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REVIEW ARTICLE

Efficacy of dry cupping therapy on nonspecific chronic low back pain: Systematic literature review with meta-analysis

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Abstract

Background: Nonspecific chronic low back pain (NCLBP) is a painful symptom in the lower spine that lasts for more than 3 months and does not have any apparent harmful involvement. Cupping therapy is an Chinese instrumental technique that has been used in musculoskeletal conditions. It consists of applying suction cups to the skin, causing vasodilation of blood capillaries, production of endogenous opioids, and increased microcirculation that appear to block nerve pain impulses. **Objectives**: to find evidence in the literature of the use and efficacy of cupping therapy as a treatment for NCLBP. **Methods:** Systematic review with meta-analysis, performed by two independent researchers. A search for randomized controlled clinical trials was performed in the Pubmed, PEDro, Science Direct, and LILACS databases that included the use of dry cupping therapy in cLBP. There was no restriction on sex, language, or year of publication. RevMan software was used for the meta-analysis. **Results:** Of the 91 articles initially found, after applying all criteria, 3 studies were used in this review. The studies performed interventions of 5 sessions, 3 and 8 weeks, observing immediate and late post-operative results. Two studies had placebo cupping therapy (Sham) as a control and another, a control that did not undergo any intervention. The points worked were the meridians of BL23, BL24, BL25, BL26, GV4, BL30, BL40, BL58. Cupping therapy was superior to placebo therapy in only one article, however, when compared with another intervention (hot pack) there was no significant difference. The meta-analysis did not indicate superiority between the experimental and control groups. **Conclusion:** Dry cupping therapy proved to be a safe therapy, however without superior results to another therapy or placebo. In addition, more Randomized Controlled Trials (RCTs) are needed, since there were few studies investigating the use of cupping therapy in cLBP with adequate methodology.

Keywords: Cupping therapy; low back pain; chronic pain.

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BACKGROUND

One of the main uses of cupping therapy, an ancient Chinese instrumental technique, is in musculoskeletal conditions, and among these, low back pain (LBP) is one of the most common ailments, potentially affecting up to 80% of the population at some point in their lives. It manifests as a painful symptom in the lower portion of the spine, involving structures such as soft tissues, vertebrae, and adjacent structures, which can have a wide range of causes. In cases where symptoms persist for more than 12 weeks

and without the specific involvement of any injurious event or associated pathology, we have what is called nonspecific chronic low back pain (NCLBP)[1].

This condition has a higher prevalence in young adults and females and is one of the main symptoms that lead to work absenteeism and incurs high healthcare costs worldwide[2,3]. The cupping technique consists of applying vacuum cups to points of tension, pain, or acupuncture points, generating negative pressure through the suction of cups on the skin[4].

In musculoskeletal conditions, its static or punctual form is the most commonly used; however, all its effects are not yet fully elucidated, as when benefits are found, they have already been observed in various other treatment areas, such as organic dysfunctions, aesthetics, and even as an antidote for harmful agents[5-7].

Physiologically, when suction is applied to the skin, one of the first mechanisms that occur is the vasodilation of blood capillaries, activation of neurotransmitters such as adenosine, histamine, and norepinephrine, as well as the increase in the production of endogenous opioids, blocking pain nerve impulses and promoting muscle relaxation and a sense of well-being. Moreover, cupping therapy seems to promote an increase in the production of red blood cells, due to the enhancement of microcirculation and better blood supply. Finally, there is an effect on lymphatic flow, where the drainage caused by the cups on the skin seems to help the body eliminate toxic agents that cause pain and adhesions in the affected area[8].

Cupping is still often seen as a complementary therapy, not yet prominent and not a substitute for some conventional physiotherapeutic treatments[9]. To date, its results seem to be better associated with other therapies such as acupuncture, herbal medicine, massage, synthetic allopathic drugs, and physical activity[10,11]. Considering these aspects, the objective of this review was to find in the literature evidence of the use and efficacy of cupping therapy as a treatment for NCLBP.

METHODS

This is a literature review with meta-analysis aimed at finding evidence of the use and efficacy of cupping therapy as a treatment for NCLBP. For this, two independent researchers conducted a search in the Pubmed, PEDro (Physiotherapy Evidence Database), ScinceDirect, and Latin American and Caribbean Literature in Health Sciences databases. (LILACS). The descriptors used were: cupping therapy or cupping and low back pain. These descriptors were in accordance with DeCS/MeSH. The inclusion criteria were: randomized clinical trials, participants with nonspecific chronic low back pain, age over 18 years, use of cupping in the static or point modality, with no restriction on language, gender, or year of publication.

In the case of duplicate studies, only the study from one platform was considered for the sequence of the outlined steps. The selection of studies initially consisted of reading titles, followed by abstracts, and, when pertinent and available, the full article was read. For the meta-analysis, the Review Manager (RevMan) software version 5.3 was used.

RESULTS

In the first search, after applying the filters, 50 articles were found on PubMed, another 13 articles on PEDro, 26 more on Science Direct, and 2 on LILACS, totaling 91 articles. The details of the selections and exclusions are described in the flowchart in Figure 1.

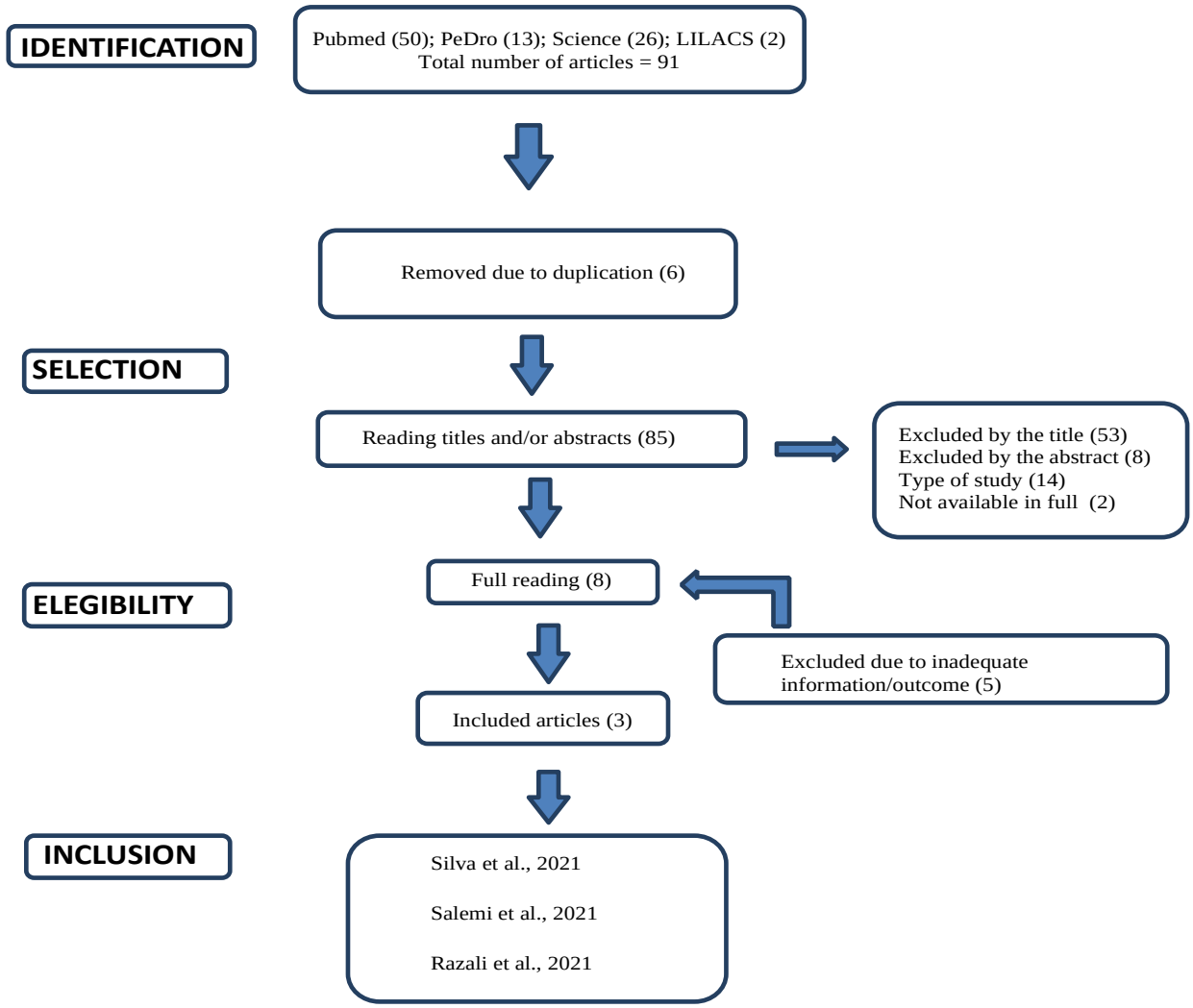

Figure 1. Flowchart of Study Selection

After applying all the inclusion criteria, only 3 studies were used to compose this review, totaling 166 participants. All the studies were published in the year 2021, written in English, with two conducted in Brazil and one in Malaysia.

The details and variables of the selected studies are described in Table 1, where the PICOT strategy (population; intervention; comparison; outcome; time) was used for better visualization of the results.

Table 1. Study details

Authors	Year	PICOT	Methodology	Results
Silva *et al*.	2021	**P:** people aged 18 to 59 with lower back pain for more than 3 months. **I:** 5 sessions, 2x/week. Minimum duration: 10 minutes of application on the anterior region of the body and 10 minutes of application on the posterior region of the body. **C:** Fake cupping group. **O:** pain and functional disability (primary outcomes); psychosocial factors and number of days per week with episodes of low back pain (secondary outcomes). **T:** 2 weeks.	N: 90. Control Group (CG): 38 Women (♀) and 7 men (♂). Intervention Group (IG): 29 ♀ and 16 ♂. • Pre-intervention analyses: 45 participants in each group. • Analyses 4 weeks: 45 people in each group. • 8-week analyses: 43 people in each group. Analyses conducted: Pain intensity – Scale Numerical rating of pain (EVA).	• First intervention: 0.0 (95% CI - 0.9 to 1.0). • 4 weeks of intervention: 0.4 (95% CI – 0.5 to 1.5). • 8 weeks of intervention: 0.6 (95% CI – 0.4 to 1.6).
Salemi *et al*.	2021	**P:** people aged 18 to 59 with lower back pain for more than 3 months. **I:** 5 sessions, 2x/week. Minimum duration: 10 minutes of application on the anterior region of the body and 10 minutes of application on the posterior region of the body. **C:** Sham cupping group. **O:** pain and functional disability (primary outcomes); psychosocial factors and number of days per week with episodes of low back pain (secondary outcomes). **T:** 2 weeks.	N: 37 GC: 9 ♂ and 9 ♀. GI: 6 ♂ and 13 ♀. Material: 17 acrylic cups with a diameter of 3.5cm. Distance between the cups using the Tsun method (measurement between 2 anatomical points). Patients used medication treatment according to medical prescription. (Possible risk of bias). The cups were positioned on acupuncture points related to lower back pain (BL23, BL24, BL25; GV4, BL30, BL40, BL58) and emotional factors. (HT3, ST36). Points related to emotional factors were placed on the supine position of the body and points related to low back pain, in the prone position. The false cupping group was treated with the same points, but the cups had a 1.9mm hole and adhesive tapes were used to keep them in place. For pain analysis, the VAS was used. A weekly pain diary was maintained by the participants. The analyses	Intervention Group showed a lower VAS • post-treatment (mean: 2.36; standard deviation: 0.58; 95% CI: –3.55 to –1.17; p: < 0.001; large effect size: –0.94) and Follow-up • post-treatment 4 weeks (mean: –1.71; standard deviation: 0.81; 95% CI: –3.37 to –0.06; p: < 0.042; effect size: 0.83) when compared with the sham cupping group. Large effect size: –0.94) and • post-treatment follow-up 4 Weeks (mean: –1.71; standard deviation: 0.81; 95% CI: –3.37 to –0.06; p: < 0.042; effect size: 0.83) when compared to the sham cupping group. Effect:

			were conducted at three time points: in the 1st week before treatment, after 5 sessions, and 4 weeks after treatment.	–0.87) compared to the control group. Considering the data, they concluded that the GI was more effective in pain reduction.
Razali *et al*.	2021	**P:** Men and Women over 18 Years old with complaints of lower back pain for at least 3 months. **I:** Three randomized groups: Cupping (N= 13), hot pack (N= 13), and control (N= 13) with no intervention. **N=** 39. Cupping group received a total of 3 sessions and Hot Pack group, 6 sessions. **C:** Control group. **O:** pain (primary outcome) and functional **disability (secondary outcome).** **T:** 3 weeks	Cupping: Points: BL22 to BL26) - Cups from the Sammora brand. Oil was applied to the skin before positioning the cupping glass. The suction applied was according to the participant's tolerance, usually two and a half pumps. They did not specify the exact pressure. The cupping glasses were left on for 15 minutes. And with an interval of 1 week. Hot water bottle: moistened in the lower back region. Kept in water at a temperature of 76.7°C. Six layers of towels covered the participants' backs to retain heat. Duration of 7 to 10 minutes with the bag. For the primary outcome (pain), the EVA was used.	Pré-intervenção: na EVA = 6 de 10. Resultados pós-intervenção: Cupping = 3 (3.31 ± 1.6) Hot pack = 4 (3.85 ± 1.07) Control = 6 (6.15 ±0.69) One-way ANOVA showed a significant difference between groups (p = 0.001). Tukey's test showed that cupping and hot pack were equally effective in reducing pain.

For the evaluation of the methodological quality of the studies, the score analyzed by the PEDro platform, specific for randomized controlled trials, was considered. The evaluation ranges from 0 to 10 and analyzes the items: randomization; allocation concealment; similarity of groups at the beginning of the study; blinding of participants; blinding of those conducting the interventions; blinding of outcome assessors; outcome measurements between baseline and follow-up in more than 85% of subjects; treatment or control group received the proposed intervention according to the allocated group; intergroup statistical comparison for at least one key outcome; measures of precision and variability for at least one key outcome. The first included article[12] was rated 8/10; the second[13] scored 9/10; and the third[14], totaled 5/10.

The result of the meta-analysis (Figure 2) indicates that cupping therapy does not show great superiority when compared to placebo therapies, resulting in an absolute difference between the means: -0.55 [-2.64, 1.54], 95% confidence interval, and heterogeneity I2= 98%, p< 0.00001.

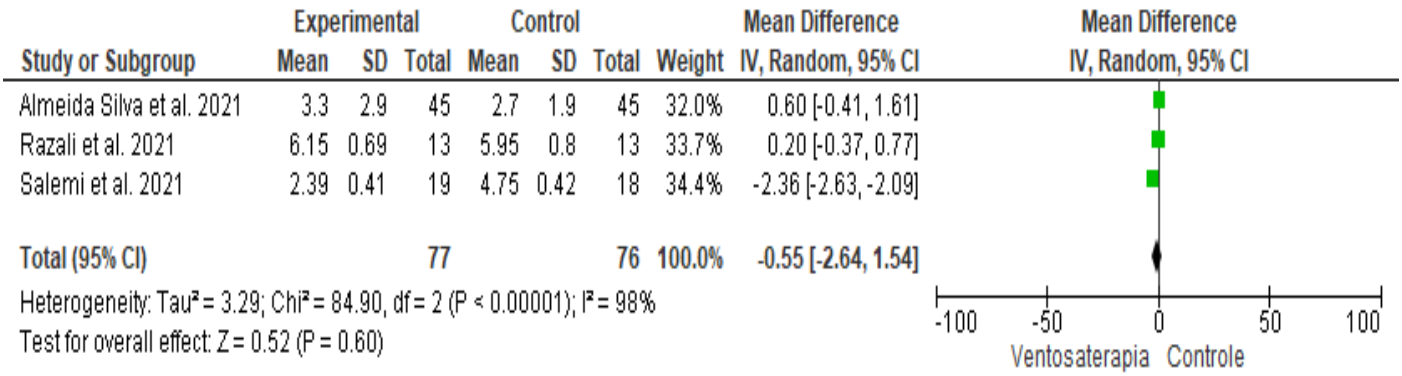

Figure 2. Meta-analysis

DISCUSSION

Of the selected studies, all had the primary objective of analyzing the behavior of LBP, using different techniques for the application of dry cupping between experimental and control groups, and pain measurement instruments. In the first study analyzed, 90 participants with LBP were randomized and followed once a week over a total period of 8 weeks. Experimental group (n=45) and control group (n=45) received cupping sessions for a duration of 10 minutes, with four cups placed on the lumbar region, parallel to the vertebrae from L1 to L5. The differentiation between the two groups was the use of the placebo cupping in the control group (Sham), where a 2mm hole was made in the cups for the release of the vacuum[12].

The aforementioned study measured pain using the resting pain numerical scale (0-10) before and immediately after the 1st, 4th, and 8th sessions. Furthermore, a scale was used to verify the participant's expectations regarding the treatment (Likert Scale), in which they were asked if they believed they would improve significantly with the offered treatment (value 5) or if they would see no improvement. (valor de 0 pontos). Although most of the participants in both groups believed in improvement, no superiority of the dry cupping treatment or placebo (Sham) was observed[12].

With a very similar methodology, a Brazilian study randomized 37 participants, with the experimental group treated with dry cupping (n=19) and the control group with Sham cupping (n=18). These participants were treated in 5 sessions (2x/week for 2 weeks and 1x/week in the last session) and the numerical pain scale was used to quantify pain pre-intervention, after the 5th session, and 4 weeks after. (efeito tardio). For the Sham cupping, a 1.9mm hole was made to eliminate the vacuum. In both groups, 13 cups were attached, distributed among the posterior acupoints BL23, BL24, BL25, GV4, BL30, BL40, BL58 (for 10 minutes) and the anterior acupoints HT3 and ST36 (10 minutes), all related to chronic low back pain. The time was divided into two, so that a change of position and a swap of the cups could be made[13].

In contrast to the first study presented in this discussion, the above study showed significant improvement results in its experimental group throughout the treatment, including in the late post-treatment phase. It is also worth noting that both studies aimed to verify some secondary outcomes such as disabilities, and again, only the second study had statistical relevance.

The difference found seems to be more related to the extent of the area treated (number of points/cups) than to the number of sessions, since in the first study the duration was longer, but the number of acupuncture points treated was much higher in the second study. This comparison, however, cannot be affirmed due to the lack of more studies with a similar methodology.

A different form of randomization was used in a study conducted by a university in Malaysia, which divided 39 volunteers into 3 groups, with the cupping group (n=13) and the hot pack group (n=13) forming the experimental group, and the control group (n=13), with no intervention. The group that received cupping was treated for 3 weeks, with one weekly application, on the meridian points from BL22 to BL26, fixed for 15 minutes. Within the same 3-week period and in the same region, another group received therapy with a hot pack (76.7ºC) in 2 weekly sessions, with an approximate duration of 7-10 minutes. For this group, 6 layers of towels were placed to separate the patient's skin from the hot pack[14].

For the above study, pre-and post-intervention pain was also analyzed using the numerical pain scale. The experimental groups showed an improvement in pain when compared to the control, but among them, there was no significant difference, meaning there was no superiority between the participant treated with a hot pack or cupping. The only systematic review with meta-analysis conducted before our study, although it did not focus specifically on NCLBP but rather on the spinal segment as a whole, demonstrated that cupping therapy was effective in reducing chronic pain compared to a control[15].

In the studies, the use of acrylic cups was prioritized, as they are the most suitable for dry cupping therapy, with economic, hygiene, and fixation advantages on various body structures, due to the variation in the diameters of each cup, also facilitating the perforation of the hole for the placebo modality[16].

The number of sessions performed in each study found coincides with that recommended in the literature, with at least five sessions being essential to determine significant effects[17]. In view of the selected articles, aspects such as the lack of blinding of the sample and the evaluator may compromise the results, however, there is no way to do this process given the techniques used. It is impossible for the therapist, specifically, not to know which type of cupping device he is using or for the patient not to know whether he is undergoing heat therapy or pressure from the cupping device.

Although we prioritized studies using dry cupping, for comparison purposes, some other studies demonstrate that wet cupping appears to have equally satisfactory results in reducing NCLBP. However, this technique is invasive and requires more caution regarding adverse conditions of the individual, especially hematological ones, which makes dry cupping more viable and safer[18-20].

The number of selected articles was low due to poorly defined methodologies, lack of randomization or studies that included the application of cupping in other segments of the spine together or primary outcomes other than exclusively pain.

CONCLUSION

Although cupping therapy showed positive outcomes on LBP in the 3 articles, after conducting the meta-analysis, these findings did not demonstrate significant statistical superiority when compared to a control group with or without intervention. Dry cupping therapy has proven to be a safe treatment, potentially providing immediate and lasting results for at least 4 weeks post-treatment. More RCTs are needed, with a longer intervention time and comparing with other treatment modalities.

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REFERENCES

1. Moura CC, Chaves ÉCL, Cardoso ACLR, Nogueira DA, Corrêa HP, Chianca TCM. Ventosaterapia e dor crônica nas costas: revisão sistemática e meta-análise. Rev Lat Am Enfermagem. 2018;26:e3094.

2. González-Gálvez N, Marcos-Pardo PJ, Carrasco-Poyatos M. Functional improvements after a pilates program in adolescents with a history of back pain: A randomised controlled trial. Complementary Ther Clin Pract. 2019;35:1–7.

3. Hrkác A, Bilic D, Cerny-Obrdalj E, Baketáric I, Puljak L. Comparison of supervised exercise therapy with or without biopsychosocial approach for chronic nonspecific low back pain: a randomized controlled trial. Musculoskelet Disord. 2022;23(1):966.

4. Oliveira MAR, Silva AP, Pereira LP. Ventosaterapia – revisão de literatura. Rev Saúde Foco. 2018:151-154.

5. Ghods R, Sayfouri N, Ayati MH. Características anatômicas da área interescapular onde a terapia de ventosa úmida é feita e sua possível relação com os meridianos de acupuntura. J Acupunct Meridian Stud. 2016;9(6):290-296.

6. Calogero R; Felix JC; Filho RCS. Tipos De Utilização Da Ventosaterapia. Faculdade De Tecnologia Ebramec Escola Brasileira De Medicina Chinesa. 2017:1-53.

7. Mehta P, Dhapte V. Ventosaterapia: Um remédio prudente para uma infinidade de doenças médicas. J Tradit Complemento Med. 2015;5(3):127-34.

8. Al-Bedah AMN, Elsubai IS, Qureshi NA, Aboushanab TS, Ali GIM, El-Olemy AT, et al. The Medical Perspective of Cupping therapy: Effects and Mechanisms of Action. J Tradit Complemento Med Medicine. 2019;9(2):90–7.

9. Wu LK, Chen YC, Hung CS, Yen CY, Chien CYC, Ciou JR et al. The efficacy and safety of cupping as complementary and alternative therapy for metabolic syndrome: A systematic review and meta-analysis. Medicine. 2023;102(13): e33341.

10. Cramer H, Klose P, Teut M, Rotter G, Ortiz M, Anheyer D, Linde K, Brinkhaus B. Cupping for Patients With Chronic Pain: A Systematic Review and Meta-Analysis. J Pain. 2020;21(9-10):943-956.

11. Iden Yuan QL, Guo TM, Liu L, Sun F, Zhang YG. Traditional Chinese medicine for neck pain and low back pain: a systematic review and meta-analysis. PLoS One. 2015;10(2):e0117146.

12. Silva HJA, Barbosa GM, Scattone Silva R, Saragiotto BT, Oliveira JMP, Pinheiro YT, et al. Dry cupping therapy is not superior to sham cupping to improve clinical outcomes in people with non-specific chronic low back pain: a randomised trial. J Physiother. 2021;67(2):132–9.

13. Salemi M de M, Gomes VM da SA, Bezerra LMR, Melo TM de S, Alencar GG de, Montenegro IHP de M, et al. Effect of Dry Cupping Therapy on Pain and Functional Disability in Persistent Non-Specific Low Back Pain: A Randomized Controlled Clinical Trial. J Acupunct Meridian Stud. 2021;14(6):219–30.

14. Razali AI, Bsc, Choo LA. The Effectiveness of Dry Cupping and Hot Pack in Pain Relief and Reduce Functional Disability on Non-specific Low Back Pain. European J Mol Med. 2021;08:2796.

15. 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:e3094.

16. AlBedah A, Khalil M, Elolemy A, Hussein AA, AlQaed M, Al Mudaiheem A, et al. The Use of Wet Cupping for Persistent Nonspecific Low Back Pain: Randomized Controlled Clinical Trial. J Altern Complement Med. 2018;21(8):504-8.

17. Corrêa HP, Moura CC, Azevedo C, Bernardes MFVG, Mata LRFP, Chianca TCM. Effect of auriculotherapy on anxiety. Rev Esc Enferm. 2020;54:e03626.

18. Kim JI, Kim TH, Lee MS, Kang JW, Kim KH, Choi JY, et al. Evaluation of wet-cupping therapy for persistent non-specific low back pain: a randomised, waiting-list controlled, open-label, parallel-group pilot trial. Trials. 2011;12:146.

19. Farhadi K, Schwebel DC, Saeb M, Choubsaz M, Mohammadi R, Ahmadi A. The effectiveness of wetcupping for nonspecific low back pain in Iran: a randomized controlledtrial. Complement Ther Med. 2009;17(1):9-16.

20. Silva KM. Comparando os efeitos da educação em dor versus exercício na modificação das crenças em pacientes com dor lombar crônica inespecífica: uma revisão bibliográfica [Trabalho de Conclusão de Curso]. Belo Horizonte (MG): Universidade Federal de Minas Gerais; 2024. 25 p.