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APPLICATION OF WET CUPPING THERAPY IN REDUCING BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION

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ABSTRACT

Cardiovascular disease includes hypertension as a risk factor. Cupping therapy is one of the complementary therapies that can be used to treat hypertension. In hypertensive patients, cupping therapy (Bekam) is a simple and cost-effective technique for lowering blood pressure.This study aims to identify the effectiveness of wet cupping for reducing blood pressure among patients with hypertension. This study employs a pre- and post-test design for a clinical observation. The participants in this study were all hypertensive patients from the Sukoharjo district in the province of Central Java, Indonesia. The study sample consisted of 27 intervention group participants and 29 control group participants. The bivariate statistics in this study were analyzed with Wilcoxon. The participants received wet cupping therapy at locations of the heart, namely points 4, 5, 6, 7, 8, for two weeks with a three-day interval between interventions, each lasting 30 minutes. There is a significant difference between pre- and post-test systolic and diastolic mean arterial pressure (MAP). In the first intervention, the mean systolic blood pressure was 18.3 mmHg (p = 0.000), and the mean diastolic blood pressure was 6.11 mmHg (p value of 0.003). After treatment, the mean diastolic pressure was 16.11 mmHg (p = 0.000) and the diastolic mean was 6.3 mmHg (p value of 0.000). Before intervention, the mean arterial pressure was 10.23 mmHg (p value = 0.000) and after intervention, it was 9.56 (p value of 0.000). This studies revealed that wet cupping therapy (Bekam Basah) is beneficial in lowering blood pressure in hypertensive patients.

Keywords: diastolic; hypertension; systolic; wet cupping therapy

INTRODUCTION

The prevalence of cardiovascular disease is expected to rise to 20 million cases throughout the next few decades (Kishore et al., 2018). It is anticipated that 23.6 million people would be diagnosed with cardiovascular disease by 2030. (Rini, Karim & Novayelinda, 2014). The primary risk factors for the development of heart disease are hypertension (HT), high cholesterol levels, and smoking (Bild et al., 2014). HT contributes to around 55% of global fatalities from heart disease (Zou et al., 2015). Hypertension, sometimes known as the silent killer, refers to an increase in systolic blood pressure >140 and diastolic blood pressure >90. (Setyawan, Budiyati and Hardiyanti, 2020). Indonesia Baseline Health Research in 2021 reported that the prevalence of hypertension in the country had risen to 26,5 percent among those aged 18 and older. From 2007 to 2013, the incidence of hypertension rose from 7.6% to 9.5%. 63.2 percent of hypertension cases in the population were undetected, given this frequency. The prevalence of hypertension among those aged 18 and older in Central Java is 2.04% (Ministry of Health of the Republic of Indonesia, 2020).

In Sukoharjo, the prevalence of hypertension is relatively high, at 12.42 per 1000 people. In Sukoharjo, the rate of hypertension has reached 11,099 cases. Within the Sukoharjo District itself, an estimated 60.44 per 1000 inhabitants are recorded (DKK Sukoharjo, 2020). More than fifty percent of the pre-elderly and elderly suffer from hypertension as a result of lifestyle changes. The management of hypertension can be pharmacological or non-pharmacological (Wahdah, 2011). Diuretic therapy, sympathetic inhibitors, beta blockers, vasodilator agents, angiotenes in conversion enzyme inhibitors, angiotenes in calcium, and angiotenes in II receptor inhibitors are included in pharmacological management (Black & Eagle, 2014). Despite having a significant effect, pharmacological therapy has the potential to cause a variety of side effects and poses a risk of drug resistance that can reduce the treatment's efficacy (Wang, Xiong & Liu, 2013). To treat chronic disorders, including hypertension, non-pharmacological modality therapies have been created (Kretchy Owusu-Daaku & Danquah, 2014). Wet cupping is widely practiced among the various modalities (Aleyeidi, Aseri & Kawthar, 2014). Cupping is a simple and cost-effective treatment for a variety of diseases with diverse causes and pathogenesis, including hypertension (HT) and elevated mean arterial pressure (MAP) (El Sayed, Mahmoud & Nabo, 2013). Wet cupping is an independent procedure that a certified nurse can perform. This study will investigate the efficacy of wet cupping therapy in reducing blood clots in hypertensive patients.

METHOD

This is a quasi-experimental study with a pretest-posttest control group design. Patients diagnosed with hypertension comprised the entire study population. This study's samples were collected using a strategy of purposive sampling. The inclusion system includes patients with a minimum one-year history of hypertension and a willingness to participate in the study. Patients who experienced complications were excluded from the study. From the village of Gayamsari in Sukoharjo, 56 participants were recruited: 27 for the intervention group and 29 for the control group. The intervention group received wet skin cupping therapy at accu-points 4, 5, 6, 7, and 8 for 30 minutes over three days. A registered nurse who possesses rapy certification performs cupping. The protocols for wet cupping therapy are standardized and reviewed by the ethics committee. The Ethics Committee of the Chakra Brahmanda Lantern provided ethical approval for the study. The control group did not receive an intervention, but they did receive health education sessions on hypertension and lifestyle to remain healthy despite their hypertension diagnosis. The characteristics of the study participants were identified by a univariate analysis, which resulted in gender, age and occupational profile . A bivariate analysis of this study carried out by Wilcoxon signed a Ranking between intervention and control. The data taken in these two research groups were interval scales and were not distributed normally. Statistical significance is considered at *a p-value* of <0.05.

RESULTS AND DISCUSSION

Table 1.
Characteristics of Participants in Gayam Village, Sukoharjo

	Group				Total (n=56)	
	Intervention (n=27)		Control (n=29)			
	f	%	f	%	f	%
Man	13	48. 14	12	41.37	25	44.64
Woman	14	51. 85	17	58.62	31	55.35
Entire	27	100	29	100	56	100
Age						

Mean ± SD						
Middle Age (45-59)	4	14.81	7	24.14	11	19.64
Seniors (60-74)	6	22.22	15	51.72	21	37.50
Yours (75-90)	17	62.96	7	24.14	24	42.86
Entire	27	100	29	100	56	100
Work						
Unemployed	9	33.33	12	41.38	21	37.50
Farmer	7	25.93	0	0	7	12.50
Workforce	7	25.93	11	37.93	18	32.14
Used	3	11.11	0	0	3	5.36
Other	1	3.70	6	20.69	7	12.50
Entire	27	100	29	100	56	100

Table 1 revealed that 31 females (55.35 percent) outnumbered males (44.65 percent) in the sample (26.79 percent). 24 participants (42.86 percent) of this study's participants were between the ages of 75 and 90, whereas 21 participants (37.50 percent) of this study were unemployed.

Table 2.
Systolic and Diastolic Blood Pressure and MAP in the First and Second Intervention Groups for Hypertensive Patients (n = 27)

Data	Average	SD	Min	Max	P value
S-pre1	160.17	22.80	135	240	0.000
S-post1	141.85	24.17	100	220	
D-pre1	86.47	14.80	70	140	0.003
D-post1	80.38	16.35	60	150	
S-pre2	144.82	20.27	110	200	0.000
S-post2	128.70	18.23	100	190	
D-pre2	83.34	10.75	70	100	0.000
D-post2	77.04	9.54	60	100	
MAP-Pre1	111.00	16.54	93	173	0.000
MAP-Post1	100.78	18.03	73	173	
MAP-Pre2	102.82	12.62	83	133	0.000
MAP-Post2	95.25	11.54	73	130	

Note: S: Systolic; D: Diastolic; MAP: Average Arterial Pressure; Pretest: Before Cupping intervention; *Posttest: After the Cupping Intervention; 1 and 2: First intervention and* second intervention.

Bivariate analysis is shown in Table 2. This table illustrates the statistically significant variations in systolic blood pressure before and after wet cupping at 3-day intervals. The p-value for both is 0.000. Similar results were observed with diastolic blood pressure. Prior to the first and second dbp interventions, the p values were 0.003 and 0.000, respectively. The intervention greatly influences the average arterial pressure. Prior to the danfter, the significance of the p-value for the

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first and second interventions is 0.000. There is a statistically significant difference between map values before and after the first and second interventions, with p values of 0.000 for each.

Table 3.
Systolic and Diastolic Blood Pressure and MAP in the First and Second Control Groups for Hypertensive Patients (n= 29)

	Mean	SD	Min	Max	*P value*
S-Pre	162.42	16.62	130	190	0.027
S-Post	157.60	16.40	130	180	
D-Pre	93.80	11.77	70	120	0.001
D-Post	89.32	12.52	70	120	
MAP-Pre	116.67	12.83	90	143	0.000
MAP-Post	112.04	13.14	90	140	

Note: S: Systolic; D: Diastolic; MAP: Average Arterial Pressure; *Pre: Before Health* Education*; Post: After Health Education Source: Primary Data*

Table 3 displays the outcomes of the paired t-test. This table highlights the differences between the two methods of measuring samples. In the control group, systolic blood pressure was 4.82 mmHg and diastolic blood pressure was 4.48 mmHg. This particular study group had a mean arterial pressure difference of 4.63 mmHg. In the control group, there were significant variations in systolic, diastolic, and MAP before and after health education sessions, with p = values of 0.027, 0.001, and 0.000, respectively.

DISCUSSION

Female individuals had a higher incidence of hypertension than male participants. This study's findings are consistent with Florea and Cohn's (2014) assertion that women are more responsive to stressors than men. Whether stress is induced by internal or external circumstances, the stressor creates a stimulus that is communicated to the brain during the process. Upon stimulation of the human brain, the sympathetic nervous system is stimulated to release CRH. CRH stimulates the secretion of ACTH, which travels through the circulatory system and eventually reaches the adrenal cortex. The adrenal cortex is induced and stimulated to release adrenaline, which then influences the homeostasis of the body.

The response of the body's organs to numerous mechanisms, including structures that regulate the dynamics of the cardiovascular system. The heart pumps faster and the heart rate increases, resulting in an increase in blood circulation flow and arterial pressure. At the onset of changes in organ function, women are typically less adventurous and more passive. Women tend to retreat and maintain silence. Females exhibited a lesser fight-or-flight reaction in comparison to males. This condition diminishes energy conservation, leading to a decline in brain power reserves. Acceptance of pressures is impacted by diminished brainpower. Women become more sensitive and fragile to pressures as they age. Frequent instances of anxiety are correlated with heightened sensitivity.Compared with men, women stimulate more adrenaline in stressful events.

The increased concentration of adrenaline in the bloodstream presents a direct effect to the cardiovascular system, resulting in a higher incidence of hypertension among the female population. The elderly age group (75-90 years) occupied a higher proportion of samples in the study by 24 participants (42.86%). Moyo *et al.* , (2016) found that cognitive and behavioral changes occur in the aging process. As the individual ages, cognitive, physiological and behavioral abilities end in changes. The study reported a correlation of 0.73 that changes occur due to the process of degeneration in the cells of the human body. The brain, kidneys, lungs and cells of the cardiovascular system are damaged.

Changes in the functioning of the Gamma-Amino Butyric Acid (GABA) system are responsible for the aging phenomenon among participants that impacts anxiety levels. Anxiety boosts blood pressure more, leading to hypertension. Lower GABA receptor affinity decreases linearly with age and maturity. The decrease in the GABA affinity receptor system correlates with the cessation of chloride ion channels, so preventing chloride ions from entering the cell. Less chloride ions in the cell result in a reduction in cell polarization. Individuals with episodes of persistent anxiety are more likely to develop hypertension. The incidence of anxiety in the older population is also associated with insulin. The drop in insulin levels impacts the body's ability to transport glucose into cells as a source of energy. Reduced blood glucose in the brain interferes with the body's defenses' energy usage. Individuals with hypoglycemia are prone to anxiety and the incidence of hypertension is directly proportionate to their susceptibility. Ningsih, Indriani, and Rosida (2017) confirmed that hypertension is more prevalent in women (54 percent) than in men (47 percent) in the United Arab Emirates, however in Yogyakarta, 226 participants (70.6 percent) of hypertension patients are female. This study demonstrates a correlation between obesity and type 2 diabetes.

The study revealed that the biggest group of hypertension patients, comprising 21 participants (37.50%), were unemployed, whereas 18 individuals (32.14%) were employed. Similar findings were reported by Hardati and Ahmad (2017), who discovered that the unemployed were 8.95 times more likely to develop hypertension than the employed. People with less physical activity, as measured by Metabolic Equivalent Task (MET) values below 600 per week, had a 1.25-fold increased risk of developing hypertension compared to those with greater physical activity. Lack of physical activity is associated with the prevalence of hypertension. Physical activity lowers the risk of hypertension through decreasing vascular resistance and suppressing the sympathetic nervous system and renin-angiotensin system. Less active individuals tend to have a higher heart rate, resulting in a heavier load of myocardial function during heart contractions and greater pressure against the arterial walls.

The average pre- and post-test scores for wet cupping in the intervention group varied between the first and second interventions. These results are consistent with Fatonah, Rihiantoro, and Astuti (2017), which reveals that substantial differences were detected in MAP between hypertension patients before and after therapy (p = 0.007; p value 0.05). Wet cupping decreases systolic and diastolic blood pressure, hence decreasing MAP. It is highly significant because MAP is derived from systolic and diastolic blood pressure. Changes in systolic or diastolic blood pressure result in MAP adjustments. Al-Surgical et al. (2018) and larasati & Wicaksono (2016) support the findings of the research. Both investigations demonstrated that certain mechanisms resulting from wet cupping therapies have the impact of decreasing mean arterial pressure (MAP).Significance of MAP Pretest-Posttest Values in the First and and Following Intervention Groups

The average pre- and post-test scores for the first and second interventions of wet cupping in the intervention group were different. These results are consistent with Fatonah, Rihiantoro, and Astuti (2017), which indicates that significant differences were observed in MAP among hypertension patients before and after therapy (p = 0.007; p value 0.05). Wet cupping reduces systolic and diastolic blood pressure, hence decreasing the mean arterial pressure. The fact that MAP is derived from systolic and diastolic blood pressure is extremely significant. Adjustments to MAP are caused by systolic and diastolic blood pressure changes. Al-Surgical et al. (2018) and larasati & Wicaksono (2016) provide support for the research findings. Some mechanisms resulting from wet cupping therapies have the effect of decreasing mean arterial pressure (MAP), according to both investigations.

First, cupping procedures that induce inflammatory responses (rubor, tumor, dolor, heat, functional loss). Inflamed tissues exhibit mast cell and cell destruction, producing chemicals such as serotonin, histamine, bradykinin, slow reaction substances (SRS), and other unidentified compounds. These compounds promote the dilatation of capillaries and arterioles in the clamped area by promoting the synthesis of endothelial derivatives' nitric oxide (NO) relaxation factor. Relaxants for the smooth muscles of blood vessels. During cupping therapies, aphoreme agents and chemicals stimulate relaxation and dilatation of blood vessels, lower wall pressure, and suppress MAP.

Second, all study participants reported feeling relaxed and at ease following therapy. Wet cupping activates the skin's nerves. These sensations are received by the spinal cord's posterior horns via the delta nerves A and C and the thalamic spino-channel, which leads to the endorphin-producing thalamus. Endorphins are recognized as tiny peptides that, when released from the hypothalamus, boost mood and heighten feelings of tranquility. A cheerful and tranquil disposition instantly induces a state of relaxation in the body, reducing the heart rate. A drop in heart rate translates in a decrease in cardiac output, which impacts MAPS.

Excretion happens during wet cupping therapy, which is characterized by blood with a high viscosity. Blood may contain cholesterol in excess of the normal range. It demonstrates the presence of cholesterol in injured blood cells retrieved during treatment. Because of the physiology of damaged cells, high cholesterol levels result in cell damage. Wet cupping therapy removes cholesterol from the body to enhance blood flow in blood vessels. Blood pressure is also connected with blood viscosity in addition to being controlled by cardiac output. In patients having wet cupping, a decrease in blood viscosity observed in the body leads to low blood pressure and MAP.

MAP Value Significance in a Control Group

The study discovered a wide variety of results. Before and after health education, systolic, diastolic, and mean arterial pressure (MAP) were substantially different with p values of 0.027, 0.001, and 0.000, respectively. These findings imply that providing health education sessions to the control group led to a reduction in blood pressure. About 45 minutes of health education was presented by researchers, which was followed by a question-and-answer session. Before instruction, participants' blood pressure was measured after 5 to 10 minutes of rest. These sessions generally altered the hemodynamics of the individuals. Relaxed sitting improves the flexibility of blood vessels and decreases blood pressure.

This study's findings were also affected by the individuals' anxiety levels. In the control group, health education sessions were entertaining because endorphins increased and reduced anxiety, which directly benefited blood pressure. Endorphins are naturally occurring, morphine-like compounds that alleviate pain and promote a happy mood. Endorphin production is increased by relaxation. This finding is pertinent to Yuwono, Ridwan, and Hanafi's (2017) evaluation of the influence of health education on anxiety levels among hypertension patients in Kwancen, Bandongan Village, Magelang Province. Patients with hypertension whose anxiety decreases after obtaining health education have lower blood pressure. Hypertension is an asymptomatic condition that frequently results in abrupt death. Unaware of the symptoms, the patient perceives this circumstance as a stressor that causes a quick rise in blood pressure. Fear, anxiety, and concern are experienced due to a lack of knowledge about illness and its treatment.

Anxiety that develops in a person diagnosed with hypertension is considered a health burden. Before the educational session, the participants in the study contemplated a variety of topics, including despair and anxiety resulting from illiteracy. Health education about hypertension imparts extensive knowledge. In education sessions, hypertension definitions, pathophysiology, influencing factors, prevention, and management are discussed. During the session, interactions are performed that are dynamic. The participants inquired about emotions of anxiety and were then given an explanation. After the session, participants reported having no concerns regarding their health as a result of the adopted nutrition, balanced activity, and rest routines. After the individual feels relaxed, adrenaline production reduces. This disorder impacts blood pressure and vascular resistance, ultimately resulting in low blood pressure and MAP.

CONCLUSION

This study confirms the efficacy of wet cupping therapy in reducing MAP levels in hypertension individuals. This study is limited by the lack of control variables over variables that may have contributed to the decrease in map values. In addition to increasing the number of participants, researchers believe that future studies should focus on the factors that play a role in the intervention for lowering blood pressure in hypertensive patients.

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