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YOGA: EFFECTIVE THERAPY TO REDUCE BLOOD PRESSURE AMONG HYPERTENSIVE CLIENTS

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ABSTRACT

Hypertension is called as "silent killer" which is designed to emphasize the direct relationship between the risk of morbidity and mortality from increasing level of blood pressure. Hypertension is not a communicable disease of concern due to its role in the causation of coronary heart disease and other vascular complication. The present study was aimed to to Evaluate the Effectiveness of yoga therapy on reducing blood pressure among clients with hypertension. After all necessary administrative and ethical clearances, pretest post test design conducted at the OPD in primary health centre, kalapet, Puducherry. On the basis of medical officer diagnosis, forty six (N=46) hypertensive client, aged 36-65 yrs Puducherry were examined with 4 variables viz systolic and diastolic blood pressure, heart rate and body weight. The subjects were non randomly assigned into 2 group experimental group underwent of the yoga session consists of selected series of yoga with antihypertensive drug and control group did not participate in yoga session but under antihypertensive drug. Yoga imparted in morning with 30min/session for a total period of 30 days. The result shows that while comparing the pretest and post test level of blood pressure in the experimental and control group the mean±SD of systolic pressure in experimental group was 124.35 ±:5.07 and in control group it was as 139.13 ±: 8.48, with t test value of 7.175 (systolic) and 5.980 (diastolic), which was statistically highly significant at $p<0.001$ level. Indicate that yoga has good impact on health. The study proved that yogatherapy reduce the blood pressure among patients with hypertension and there is slight changes in heart rate and BMI.

INTRODUCTION

Hypertension (HT) is called as "silent killer" which is designed to emphasize the direct relationship between the risk of morbidity and mortality from increasing level of blood pressure. Prolonged BP elevation eventually damage blood vessels throughout the body. The heart and BP operates involuntarily. During the times of emotional stress sympathetic nervous system is stimulated and affects a number of physical responses and exhibits like increased heart rate, respiratory rate, tensed muscles, increased sweating and etc. if the process happens over a long period of time, the sympathetic nervous system becomes over stimulated leading to an imbalance that can affect physical health resulting in inflammation, high blood pressure and muscle pain, etc Today, approximately 1 billion people worldwide have blood pressure, and this number is expected to increase to 1.56 billion people by the year 2025.

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That translates to about 1 out of every 4 adults being afflicted with hypertension. Hypertension is prevalent in developing as well as in developed countries. Hypertension is one of the primary risk factors for stroke, ischemic heart disease, chronic kidney disease &CVD (Jan, 2010). With the steadily aging population across the globe and fast paced lifestyles leading to unhealthy diets and lack of exercise, the increasing trend for the past 5 years expected to continue. (kadi vol, 2006) Hypertension is already a highly prevalent cardiovascular risk factor worldwide because of increasing longevity and prevalence of contributing factors such as obesity. Whereas the treatment of hypertension has been shown to prevent cardiovascular diseases and to extend and enhance life, hypertension remains inadequately managed everywhere. High blood pressure is the leading risk factor for mortality around the world. The prevalence of HT among urban adults was estimated that 14% of people were affected with hypertension in Chennai. Among them 31% of them were men and 36% of them were women (WHO, 2001). Life in the modern world is fraught with stress and stressful conditions and the consequent effects on health are many. Stress-related diseases are steadily

on the rise and one among these is hypertension, also known as high blood pressure. Hypertension could be controlled through intake of several allopathic drugs like – ACE inhibitors, terazosin, propranolol, amlodipine, bendroflumethiazide etc. though there are several hundred besides them. But it is mostly found that there are always some side effects associated with them. In treating hypertension, antihypertensive have their role, but attention may be directed towards some lifestyle modifications. Among many therapies that can lower blood pressure, yoga stands out because of direct and indirect effects on the disease. Yoga is one such alternative healthcare practice thought to improve blood pressure control.

There is no single definition of the practice of yoga, that is universally accepted although it is generally described as an ancient tradition (originating 5,000 to 8,000 years ago) that incorporates postures, breath control, and meditation, as well as specific ethical practices. Researchers have established the efficacy of yogic practices in preventing and even treating psychosomatic disorders/diseases, this has now drawn the attention of many to yogic therapy, all over the world. Now Yoga is no longer only an alternative therapy. World health Organization (WHO), the highest body of medical practitioners has now recognized the important role of yoga as a supplementary and complementary therapy (WHO, 1998). Studies show that the slow breathing has the physiological effect of relaxing the muscles surround the small blood vessels which allows the blood to flow more easily. Alpha blockers blocks receptors in arteries and smooth muscles. This action relaxes the blood vessels and leading to an increase in blood flow. And lower pressure for control of hypertension. The slow breathing can be used to directly influence the stressful changes causing a direct stimulation of parasympathetic nervous system resulting in relation and areversal of the changes seen with the stimulation of sympathetic nervous system (Madanmohan, 2005 and Zaretuni, 2002). People who live in a chronically stressed act condition are more likely to take up smoking and over eating and for less likely to exercise. Even for without any heart abnormalities it is a peculiar feeling when heart "race" in response to stress. Stein illustrated that yoga reduces stress and that by reducing stress induced hypertension can be reduced[4] Yoga therapy is a multifunctional exercise modality with numerous benefits. Not only does yoga reduce high BP but it has also been demonstrated to effectively reduce blood glucose level, cholesterol level, and body weight.

METHODS AND MATERIALS

A type of quasi-experimental study, pretest post test control group design with multiple observation was conducted at PHC, kalapet, Puducherry. 46 identified case of hypertensive subjects were selected by using simple random sampling technique. Validity and reliability of the tool was tested through pilot study. A formal written permission was obtained from Medical officer Kalapet, Puducherry. An informed consent was taken from each respondent after providing an explanation of the study purposes study output etc. Confidentiality was assured to the entire subjects to get their co-operation. the subject were divided into experimental and control group ,first data were collected for control group after which they study was carried out for the experimental group A pretested, structured and close ended questions were administered in the local language. Initially they were interviewed about their demographical data and information related to disease condition, dietary pattern and habit of exercise. Afterwards blood pressure level was measured by using sphygmomanometerm followed by the series of selected yoga therapy. Yoga was demonstrated only to the experimental group for 30 to 40 minute/day and they were asked to come to PHC daily for 30 days where under the instruction and supervision the subjects were invited to perform yoga therapy daily between 10am to 11 am and it was observed .Blood pressure was checked on the 15th day and 30th day for both the group by using sphygmomanometer. Data were entered, statistical analysis were done using computerized software using inferential and descriptive statistics.

The techniques of yoga therapy are

Basic warming up practices:

- Stand on one leg and shake the other leg. Repeat on the other side and then alternative a few times between right and left. Stand on both legs and start to shake your hands one at a time. Alternate between the right and leg a few times and then start to shake both hands at the same time.
- Shake your hands and move them up, down, to the left and to the right. Shake your hands all around you in a circular movement. This help to energize the pranamaya kosha, our energy sheath or subtle body. Come back to the standing position. Open the legs two feet apart and keep the hands on the hip. Move the torso in all four directions clock wise and anticlock wise in a grinding action. Then do it in a continuous manner. Bend forward and perform some toe touching with a bouncing action. Bounce to the front, and then move to your left. Move to your right and then come back to the front. Come back to the standing position.
- Spread your feet a bit and lift both arms to the side. Start to twist your torso from side to side a few times. Feel the stretch in your hip region and back. Come back to the tanding position and relax with deep breathing for some time.
- Sit down with both legs stretched out in front of you. Draw your right knee up to your chest and then kick out with a whooshing sound. Perform the same action on the left side. Continue to alternate legs for some time. Draw up both your knees and do the same action with a whooshing sound as you release the feet. Relax with your feet stretched out in front.

RESULTS

46 subjects were examined , among them majority of sample 13out of 23 (56.52%) in the experimental group and 13 out of 23 (56.52%) in control group were between the age group of 46-55 yrs. Regarding gender, the majority of sample 13 out of 23 (56.52%) in experimental group and 11 out of 23 (47.83%) in control group were males. With respect to educational status, majority of sample 18 out of 23 (78.26%) in experimental group and 19 out of 23 (82.61%) in control group were no education. On occupation, most of the samples 8 out of

23(34.78%) in experimental and 7 out of 23 (30.43%) were unemployed. And regarding religion, the majority of the sample 22 out of 23 (95.65%) in experimental group and 21 out of 23 (91.30%) were comes under Hindus. In the reply to the questions related to the basis of disease condition includes duration if illness, history of Hospitalisation, duration of taking treatment etc

stage 1 hypertension (140-159mm Hg,) stage 2(>160 mm Hg). Based on this category BP was measured before and after the intervention .While assessing the pretest level of systolic pressure among study group it was identified 13(56.52%) were falling under the category of Stage 1 Hypertension ,but in post test it was found 23 (100%), the tremendous transformation into pre hypertension.

Table 1. Distribution of sample a according to patients profile

N=46

Demographic Variables		Experimental Group (n=23)		Control Group (n=23)	
		No.	%	No.	%
Age					
36 - 45 years		3	13.04	3	13.04
46 - 55 years		13	56.52	13	56.52
56 - 65 years		7	30.43	7	30.43
Sex					
Male		13	56.52	11	47.83
Female		10	43.48	12	52.17
Educational Status					
No education		18	78.26	19	82.61
Higher secondary		1	4.35	3	13.04
Graduate		4	17.39	1	4.35
Post graduate		0	0.00	0	0.00
Occupation		3			
Employed	Heavy worker		13.04	2	8.70
	Moderate worker	6	26.09	6	26.09
	Sedentary worker	6	26.09	8	34.78
Unemployed		8	34.78	7	30.43
Religion					
Hindu		22	95.65	21	91.30
Christian		1	4.35	1	4.35
Muslim		0	0.00	1	4.35
Others		0	0.00	0	0.00

Table 2. Distribution of samples on the basis of disease condition

No=46

Demographic Variables	Experimental Group n=23)		Control Group (n=23)	
	No.	%	No.	%
Duration of Illness				
1 - 3 years	13	56.52	6	26.09
4 - 6 years	8	34.78	12	52.17
Above 7 years	2	8.70	5	21.74
History of hospitalization for hypertension?				
Yes	7	30.43	9	39.13
No	16	69.57	14	60.87
How long are you taking treatment?				
1 - 5 years	19	82.61	13	56.52
Above 5 years	4	17.39	10	43.48
Are you taking treatment regularly?				
Yes	21	91.30	19	82.61
No	2	8.70	4	17.39

Above Table 2 Shows the Distribution of samples on the basis of disease condition**,** most of the samples 8(34.78%)in experimental group and 12 (52.17%) in control group had hypertension for the duration between 4-6 yrs. Regarding history of hospitalization for hypertensive patients, 16(69.57%) and 14(60.87%) in experimental and control group had no history of hospitalization respectively. Regarding patients under regularity of treatment, most of the sample in experimental group 21(91.30) % and in control group 19(82.61%) were taking medication regularly. In order to have a clarity in measuring BP level it had been categorized into Normal ,pre hypertension(120-139 mm Hg),

When considering the diastolic measurement 14(60.87%) were falling under stage 2 hypertension in pretest where as in post test almost 39% were observed of having pre and stage 1 hypertension. The above table 3&4 depicts that the mean pre test systolic pressure levels is 143.04 ±11.45 and mean post test is 124.35 ±5.07.with the obtained t test of 8.845,and the mean post test diastolic blood pressure is 98.69 ±18.66 and mean score of post test is 82.17 ± 9.02. with 't' value of diastolic blood pressure 3.849 is statistically significant at $p<0.001$ level which shows that there is a reduction of blood pressure due to practice of Yoga therapy. Table 5 summaries that the mean systolic pressure in experimental group is

124.35 ±:5.07 and the mean systolic pressure in control group is 139.13 ±: 8.48, thus the mean systolic pressure value of experimental group is lower than the mean value of control group.

Table 3 Comparison of pretest and post test level of systolic blood pressure in the experimental group

N=23

Experimental group	Mean	SD	't' value
Systolic			
Pretest	143.04	11.45	8.845***
Post test	124.35	5.07	(S)

*** p<0.001, S – Significant

Table 4. Comparison of pretest and post test level of diastolic blood pressure in the experimental group

Experimental group	Mean	SD	't' value
Diastolic			
Pretest	98.69	18.66	18.66
Post test	82.17	9.02	9.02

*** p<0.001, S – Significant

The obtained 't' value is 7.175 which is highly significant at p<0.001 levels. The mean diastolic pressure value in experimental group is 82.17 ±: 9.02 and the mean systolic pressure in control group is 96.09 ±:6.56, thus the mean diastolic pressure of value of experimental group is lower than the mean value of control group. The obtained't' value is 5.980 which is highly significant at p<0.001 levels.

Table 5. Comparison of post test level of blood pressure between the experimental and control group

Groups	Mean	SD	Unpaired 't' value
Systolic			
Experimental group	124.35	5.07	7.175***
Control group	139.13	8.48	(S)
Diastolic			
Experimental group	82.17	9.02	5.980***
Control group	96.09	6.56	(S)

***p<0.001, S – Significant, N.S – Not Significant

Table 6. Comparison of pretest and post test level of Heart rate &BMI in the experimental group

Variable		Mean	S.D	't' Value
Heart	Pretest	75.65	3.34	4.101***(S)
Rate	Post Test	72.69	1.29	
BMI	Pretest	28.90	3.03	15.584***(S)
	Post Test	27.57	2.95	

***p<0.001, S – Significant, N.S – Not Significant

Table 6 represent the influence yoga therapy on heart rate and BMI among experiemental group. The mean± SD pretest level of heart rate was75.65 ±3.34, and post test level of heart rate was 72.69 ±1.29. with the obtained 't'value of 4.101 was statistically significant at 0.001 level. So, yoga therapy has good effect on heart rate.With regard to BMI score the mean± SD pretest BMI 28.90±3.03,and post test BMI score on post test was27.57± 2.95. with the obtained 't'value of 15.584 was statistically significant at 0.001 level. So, the yoga has good effect on reducing obese. Table 7 indicates that there is an association between the level of BP with age and the duration of illness which is highly significant at p<0.001 level.

DISCUSSION

The present study was conducted to determine the effects of yoga on reduction of BP. All the group were well matched. With regard to demographic parameters responses and observations were made/assessed. Pretest and Post test in each group as well as pre test and post test across group were carried out. Control group showed no difference but rather a slight decline in BP was noticed. But results demonstrated a significant reduction in DBP &SBP in the patients who practiced yoga compared to the control group. The results imply that simple yoga exercises may be useful as a supplementary BP therapy in addition to medical treatment. It is well known that excercise has a effect of lowering BP. For those patients who are not able or willing to do physical activity, yoga program could be an alternative emthod to follow ans an easy method as well. The present study contributes to examine the effects of yoga in a primary health care setting, where most patients with hypertension are treated.

The shorter intervention (yoga) can easily be taught to the patient by at the health care center. Previous studies have shown that yoga reduces BP (Cohen et al., 2011; Mourya et al., 2009 and Cade, 2010), However, the yoga intervention design varied among these studies and the length of the intervention ranged from 3 to 20 weeks, making it difficult to compare the interventions in terms of effectiveness. Present study also was conducted for 4 week followed by strict observation by the Researcher. Different studies stated that the benefits of yoga could only be maintained by the regular practice and integration of these techniques in the day to day life (Patel, 2007). Regular yoga and meditation is required to maintain positive effects on the blood pressure and baseline weight (Hafner, 1982). Several studies have shown that yoga also has long term benefits for hypertension with its use of mediation, relaxation, stretching, posture improvement, and

Table 7. Association of post test level of blood pressure with age& Duration of illness in the experimental group

N=23

Demographic Variables	Normal		Pre Hypertension		Stage I		Stage 2		χ^2
Age	No.	%	No.	%	No.	%	No.	%	
36 - 45 years	1	4.3	1	4.3	0	0	1	4.3	12.605
46 - 55 years	5	21.7	4	17.4	4	17.4	0	0	d.f = 6 S*
56 - 65 years	0	0	2	8.7	5	21.7	0	0	
Duration of illness									
1 - 3 years	5	21.7	3	13.0	5	21.7	0	0	14.264d.f
4 - 6 years	1	4.3	4	17.4	3	13.0	0	0	= 6 S*
>7years	0	0	0	0	1	4.3	1	4.3	

more helping reduce stress and anxiety in the patient, which are that are thought to be contributing factors to the elevation of blood pressure (Singh, 2007) Yoga is one such alternative healthcare practice thought to improve blood pressure control [14]In the present study effectiveness of yoga in study group produced a statistically highly significant in reducing blood pressure among client with hypertension at $p<0.001$ level. The mean pre test systolic pressure mean± SD levels was 143.04 ± 11.45 and mean post test was 124.35 ± 5.07. And the mean post test diastolic blood pressure is 98.69 ± 18.66 and mean score of post test is 82.17 ± 9.02. which was highly significant thus indicates effect of yoga on reducing BP.

Conclusion

Simple yoga exercises may be useful as a supplementary BP therapy in addition to medical treatment. when there is a clear clinical significance on reduction of BP it is very well suggested that yoga may offer an effective intervention for reducing BP in different health care settings as well as advice the Clients to follow it in the home settings to reduce the side effects, complication and cost effect of taking medical treatment. So Yoga can be preliminarily recommended as an effective intervention for reducing blood pressure (Marshall, 2013). The completed integrative review provides guidelines for nursing implementation as a complementary treatment of high BP.

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