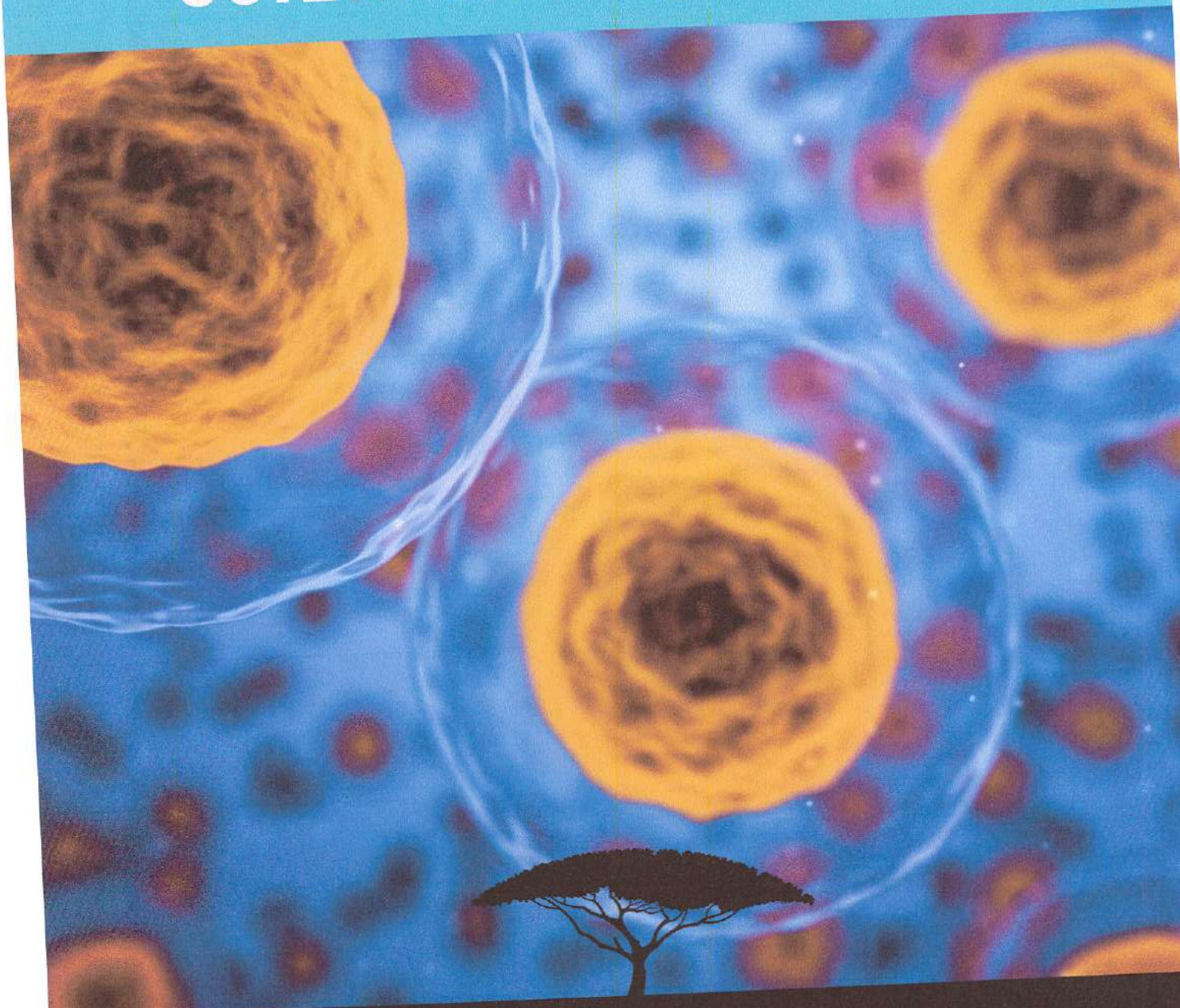
WWW.IJSCIA.COM

Volume 2 Issue 6: Nov-Dec 2021

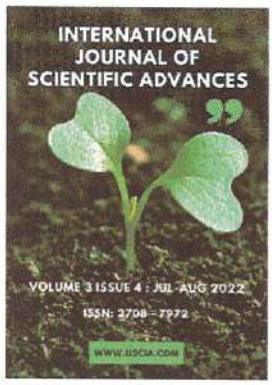
INTERNATIONAL JOURNAL OF SCIENTIFIC ADVANCES



WWW.IJSCIA.COM

VOLUME 2 | ISSUE 6 : NOV-DEC 2021

CURRENT ISSUE



VOLUME 3 | ISSUE 4 : JUL - AUG 2022

Archives

- Current Issue
- Past Issues
- Call for Papers
- Article Processing Charges
- Sample Paper Format
- Copyright Form

Call for papers

- Submit Papers Online

Volume 3 | Issue 4

Last date: 31/08/2022

Vaping and Suicidality Among Adolescents: A Possible Link?

Hafiz Olatunde MD, MPH[1*]; Alexandra Urhi MD[2]; Okelue Edwards Okobi MD, MSc[3]; Joseph Ikekwere MD, MPH[4]

PUBLISHED: 3 Nov 2021 (929-930)

https://doi.org/10.51542/ijscia.v2i6.1

Full Text

PDF

Food Control in Uganda: Gaps and Opportunities in the Rice Value Chain

Leatitiah Namubirua[1*], Denis Maleb[2] and Yusuf Byenkya Byaruhangab[2]

PUBLISHED: 3 Nov 2021 (931-940)

https://doi.org/10.51542/ijscia.v2i6.2

Full Text

PDF

The possibility of solidarity or broken relationship between social relatives and women prisoners in Tunisia

Maissène BEN ARAB[1*], Ali ELLOUMI[2]

PUBLISHED: 11 Nov 2021 (941-950)

https://doi.org/10.51542/ijscia.v2i6.3

Full Text

PDF

Ludwig's Angina: Clinical Profile and Microbiology with Antibiotic Resistance and Sensitivity at Referral Hospital

Muhamad Saifuddin*, Sahudi

PUBLISHED: 12 Nov 2021 (951-955)

https://doi.org/10.51542/ijscia.v2i6.4

Full Text

PDF

Schwannoma on Cervical Cervices (C2 & C3): A Case Report

Djoko Supriyandono*, Marjono Dwi Wibowo

PUBLISHED: 13 Nov 2021 (956-958)

https://doi.org/10.51542/ijscia.v2i6.5

Full Text

PDF

Case Report: Residive Ameloblastoma of Mandible

Kania Difa Parama[1], Sunarto Reksoprawiro[2*]

PUBLISHED: 16 Nov 2021 (959-963)

https://doi.org/10.51542/ijscia.v2i6.6

Full Text

PDF

The Prevalence of Rotavirus and Adenovirus in Children 0-5 years old Suffering from Acute Diarrhea in the University Hospital Center of Mother and Child (UHC-MC) in N'Djamena, Chad

Fombotioh Ndifor[1], Abakar Idriss Lawane[1*], Nadjioroum Ngam-Asra[1, 2], Mouktar Abaya Adoum[2], Brahim Boy Otchom[2] and Hamit Mahamat Alio[1]

PUBLISHED: 26 Nov 2021 (964-968)

https://doi.org/10.51542/ijscia.v2i6.7

Full Text

PDF

Evaluating the Relationships Between Demographic, Level of Drug Use and Self Esteem Among Female Students in Kaduna, Nigeria

Farouk Ndamadu Musa[1*] , Gladys John[2] , Abdul Garba Sadiq[3]

PUBLISHED: 5 Dec 2021 (969-975)

https://doi.org/10.51542/ijscia.v2i6.8

Full Text

PDF

A Method for Automatic Measurement of Oil Flow Rate

Rzayev Ab.G.[1], Asadova R.Sh.[1*], Gurbanov Z.G.[2]

PUBLISHED: 7 Dec 2021 (976-978)

https://doi.org/10.51542/ijscia.v2i6.9

Full Text

PDF

Comorbidities as Risk Factors for Mortality in COVID-19 Acute Respiratory Distress Syndrome Adult Patients: A Single-Center Retrospective Study

Putra Kurnia Nugraha[1], Edward Kusuma[2*], Soni Sunarso Sulistiawan[3], Teuku Aswin Husain[4]

PUBLISHED: 7 Dec 2021 (979-984)

https://doi.org/10.51542/ijscia.v2i6.10

Full Text

PDF

Strength Difficulties Questionnaire (SDQ) Profile of Children with Sensorineural Hearing Loss: A Descriptive Study

Jeffrey Agung*, Yunias Setiawati, Nining Febryana

PUBLISHED: 11 Dec 2021 (985-989)

https://doi.org/10.51542/ijscia.v2i6.11

Full Text

PDF

Cupping as An Effective Complementary Therapy to Reduce Chronic Low Back Pain in Medical Rehabilitation Subdivision Perkebunan Hospital Jember

Debie Saktyana Iriawandani[1], Hanik Badriyah Hidayati[2*], Wahyudi Widada[3], Zuhrotul Eka Yulis[3], Azham Purwandhono[4]

PUBLISHED: 13 Dec 2021 (990-994)

https://doi.org/10.51542/ijscia.v2i6.12

Full Text

PDF

Lived Experiences of Students in Remote Area in The New Normal

Virginia S. Ariza, Ph. D[1*], Junelle S. Ariza, LPT[2]

PUBLISHED: 14 Dec 2021 (995-999)

https://doi.org/10.51542/ijscia.v2i6.13

Full Text

PDF

The Tendency for Adolescent Girls to Feel Comfortable in Communicating About Puberty and Reproductive Health with Their Families: A Systematic Review

Eighty Mardiyan Kurniawati[1*], Ernawati[1], Nur Anisah Rahmawati[2], Cahyani Tiara Safitri[3], Safa Salsabilla[3]

PUBLISHED: 17 Dec 2021 (1000-1004)

https://doi.org/10.51542/ijscia.v2i6.14

Full Text

PDF

Toxicological Risk Associated with Consumption of Rice Sold in Uganda

Leatitiah Namubiru[1*], Denis Male[2], Ivan Mukisa Muzira[2] and Yusuf Byenkya Byaruhanga[2]

PUBLISHED: 17 Dec 2021 (1005-1015)

https://doi.org/10.51542/ijscia.v2i6.15

Full Text

PDF

Notes: Time As An Energy Wave

Anthony Maccini

PUBLISHED: 18 Dec 2021 (1016-1017)

https://doi.org/10.51542/ijscia.v2i6.16

Full Text

PDF

Effect of BMI on Foot Dimensions in Different Weight Bearing Conditions of Obokwe Indigenes in Imo State

Bob-Manuel, Ibinabo. Fubara[1*], Ogoun, Timipa Richard[2]

PUBLISHED: 19 Dec 2021 (1018-1023)

https://doi.org/10.51542/ijscia.v2i6.17

Full Text

PDF

Juveniles Justice

Phillip D. Clingan

PUBLISHED: 28 Dec 2021 (1024-1029)

https://doi.org/10.51542/ijscia.v2i6.18

Full Text

PDF

A Brief Literature Review of Juvenile Statistics, A Comparative Analysis of Current Racial Differences Within the Criminal Justice System

Phillip D. Clingan

PUBLISHED: 28 Dec 2021 (1030-1032)

https://doi.org/10.51542/ijscia.v2i6.19

Full Text

PDF

Morphological Variability and Storage Root Productivity of Some Sweet Potato (Ipomoea Batatas (L.) Lam) Genotypes in An Ultisol

Gamaliel I. Harry, Joseph I. Ulasi*

PUBLISHED: 29 Dec 2021 (1033-1041)

https://doi.org/10.51542/ijscia.v2i6.20

Full Text

PDF

EDITORIAL BOARD

EDITORIAL MEMBERS

IJSCIA

International Journal of Scientific Advances
ISSN: 2708-7972
Volume: 2 | Issue: 6 | Nov - Dec 2021 Available Online: www.ijscia.com
DOI: 10.51542/ijscia.v2i6.12

Cupping as An Effective Complementary Therapy to Reduce Chronic Low Back Pain in Medical Rehabilitation Subdivision Perkebunan Hospital Jember

Debie Saktyana Iriawandani[1], Hanik Badriyah Hidayati[2*], Wahyudi Widada[3], Zuhrotul Eka Yulis[3], Azham Purwandhono[4]

[1]Faculty of Health Science, Universitas Muhammadiyah Jember, East Java, Indonesia

[2]Department of Neurology, Faculty of Medicine, Universitas Airlangga / dr. Soetomo General Hospital Surabaya, East Java, Indonesia

[3]Lecturer, Faculty of Health Science, Universitas Muhammadiyah Jember, East Java, Indonesia

[4]Faculty of Medicine, University of Jember / dr. Soetomo General Hospital Surabaya, East Java, Indonesia

*Corresponding author details: Hanik Badriyah Hidayati; hanikhidayati@yahoo.com

ABSTRACT

Pain, especially chronic pain lasts prolonged weariness, usually persistent and recurring. Thus, pain is often found in patients with Chronic Low Back Pain (CLBP). One alternative treatment to reduce chronic low back pain is cupping therapy. The main principle of cupping therapy is using of negative pressure to attract toxin substances, free radicals in the blood, inflammation cells, metabolic waste or Causative Pathological Substances (CPS), scarification in the form of skin removal and removing CPS. The aim of this study was to analyze the effect of cupping therapy on pain intensity of CLBP patients in Medical Rehabilitation Sub Division Perkebunan Hospital Jember. The design in this study was quasi experiment nonequivalent control group. The population was all CLBP patients who underwent physiotherapy in the physiotherapy room at Perkebunan Hospital Jember. The sample consisted of 34 respondents (17 respondents in the intervention group and 17 respondents in the control group) using purposive sampling. A cupping therapy was done once in the intervention group. Statistical test results using Wilcoxon obtained p value 0.000 with a value of $\alpha < 0.05$, so it can be concluded that there is an effect of cupping therapy on pain intensity of CLBP patients in Medical Rehabilitation Sub Division Perkebunan Hospital Jember. Cupping Therapy can be used as a complementary or alternative therapy to reduce pain of CLBP patients at Perkebunan Hospital Jember.

Abbreviations: CLBP – Chronic Low Back Pain; CPS – Causative Pathological Substances; LBP – Low Back Pain; NPRS - Numeric Pain Rating Scale; SWD - Short Wave Diathermy; TENS - Transcutaneous Electrical Nerve Stimulation; YLD - Years Lived with Disability

Keywords: chronic low back pain; cupping therapy; pain intensity

INTRODUCTION

Low Back Pain (LBP) is a pain that felt in the lower back area. LBP could be local, radicular or both and usually felt between the corner of the lower ribs to the fold of the lower buttocks, specifically in the lumbar region. This pain is often accompanied by radiating sensation down the leg and the quality is commonly hot, shaking, tingling, or stabbing. Pain is a crucial problem since it can interfere daily activities[1].

According to its clinical course, LBP divided into two types, acute and chronic low back pain. Acute low back pain is characterized by pain sensation attacked immediately and last for days to several weeks and usually disappear on its own. Chronic low back pain (CLBP) lasts for more than three months and the onset of this pain usually harmful, slowly recovered, and could be relapse at any time. Additional symptoms such as depression, anxiety, stiffness and sleep disturbance often occur and will disrupt daily activities if left untreated. Osteoarthritis, rheumatoid arthritis, intervertebral disc degeneration, and tumour might also be the etiology[2,3].

In 2010, Global Burden of Diseases reported LBP as the largest contributor to global disability over 291 disease studied as measured by years lived with disability (YLD). LBP also reported as the third most common disease of outpatient installation in Dr. Soetomo General Hospital [4]. In Perkebunan Hospital Jember alone, there were 16.523 patients came with pain complaints, 682 of them had LBP with CLBP become the most complaint. It is reported that chronic pain burden high costs and causes problems in several aspects, including health, social life, spiritual and economic problems[5].

A huge number of CLBP patients returned to several hospitals or health clinics indicated the previous treatment was less than optimal. Moreover, most patient received pharmacological treatment including non-steroidal anti-inflammatory drugs, steroids, or opioids can not tolerate the adverse effects and eventually stop taking the drug[6]. Mostly, people tried to find an alternative treatment such as acupuncture, hypnotherapy, and massage that effective, economical, and has minimal adverse effects to reduce pain. However, to the best of our knowledge, there is no studied showed that these therapy is superior to standard therapy.

Cupping is one of the oldest therapies in the world. Historical evidence shows cupping has been done since 3000 BC. Cupping become the preferred therapies not only to cure but also to prevent disease[7]. Previous study revealed that 309 patients with chronic pain received cupping therapy at King Abdul Aziz University Hospital felt that the pain was reduced and their quality of life improved[8].

This study aims to investigate the effect of cupping therapy on pain intensity of CLBP patients at Medical Rehabilitation division, Perkebunan Hospital Jember. Hopefully, this study could serve an evidence regarding cupping as an alternative intervention used by health care workers to reduce pain intensity of CLBP patients.

METHODS

A quasi experiment with nonequivalent control group were used a research design in this study. This design is similar to pretest - post-test control group design, but the experimental and the control group were not randomly selected. The study was conducted from October 18th to November 10th 2019 at Medical Rehabilitation division, Perkebunan Hospital Jember.

Non probability sampling with purposive sampling technique was used as the sampling method. The sample is determined by selecting among population according to researcher intention so that the sample can represent the characteristics of the population. Samples, both control and intervention groups that meet the inclusion criteria will be measured the pain intensity using Numeric Pain Rating Scale (NPRS) and structured questionnaire before and after cupping therapy. Data analysis using univariate test was conducted to identify age, sex, and occupation variables.

Bivariate analysis was also conducted to analyse the effect of cupping therapy on pain intensity in CLBP patients using Wilcoxon test with a significance level of $\alpha = 0.05$ or p value <0.05.

RESULT AND DISCUSSIONS

There are 34 respondents divided into control and intervention group in this study. Table 1 showed most of the patients in the intervention group were in the range 46-55 years, as many as 9 patients (52.9%), while in the control group most were in the range of 56-65 years, as many as 8 (47.1%).

TABLE 1: Age Distribution of CLBP Patients

Age (year)	Intervention		Control	
	(n)	%	(n)	%
< 25	0	0	0	0
26-35	1	5,9	1	5,9
36-45	1	5,9	4	23,5
46-55	9	52,9	4	23,5
56-65	6	35,3	8	47,1
Total	**17**	**100**	**17**	**100**

CLBP incidences increased as well as age in both groups. This is in line with a previous study that showed CLBP prevalence occurs at the age 45-54 years. This happens because the strength and endurance of the muscles begin to weaken as a person gets older[9].

TABLE 2: Sex Distribution of CLBP Patients

Sex	Intervention		Control	
	(n)	%	(n)	%
Male	5	29,4	5	29,4
Female	12	70,6	12	70,6
Total	**17**	**100**	**17**	**100**

The majority of patients in the intervention and control groups were female, as many as 12 people (70.6%). Similar study stated that female experienced LBP more often than male. The role of estrogen that decrease in menopause female patients affect bone density and allows LBP to occur [10].

TABLE 3: Occupation of CLBP Patients

Occupation	Intervention		Control	
	(n)	%	(fn)	%
Employee	2	11,8	5	29,4
House wife	10	58,8	9	52,9
Household assistant	1	5,9	0	0
Entrepreneur	2	11,8	0	0
Retired	2	11,8	3	17,6
Total	**17**	**100**	**17**	**100**

Based on the table above, most of patients in both groups were housewives, namely 10 patients (58.8%) in the intervention group and 9 patients (52.9%) in the control group. Study explains that body posture also affects the occurrence of LBP. Posture is the relative position of a certain body part when working which determined by body size, work area design, work equipment and the size of other equipment used while working.

Not suitable posture can put the risk of injury to musculosceletal system. It is also conveyed by Tarwaka , 2014 that non-ergonomic work attitude can cause fatigue and injury to muscles [11,12].

TABLE 4: Pain Intensity (NPRS) Distribution in Pre and Post intervention group (n = 17)

Variable	Mean	Min	Max	SD
Pre cupping	5,5	3	10	1,8
Post cupping	2,9	0	6	1,7

The average pain intensity / Numeric Pain Rating Scale (NPRS) result of 17 CLBP patients before cupping therapy intervention was 5.5 with a minimum value of 3 and a maximum value of 10. Whereas, the results after cupping therapy treatment obtained an average value of 2,9 with a minimum value of 0 and a maximum value of 6.

TABLE 5: Pain Intensity (NPRS) Distribution in Pre and Post control group (n = 17)

Variable	Mean	Min.	Max.	SD
Pre cupping	4,8	3	8	1,1
Post cupping	3,6	1	7	1,5

As a comparison, 17 CLBP patients before physiotherapy (SWD and TENS), the average pain intensity value is 4.8 with a minimum value of 3 and a maximum value of 8. While the results after physiotherapy (SWD and TENS), the average pain intensity was 3.6 with a minimum value of 1 and a maximum value of 7

TABLE 6: *Wilcoxon* Test Result on Pain Intensity in both groups

Group	Pain Intensity	p value
Intervention	Pretest Postest	0,000
Control	Pretest Postest	0,003

Based on table 6, the Wilcoxon test result in the intervention group showed a significant difference (p = 0.000) in pain intensity before and after cupping therapy. In contrast, the control group obtained p=0.003 indicate that even though the control group did not receive intervention, there were differences in pain intensity values time before and after. Because p <0.05, it can be indicated that both groups have an effect on reducing pain intensity of CLBP patients.

TABLE 7: *Delta value* of Pain Intensity of Both Groups

Variable	Group	*Delta value* (Mean ± SD
Pain intensity	Intervention	(2.47 ± 1.504)
Pain intensity	Control	(1.17 ± 1.074)

As shown in Table 7, the mean difference pain intensity value between pre and post in intervention group was 2.47 with SD ± 1.504 while the mean difference in control group was 1.17 with SD ± 1.074.

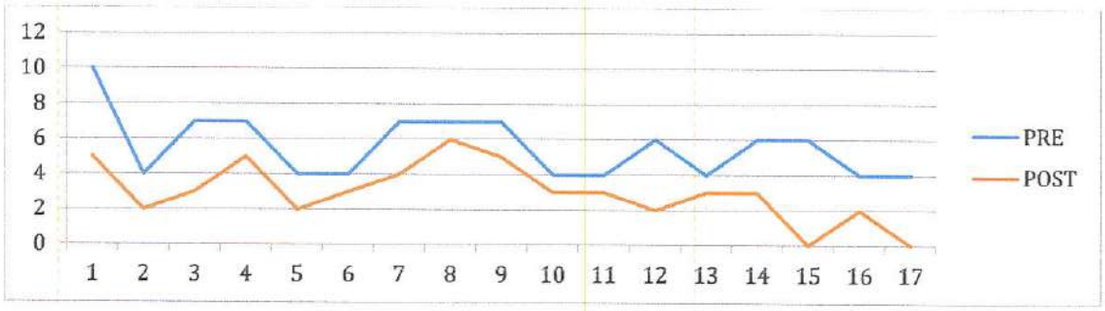


FIGURE 1: Pain intensity graph in intervention group

Figure 1 showed that pain intensity of 17 CLBP patients in intervention group had decreased before and after the cupping therapy. As comparison, pain intensity in control group also mostly decreased, although some remain same.

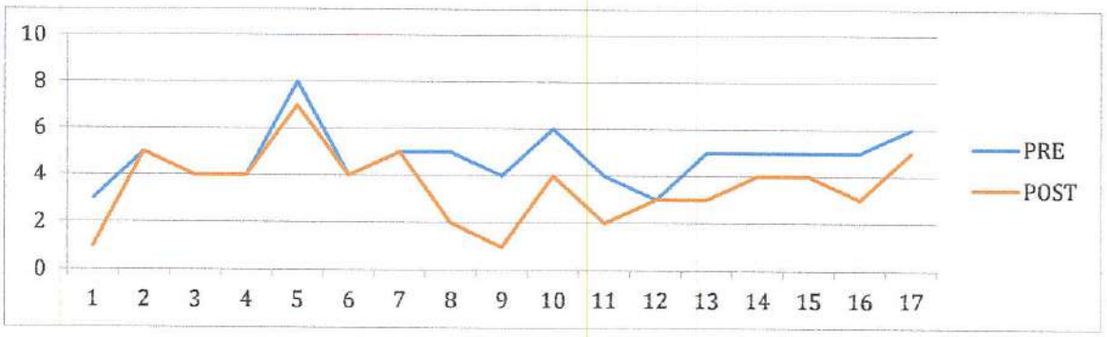


FIGURE 2: Pain intensity graph in control group

Cupping therapy is an excretory procedure to clean blood and interstitial fluids that contain metabolic waste, namely Causative Pathological Substances (CPS), which cause autoantibodies, immune complexes, soluble interleukin-2 receptors, inflammatory mediators, certain cytokines, prostaglandines, and toxic cellular products[13]. The explanation of cupping therapy process is as follows:

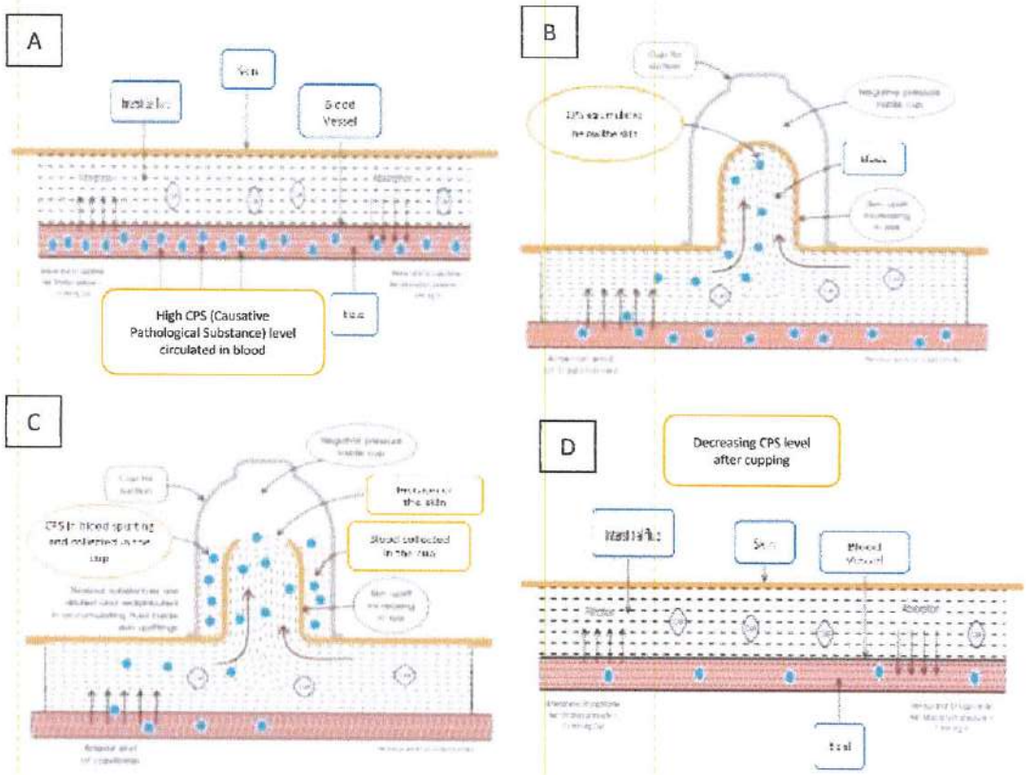


FIGURE 3: Cupping process in reducing pain (Adopted from El-Sayed, 2013)

Figure 3 explain the skin condition and blood vessels prior to cupping therapy. Blood vessels contain many metabolic waste called CPS which contain algogens, one of which is prostaglandines, which can increase the sensitivity of the nociceptors, causing pain. Next, cupping therapy is started first without any injury. The skin starts to lift because of the negative pressure on the cupping cup. In addition, the blood and CPS also began to rise towards the clamped skin. Furthermore, the next process makes an injury to the cupped skin to pull out CPS contained in the blood. After the cupping is done, it is showed that the CPS is significantly reduced[13,14].

Most patients undergoing cupping therapy experienced swelling for various reasons, one of which was strain and sprain. CPS is significantly reduced through cupping therapy which impact on decreasing muscle spasm of the lower back, reducing edema, and reducing CLBP as well as improving patient's quality of life. This therapy actually not only reducing CLBP, but also proposing many benefits when compared to conventional pharmacological therapies[15–18].

In terms of economic factors, actually cupping therapy is not cost effective than using analgesic drugs. Several studies revealed that the cost of cupping therapy is same or even more expensive than conventional medical treatment, but another study showed that financial considerations are not the main factor in choosing this therapy, moreover spiritual aspect become the main one. Cupping therapy is not only a suggestion, Muslims believe that this therapy is based on the guidance of God and Prophet's Sunnah[19,20].

A study conducted by Rayner in 2010, reported that the minimum adverse effects of cupping therapy become its physiological advantages so that long-term drug use in CLBP can be minimized or stopped[21].

In addition, patients benefit from this therapy because of its natural properties. Cupping therapy also plays a role in removing prostaglandins due to cell inflammation. This substance serves to send pain signals to the brain. Through cupping therapy, this substance is removed as of reducing patient's pain. Furthermore, cupping could stimulate the release of β-endorphins and encephalins, which play a crucial role in reducing sensitivity to pain[13]. Previous experimental study on mice reported that cupping therapy could significantly increase the expression of opioid *mu* receptor in dorsal horn compared to control groups. This result also in line with another study that showed a positive correlation between increased opioid *mu* receptor with pain threshold reaction time ($\beta = 0.713$; $p = 0.002$)[22,23].

Cupping could also increase capillary microcirculation by regenerating erythrocytes, removing pain caused by bradykinin, histamine and lactic acid[24]. The removal of these substances can reduce pain and inflammation in the affected part of the body. Cupping is a holistic natural health therapy method that covered prevention and treatment aspects[7].

CONCLUSION

In conclusion, cupping therapy could reduce pain on CLBP patients. The study results can be used as an intervention by health care workers in providing patient care. In addition, it was considered that cupping therapy could be used as a complementary therapy in health care centre.

REFERENCECS

[1] Grabovac I, Dorner TE. Association between low back pain and various everyday performances: Activities of daily living, ability to work and sexual function. *Wien Klin Wochenschr.* 2019;131(21-22):541-549. doi:10.1007/s00508-019-01542-7

[2] Allegri M, Montella S, Salici F, Valente A, Marchesini M, Compagnone C, et al. Mechanisms of low back pain: A guide for diagnosis and therapy [version 1; referees: 3 approved]. *F1000Research.* 2016;5:1-11. doi:10.12688/F1000RESEARCH.8105.1

[3] Kruger PE, Billson JH, Wood PS, Du Toit PJ. The effect of chronic low back pain on daily living and fearavoidance beliefs in working adults. *African J Phys Heal Educ Recreat Danc.* 2015;21(1:2):300-314. http://ezproxy.usherbrooke.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=103633091&site=ehost-live.

[4] Pandango BAL. Profile of Low Back Pain in Adult Patients of Medical Rehabilitation Outpatient Clinic in Rsud Dr. Soetomo During January – June 2016. 2017. http://repository.unair.ac.id/66343/.

[5] Subadi I, Nugraha B, Laswati H, Josomuljono H. Pain relief with wet cupping therapy in rats is mediated by heat shock protein 70 and ß-endorphin. *Iran J Med Sci.* 2017;42(4):384-391.

[6] Palos GR, Mendoza TR, Cantor SB, Aday LA, Cleeland CS. Perceptions of analgesic use and side effects: What the public values in pain management. *J Pain Symptom Manage.* 2004;28(5):460-473. doi:10.1016/j.jpainsymman.2004.02.016

[7] Sari FR. Bekam Kenabian. In: Sari FR, Anwar S, eds. *Bekam Sebagai Kedokteran Profetik.* 1st ed. Depok: Raja Grafindo Persada; 2018:23.

[8] Al Jaouni SK, El-Fiky EA, Mourad SA, Ibrahim NK, Kaki AM, Rohaiem SM, et al. The effect of wet cupping on quality of life of adult patients with chronic medical conditions in King Abdulaziz University Hospital. *Saudi Med J.* 2017;38(1):53-62. doi:10.15537/smj.2017.1.15154

[9] Freburger JK, Holmes GM, Agans RP, Jackman AM, Darter JD, Wallace AS, et al. The rising prevalence of chronic low back pain. *Arch Intern Med.* 2009;169(3):251-258. doi:10.1001/archinternmed.2008.543

[10] Rasyidah, Dayani H, Maulani M. Masa Kerja, Sikap Kerja Dan Jenis Kelamin Dengan Keluhan Nyeri Low Back Pain. *Real Nurs J.* 2019;2(2):66. doi:10.32883/rnj.v2i2.486

[11] Suriatmini S. Tinjauan Faktor Risiko Ergonomi Terhadap Keluhan Muskuloskeletal Pada Aktivitas Manual Handling Pada Pekerja di Bagian Produksi PTMI tahun 2010. 2011;(April):1-117.

[12] Tarwaka. *Ergonomi Indutri: Dasar-Dasar Ergonomi Dan Implementasi Di Tempat Kerja.* 2nd ed. Surakarta: Harapan Press Surakarta; 2014.

[13] El Sayed SM, Mahmoud, Nabo. Medical and Scientific Bases of Wet Cupping Therapy (Al-hijamah): in Light of Modern Medicine and Prophetic Medicine. *Altern Integr Med.* 2013;02(05). doi:10.4172/2327-5162.1000122

[14] Lowe DT. Cupping therapy: An analysis of the effects of suction on skin and the possible influence on human health. *Complement Ther Clin Pract.* 2017;29:162-168. doi:10.1016/j.ctcp.2017.09.008

[15] Lauche R, Cramer H, Hohmann C, Choi KE, Rampp T, Saha FJ, et al. The effect of traditional cupping on pain and mechanical thresholds in patients with chronic nonspecific neck pain: A randomised controlled pilot study. *Evidence-based Complement Altern Med.* 2012;2012. doi:10.1155/2012/429718

[16] Mehta P, Dhapte V. Cupping therapy: A prudent remedy for a plethora of medical ailments. *J Tradit Complement Med.* 2015;(2014). doi:10.1016/j.jtcme.2014.11.036

[17] Teut M, Ullmann A, Ortiz M, Rotter G, Binting S, Cree M, et al. Pulsatile dry cupping in chronic low back pain – a randomized three-armed controlled clinical trial. *BMC Complement Altern Med.* 2018;18(115):1-9. doi:10.1186/s12906-018-2187-8

[18] Moura C de C, Chaves É de CL, Cardoso ACLR, Nogueira DA, Corrêa HP, Chianca TCM. Cupping therapy and chronic back pain: Systematic review and meta-analysis. *Rev Lat Am Enfermagem.* 2018;26. doi:10.1590/1518-8345.2888.3094

[19] Khalil MKM, Al-Eidi S, Al-Qaed M, AlSanad S. Cupping therapy in Saudi Arabia: from control to integration. *Integr Med Res.* 2018;7(3):214-218. doi:10.1016/j.imr.2018.05.002

[20] 20. Muela SH, Mushi AK, Ribera JM. The paradox of the cost and affordability of traditional and government health services in Tanzania. *Health Policy Plan.* 2000;15(3):296-302. doi:10.1093/heapol/15.3.296

[21] Rayner JA, McLachlan HL, Forster DA, Cramer R. Australian women's use of complementary and alternative medicines to enhance fertility: Exploring the experiences of women and practitioners. *BMC Complement Altern Med.* 2009;9:1-10. doi:10.1186/1472-6882-9-52

[22] Subadi I, Laswati H, Jm H. Expression of HSP 70 and Mu Opioid Receptors Decrease Pain on Wet Cupping Therapy. *J Ners.* 2016;1(11):34-39.

[23] Subadi I, Kusumawardani MK, Qorib MF, Susilo I, Hidayati HB. Wet cupping therapy improves mu opioid receptor expression and pain threshold in animal models of inflammation. *Anaesthesia, Pain Intensive Care.* 2019;23(4):348-352. doi:10.35975/apic.v23i4.1166

[24] Widada W. Pengaruh Bekam terhadap Peningkatan Deformabilitas Eritrosit pada Perokok. *Maj Keperawatan Unpad.* 2010;12(1):58-59.