with or without leg pain. In the world, it is estimated that the prevalence of LBP ranges from 1.4% to 20.0%. In 2013, around 24.7% of workers in Indonesia had experienced occupational diseases caused by low back pain. Based on the Riset Kesehatan Dasar (RKD) survey pada in 2018, 31.4% of Indonesians have used traditional medicine, with manual treatment skill, the type of traditional medicine effort, most widely used (65.3%) and one of it is cupping therapy. Cupping (therapy) also named Hijamah. Cupping therapy is one of the alternative medicines that uses vacuum cups on the cupping point of the skin surface. Although the mechanism of action of cupping therapy is still unclear, there are several reported effects of cupping therapy including increasing skin blood flow, changing skin biomechanical properties, increasing the pain threshold, increasing local anaerobic metabolism, reducing inflammation, and modulating the immune system. cellular. According to research conducted by Volpato et al. (2019) demonstrated the effectiveness of cupping therapy in reducing pain perception and improving function in individuals with low back pain.

**Key words:** *Bekam, Cupping Therapy, Hijamah, Low Back Pain, Lumbago.*

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## 1. INTRODUCTION

The World Health Organisation (WHO) defined low back pain (LBP) as pain or discomfort that is localized between the costal margin and above the inferior gluteal folds, with or without leg pain. Low back pain is a symptom and not a diagnosis. An estimated 65% to 80% of the population will experience low back pain during their lifetime. The prevalence of low back pain increases with age up to 60-65 years, which then decreases. Low back pain is the main cause of activity limitation for patients under 45 years old. There are more women experiencing low back pain than men (Dixit, 2017).

In the world, it is estimated that the prevalence of low back pain ranges from 1.4% to 20.0%. In western countries, it is estimated that the costs due low back pain are around 1% and 2% of the gross national product (Šagát et al., 2020). In 2013, around 24.7% of workers in Indonesia had experienced occupational diseases caused by low back pain (Badan Penelitian dan Pengembangan Kesehatan, 2013).

There are a variety of non-invasive treatment options for both radicular and non radicular low back pain, including pharmacological and nonpharmacological interventions (Qaseem, A., Wilt, T. J., McLean, R. M., & Forciea, 2017).

Based on the Riset Kesehatan Dasar (RKD) survey in 2013, 30.4% of Indonesian families used traditional medicine. In 2018 according to the RKD, 31.4% of Indonesians have used traditional medicine, and 98.5% have used "pelayanan penyehat Indonesia". Manual treatment skill, the type of traditional medicine effort, most widely used (65.3%) which includes cupping (Risniati et al., 2019).

Cupping (therapy) also named Hijamah. Cupping therapy is one of the alternative medicines that uses vacuum cups on the cupping point of the skin surface. Al-Hijamah comes from the word Al-Haj that means suck. Cupping development has grown rapidly in the world, not only in Asia, but even in western countries such as America and Europe (Wicaksono & Larasati, 2016).

Anderson in 1985 wrote a book entitled "100 Diseases Treated by Cupping Method". And cupping therapy has been medically proven to have a good impact on various diseases, including migraine, carpal tunnel syndrome, hypertension, rheumatoid arthritis, migraine, and others (Wicaksono & Larasati, 2016). According to research, cupping can induce a relaxation response in low back pain caused by vasospasm of blood vessels and muscle spasm. This makes cupping effective for reducing pain, especially mild pain scales (Lestari, 2019).

Because of it, this paper aims to determine the mechanism and impact of cupping therapy on low back pain.

## 2. METHOD

The research method used is literature review with a descriptive approach. Search was conducted through google scholar, Pubmed, and Science Direct. The keywords used are "bekam", "cupping therapy", "hijamah", "low back pain", "lumbago".

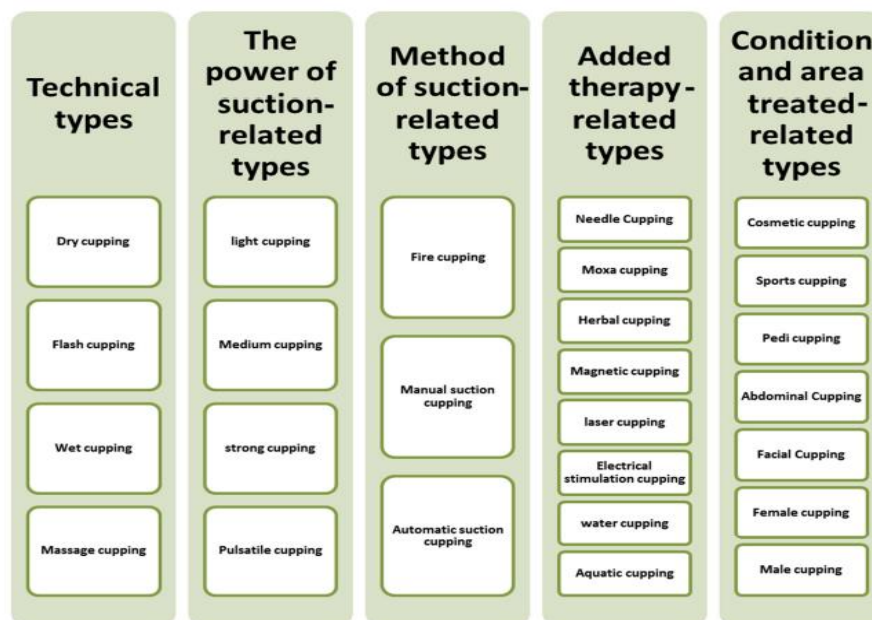
## 3. DISCUSSION

### Cupping Therapy

Cupping Therapy is an ancient therapeutic technique that is performed by placing cups on the surface of the skin on a certain part of the body and creating a subatmospheric pressure, either by heat or by suction in the cupping process (Aboushanab & AlSanad, 2018).

The purpose of cupping therapy is the resulting suction effect, such as increasing blood circulation and improving the immune system. It has been reported that the effect of cupping is to increase blood flow to the skin, change the biochemical properties of the skin, increase the pain threshold, stimulate local anaerobic metabolism, reduce inflammatory reactions, and trigger an increase in the cellular immune system (Aboushanab & AlSanad, 2018). Cup suction in cupping therapy will generate negative pressure.

Cupping therapy is classified into several types which can be seen in figure 1.



**Figure 1. Cupping Therapy Classification**  
(Aboushanab & AlSanad, 2018)

in wet cupping, before placing the cup, the skin will be pricked first using a needle or using a small scalpel (minor surgery). In dry cupping, before placing the cup on the surface of the skin, first heat the air in the cup by putting the fire in the cup with a cotton ball and let it sit for a few seconds, then remove the fire from the cup and the cup is placed on the skin surface. The cup that has been warmed then pressed against the surface of the skin so that the skin will be drawn into the cup due to the negative pressure when the air starts to cool. Suction can be done by hand pump, electric pump, or with a silicone cup that is suction done by hand (Lowe, 2017).

The negative pressure generated due to compression on the skin in cupping therapy causes distraction of the skin, and vasodilatation of the blood vessels under the skin that cause the skin to look hyperemic. The amount of suction by the cup will increase blood flow, which is one of the cupping therapy mechanisms in reducing local pain (Lowe, 2017).

Cupping therapy is indicated for several diseases such as low back pain, neck and shoulder pain, headaches and migraines, knee pain, facial paralysis, brachialgia, Carpal tunnel syndrome (CTS), hypertension, diabetes mellitus, rheumatoid arthritis, and asthma. The location of cupping therapy is chosen according to the location of the disease being treated. Also, cupping therapy has contraindications, namely cupping therapy should not be applied directly to veins, arteries, nerves, inflamed skin or skin with lesions, lymph nodes, body parts with holes, body parts with fractures, varicose veins, and deep vein thrombosis (Aboushanab & AlSanad, 2018).

One indication of cupping therapy is to reduce pain. There are three theories regarding the cupping therapy mechanism in reducing pain, namely pain gate theory (PGT), diffuse noxious inhibitory controls theory, and reflex zone theory. The pain gate theory explains the transmission of pain to the brain and explains how pain signals from the brain are carried to the efferent parts that experience pain. The diffuse noxious inhibitory controls theory explains how cupping therapy inhibits the activity of spinal nociceptive nerve fibers. Whereas the reflex zone theory explains the cupping therapy mechanism in certain areas such as the median nerve area which aims to overcome carpal tunnel syndrome (Al-Surgical, et al., 2018).

Cupping therapy has side effects that can be prevented and side effects that cannot be prevented. Side effects that can be prevented include scar formation, heat, bullae and abscess formation, infection, itching, anemia, and panniculitis. While side effects that cannot be prevented are the formation of the Koebner phenomenon, headaches, dizziness, fatigue, vasovagal attacks, nausea, and insomnia (Aboushanab & AlSanad, 2018).

### **Low Back Pain**

Low back pain is pain that is felt in the lower back between the lower ribs and lumbosacral angles (Putri & Hasina, 2020). Broadly speaking, there are 3 sources of pain in low back pain, namely pain in the lumbosacral axis (L1-L5 and S1-sacroccygeal junction), radicular pain, and referred pain (Rizki & Saftarina, 2020).

Soft tissue disorders (ligament injury, spasm, muscle fatigue) are the most common causes of low back pain. other causes can include vertebral fractures, infections, and tumors. Low back pain can also be caused by a large load on the spine due to excess body weight (Nugraha, Respati, & Rachmi, 2020).

Age and occupation are the most influencing risk factors for low back pain. Low back pain will be more at risk if a person gets older because of degeneration of the intervertebral discs. Low back pain will also be at risk if a person's work is heavy and causes overloading of the spinal ability (Rizki & Saftarina, 2020). Also, position in work affects back pain such as sitting in the wrong position or sitting for too long (Chandra & Indra, 2020). Low back pain is more common in women because women have weak muscle physiology compared to men and women have menstrual cycles so they are more sensitive to pain (Nugraha, Respati, & Rachmi, 2020).

Low back pain is diagnosed by taking anamnesis, physical examination, and investigations. Things that need to be asked in the history are pain duration, pain location, pain distribution, pain severity, pain sensation, factors that alleviate and aggravate pain, history of medication, past medical history, family history. After doing anamnesis proceed with a physical examination. The examinations are carried out in the form of a general physical examination (vital signs, general condition, psychological condition) and a special physical examination. There are several examinations in a special physical examination, namely the Patrick's test which aims to evaluate the pelvic and sacroiliac pathology, the straight leg raise test aims to assess the tension in the lumbar nerve branch, and the Gaenslen's test which is performed with maximum flexion on one side of the hip joint and the other (Rizki & Saftarina, 2020).

Investigations for low back pain include laboratory tests if there is a suspicion that the cause of low back pain is inflammation, infection, or a tumor. If you suspect a fracture or instability of the spine, a radiological examination can be performed. To identify more significant and clear tumors, spondylitis, and osteomyelitis, MRI examinations and CT-scans can be performed. Usually, MRI and CT-Scan will be done if low back pain cannot be relieved after 4 to 5 weeks (Popescu & Lee, 2019).

Low back pain can be managed pharmacologically and non-pharmacologically. Pharmacological therapy in the form of non-steroidal anti-inflammatory drugs (NSAIDs) (Rizki & Saftarina, 2020). NSAIDs work by inhibiting the COX enzyme so that prostaglandins are not formed and will eliminate pain, but NSAIDs have side effects, namely gastric ulcers, if left for a long time it can result in gastric perforation (Rizki & Saftarina, 2020). while non-pharmacological therapies are skin massage, immobilization, distraction, relaxation, diathermy, and cupping therapy (Nugraha, Respati, & Rachmi, 2020).

### **Cupping Mechanism**

The mechanism of action of cupping therapy is still unclear. The main proposed mechanism of action is the effect of subatmosphere pressure suction, increasing peripheral blood circulation, and enhancing immunity. The reported effects of cupping therapy include increasing skin blood flow, changing the skin's biomechanical properties, increasing the pain threshold, increasing local anaerobic metabolism, reducing inflammation, and modulating the cellular immune system (Aboushanab & Alsanad, 2018).

Many theories explain the mechanism of action of cupping. Research by Guo et al. about the immunomodulation theory suggests that cupping and acupuncture have the same mechanism of action. The immunomodulation theory states that changing the



microenvironment by stimulating the skin can turn into biological signals and activate the neuroendocrine-immune system (Aboushanab & Alsanad, 2018).

Research by Shaban and Rarvalia proposes a genetic theory, which states that skin mechanical stress (due to subatmosphere pressure) and local anaerobic metabolism (partial loss of O<sub>2</sub>), during cupping suckling can produce physiological and mechanical signals that can activate or inhibit gene expression. In wet cupping therapy, superficial scarification can activate wound healing mechanisms and gene expression programs. Modulation of gene expression has been reported in various acupuncture studies. Thus, there is no clearly identified mechanism of action related to cupping therapy. Clinical studies in the field of the working mechanism of cupping therapy are highly recommended (Aboushanab & Alsanad, 2018).

In the systematic review conducted by Risniati (2019), it is stated that generally, studies show good results related to the effectiveness of cupping in reducing pain. However, there is a shortage of finding journals with a robust methodology, so it is still difficult to argue that cupping is good for pain relief with current evidence. The theory of the working mechanism of cupping to reduce pain already exists, which assumes that cupping is useful for management according to the TCM (Traditional Chinese Medicine) theory of energy balance, pain is thought to occur due to impaired blood circulation and obstruction of inflammatory extravasation (out of body fluids such as blood. ) from the network. Another theory is that cupping can affect the autonomic nervous system and help reduce pain. These theories have not been supported by the results of scientific research (Risniati et al., 2019)

The Taibah theory states that the pain-reducing effect of cupping can result from changes in the biomechanical properties of the skin as described by the pain-gate theory, diffuse noxious inhibitory controls, reflex zone theory. ). Transmission of pain according to the three theories occurs in the spinal cord. In the pain gate theory, it is stated that pain is influenced by a balance of factors that affect and inhibit the spinal tissue in the somatosensory system. In the control theory of harmful toxic inhibition, it is stated that opioids produced in the body can initiate inhibition of the pain pathways in the supraspinal (Risniati et al., 2019)

Research conducted by Volpato (2019), said the potential effects of cupping suggested by Musial et al., Generally propose three potential mechanisms of action: (1) pain reduction can be caused by skin deformation that can stimulate A $\beta$  sensory nerve fibers in areas of painful skin. , (2) manipulation can stimulate receptive field inhibition in multi-receptive dorsal horn neurons, and (3) arrangement provides relief from physical and emotional tension and social comfort effects. Cupping affects impaired neuro-vegetative function and diseases of internal organs and can affect the immune system in two ways, namely: first by irritating the immune system, causing local inflammation, and then activating the complement system, and increasing IFN and TNF levels; or secondly by increasing lymph flow, which plays an important role in protein biosynthesis (Volpato et al., 2019).

The application of soft tissue manipulation in treating lumbar muscle strain can effectively relieve the patient's lumbar muscle spasm, help the patient correct lumbar scoliosis, and process the spinous skew so that the patient's lumbar segment returns to normal. Through hits and strikes, tendon regulation, and other soft tissue manipulation, adhesions to deep tissue can be loosened so that the tissue fibers can restore their

activity. Besides, soft tissue manipulation can not only improve blood circulation in the lumbar muscles but can also increase metabolism and speed up tissue recovery. Oblique lateral traction can relieve the spasm of the upper latissimus and erector spinae with a significant effect. Besides, the combination of soft tissue manipulation therapy and exercise can help patients relieve pain, relieve muscle spasm, improve lumbar muscle flexibility, balance, and coordination (Li et al., 2017).

The process of cupping stimulates the release of endogenous opioid peptides such as endorphins which ultimately reduce pain. The result of pain stimulation in the periaqueductal gray matter, the specific nuclei in the medulla, and the reticular formation are endogenous opiates. From the results, the three regions will form an analgesic system in the body, known as the descending analgesic pathway. Stimulation of periaqueductal gray matter will be responded to by specific nuclei in the medulla and reticular formation. Then the impulse will be continued through inhibitory interneurons in the dorsal horn of the spinal cord, this is where endogenous opiates such as endorphins, enkephalins, and dynorphins are produced which will eventually be released to the afferent nerve endings. This endogenous opiate will bind to opiate receptors and will inhibit the release of substance P (pain-related pathway) so that this will inhibit the transition of pain impulses along the ascending pain pathway (Putri & Hasina, 2020).

The tactile effect on cupping can stimulate large A $\beta$ -type fibers that originate from tactile receptors in the periphery. This receptor stimulation suppresses the sending of pain signals from the same area of the body. This occurs due to localized lateral inhibition of the spinal cord. Besides, the tactile stimulation that arises can induce the release of the hormone  $\beta$ -endorphin.  $\beta$ -Endorphins play a role in the inactivation of pain pathways by causing presynaptic and post-synaptic barriers to type C and type A pain fibers (Putri & Hasina, 2020).

The point of cupping can cause the pain gate to increase the frequency of the pain impulses, thus leading to closing the gate and reducing pain. Endorphins are released due to mild pain from suction and incision of the cupping device. Skin stimulation can stimulate the transmission of larger and faster A $\beta$  sensory nerve fibers. This process decreases the transmission of pain through the small-diameter C and A $\delta$  fibers so that the synaptic gate closes the transmission of pain impulses (Putri & Hasina, 2020).

The effect of cupping therapy in reducing pain is reported to be equivalent to that of an analgesic. In low back pain, ischemia occurs which gives rise to inflammatory and pain mediators. This mediator will stimulate the nerve fibers in pain, causing pain. When ischemia occurs, the accumulation of lactic acid in the tissues increases as a consequence of anaerobic metabolism. Cupping therapy will remove inflammatory and pain mediators from the body, resulting in decreased stimulation of the pain nerve fibers. Also, there is the release of the hormone  $\beta$ -endorphin which plays a role in reducing pain. (Putri & Hasina, 2020)

Research results by Li et al. (2017), stated that applying combination sports therapy and soft tissue manipulation for patients with lumbar muscle tension not only effectively helps patients relieve pain, increases joint range of motion, but can also improve the outcome of rehabilitation in patients (Li et al., 2017).

From research conducted by Volpato et al. (2019), tested the hypothesis that one cupping session would be sufficient to temporarily reduce pain and improve disability in individuals with low back pain. The result is an effective cupping session to reduce the

intensity of temporary pain and improve disability. However, one cupping session does not increase the pain threshold or change skin temperature. The patient experienced a decrease in BPI (Brief Pain Inventory) after one cupping session. This is probably due to inhibition of pain sensory afferents (Volpato et al., 2019).

The results of research conducted by Volpato et al. (2019) demonstrated the effectiveness of cupping therapy in reducing pain perception and improving function in individuals with low back pain.

#### 4. CONCLUSION

Based on the explanation above, it is concluded that cupping therapy, which also called hijamah, is effective in reducing pain perception and improving function in individual with low back pain. The mechanism for reducing pain in cupping therapy can be caused by several mechanisms, skin deformation which then stimulates A $\beta$  sensory nerve fibers in the painful skin area, as well as inhibition of receptive fields in multireceptive dorsal horn neurons.

Meskipun demikian, penelitian mengenai pemanfaatan terapi bekam terhadap nyeri punggung bawah masih cukup terbatas, sehingga diperlukan penelitian lebih lanjut untuk mendapatkan bukti yang lebih baik dan meyakinkan.

However, there is still quite limited evidence about the effectiveness of cupping therapy on low back pain cases. Further studies are necessary to confirm these results and to get more convincing evidence.

#### REFERENCE

- Aboushanab, T. S., & Alsanad, S. (2018). Cupping Therapy : An Overview from a Modern Medicine Perspective. *Journal of Acupuncture and Meridian Studies*, 2(1), 1–5.
- Al-Bedah, A. M., Elsubai, I. S., Qureshi, N. A., Aboushanab, T. S., Ali, G. I., El-Olemy, A. T., *et al.* (2018). The Medical Perspective of Cupping Therapy; Effect and Mechanism of Action. *Journal of Traditional and Complementary Medicine*.
- Chandra, A., & Indra, L. (2020). Hubungan Nyeri Punggung Bawah dengan Duduk Lama: Sebuah Tinjauan Literatur Naratif.
- Dixit, R. (2017). Low Back Pain. In *Kelley and Firestein's Textbook of Rheumatology (Tenth Edition)* (p. 696).
- Lestari, N. K. Y. . N. E. S. (2019). *Pengaruh terapi bekam kering terhadap keluhan nyeri punggung bawah pada pengerajin wanci di desa bresela kecamatan payangan*. 3(2).
- Li, H., Zhang, H., Liu, S., Gai, D., Lu, Q., Gan, H., ... Qi, W. (2017). Rehabilitation Effect of Exercise with Soft Tissue Manipulation in Patients with Lumbar Muscle Strain. *Nigerian Journal of Clinical Practice*, 20(5), 629–633.
- Lowe, D. T. (2017). Cupping Therapy: An Analysis of the Effect of Suction on Skin and the Possible Influence on Human Health.
- Nugraha, F. R., Respati, T., & Rachmi, A. (2020). Faktor Risiko Nyeri Punggung Bawah pada Ibu Rumah Tangga. *Jurnal Integrasi Kesehatan dan Sains (JKS)* .
- Popescu, A., & Lee, H. (2019). Neck Pain and Lower Back Pain.
- Putri, A. R., & Hasina, N. S. (2020). Perbedaan Terapi Bekam dan Kompres Hangat terhadap Tingkat Nyeri Punggung Bawah pada Lansia.



- Qaseem, A., Wilt, T. J., McLean, R. M., & Forciea, M. A. (2017). Noninvasive treatments for acute, subacute, and chronic low back pain: a clinical practice guideline from the American College of Physicians. *Annals of Internal Medicine*, 166(7), 514–530.
- Risniati, Y., Afrilia, A. R., Lestari, T. W., & Siswoyo, H. (2019). Pelayanan Kesehatan Tradisional Bekam : Kajian Mekanisme , Keamanan dan Manfaat Traditional Cupping Therapy : A Review of Mechanism , Safety and Benefits. *Jurnal Penelitian Dan Pengembangan Pelayanan Kesehatan*, 3(3), 212–225.
- Rizki, M. M., & Saftarina, F. (2020). Tatalaksana Medikamentosa pada Low Back Pain Kronis.
- Šagát, P., Bartík, P., González, P. P., Tohănean, D. I., & Knjaz, D. (2020). Impact of COVID-19 quarantine on low back pain intensity, prevalence, and associated risk factors among adult citizens residing in riyadh (Saudi Arabia): A cross-sectional study. *International Journal of Environmental Research and Public Health*, 17(19), 1–13.
- Volpato, M. P., Cristina, I., Breda, A., De, R. C., Moura, C. D. C., Ferreira, L. L., ... Silva, T. (2019). Single Cupping Therapy Session Improves Pain, Sleep And Disability In Patients With Nonspecific Chronic Low Back Pain. *Journal of Acupuncture and Meridian Studies*.
- Wicaksono, T. D., & Larasati, T. A. (2016). Mekanisme Bekam sebagai Terapi Alternatif dalam Menurunkan Hipertensi Mechanism of Wet Cuppingas Alternative Therapy in Lowering Hypertension. *Majority*, 5(April), 112–119.