EFFECTIVENESS OF GARLIC ON REDUCTION OF BLOOD PRESSURE AMONG HYPERTENSIVE CLIENTS IN A SELECTED HOSPITAL AT CUTTACK, ODISHA: A PILOT STUDY REPORT

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ABSTRACT

Background: *Worldwide, hypertension increases cardiac and renal diseases. Hence it has been an International health challenge (Mills KT, Bundy JD, Jiang He, 2007). The rates of prevalence of hypertension in percentage are projected to go up to 22.9 and 23.6 for Indian men and women, respectively, by 2025 (Vinod G Kulkarni, Shashidhara Hittur Lingappa 2018). Garlic supplements have shown a promise in improvement in the treatment of high blood pressure (Karin Ried, Nikolaj Travica, Avni Sali , 2016). The anti-hypertensive effects of garlic have shown to stimulate the intracellular nitric oxide and hydrogen sulphide production, and block the angiotensin II production, that promotes vasodilation and hence there was a reduction in elevated blood pressure (Ried, K., Frank, O. R., & Stocks, N. P, 2013).*

Research Approach & Design: *Evaluative research approach with quasi experimental research design of one group pre- and post-test with control group was used in this study.* ***Setting:*** *The study was conducted in a selected Hospital, at Cuttack (Odisha) after obtaining administrative permission.* ***Subjects:*** *All adults who met inclusive criteria were the samples.* ***Sample size and sampling techniques:*** *The sample sizes were 20 and 20 hypertensive clients who had been attending hypertensive clinic. Purposive sampling was used to choose subjects based on inclusive criteria.* ***Findings****: Descriptive and inferential statistics were computed. The comparison of pre- and post-test shows that the pre-test mean score of systolic blood pressure which was 161.35, read 148.75 after 21 days. Similarly, the pre-test mean score of diastolic blood pressure which was 98.3, read 88.6 after 21 days. The t-test was computed to find out its significance. It was statistically significant at P value <0.001. Therefore, it was inferred that post-test blood pressure had significantly reduced after garlic administration in experimental group.* ***Conclusion:*** *In addition to the pharmacological management, garlic can be added as an adjuvant in the diet so that it helps in maintaining the normal blood pressure among hypertensive clients.* ***Limitations:*** *Demand of Nature of work, length of illness and workouts are associated with reduction in systolic blood pressure. The client should be advocated to loosen up at the same time to do required exercises.*

Key Words: Garlic, Hyper sensitive patients, Blood pressure, Cuttack.

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INTRODUCTION

Hypertension is a silent slayer, since it exists with no immediate symptoms. It is a crucial global public health issue and is most extensively documented amendable menace for cardiovascular disease, stroke and renal disease. (Ashraf, R., Khan, R. A., Ashraf, I., & Qureshi, A. A , 2013). It is directly responsible for 57% of all stroke deaths and 24% of hypertensive deaths in India, (Gupta R, 2004). In associate degree analysis of worldwide information for the world burden of Hypertension, 20.6% of Indian men and 20.9% of Indian ladies were found affected with Hypertension in 2005 (Kearney, P. M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P. K., & He, J, 2005). The rates for high blood pressure in percentage measure are projected to travel up to 22.9 and 23.6 for Indian men and girls, respectively by 2025. The risk of developing cardiovascular disease (CVD) beginning at 115/75 mmHg doubles with each increment of 20/10 mm Hg (A. V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo Jr, J. L., & Roccella, E. J, 2005). Interference and management of high blood pressure could be a world public health challenge. When used early, lifestyle modifications can decrease other disease risks and may avoid the need for drug therapy, or can serve as an adjunct to drug therapy in persons already on medication (A. V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo Jr, J. L., ... & Roccella, E. J, 2003 and Appel, L. J., Champagne, C. M., Harsha, D. W., Cooper, L. S., Obarzanek, E., Elmer, P. J., & Young, D. R, 2003). Healthy way like weight loss, dietary modifications and total fat reduction, limiting alcohol intake, magnified intake of vegetables and fruit, quitting smoking and regular work up could lower systolic blood pressure within the variance of 4–9 mmHg (Appel, L. J., Champagne, C. M., Harsha, D. W., Cooper, L. S., Obarzanek, E., Elmer, P. J., ... & Young, D. R. , 2003 and Innes, K. E., Bourguignon, C., & Taylor, A. G, 2005). Garlic supplements have shown promise in lowering pressure in many meta-analyses and also the blood pressure–lowering action of garlic is biologically proven (Ried, K., Frank, O. R., Stocks, N. P., Fakler, P., & Sullivan, T, 2008, Silagy, C. A., & Neil, H. A, 1994 and Reinhart, K. M., Coleman, C. I., Teevan, C., Vachhani, P., & White, C. M, 2008). Garlic contains variety of active sulphur compounds (Amagase, H, 2006) that are reported to modulate endothelium- derived relaxing and constricting factors, resulting in pressure reduction. Specifically, garlic has been shown to stimulate the assembly of NO and gas sulphide, each gasotransmitter resulting in vasorelaxation (Coletta, C., Papapetropoulos, A., Erdelyi, K., Olah, G., Módis, K., Panopoulos, P., ... & Szabo, C ,2012).

OBJECTIVES .

1. To assess the blood pressure before and after garlic administration among hypertensive clients in experimental group.
2. To compare the mean difference in blood pressure among hypertensive clients in experimental and control groups.
3. To test the association between the mean difference in blood pressure in relation to selected demographic variables among hypertensive clients in the experimental group.

HYPOTHESES

H1: There will be significant difference of systolic and diastolic blood pressure before and after garlic administration amongst hypertensive clients in the experimental group.

H2: There will be significant difference within the mean difference in systolic and diastolic blood pressure among hypertension affected person in experimental and control groups.

METHODS & MATERIALS

The design selected for the present study was quasi-experimental design. The authors' intention was to evaluate the efficacy of garlic on blood pressure among hypertensive clients who had been attending hypertensive outpatient clinic in a selected hospital. The experimental group acquired intervention through garlic consumption for continuous 21 days in conjunction with their normal treatment,

The control group comprised hypertensive clients of equal number who did not get the intervention, but acquired their ordinary remedy. They were observed for the study in outpatient clinic in a selected hospital, at Cuttack,

Odisha, India. It was a pilot study. Therefore, authors recruited 40 (forty) hypertensive clients who had been attending hypertensive outpatient clinic. Among them, 20 were considered under control group and 20 under the experimental group. Purposive sampling technique was used to choose subjects.

Intervention (Treatment): A form of garlic (Allium sativum-nutritional garlic) that was arranged to be given to hypertensive clients was about 6 gms (09 cloves) once a day for 21 days. The garlic was measured and medium fried. The measured quantum of garlic was given in separate packet for each day. Under the direction of the researcher the samples consumed garlic. 20 samples were selected for the experimental group and 20 were picked for control group.

The objectives of the study were explained to the samples. Informed consent was obtained from each group. Pre-test blood pressure was recorded. Experimental group were advised to consume garlic regularly for 21 days. That is 09 cloves of garlic (06 gms) was packed and given to clients. They were supervised at their houses for compliance. The control group did not have any intervention. After 21 days post-test blood Pressure was recorded in the outpatient clinic of the selected hospital at Cuttack in Odisha.

FINDINGS

1: Demographic variables of hypertensive clients.

2. Blood pressure of Pre- and post-test of garlic administration amongst hypertensive clients in experimental group.

3. Comparison of blood pressure among hypertensive clients in experimental and control groups.

SECTION - I: DATA ON BACKGROUND FACTORS OF HYPERTENSIVE CLIENTS

Table – 1: Frequency, percentage distributions of demographic factors among experimental group and control group

Sl. No.	*Demographic Variables*		*Experimental group (n=20)*		*Control group (n= 20)*	
			F	*%*	*F*	*%*
1.	Age in yrs	30-35	6	30	5	25
		36- 45	4	20	7	35
		46-55	7	35	2	10
		above 55	3	15	6	30
2.	Gender	Male	12	60	11	55
		Female	8	40	9	45
3.	Occupation	self employment	7	35	5	25
		Govt job	4	20	5	25
		Private job	5	25	6	30
		Others	4	20	4	20
4.	Educational qualification	illiterate	3	15	5	25
		upto H.S.C	6	30	8	40
		Graduate	7	35	5	25
		Post graduate & above	4	20	2	10
5.	Monthly income	Upto 10000	8	40	6	30
		10001-22000	7	35	6	30
		22001- 35000	2	10	5	25
		Above 35000	3	15	3	15
6.	Duration of illness	Up to 5 years	7	35	5	25
		5- 8 years	5	25	7	35
		8- 10 years	5	25	3	15
		Above 10 years	3	15	5	25

Table – 2: Pre- and Post-systolic blood pressure among hypertensive clients in experimental group

Test	*Systolic BP of Experimental Group (n=20)*				
	Mean	*Range*	*SD*	*Mean difference*	*'t' Value (P)*
Pre-test	161.35	140-170	9.08	12.15	7.179 P=0.001 **(S)
Post-test	148.75	130-160	9.89		

Table-2 Shows the mean, range, standard deviation, mean difference and 't' value regarding the pre- and post-test systolic blood pressure among hypertensive clients in the experimental group. The obtained post-test mean systolic blood pressure 148.75 (SD=9.89) was less than the pre-test systolic blood pressure of 161.35 (SD=8.14). The obtained mean difference was12.15 and the obtained value of 't'=7.179 (P=0.001) was significant. It was inferred that systolic blood pressure had significantly reduced after garlic administration among hypertensive clients in the experiential group.

Table – 3: Pre- and Post-test diastolic blood pressure among hypertensive clients in experimental group

Test	*Diastolic BP of Experimental Group (n=20)*				
	Mean	*Range*	*SD*	*Mean difference*	*'t' Value (P)*
Pre-test	98.3	90-108	5.77	9.07	7.11 P=0.0001 ***(S)
Post-test	88.6	81-95	5.22		

Table - 3 Shows the mean, range, standard deviation, mean difference and 't' value regarding the pre- and post-test diastolic blood pressure among hypertensive clients in the experimental group. The obtained post-test mean diastolic blood pressure, 88.6 (SD=5.22) was less than the pre-test diastolic blood pressure of 98.3 (SD=5.77). The obtained mean difference was 9.07 and the obtained 't' value t=7.11 (P= 0.0001) was significant. It was inferred that diastolic blood pressure had significantly reduced after garlic administration among hypertensive clients in the experimental group.

SECTION - II: DATA ON MEAN DIFFERENCE IN BLOOD PRESSURE AMONG HYPERTENSIVE CLIENTS IN EXPERIMENTAL GROUP AND CONTROL GROUP

Table – 4: Mean difference in Systolic blood pressure among hypertensive clients in experimental group and control group.

Group	**Mean difference between the Pre- and Post-Systolic BP**				
	N	*Mean difference*	*SD*	*Difference in Mean difference*	*'t' Value (P)*
Experimental Group	20	12.15	7.65	6.92	3.453 P=0.001 **(S)
Control Group	20	5.23	4.67		

Table - 4 shows the mean, standard deviation, mean difference and 't' value regarding mean difference in systolic blood pressure among hypertensive clients in experimental and control groups. The obtained mean value of the mean difference in systolic blood pressure 12.15 (SD=7.65) in the experimental group was more than the mean value of the mean difference in systolic blood pressure 5.23 (SD=4.67) of the control group. The obtained mean difference was 6.92 and 't' value t= 3.45 (P=0.001) was significant. It was inferred that systolic blood pressure had significantly reduced after garlic administration in the experimental group.

Table – 5: Mean difference in Diastolic blood pressure among hypertensive clients in experimental group and control group.

Group	**Mean difference between the Pre-test and Post-test Diastolic BP**				
	N	***Mean difference***	***SD***	***Difference in Mean difference***	***'t' Value (P)***
Experimental Group	20	9.07	5.14	4.2	2.93 P=0.005*(S)
Control Group	20	4.87	3.80		

Tablev- 5 shows the mean, standard deviation, mean difference and 't' value regarding mean difference in diastolic pressure among hypertensive clients in experimental and control groups. The obtained mean value of difference in diastolic blood pressure 9.07 (SD=5.14) in the experimental group was more than the mean value of difference in diastolic blood pressure (SD=3.80) of the control group. The obtained mean difference was 4.2 and 't' value t= 2.93 (P=0.005) was significant. Therefore it was inferred that post-test diastolic blood pressure had significantly reduced in the experimental group after garlic administration in the experimental group.

DISCUSSION

In the present study, participants in the experimental group who took garlic along with their routine medication had significantly maintained their normal blood pressure as compared to those in the control group. The study findings is congruent with the study conducted by Ried, K., Frank, O. R., Stocks, N. P., Fakler, P., & Sullivan, T. (2008), on the effect of garlic in reduction of blood pressure in hypertensives, the result in this present shows that the mean value of difference in systolic and diastolic blood pressure was more in the experimental group compared to the placebo. Ried et al.(2019), in their meta-analysis study of 12 trials and 553 hypertensive participants confirmed that garlic supplements lowered systolic blood pressure (SBP) by P<0.00001 and diastolic blood pressure by P<0.00001, similarly to standard anti-hypertensive medications.

CONCLUSION

In addition to the pharmacological remedy, nurses can educate the hypertensive clients on the significance of including garlic in their diet to reduce their blood pressure.

Limitation: Nature of work demand length of illness and workouts are associated with reduction in systolic blood pressure. Client shall be advocated to simultaneously loosen up to do the required exercises.

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