





Original research

Evaluation of Complementary Cupping Therapy in the Management of Hypertension and Triglyceride Levels in Coastal Fishermen Communities

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Abstract

Background: Fishermen are community groups requiring special attention due to the nature of their work. The characteristics of a stressful job, unhealthy diet, and challenging environmental and weather conditions are risk factors for hypertension and elevated triglycerides. Wet cupping therapy is expected to help improve imbalances in triglyceride levels, blood pressure, and pulse rate among fishermen living in coastal areas.

Methods: Sixty individuals from fishing communities participated in this study through random sampling by creating a serial number list. The hypertensive group (n=30) received cupping therapy combined with Al-Quran therapy, while the normotensive group (n=30) received only cupping therapy. Blood pressure, pulse rate, and triglyceride levels were measured in both groups before and one week after cupping therapy.

Results: In the hypertensive group that received cupping therapy combined with Al-Quran therapy, there were significant changes in blood pressure, with the mean systolic blood pressure decreasing from 155.4 ± 21.8 to 141.3 ± 19.9 , and diastolic blood pressure decreasing from 92.9 ± 10.6 to 85.3 ± 11.3 . Triglyceride levels also showed a significant reduction from 259.4 ± 154.6 to 173 ± 74.5 , with a statistically significant P value <0.05 . In the normotensive group, there was a statistically significant change within normal limits in both systolic and diastolic blood pressure, as well as a decrease in triglyceride levels.

Conclusion: The results of this study indicate that wet cupping therapy combined with Al-Quran therapy is a promising complementary approach for controlling blood pressure and triglyceride levels in hypertensive patients. Therefore, it could serve as an alternative therapy for fishing communities in coastal areas.

Keywords: Al-Quran therapy; wet cupping therapy; hypertension management; triglyceride levels; fishermen communities

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Background

Hypertension plays a major role in the prevention of stroke and coronary heart disease in coastal areas. This is because the high salt content in coastal areas can lead to increased blood pressure, which is a significant risk factor for both stroke and coronary heart disease. Additionally, the combination of salty

air and high humidity in coastal regions can contribute to the development of hypertension (Aslami & Jobby, 2015). According to The Eighth Joint National Committee (JNC 8), systolic blood pressure is 140 mmHg or diastolic blood pressure is 90 mmHg. Hypertension, also known as high blood pressure, is a common medical condition that increases the risk of heart disease and stroke. It is important to monitor and manage blood pressure to prevent complications and maintain overall health (James et al., 2014). A community segment that requires significant attention is fishermen, who work in demanding, hazardous, and stressful environments and lead unhealthy lifestyles. Fishermen must spend hours at sea, which leaves them susceptible to a variety of illnesses (Qasim et al., 2019; Singh, Abdulrahman, & Rashid, 2018). Due to the unpredictability of sea life, frequent separation from family, the presence of wind and waves, and the boat-to-sink scenario, working at sea is one of the stressors for fishermen, which can result in risk factors for hypertension (Doddamani, Ballala, Madhyastha, Kamath, & Kulkarni, 2021).

Some of the risk factors for health in fishermen, The presence of stress, poor diet, use of drugs, alcohol, drugs, smoking, exercise, and diving habits (Sillehu, Utami, Ibrahim, Peluw, & Lating, 2024), Physical activity at sea, increased waist circumference, and higher body mass index (BMI) for risk hypertension in fishermen (Doddamani et al., 2021). Additionally, the irregular and unpredictable work schedules of fishermen, which often involve long hours and a lack of sleep, can contribute to the development of hypertension. Furthermore, the isolated nature of their work can limit access to healthcare resources and preventive measures, further increasing the risk of developing hypertension (Doddamani et al., 2021). Irregular work schedules, frequent waking at night, lack of sleep cause circadian disorders that change the 24-hour blood pressure rhythm (Shafer, Kogan, & McHill, 2024), Mechanistically, changes in blood pressure occur through disturbances in the balance of the autonomic nervous system, variations in sodium retention, dysregulation of the endothelial vasodilation response, and activation of pro-inflammatory mechanisms, which can increase the risk of hypertension through increased sympathetic nerve activation (Shafer et al., 2024).

Proper treatment must be prioritized for public health problems related to hypertension, One treatment is wet cupping therapy, in several research results there was a reduction and control of blood pressure in hypertensive patients after cupping therapy, this can be used an addition to conventional therapy, with the aim is to reduce the dose of the antihypertensive medication given (Al-Tabakha et al., 2018). Hypertension, also known as high blood pressure (BP), affects millions of people worldwide and is a leading cause of heart disease, stroke, and other serious health complications. It is crucial that healthcare systems allocate resources and develop effective strategies to diagnose, manage, and prevent hypertension to reduce the burden on individuals and society as a whole. Additionally, raising awareness of the importance of lifestyle modifications, such as maintaining a healthy diet, regular exercise, and stress management, can play a significant role in prevention and management (Astutik, Puspikawati, Dewi, Mandagi, & Sebayang, 2020). Men with poor dietary habits are at risk for hypertension with eating fewer fruits and vegetables and more fried foods and high-fat snacks, as well as irregular meals while at sea (Laraqui et al., 2018). Fishermen's diet is high in fat, high consumption of sugar and salt which is inversely proportional to vegetable and fruit intake, as well as the habit of snacking at night, is a habit that will cause the risk of hypertension (Sakir, Hwang, Park, & Lee, 2024). Dietary modification plays an important role in managing blood pressure. Extensive data showing a causal relationship between dietary factors and blood pressure highlights the important role of diet in managing hypertension (Zhao et al., 2024).

Fishing communities' habit of salting and drying their catch increases salt intake, which can increase blood pressure (Astutik et al., 2020; Laraqui et al., 2018). Hypertension is a public health concern worldwide because of its high mortality and disability rates. Various techniques, such as cupping therapy, have been applied as complementary therapies (Wang & Xiong, 2013). Complementary medicine (CM) has gained attention as a therapeutic option in both developed and developing nations in recent years. Complementary medicine aims to improve public health by preventing and treating diseases, offering treatment options to the community, and enhancing the role of nurses in providing healthcare (Mbizo et al., 2018). Cultural beliefs and practices frequently lead to self-care and conventional medicine, and over 70% of the world's population uses complementary medicine systems, particularly in rural areas. The roots of cupping therapy are science, culture, and faith. It can restore blood flow and balance out the body (Aboushanab & AlSanad, 2018; Sutriyono, Robbina, & Ndi, 2019).

The idea behind cupping therapy for hypertensive patients is excretion, which is achieved by eliminating hazardous metabolic materials, excess interstitial and intravascular fluid, oxidants, and oxidative stress (Tagil et al., 2014). Along with increasing vasoactive compounds and free radical accumulation, cupping therapy also increases endogenous nitric oxide production and excretion (Yucel, Cahit, Duran, & Meric, 2021). This may cause blood pressure to drop. A retrospective investigation of hypertensive patients revealed that wet cupping helped lower and regulate blood pressure in these

patients (Sajid, 2016). One observational study tested wet cupping for acute hypertension and found that one-time cupping therapy could reduce systolic blood pressure. There has been little prior research on cupping, and some of it has been affected by social, cultural, and religious considerations. Better clinical and methodological testing should be used in future studies (Al Bedah et al., 2016; Almaiman, 2018)

This study aimed to evaluate the effects of complementary cupping therapy on the management of hypertension and triglyceride levels in coastal fishing communities. Coastal fishing communities are particularly vulnerable to hypertension and high triglyceride levels, owing to their occupation and lifestyle. By assessing the impact of complementary cupping therapy on these health conditions, this study provides valuable insights into potential alternative treatments for these communities.

Methods

Study design

The study team met with the village head to discuss educating the community after visiting the North Konawe Health Center in the Sawa subdistrict to gather data on outpatient hypertension patients. The research team then offered counseling regarding the introduction of supplementary cupping therapy. Those willing to participate in the study can register for two weeks. From April to September 2023, the study was conducted at the Sawa subdistrict village hall.

Sample size

For both experimental and comparison studies, the sample size ranged from 15 to 30 respondents per group. Thirty respondents were estimated for each group, and the sample size was determined using 90% power and 95% confidence interval. Male and female participants in the study were aged between 30 and 70 years. Bloody diathesis and kidney disease were excluded. SBPs must be between 110 and 120 mmHg in the normotensive group and 140 to 180 mmHg in the hypertension group.

Randomization sampling methods

Of the 140 registered respondents, 70 belonged to the hypertension group and 70 to the normotension group according to the randomization list that was generated. Random sampling was applied to both groups using 1:1 allocation and a random block list generated in Excel 2020. Fifty responses from the hypertension group and 50 from the normotension group comprised the findings of the random sampling. Following the application of the inclusion and exclusion criteria, 60 respondents were gathered, with each group being broken into smaller groups.

Clinical evaluation

Using an Omron HEM-705CP HealthCar standard digital sphygmomanometer, the respondent's blood pressure and pulse were measured twice: one week before and one week after cupping therapy. The measurements were taken while the respondent was seated, following a 10-minute rest period. Triglycerides are hydrolyzed by lipoprotein lipase to produce glycerol and fatty acids. The concentration of triglycerides in the sample was directly related to the increase in absorption. The measurement is performed at the Prodia Clinical Laboratory using the enzymatic colorimetry (GPO PAP) method.

Intervention

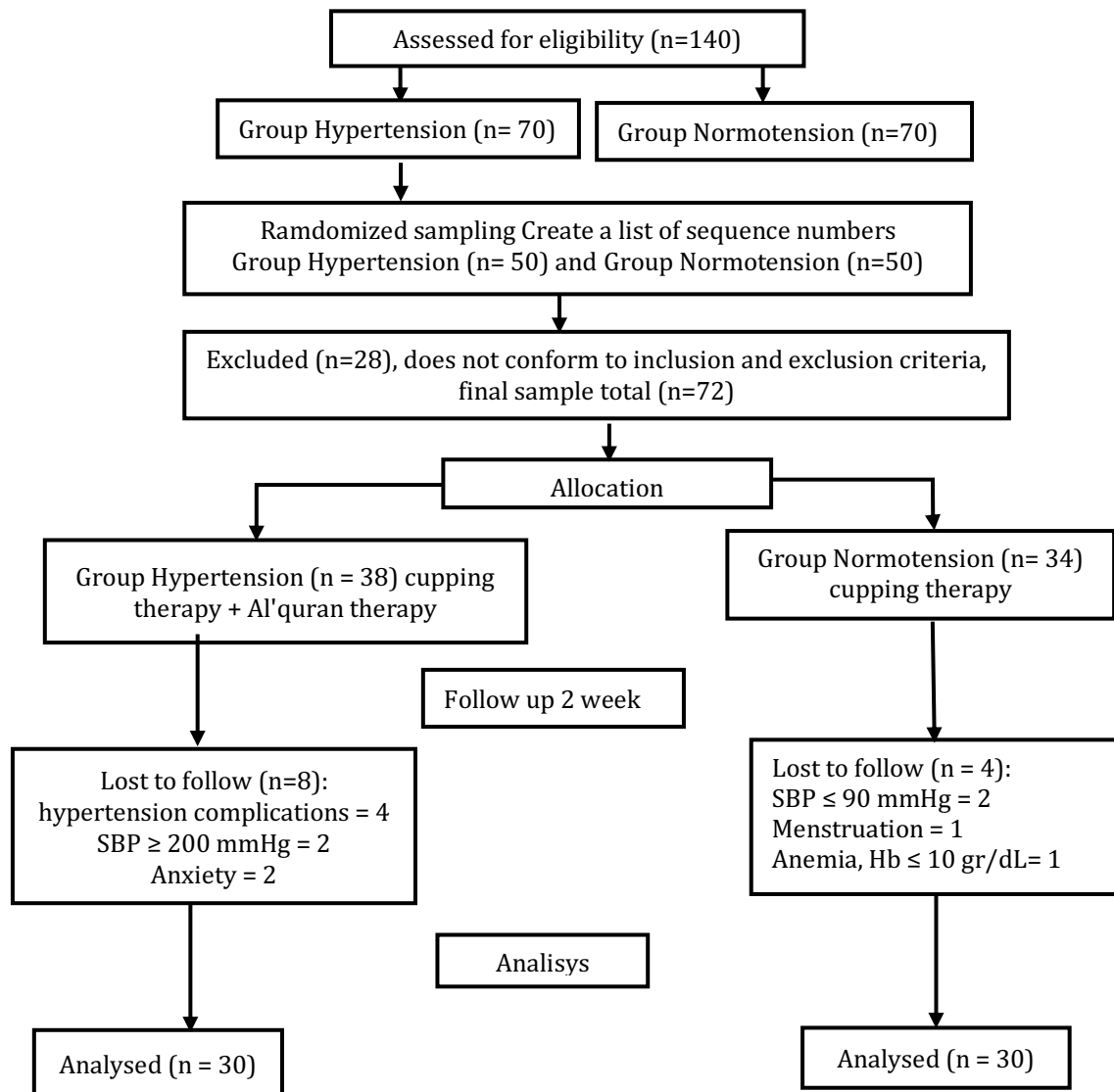
Al-Quran therapy and cupping therapy were administered to the hypertension group (n = 38), while cupping therapy was the only treatment offered to the normotensive group (n = 34). After a two-week period, 12 of the 30 responders fell into the hypertension group and the remaining 30 fell into the normotension group.

Cupping therapy procedure

The cupping session consisted of six steps. First, the Respondent filled out an informed consent form, conducted interviews, and carried out a health check on blood pressure, pulse rate, and triglyceride levels. Wet cupping lasts approximately 30-40 minutes according to aseptic technique requirements. The second category includes sterilized cupping equipment, environmental cleanliness, sleeping equipment, and PPE. Third, the therapist allocated a special point for cupping and disinfecting the area using alcohol-betadine and olive oil. Next, the first cup was sucked at the selected point, and the therapist sucked the air in the cup with two suction, for 3-5 minutes. fourth, perform scarification (small shallow incisions), using a 15 gauge sterile scalpel, make 10 incisions per cup location, each incision is 2-3 mm long and 0.1 mm deep,

just to open the skin barrier and reach the fenestration shallowest. Scarification was performed by a professional therapist from the research team, and the cup was placed back on the skin using the procedure described above for 30 seconds to 1 min. External pressure suction cups help filter small molecules through fenestrated skin capillaries. Sixth, clean and disinfect cupped skin (Husain et al., 2020).

Figure 1. Research Flow Diagram



Data Processing and Analysis

SPSS version 22 (IBM SPSS, Chicago) was used for data processing and analysis. An independent sample t-test was used to determine whether the two groups had the same mean value or were substantially different, while a paired sample t-test was used to compare the differences between the hypertensive and normotensive groups before and after the intervention. The confidence interval was 95% for $\alpha = 0.05$.

Ethical consideration

In accordance with the guidelines of the Declaration of Helsinki, ethical approval was obtained from the Research Ethics Committee of Poltekkes Kemenkes Kendari (approval number LB.02.01; Ethics 030/2022), and each subject provided written informed consent.

Results

The findings showed that there was no discernible difference between the means or standard deviations of the hypertensive and normotensive groups. The patients were between 30 and 70 years of age. Most people in both categories were between the ages of 41 and 50 and were evenly distributed. Most belonged to the Tolaki tribe, and the majority were fishermen or wives. Senior high schools had the highest level of education. The majority of the participants in the hypertension group had a history of smoking and marital status. Further details can be found in Table 1

Table 1. Demographic Characteristics of Study Respondent

Variable	Group A			Group B		
	(n)	(%)	(Mean±SD)	(n)	(%)	(Mean±SD)
Age (years)						
30-40	6	20		9	30.0	
41-50	11	36,7	2.46±1.07	13	43.3	2.00±.830
51-60	6	20		7	23.3	
61-70	7	23,3		1	3.3	
Gender						
Male	15	50.0	1.50±508	19	63.3	1.36±.490
Female	15	50.0		11	36.7	
Job						
Civil Servants	1	3.3		7	23.3	
Farmer	2	6.7		1	3.3	
Fisherman	10	33.3	3.53±1.38	7	23.3	3.06±1.59
Private	6	20.0		7	23.3	
fisherman's wife	11	36.7		8	26.7	
Ethnic group						
Tolaki	17	56.7		14	46.7	
Java	3	10.0	1.73±1.01	4	13.3	2.13±1.13
Bajo	7	23.3		3	10.0	
Buginese	3	10.0		9	30.0	
Education						
Elementary School	6	20.0		2	6.7	
Junior High School	9	30.0	2.36±.889	11	36.7	2.60±.770
Senior High school	13	43.3		14	46.7	
Bachelor	2	6.7		3	10.0	
Marital status						
Married	22	71.0		21	67.7	
Widow	4	12.9	1.46±0.86	4	12.9	1.53±0.93
widower	3	9.7		3	9.7	
not married	1	4.2		2	6,5	
Smoking history						
Smoking	18	58.1	1.50±508	8	25.8	1.36±.490
Not smoking	12	38.7		22	71.0	

In Table 2. The differences before and after intervention, average blood pressure, systolic and diastolic blood pressure, pulse, and triglyceride levels. In the hypertension group (n=30), SBP from (155 ± 21.8) decreased to (141 ± 19.9), DBP from (92.9 ± 10.6) decreased to (85.3 ± 11.3), and triglyceride levels from (259 ± 154) decreased to (173 ± 74.6), Meanwhile, in the normotensive group (n=30), SBP from (113 ± 11.5) increased to (115 ± 9.84), DBP from (75.8 ± 7.74) increased to (76.0 ± 6.2), and triglyceride levels from (226 ± 108) decreased to (160 ± 76.4). In both groups, statistical significance was set at P value <0.05.

In Table 3, the comparison between the hypertensive group (n=60) and the normotensive group (n=60) before and after intervention in terms of riglyceride levels (P=0.961) and pulse rate (P=0.232) did not differ between the TG and Nadi groups in the hypertensive and normotensive groups. Meanwhile, when checking blood pressure, the SBP (P=0.000) and DBP (P=0.000) that there was a difference in blood pressure after cupping therapy in the hypertensive group and the normotensive group.

Table 2. Distribution of the difference between the two groups before and after cupping therapy combined with Al-Quran therapy

Group	Variable	(Mean±SD)		Mean Difference ±SD	P-Value
		Before	After		
Hypertensi	Triglyceride	259±154	174±74.6	85.1±80.1	0.000*
	Systolic Blood Pressure	155±21.8	141±19.9	14.1±1.9	0.000*
	Diastolic Blood Pressure	92.9±10.6	85.3±11.3	7.6±-0.7	0.000*
	Pressure	85.4±12.6	81.8±9.97	3.6±2.7	0.178
Normotensi	Triglyceride	226±108	160±76.4	66.7±31.6	0.001*
	Systolic Blood Pressure	113±11.5	115±9.84	-2.1±1.7	0.000*
	Diastolic Blood Pressure	75.8±7.74	76.0±6.2	-1.6±1.4	0.000*
	Pulse	79.6±10.9	78.7±9.84	0.9±1.1	0.502

Table 3. Comparison of hypertensive and normotensive of the two groups before and after cupping therapy

Variabel	Mean Difference	Std. Error Difference	Std. Error		Sig. (2-tailed)	N
			Lower	Upper		
Trigliserida	1.1000	22.2855	-43.5087	45.7087	0.961	60
Systolic Blood Pressure	19.3667	2.5547	14.2535	24.4799	0.000*	60
Diastolic Blood Pressure	9.9667	2.0920	5.7788	14.1555	0.000*	60
Pulse	3.4000	2.8124	-2.2301	9.0301	0.232	60

Discussion

In terms of demographics, most respondents were married fishermen, Tolaki tribe, high school education, aged 41–50 years, and smokers, which are risk factors for hypertension and increased triglyceride levels. Being a fisherman presents its own difficulties. Research on the health and treatment of fishermen is still lacking, and studies that have been conducted have mostly concentrated on the accidents and fatalities of fishermen (Laraqui et al., 2018). However, it is important to note that occupational hazards faced by fishermen, such as long working hours, physical exertion, and exposure to harsh weather conditions, can also contribute to their overall health issues. Additionally, the lack of access to healthcare facilities and limited awareness of preventive measures further exacerbates the health challenges faced by this specific demographic. Age is a predictor of a higher incidence of hypertension, according to fishermen aged > 40 years in Copacabana and Ponta Grossa, who are 55 years old, and older rural residents, with an average age of 63 years (Astutik et al., 2020). This finding suggests that as individuals age, they become

more susceptible to hypertension. Therefore, it is important to consider age as a significant factor when assessing the risk of hypertension in different populations. In fishing communities, higher sodium levels are linked to increased salt intake by fishermen, which may have an increasing impact on blood pressure and hypertension (Alayyannur, Ramdhan, & Tejamaya, 2023; Grillo, Salvi, Coruzzi, Salvi, & Parati, 2019). This is particularly concerning because high blood pressure and hypertension are known risk factors for cardiovascular diseases. Therefore, it is crucial to implement effective strategies to educate fishermen and promote healthier dietary habits to mitigate these potential health risks.

Traditional remedies are often used to provide medical care in fishing villages. Therefore, complementary and alternative medicines should be considered seriously. Complementary medicine is incorporated into the communities' traditional medical practices. Cultural practices and beliefs are widely used by communities, particularly in rural areas. These traditional remedies have been passed down through generations, and are deeply rooted in the cultural heritage of fishing villages. They are considered effective and trusted methods of healing, providing a sense of comfort and familiarity with community members. However, it is important to acknowledge that complementary and alternative medicine should not replace modern medical treatments but should be integrated alongside them for holistic healthcare approaches (Patwardhan et al., 2023). Complementary medicine is incorporated into the communities' traditional medical practices. Cultural practices and beliefs are widely used by communities, particularly in rural areas (Adatara, Strumphor, Ricks, & Mwini-Nyaledzigbor, 2019). In this study, the parameters changed after the cupping therapy. This is in accordance with the results of several studies, namely, the relationship between wet cupping and a decrease in SBP in patients with hypertension. Vascular compliance and vascular filling rate are significantly affected by cupping therapy, and in acute hypertension patients, wet cupping with a single cupping treatment can lower systolic blood pressure (Hekmatpou, L, & S, 2013). Research on hypertension patients who undertake wet cupping therapy is based on suggestions from friends and their religious views, in addition to using prescription medications and complementary and alternative medicine (Aleyeidi, Aseri, Matbouli, Sulaiamani, & Kobeisy, 2015; Ismail, Ahmad Hassali, Farooqui, Saleem, & Roslan, 2018). Consequently, the dosage of antihypertensive medications can be decreased using cupping therapy as an adjunct to traditional therapy. Cupping therapy improves blood circulation and promotes relaxation, which can help reduce high blood pressure. This complementary approach may also enhance the effectiveness of antihypertensive medications, allowing for a lower dosage to be prescribed.

Methods by which wet cupping therapy lowers blood pressure. Wet cupping reduces pain, whereas scarification and blood suction decrease arterial blood volume and directly affect blood pressure. These techniques stimulate the natural healing response of the body and promote blood circulation. Wet cupping specifically helps remove toxins and stagnant blood from the body, which can contribute to high blood pressure. Additionally, scarification and blood suction promote the release of endorphins, which can help relax blood vessels and reduce the overall blood pressure levels (Aleyeidi et al., 2015). Blood pressure can increase as a result of increased sympathetic activity caused by pain. Cupping alleviates pain, sympathetic decline directly lowers blood pressure, and cutting back on NSAID use indirectly lowers blood pressure (Fournier et al., 2012). Additionally, cupping therapy promotes relaxation and reduces stress levels, which can further contribute to a decrease in sympathetic activity and blood pressure. Moreover, reducing the intake of nonsteroidal anti-inflammatory drugs (NSAIDs) can have a positive impact on blood pressure, as these medications are known to potentially elevate blood pressure in some individuals.

The 'thickness' of the blood passing through circulation is the scientific basis for the use of wet cupping to control high blood pressure. Selected 'stagnant' blood—the heaviest and most damaged—was extracted using wet cupping therapy. Blood pressure is lowered and circulation is made smoother and cleaner as a result (Aleyeidi et al., 2015; Ismail et al., 2018). Wet cupping therapy involves creating small incisions on the skin and applying suction cups to draw out a small amount of blood. This process helps remove toxins and waste products from the body, improving overall blood flow and reducing the strain on the cardiovascular system. Additionally, by removing stagnant blood, wet cupping therapy promotes the release of fresh oxygenated blood, thereby enhancing the delivery of nutrients to various organs and tissues in the body. Elimination of toxic metabolic chemicals and excess intravascular and interstitial fluids is another mechanism of wet cupping in hypertension. Through the stimulation of endogenous nitric oxide generation and excretion, including the accumulation of vasoactive chemicals and free radicals, wet cupping therapy can lower blood pressure. According to the Taibah principle, negative pressure and small incisions made during wet cupping can enhance blood flow (Ismail et al., 2018; Qureshi et al., 2017). This increased blood flow helps remove waste products and toxins from the body, further aiding in the elimination of metabolic chemicals. Additionally, the release of endogenous nitric

oxide during wet cupping therapy promotes vasodilation, improves blood circulation, and reduces hypertension symptoms. By stimulating the peripheral nervous system and providing cardioprotection, wet cupping can also correct sympathovagal imbalance in the cardiac rhythm (Arslan, Yeşilçam, Aydın, Yüksel, & Dane, 2014)

Numerous studies on the advantages of cupping therapy complement the findings of this study, which showed that the mean respondent's triglyceride levels considerably decreased after one week of wet cupping therapy. By controlling the expression of nitric oxide synthase (NOS), mild scarification of the skin results in an increase in endogenous NO production. In addition to its role in biochemical clearance, including triglycerides, cholesterol, serum, interstitial fluid, and excretion, nitric oxide also plays a significant role in vasodilation, antioxidant effects, and antibacterial effects (El-Tantawy, 2015). Furthermore, nitric oxide has been found to regulate blood pressure and improve blood flow, which can contribute to a reduction in triglyceride levels. Additionally, the vasodilator activity of nitric oxide can help enhance the delivery of nutrients and oxygen to tissues, promoting overall health and well-being.

Cupping therapy helps patients return to a normal functional state by increasing body circulation, repairing capillary endothelial cells, accelerating granulation, and stimulating angiogenesis in the local tissues. They also improve blood circulation and eliminate waste products and toxins from the body (Al-Bedah et al., 2019; Siddiqui & Shoaib). Additionally, cupping therapy has been found to reduce muscle tension and promote relaxation, which can help alleviate stress and improve overall wellbeing. Furthermore, this therapy has been used to relieve pain and inflammation associated with various conditions such as arthritis or fibromyalgia. Cupping is a useful technique for lowering total cholesterol, triglycerides, low-density lipoprotein (LDL), and high-density lipoprotein (HDL) levels, which helps avoid atherosclerosis and cardiovascular disease. Cupping causes excretion of CPS, which clears the interstitial fluid and blood. Blood traveling via skin capillaries with fenestrations is cleansed by cupping (El-Shanshory et al., 2018). According to multiple studies on cupping, side effects are uncommon. When performed professionally by professionals who are certified, trained, and licensed, wet cupping therapy is a safe process. When the requirements for the proper application of wet cupping therapy were fulfilled, relatively few adverse effects were observed. Strict sterilization is required at the start of therapy, during the treatment process, and thereafter. Further research is required to understand the exact mechanism by which cupping reduces triglyceride levels and blood pressure. In addition, it is important to note that individual experiences with wet cupping therapy may vary. Although side effects are generally rare, some individuals may experience mild bruising or skin irritation at the cupping site. It is always recommended to consult a healthcare professional before undergoing any alternative therapy to ensure its suitability for specific health conditions.

Conclusion

The findings of this study suggest that wet cupping, along with suggestions for lowering triglyceride levels that might cause heart disease such as hypertension, can be utilized as a supplemental therapy in coastal fishing communities to lower systolic and diastolic blood pressure. To support the long-term benefits of wet cupping therapy, demonstrate its sustainable effects, and investigate the mechanisms of cupping against chronic diseases through blood removal pathways, scarification techniques, suction techniques, pain mechanisms, and cellular and genetic functions, more research on cupping therapy is still necessary. Further research on cupping therapy can help in understanding its potential side effects and contraindications, ensuring its safe and effective use. Exploring the cultural and psychological aspects of cupping therapy can provide a holistic understanding of its impact on individuals and communities.

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Conflict of interest

The authors declare that there are no conflicts of interest.

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Author Contribution

All authors were actively engaged from the beginning of the research activities to the publication process. IH and LR wrote the first draft. LR, IH, MS, ASY developed the idea for the article. All authors have seen and approved the final version.

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