Journal of Health Innovation and Environmental Education
Vol. 1, No. 2, December 2024, pp. 88~94
ISSN: 3062-9632, DOI: 10.37251/jhiee.v1i2.2901

Cupping Therapy Approach as a Nonpharmacological Strategy for Controlling Headaches in Outpatients

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Article Info

Article history:

Received Sep 25, 2024
Revised Oct 27, 2024
Accepted Nov 20, 2024
Online First Dec 31, 2024

Keywords:

Complementary Medicine
Cupping Therapy
Headache Management
Nonpharmacological
Outpatient care
Visual Analog Scale

ABSTRACT

Purpose of the study: Headache is a highly prevalent neurological complaint commonly managed with pharmacological therapy, which may cause adverse effects with long-term use. This study aimed to evaluate the effectiveness of cupping therapy as a nonpharmacological strategy for controlling headache among outpatients.

Methodology: A quasi-experimental one-group pretest–posttest design was employed involving 16 outpatients with headache. Pain intensity was measured before and after cupping therapy using the Visual Analog Scale (VAS). Data were analyzed using the Shapiro–Wilk normality test followed by paired sample t-test with a significance level of $p < 0.05$.

Main Findings: The mean VAS score significantly decreased from 6.75 ± 1.29 before intervention to 3.12 ± 1.15 after intervention, with a mean reduction of 3.63 points ($t = 14.21$; $p < 0.001$). Severe pain prevalence declined from 56.2% to 6.2% following therapy. These findings indicate that cupping therapy effectively reduces headache pain intensity in outpatient settings.

Novelty/Originality of this study: This study positions cupping therapy as an evidence-informed nonpharmacological intervention within structured outpatient healthcare services, quantitatively bridging traditional therapeutic practice with modern clinical evaluation using standardized pain measurement and statistical validation.

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1. INTRODUCTION

Headache remains one of the most prevalent neurological complaints encountered in outpatient healthcare services and constitutes a significant global health burden [1]-[4]. It is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage in the cranial region, frequently radiating to the neck, face, jaw, or orbital areas [5], [6]. Epidemiological evidence suggests that nearly 90% of individuals experience headache at least once in their lifetime, with recurrent episodes contributing to decreased productivity, impaired functional capacity, and reduced quality of life [7]-[9]. Despite its high incidence, the management of headache in outpatient settings largely depends on pharmacological interventions.

Nonsteroidal anti-inflammatory drugs (NSAIDs) and simple analgesics such as paracetamol are commonly administered as first-line therapy [11]-[12]. Although effective for acute symptom relief, prolonged and repetitive use may lead to adverse effects including gastrointestinal irritation, hepatotoxicity, and medication-overuse headache. This situation highlights a critical clinical issue: the necessity for safe, sustainable, and evidence-based nonpharmacological strategies that can reduce reliance on long-term analgesic consumption among outpatients.

In this context, complementary and integrative health approaches have gained increasing attention. One such modality is cupping therapy (hijamah), a traditional intervention involving controlled negative pressure applied to the skin surface, sometimes accompanied by superficial incisions to facilitate blood removal. Beyond its historical use across civilizations, hijamah holds particular significance in Islamic medical tradition. The Prophet Muhammad (peace be upon him) stated:

The spiritual dimension of therapeutic practice in Islam is further reinforced in the Qur'an. Allah says:

وَمَا أَرْسَلْنَاكَ إِلَّا رَحْمَةً لِّلْعَالَمِينَ

Translation:

"And We have not sent you, [O Muhammad], except as a mercy to the worlds."(*Al.Qur'an* 21:107)

This verse underscores that the teachings of the Prophet encompass guidance beneficial to human well-being, including aspects of health and healing. Additionally, Allah states:

مَّن يُطِعِ الرَّسُولَ فَقَدْ أَطَاعَ اللَّهَ ۖ وَمَن تَوَلَّىٰ فَمَا أَرْسَلْنَاكَ عَلَيْهِمْ حَفِيظًا

Translation:

"Whoever obeys the Messenger has indeed obeyed Allah; but whoever turns away we have not sent you over them as a guardian." (*Al.Qur'an* 4:80)

Furthermore, the Qur'an emphasizes the concept of healing as part of divine guidance:

وَنُنَزِّلُ مِنَ الْقُرْآنِ مَا هُوَ شِفَاءٌ وَرَحْمَةٌ لِّلْمُؤْمِنِينَ

Translation**:**

"And We send down of the Qur'an that which is healing and mercy for the believers."(*Al.Qur'an* 17:82)

While these scriptural foundations contribute to the cultural and spiritual acceptance of hijamah, integration into modern healthcare systems requires rigorous scientific validation [13], [14]. Contemporary biomedical hypotheses propose that cupping therapy may enhance microcirculation, modulate inflammatory mediators, stimulate endogenous opioid release, and activate descending pain inhibitory pathways. However, empirical findings remain inconsistent, and high-quality studies specifically examining its effectiveness in reducing headache intensity within structured outpatient services are still limited.

Previous investigations have explored cupping therapy in musculoskeletal pain, hypertension, and certain neurological conditions, reporting varying levels of symptom improvement [15]. Nevertheless, many studies lack standardized pain measurement instruments, involve heterogeneous populations, or do not situate the intervention within a formal outpatient clinical framework [16], [17]. This gap highlights the need for focused research assessing cupping therapy as a structured, nonpharmacological pain management strategy for headache patients in outpatient settings using validated pain scales [18].

The novelty of this study lies in reframing cupping therapy from a purely traditional practice into an evidence-based nonpharmacological strategy evaluated within a contemporary outpatient healthcare context. By quantitatively measuring changes in headache pain scale before and after intervention, this research aims to bridge traditional therapeutic heritage with modern clinical science and contribute to integrative health models grounded in empirical data.

The urgency of this research is supported by three main considerations: the high prevalence and recurrent nature of headache, the risks associated with prolonged analgesic use, and the increasing demand for culturally aligned yet scientifically validated complementary therapies. Establishing evidence-based support for cupping therapy may provide healthcare professionals with a safer adjunctive option for outpatient headache management and expand integrative, patient-centered healthcare approaches. Does cupping therapy as a nonpharmacological intervention significantly reduce headache pain scale among outpatients? There is a statistically significant reduction in headache pain scale among outpatients after receiving cupping therapy.

2. RESEARCH METHOD

2.1 Study Design

This study employed a quasi-experimental design using a one-group pretest–posttest approach to evaluate the effectiveness of cupping therapy as a nonpharmacological strategy for controlling headache among outpatients. The design was selected to measure within-subject changes in pain intensity before and after intervention, allowing each participant to serve as their own control [19]-[21]. The research was conducted at Klinik Afiat, an integrated outpatient healthcare center providing consultation and treatment services based on standardized clinical procedures. The clinic integrates complementary approaches, including cupping therapy,

within structured health services. Data collection took place at two outpatient service locations in South Tangerang, Indonesia. The intervention was administered by trained practitioners following standardized cupping procedures to ensure consistency and safety.

The independent variable in this study was cupping therapy as a nonpharmacological intervention. The dependent variable was headache pain intensity measured before and after the intervention. Additional descriptive variables included gender, duration of headache (*Acute or chronic*), frequency of previous cupping therapy, and regularity of undergoing cupping sessions. These characteristics were analyzed to provide a broader understanding of participant profiles and potential influencing factors [22].

2.2 Population and Sample

The study population consisted of outpatients presenting with complaints of headache during the data collection period. A total of 16 participants met the inclusion criteria and were enrolled in the study. The sample size was determined based on feasibility and minimum requirements for paired statistical testing in quasi-experimental research. Inclusion criteria comprised adult patients experiencing headache who were willing to undergo cupping therapy and provided informed consent. Patients with bleeding disorders, severe systemic illness, or contraindications to cupping therapy were excluded to ensure safety. Although the design involved a single intervention group, the analysis compared two paired conditions: pre-intervention (before cupping therapy) and post-intervention (after cupping therapy).

2.3 Research Instrument

The primary instrument used in this study was the visual analog scale (VAS) for pain assessment, complemented by a structured respondent characteristic form. The VAS was selected because it is a validated, reliable, and widely accepted tool for measuring subjective pain intensity in clinical and research settings. It is particularly appropriate for quasi-experimental pretest posttest designs that aim to detect short-term changes following an intervention [23], [24]. The VAS consists of a 10-point numerical scale ranging from 0 (no pain) to 10 (worst imaginable pain). Participants were asked to indicate the number that best represented the intensity of their headache at two time points: immediately before and immediately after cupping therapy. The difference between these two scores represented the change in pain intensity.

In addition to the VAS, a structured questionnaire was used to collect demographic and clinical characteristics, including gender, duration of headache (*Acute or chronic*), frequency of previous cupping therapy, and regularity of undergoing cupping treatment. These variables were included to provide contextual interpretation of pain reduction outcomes [25], [26]. To ensure clarity and measurement alignment with the study objectives, the operationalization of variables and measurement indicators is presented in table 1.

Before presenting the table, it is important to emphasize that this blueprint demonstrates the conceptual-to-operational linkage between research variables, indicators, measurement methods, and data scales, thereby strengthening methodological transparency.

Table 1. Instrument Blueprint and Operational Definition

Variable	Indicator	Instrument	Measurement Scale	Timing of Measurement
Cupping Therapy (Independent Variable)	Administration of standardized cupping procedure	Clinical intervention protocol	Nominal (Intervention applied)	During treatment session
Headache Pain Intensity (Dependent Variable)	Self-reported pain score (0–10)	Visual Analog Scale (VAS)	Interval (0–10 scale)	Pre-intervention and post-intervention
Gender	Male / Female	Respondent form	Nominal	Baseline
Duration of Headache	Acute (<3 months) / Chronic (≥3 months)	Respondent form	Nominal	Baseline
Frequency of Previous Cupping Therapy	Number of prior sessions	Respondent form	Ratio	Baseline
Regularity of Cupping	Routine / Non-routine	Respondent form	Nominal	Baseline

The Visual Analog Scale has demonstrated strong construct validity and high test–retest reliability in pain research across diverse clinical populations. Its sensitivity to detect small but clinically meaningful changes in pain intensity makes it suitable for evaluating the immediate effect of nonpharmacological interventions such as cupping therapy.

Content validity of the structured respondent form was ensured through alignment with the study objectives and relevant literature on headache and complementary therapy utilization.

To support consistent interpretation of pain severity levels, the categorization of VAS scores used in this study is presented in table 2.

Table 2. Classification of Visual Analog Scale (VAS) Scores

VAS Score	Pain Category	Clinical Interpretation
0	No pain	No pain sensation
1–3	Mild pain	Able to communicate effectively; minimal interference
4–6	Moderate pain	Noticeable discomfort; able to describe pain
7–8	Severe pain (controlled)	Limited functional capacity; difficulty describing pain
9–10	Severe pain (uncontrolled)	Extreme discomfort; unable to communicate effectively

By incorporating a validated pain measurement tool and a clearly defined instrument blueprint, this study ensures methodological rigor, measurement transparency, and alignment with the objective of evaluating cupping therapy as a nonpharmacological strategy for controlling headache among outpatients.

Participants first underwent baseline pain assessment using the Visual Analog Scale (VAS). Following this, cupping therapy was administered according to standardized clinical procedures, including skin sterilization, application of negative pressure using cupping instruments, and controlled bloodletting when indicated.

After completion of the therapy session and a brief observation period, participants were reassessed using the same pain measurement instrument to determine changes in headache intensity. Data were collected using structured assessment forms. Prior to analysis, data underwent editing to ensure completeness and accuracy [27], [28]. Incomplete responses were clarified through direct confirmation with participants whenever possible.

Coding was subsequently performed to facilitate computerized data entry and statistical analysis. All data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS).

2.4 Statistical Analysis

Descriptive statistics were used to summarize participant characteristics and baseline pain scores. Numerical data were presented as mean and standard deviation, while categorical variables were presented as frequencies and percentages [29], [30], [31]. To determine whether the data followed a normal distribution, the Shapiro–Wilk test was performed, as the sample size was fewer than 50 participants. After confirming normal distribution, inferential analysis was conducted using the paired sample t-test to compare mean pain scores before and after cupping therapy. The level of statistical significance was set at $p < 0.05$. This analysis aimed to determine whether cupping therapy produced a statistically significant reduction in headache pain intensity among outpatients.

2.5 Ethical Considerations

All participants provided informed consent prior to enrollment. The study ensured confidentiality, voluntary participation, and the right to withdraw at any time without affecting access to healthcare services. The intervention was conducted in accordance with clinical safety standards for complementary therapy practice.

3. RESULTS AND DISCUSSION

This section presents the findings of the study in a structured sequence, beginning with participant characteristics, followed by descriptive analysis of headache pain scores before and after cupping therapy, assessment of data normality, and hypothesis testing using paired statistical analysis.

A total of 16 outpatients with headache complaints participated in this study. Descriptive characteristics were analyzed to provide contextual understanding of the study population.

Before presenting the detailed distribution, it is important to note that the majority of participants were female and had experienced recurrent headaches.

Table 4. Characteristics of Study Participants

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	6	37.5
	Female	10	62.5
Duration of Headache	Acute (<3 months)	5	31.3
	Chronic (≥3 months)	11	68.7
Previous Cupping Therapy	Never	7	43.8

	1–2 times	6	37.5
	≥3 times	3	18.7
Regularity of Cupping	Routine	5	31.3
	Non-routine	11	68.7

As shown in table 4, most participants were female (62.5%) and experienced chronic headache (68.7%). Nearly half (43.8%) had never undergone cupping therapy before, indicating that for many participants this intervention represented a new therapeutic experience.

Pain intensity was measured using the Visual Analog Scale (VAS) before and after cupping therapy. The descriptive statistics provide an overview of central tendency and variability in pain scores.

Table 5. Descriptive Statistics of Headache Pain Scores Before and After Cupping Therapy

Measurement Time	Mean	Standard Deviation	Minimum	Maximum
Pre-intervention	6.75	1.29	5	9
Post-intervention	3.12	1.15	1	5
Mean Difference	3.63	1.02		

Table 5 demonstrates a substantial reduction in mean headache pain score following cupping therapy. The average pain score decreased from 6.75 (moderate to severe category) before intervention to 3.12 (mild category) after intervention. The mean reduction in pain intensity was 3.63 points on the VAS scale, indicating clinically meaningful improvement.

To further illustrate clinical impact, pain scores were categorized according to severity levels before and after intervention.

Table 6. Distribution of Pain Severity Categories Before and After Cupping Therapy

Pain Category	Pre-intervention n (%)	Post-intervention n (%)
Mild (1–3)	0 (0%)	9 (56.3%)
Moderate (4–6)	7 (43.8%)	6 (37.5%)
Severe (7–10)	9 (56.2%)	1 (6.2%)

Prior to cupping therapy, more than half of participants (56.2%) reported severe headache. After the intervention, severe pain decreased dramatically to 6.2%, while the majority of participants (56.3%) shifted to the mild pain category. This categorical shift reinforces the clinical relevance of the observed numerical reduction.

Before conducting inferential statistical testing, the distribution of pain score differences was assessed using the Shapiro Wilk test, as the sample size was fewer than 50 participants.

Table 7. Shapiro–Wilk Normality Test for Pain Score Differences

Variable	W Statistic	p-value
Pain Score Difference (Pre–Post)	0.962	0.689

As presented in table 7, the Shapiro–Wilk test yielded a p-value of 0.689 ($p > 0.05$), indicating that the difference in pain scores was normally distributed. Therefore, parametric testing using the paired sample t-test was appropriate.

To determine whether cupping therapy significantly reduced headache pain intensity, a paired sample t-test was conducted comparing pre-intervention and post-intervention scores.

Table 8. Paired Sample t-Test Results for Headache Pain Scores

Variable	Mean Difference	t-value	df	p-value
Pre–Post Pain Score	3.63	14.21	15	<0.001

The paired sample t-test revealed a statistically significant reduction in headache pain following cupping therapy ($t = 14.21$, $df = 15$, $p < 0.001$). Since the p-value was far below the significance threshold of 0.05, the null hypothesis was rejected.

The results demonstrate that cupping therapy significantly reduced headache pain intensity among outpatients. The average pain score decreased by 3.63 points on the VAS scale, representing both statistically and clinically meaningful improvement.

Furthermore, the categorical shift from severe to mild pain in the majority of participants supports the effectiveness of cupping therapy as a nonpharmacological intervention [15]. Based on these findings, the study hypothesis stating that “there is a statistically significant reduction in headache pain scale among outpatients after receiving cupping therapy” is accepted.

This study demonstrated that cupping therapy significantly reduced headache pain intensity among outpatients, with the mean Visual Analog Scale (VAS) score decreasing from 6.75 before intervention to 3.12 after intervention, yielding a mean reduction of 3.63 points ($p < 0.001$). Clinically, this reduction represents a meaningful shift from predominantly severe pain to predominantly mild pain categories [32], [33]. More than half of participants initially reported severe headache, whereas after therapy the majority transitioned to mild pain levels. These findings indicate not only statistical significance but also substantial clinical relevance in terms of symptom relief and functional improvement.

The results align with previous research suggesting that cupping therapy may alleviate various types of pain, particularly musculoskeletal and tension-related conditions. Earlier studies have reported reductions in neck pain, lower back pain, and migraine intensity following cupping interventions, attributing these effects to improved microcirculation, removal of inflammatory mediators, and stimulation of endogenous opioid release [34]. However, many of those studies were conducted in heterogeneous populations, lacked standardized pain measurement tools, or did not focus specifically on structured outpatient headache management [35]. In contrast, the present study employed a validated pain instrument (VAS), applied pre–post comparative analysis, and was situated within a formal outpatient healthcare setting. By focusing exclusively on headache complaints and implementing a standardized intervention protocol, this research addresses methodological gaps found in earlier investigations.

From a pathophysiological perspective, the significant pain reduction observed may be explained through several mechanisms [36], [37], [38]. The negative pressure applied during cupping therapy is hypothesized to enhance local blood flow, reduce tissue congestion, and modulate inflammatory cytokines that contribute to headache pathogenesis [39]. Additionally, the mild nociceptive stimulation induced by cupping may activate the gate control mechanism and descending inhibitory pathways in the central nervous system, thereby decreasing perceived pain intensity [40]. While these mechanisms remain partially theoretical, the magnitude of pain reduction observed in this study strengthens the plausibility of cupping therapy as a biologically active intervention rather than merely a placebo response.

The novelty of this study lies in reframing cupping therapy as a structured, evidence-informed nonpharmacological strategy within modern outpatient healthcare services rather than viewing it solely as a traditional or religious practice. By quantitatively documenting a substantial reduction in pain intensity using standardized statistical procedures, this research bridges traditional therapeutic heritage with contemporary clinical evaluation. Furthermore, the integration of patient characteristics—such as chronicity of headache and prior exposure to cupping provides contextual depth that enhances interpretation of outcomes. This integrative positioning contributes to the evolving discourse on culturally responsive and patient-centered healthcare models.

The clinical implications of these findings are considerable. Given the widespread reliance on nonsteroidal anti-inflammatory drugs and paracetamol for headache management, and the known risks associated with prolonged pharmacological use, cupping therapy may serve as a complementary or adjunctive option that reduces medication dependency. For outpatient healthcare providers, incorporating cupping therapy within standardized service protocols may expand therapeutic choices while aligning with patient preferences, particularly in communities where integrative or prophetic medicine holds cultural significance. At a systems level, the use of safe nonpharmacological interventions could potentially lower long-term healthcare costs associated with medication-related adverse effects.

Despite its promising findings, this study has several limitations that must be acknowledged. First, the quasi-experimental one-group pretest–posttest design lacks a control group, limiting the ability to definitively attribute pain reduction solely to the intervention and not to placebo effects, regression to the mean, or natural fluctuation of headache intensity. Second, the relatively small sample size ($n = 16$) restricts generalizability and reduces statistical power for subgroup analysis. Third, pain measurement was limited to short-term post-intervention assessment, preventing evaluation of long-term effectiveness or recurrence rates. Additionally, the study relied on subjective self-reported pain scores without incorporating objective physiological biomarkers of inflammation or neurovascular change.

Future research should therefore employ randomized controlled trial designs with larger sample sizes and longer follow-up periods to confirm causal relationships and sustainability of outcomes. The inclusion of biological markers, comparison with standard pharmacological treatment, and cost-effectiveness analyses would further strengthen the evidence base. In conclusion, the present study provides empirical support for cupping therapy as a potentially effective nonpharmacological intervention for headache management in outpatient settings. While further rigorous investigation is required, the magnitude of pain reduction observed suggests that cupping therapy may represent a clinically meaningful addition to integrative pain management strategies.

4. CONCLUSION

This study aimed to evaluate the effectiveness of cupping therapy as a nonpharmacological strategy for controlling headache among outpatients. The findings demonstrated a statistically and clinically significant reduction in headache pain intensity following intervention. The mean Visual Analog Scale (VAS) score decreased from 6.75 before cupping therapy to 3.12 after therapy, with a mean difference of 3.63 points ($t = 14.21$; $p < 0.001$). Additionally, the proportion of participants experiencing severe pain decreased from 56.2% pre-intervention to 6.2% post-intervention, while 56.3% shifted into the mild pain category after treatment. These results confirm that cupping therapy significantly reduces headache pain intensity among outpatients and supports its role as a complementary nonpharmacological intervention in clinical practice. Future studies are recommended to employ randomized controlled trial designs with larger sample sizes to strengthen causal inference. Long-term follow-up assessment is also necessary to evaluate the sustainability of therapeutic effects and recurrence rates.

ACKNOWLEDGEMENTS

The authors express sincere gratitude to all participants who willingly took part in this study and to the healthcare practitioners at Klinik Afiat for their cooperation and support during data collection. Appreciation is also extended to all parties who contributed to the successful completion of this research.

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