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EFFECTIVENESS OF HIBISCUS TEA ON CONTROL OF BLOOD PRESSURE

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Abstract

India has only 12% have their blood pressure under control. Long queue, invasive & strange diagnostic procedures, mistrust towards allopathic management are factors of poor health seeking behavior. National center of complementary and integrative health points out hibiscus in lowering blood pressure, but not an alternative for medications. This study aimed to find out the effectiveness of hibiscus tea on control of blood pressure. This pre and post test group experimental design conducted among 60 hypertensive clients (30 – experimental group and 30 – control group), who were selected by simple random sampling technique in selected primary health centres in Puducherry. Pre test blood pressure was measured and followed that hibiscus tea recipe was demonstrated to experimental group and instructed them to take consume twice daily for 30 days. Results exhibited, in experimental group pre test majority 16 (53.33%) of samples were at stage 1 hypertension, in post test majority 17 (56.67%) of samples were at stage 1 hypertension. The pre and post mean score was 133.50±37.43 and 109.93±18.14. The paired't' value (t = 5.478) found to statistically highly significant at $p<0.001$ level. This clearly indicates that the Hibiscus tea was found effective in reducing the blood pressure level among hypertensive in the experimental group. Henceforth, regular health education required to the hypertensive clients to effective use of various complementary treatment modalities along regular treatment.

Key-words: Hibiscus tea, Blood pressure

INTRODUCTION

Hypertension is a "silent killer". Increased blood pressure can be injuriously affecting the comorbid condition increases the risk of heart, brain, kidney and other diseases. Worldwide, hypertension complications can include heart attacks, heart failure, stroke, and chronic kidney disease significantly and also pronounce for increases in disability-adjusted life years (DALY) and deaths. It can be controlled with lifestyle modifications which includes healthy eating habits, physically active, maintaining a healthy BMI, restrictive alcohol intake, and powerful coping with stress besides of regular proper treatment. [1]

It is estimated that one in four adults in India has hypertension but only 12% among them have their blood pressure under control. [2] Studies revealed that long queue, invasive & strange diagnostic procedures, mistrust towards allopathic management are factors of poor health seeking behavior. [3] In contrast, there is an evolving use of complementary treatment as a substitute to chemical medication which possibly will have various ins and outs including side effects of other alternative treatment. Considering this all-in hand with positive beliefs and experiences of complementary and alternative treatment among people with their traditions makes them more attention to trust and practice indigenous medicine. Ethnicities proposed herbs such as garlic, onion, black and green tea, and sour tea or *Hibiscus sabdariffa*. Some studies have proven some of these medications' positive effects. [4]

There was many researchers found that the Hibiscus tea has control over blood pressure. The tropical variant in South East Asia, *Hibiscus rosa-sinensis* has various health benefits as follows; protects antibiotics, fights against

inflammation, lower cholesterol, promotes weight loss, products liver etc. National centre of complementary and integrative health points out hibiscus in lowering blood pressure, but not an alternative for medications.[5]

Amthaghri,et.al. (2022) conducted in vivo study among laboratory rats. In these hypertensive and normotensive rats were treated by Aqueous Extract of Hibiscus Rosa Sinunsis (AEHRS) (100 mg/kg) per oral about 6 hours in the acute phase of treatment and till 7 days in the sub-chronic treatment. The systolic, diastolic, and mean arterial blood pressure values also heart rate were then recorded by using a tail cuff and with a computer-assisted monitoring device. Vasorelaxant activity of AEHRS was assessed by, isolated thoracic aortic rings were suspended in a tissue bath and changes in tension were recorded using a data acquisition system. Several standard pharmacological agents were used as potential pathways involved in the elevation of vasorelaxant activity. Repeated oral administration of AEHRS during 7 days lowered systolic, diastolic, and mean arterial blood pressure in hypertensive rats without affecting normotensive rats. The data discovered that AEHRS exerts vasorelaxant properties via an endothelium-independent pathway. More remarkably, the study proves that the vasorelaxant capacity of AEHRS seem like exercised over the stimulation of angiotensin-converting enzyme-2 (ACE-2) and the inhibition of Ca2+ channels pathway. [5]

In 2008 a study presented at the American Heart Association (AHA) meeting disclosed that, consuming three cups of herbal tea containing hibiscus every day reduced blood pressure among healthy people with self-effacingly elevated blood pressure. Working diet could be an actual way of preventing also treating this deadly disorder.[6] Research has initiate a range of health aids connected to drinking hibiscus tea - from lowering your blood pressure to fighting bacteria and also supporting weight loss. Hibiscus tea, which is generally prepared by using dried flowers from the Hibiscus plant, is packed with antioxidants that may support to fight free radicals, which root damage cells. It is appealed that the herbal tea could support lower blood pressure as its rich in anthocyanins, a type of flavonoid linked to improve blood vessel function.[7]

Harvard Health reports that a study demonstrated hibiscus tea helps to lower blood pressure. One more thought-provoking benefit in cardiovascular of this tea is, it has power to decrease LDL (bad) cholesterol levels. Review research explained that drinking hibiscus tea or extract reduce bad LDL cholesterol and triglyceride levels. Now, that is a dual benefit. [8]

This study aimed to find out the effectiveness of hibiscus on control of blood pressure in among hypertensive clients.

PROBLEM STATEMENT

"A study to evaluate the effectiveness of hibiscus tea in reducing blood pressure among hypertensive clients in selected areas in Puducherry"

OBJECTIVES

1. To assess the pre-test level of blood pressure among the control and experimental group.
2. To evaluate the effectiveness of hibiscus tea in experimental and group.
3. To associate the effectiveness of hibiscus tea with selected demographic variables of experiential group.

SUBJECTS AND METHODS:

The quantitative research approach and pre and post test group experimental design was used in this study. This study was conducted in selected primary health centres in Puducherry. 60 hypertensive clients (30 – experimental group and 30 – control group) who are visiting selected PHC and those met the sampling criteria were selected as the samples for this study by simple random sampling technique. After getting formal permission from the authority, the study aim and data collection procedure was explained to each samples and written consent was obtained from them. The very first day, the samples were interviewed in order to collect demographic data and them the blood pressure was measured by using standardized spigmomanometer in both control and experimental group. The hibiscus tea recipe was demonstrated to experimental group and instructed them to take consume hibiscus tea twice daily for 30 days. The investigator did daily follow up of each experimental group samples through directly and telephone call. After intervention the effectiveness of intervention was assessed by measuring 30th day of the intervention in both control and experimental group. Prior to analysis of data the samples were classified as per standard criteria as shown in table 1. Descriptive and inferential statistics were used to analysis the data.

Table 1: classification of blood pressure

Blood pressure classification	Systolic blood pressure (mm of Hg)	Diastolic blood pressure (mm of Hg)
Normal / pre hypertension	<120	<80
Stage 1 hypertension	120 – 139	80 – 89
Stage 2 hypertension	≥160	≥100

DESCRIPTION OF INTERVENTION

HIBISCUS TEA

Figure 1: Hibiscus tea

Hibiscus tea is one of herbal tea which has several health benefits. By reviewing some studies, it clearly denotes that, drink up to 2 cups a day to help reduce the hypertension or drinking 500 millilitres serving of hibiscus tea each day before breakfast or alternatively may also help to lower your blood pressure levels. It also alternates for caffeinated drinks.[10] The recipe can made with minimal ingredients and smaller effort that is adding two or three dried or fresh hibiscus petals in a boiled water and steep for 5 minutes. Add honey or country sugar according to preference of samples, if they need it as sweeten. A pack of clean, shadow dried hibiscus petals were given to each sample and live demonstration of recipe was given. The samples were instructed to consume freshly made hibiscus tea for two times a day i.e. morning before breakfast and evening for about 30 days. Everyday each sample was followed by telephonic calls and doubts were cleared. Blood pressure was assessed in the experimental and control group in 30th day by direct home visit.

RESULTS

Distribution of demographic variables

Apropos to demographic variable of age in experimental group the majority 14 (46.66%) of hypertension client were in the age group of 41 -50 years of age, 15 (50%) were Female, 25 (83.33%) were belongs to Hindu religion, 14 (46.6%) were Illiterate or at Primary school, 15 (50%) were Sedentary worker, were as similarly the control group majority 13 (43.3%) were in the age group of 51-60 years of age, 17 (56.6%) were male, 29 (96.6%) were Hindus, 19 (63.3%) were Illiterate or at Primary school level, 17 (56.6%) were been Sedentary workers. In view of demographic variable of family income, samples in experimental group the majority 24 (80%) were earning <5,000, 15 (50%) were in the family history of nobody has, 26 (43.33%) were both vegetarian & non-vegetarian, 26 (86.6%) were none of the above in personal habits, similarly in the control group, 26 (86.6%) were belongs to earning < 5,000, 19 (63.3%) were in the family history of nobody has, 25 (83.3%) were both vegetarian & non-vegetarian, 25 (83.3%) were none of the above in personal habits.

In account of BMI, 21 (35%) were Normal weight, were as in control group 23 (38.3%) were in Normal weight, both the study and control group majority 30 (50%) were taking Allopathic treatment.

Pre and post test level of blood pressure among experimental and control group

The table 2, figure 2 shows the frequency and percentage distribution of pre test and level of blood pressure in experimental group. In pre test majority 16 (53.33%) of samples were at stage 1 hypertension, 11 (36.67%) of samples were at stage 2 hypertension and only 3 (10%) of samples were at normal hypertension. In post test majority 17 (56.67%) of samples were at stage 1 hypertension, 10 (33.3%) of samples were at normal hypertension stage and only 3 (10%) of samples were at normal hypertension.

Table 2: Frequency and percentage distribution of pre and post test level of blood pressure in the experimental group. (N=30)

Blood pressure	Normal		Stage 1 hypertension		Stage 2 hypertension	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Pre test	3	10	16	53.33	11	36.67
Post test	10	33.3	17	56.67	3	10

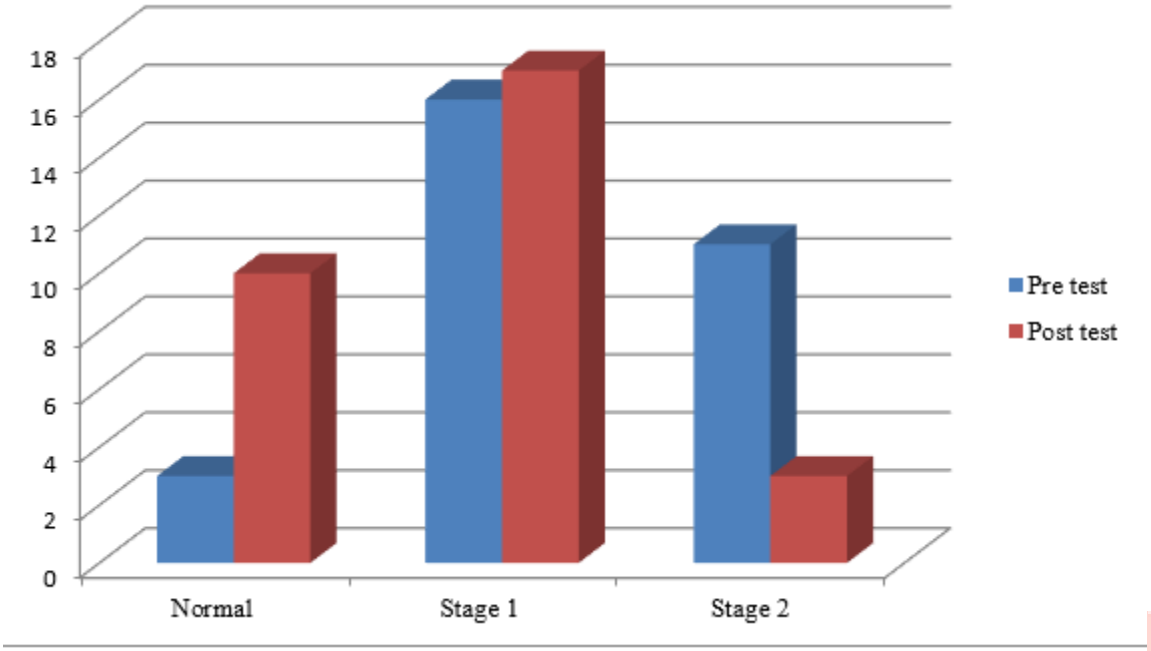

Figure 2: Frequency distribution of pre and post test level of blood pressure in the experimental group.

Table 3 and figure 3 shows the frequency and percentage of the pre and post test level of blood pressure in control group. It explains that in pre test majority 15 (50%) of samples were at stage 1 hypertension, 13 (43.33%) of samples were at stage 2 hypertension and only 2 (6.67%) of samples were at normal hypertension. In post test majority 22 (73.33%) of samples were at stage 2 hypertension, 8 (26.67%) of samples were at stage 2 hypertension.

Table 3: Frequency and percentage distribution of pre and post test level of blood pressure in the control group.

Level of Blood pressure	Normal		Stage 1 hypertension		Stage 2 hypertension	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Pre test	2	6.67	15	50	13	43.33
Post test	0	0	8	26.67	22	73.33

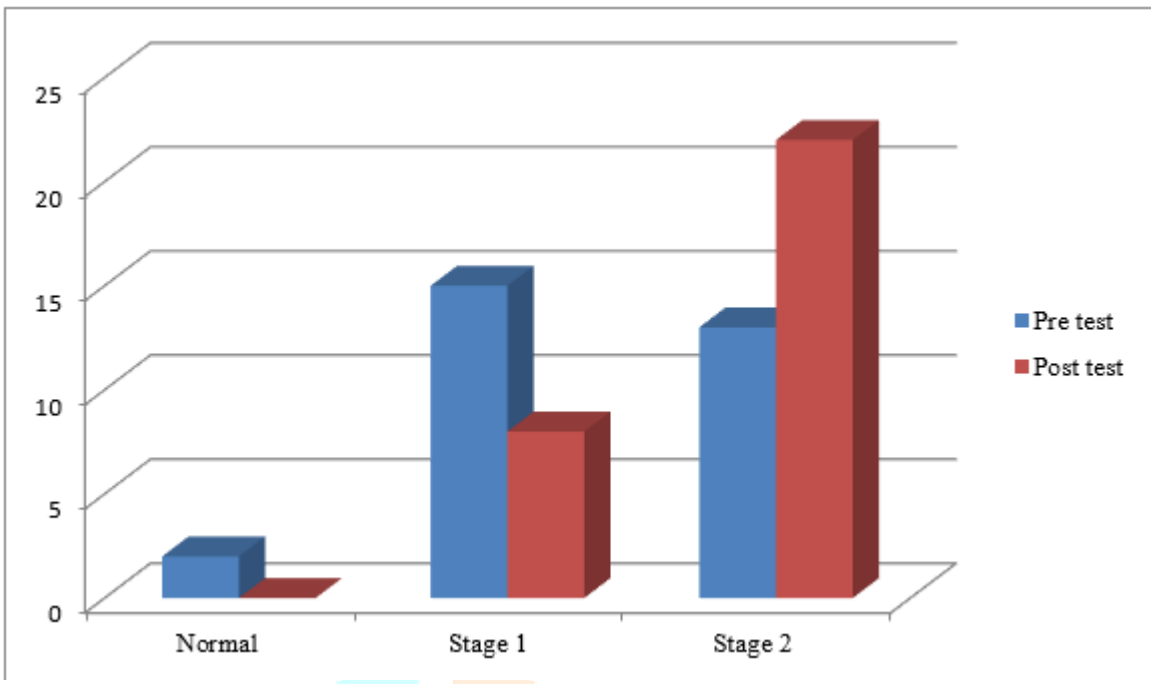

Figure 3: Frequency and percentage distribution of pre and post test level of blood pressure in the control group.

Association between Pre and post test level of blood pressure among experimental and control group

The table 4 shows the mean value of pre and post test level of blood pressure in experimental group, the pre test mean score of blood pressure was 103.50±30.33 and after the administration of hibiscus tea the post test mean score was 74.93±16.13. The mean difference score was 28.57. The calculated paired't' value of t = 5.478 was found to statistically highly significant at p<0.001 level.

Table 4: Comparison of pre and post test blood pressure level in experimental group.

Level of blood pressure	Mean	SD	Mean difference	Paired 't' value
Pre test	103.50	30.33	28.57	t = 5.478 p = 0.000 S
Post test	74.93	16.13		

In comparison of post test blood pressure level among experimental and control group, as shows in table 5 the experimental group, the post test mean score of blood pressure level was 2.33±73.18 and in the control group the post test mean score was 173.53±45.99. The calculated unpaired t value of t = 8.103.

Table 5: Comparison of post test level of blood pressure among experimental and control group.

Level of blood pressure	Mean	SD	Mean difference	Paired 't' value
Experimental group	233.60	73.18	60.07	t = 8.103 p = 0.010 S
Control group	173.53	45.99		

Association between post test level of blood pressure among experimental with their demographic variables

The demographic variable marital status had shown statistically significant association with post test level of blood pressure among hypertensive clients at p<0.01 level and other demographic variables had not shown statistically significant association with post test level of blood pressure among hypertensive clients in the experimental group.

DISCUSSION

The results exhibit that, in pre test the experimental group and control group shows, majority 16 (53.33%) and 15(50%) had more than normal blood pressure levels respectively. Hibiscus tea was given to the experimental group followed by the pre test had significant effect in the reduction of blood pressure level in the post test among hypertensive client than the clients in the control group who carried on with normal procedure.

The pre and post test level of blood pressure in experimental group, the pre test mean score of blood pressure was 103.50±30.33 and after the administration of hibiscus tea the post test mean score was 74.93±16.13. The mean difference score was 28.57. The calculated paired't' value of t = 5.478 was found to statistically highly significant at $p<0.001$ level. This clearly indicates that the Hibiscus tea was found to be effective in reducing the blood pressure level among hypertensive in the experimental group. The hypothesis was framed for this study is there will be significant different in pre and post test level of blood pressure in experimental group samples. The frequency and percentage values and the 't' test value confirmed that hypothesis was accepted statistically.

The study results were comparable to the research done at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, **Boston (USA),** they are subjected accepting patients via randomised, double-blind, placebo-controlled clinical trial that was done among 65 pre-hypertensive and mildly hypertensive adults, who are aged about 30-70 years, without hypertension medications, with either 3 servings per day of 240-mL brewed hibiscus tea or placebo beverage administered for 6 weeks. At 6^{th} weeks, hibiscus tea was found to have lowered systolic BP (SBP) compared with placebo. Diastolic BP was also lower. Samples with higher SBP at baseline showed a greater retort to hibiscus. Researchers concluded that daily drinking of hibiscus tea, in an amount readily combined into the daily diet, lowers BP and it also recommended an effective constituent of the dietary modification for people with hypertension.[9]

In comparison of post test blood pressure level among experimental and control group, as shows in table 5 the experimental group, the post test mean score of blood pressure level was 2.33±73.18 and in the control group the post test mean score was 173.53±45.99. The calculated unpaired t value of t = 8.103 was found to be statistically highly significant at $p<0.001$ level which implies that there was significant difference in the level of blood pressure among hypertension client between the experimental and control group.

LIMITATIONS

This study conducted among the small-scale of sample. Psychological factors are not considered as variable, which also has influence over blood pressure in this study.

RECOMMENDATIONS FOR FUTURE RESEARCH

The same study can be conducted in large number of samples. Comparative study can be done with other alternative treatment modalities after experts' suggestion.

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