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Influence of pranayama practices on hypertension

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Abstract

The World Health Organization attributes hypertension, or high blood pressure, as the leading cause of cardiovascular mortality. In order to prevent this disease, yogic practices should be incorporated into our daily routine. Yoga helps in regulating the blood pressure by stabilizing the sympathetic and parasympathetic nervous system. The purpose of this study was to find out influence of pranayama practices to reduce the hypertension. For this study thirty middle aged women with hypertension were selected as subjects and their age ranged between 35 to 50 years. The systolic and diastolic blood pressure were selected as criterion variables and intervened for six weeks of exclusive pranayama practices were selected as experimental variable. The pre and post-test were taken for all subjects before and after the training respectively. The data pertaining to the variables in this were examined by using paired 't' test was used. The investigation show significant deduction in systolic and diastolic blood pressure due to pranayama practices.

Keywords: Systolic and Diastolic Blood Pressure, Pranayama, Hypertension

Introduction

When the breath wanders the mind also is unsteady. But when the breath is calmed the mind too will be still, and the yogi achieves long life. Therefore, one should learn to control the breath. –Svatmarama, Hatha Yoga Pradipika.

According to World Health Organization, (2011) ^[9] “globally, nearly one billion people have high blood pressure (hypertension); of these, two-thirds are in developing countries. Hypertension is one of the most important causes of premature death worldwide and the problem is growing in 2025, an estimated 1.56 billion adults will be living with hypertension. Hypertension kills nearly 8 million people every year, worldwide and nearly 1.5 million people each year in the South-East Asia Region. Approximately one-third of the adult population in the South-East Asia Region has high blood pressure”.

Pranayama is generally defined as conscious breath extension process. Prana means vital energy or life force. Yama means control and expansion or extension. Pranayama means control or extension or expansion of breathing. This means breathing fully and rhythmically, making use of all the parts of our lungs to increase our oxygen intake. Proper breathing should be deep, slow and rhythmical. To achieve this, we need to be able to regulate the length and duration of our inhalation, exhalation, and the retention of air in our lungs or the pauses between breaths. Yoga breathing exercises or pranayama teaches us on how we can recharge your body and control our mental state by regulating the flow of prana – the life force. This helps is to achieve a calmer and more focused mind, and increases your energy level. Slow and fast breathing exercises on autonomic functions in patients with essential hypertension found that the breathing exercises and various forms of meditation may influence autonomic functions in their work and asserted that both types of breathing exercises benefit patients with hypertension. (Mourya, *et al.*, 2009) ^[4].

According to Pal, (2009) ^[1] hypertension means high blood pressure. “Blood pressure is defined as the lateral pressure exerted by the column of blood on the wall of arteries. Blood pressure means the arterial pressure. The arterial pressure fluctuates during systole and diastole of the heart”. Blood pressure is written as two numbers. The first (systolic) number represents the pressure in blood vessels when the heart beats. The second (diastolic) number represents the pressure in the vessels when the heart rests between beats. The classification of blood pressure are given in table-I.

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Table 1: British Hypertension Society classification of Blood Pressure Levels (BHS-IV)

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Optimal blood pressure	<120	<80
Normal blood pressure	<130	<85
High-normal blood pressure	130-139	85-89
Grade 1 hypertension (mild)	140-159	90-99
Grade 2 hypertension (moderate)	160-179	100-109
Grade 3 hypertension (severe)	≥ 180	≥ 110

mm - millimeters of mercury pressure
Hg - chemical symbol of the element mercury

Materials and Methods

The selection of subjects, variables, training procedure and statistical techniques are explained below.

Selection of Subjects

To achieve the purpose of the present study, 30 middle age hypertensive women from in and around of Kannur town, Kerala were selected as subjects at random and their ages ranged from 35 to 50 years. The subjects were divided into two equal groups. The group-I underwent pranayama practices as experimental and group-II did not practicing any kind of yoga practices and act as control.

Selection of Variables

Based on the consideration of feasibility on criteria and availability the systolic and diastolic blood pressure were selected as criterion variables. The sphygmomanometer was used to measure the systolic and diastolic blood pressure of the subjects and the unit of measurement is in mm Hg. The pranayama practices were selected as experimental variable for this study.

Training Program

The scientifically designed pranayama programme was given to the subjects of experimental group. The Adhama pranayama, Chandra bhedana pranayama and Bharmari pranayama were included in pranayama practices. The duration of the training were five days per week for six weeks. The subjects underwent their respective training programme under strict supervision throw out the study.

Statistical Procedure

The following statistical technique was used to find the influence of the pranayama on hypertension. To test the significant differences between pre and posttests. The paired 't' test was used.

Results

The pre and posttests data obtained on Systolic and Diastolic blood pressure of experimental and control groups were tabulated and are presented in table-II.

Table 2: Descriptive Analysis of Obtained Data on Systolic and Diastolic Blood Pressure

S. No.	Variables	Group	Pre-Test Mean	Post-Test Mean
1.	SBP	Experimental Group	139.40	130.93
			2.10	1.36
		Control Group	139.60	138.80
			2.23	1.52
2.	DBP	Experimental Group	89.47	81.20
			1.91	1.22
		Control Group	89.33	89.00
			2.11	1.88

Computation of "t" ratio is describing the differences between the pre-test and post-test of middle aged women belonging to

pranayama techniques on criterion measures such as systolic and diastolic blood pressure are presented in table-III.

Table 3: Computation of 'T' Ratio on Systolic and Diastolic Blood Pressure

S. No.	Variables	Group	Mean Difference	σ DM	T-ratio
1.	SBP	Experimental Group	8.47	0.35	24.19*
		Control Group	0.80	0.39	2.03
2.	DBP	Experimental Group	8.27	0.32	26.18*
		Control Group	0.33	0.35	1.78

* required table value 2.14 at 0.05 level of significance for 14 degrees of freedom.

An examination of table-III indicates that the obtained 't' ratio 24.19 on systolic blood pressure were found to be greater than the required table value 2.14 at 0.05 level of significance for 14 degrees of freedom. So, it was found to be significant. The results of this study showed that 6 weeks practice of pranayama produced a significant lose in systolic blood pressure, The table – III also indicates that the obtained 't' ratios were 2.03 for systolic blood pressure of control group was found to be lesser than the required table value of 2.14 at 0.05 level off significance for 14 degrees of freedom. So it was found to be insignificant.

Further table III indicated that, the obtained 't' ratios is 26.18 for diastolic Blood pressure. The obtained 't' ratio 26.18 on diastolic blood pressure were found to be greater than the required table value of 2.14 at 0.05 level off significance for 14 degrees of freedom. So it was found to be significant. The results of this study showed that 6 weeks practice of pranayama produced a significant lower in diastolic blood pressure. An investigation of table-III also specifies that the obtained "t" ratio was 1.78 on diastolic blood pressure was found to be lesser than the required table value of 2.14 at 0.05 level of significance for 14 degrees of freedom. So it was

found to be insignificant. The obtained pre and posttests mean values of control and

experimental groups on systolic and diastolic blood pressure are graphically represented in figure-I and II.

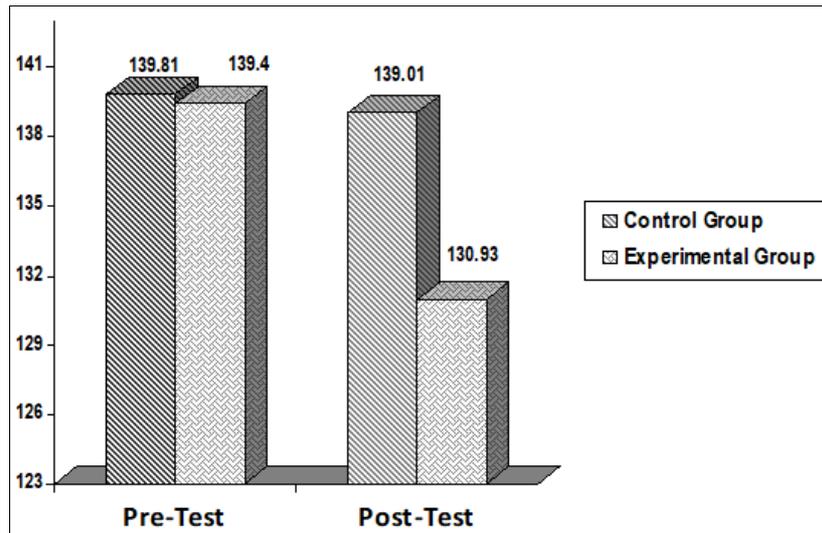


Fig 1: The Pre & Post Tests Mean Values of Control and Experimental Groups on Systolic Blood Pressure

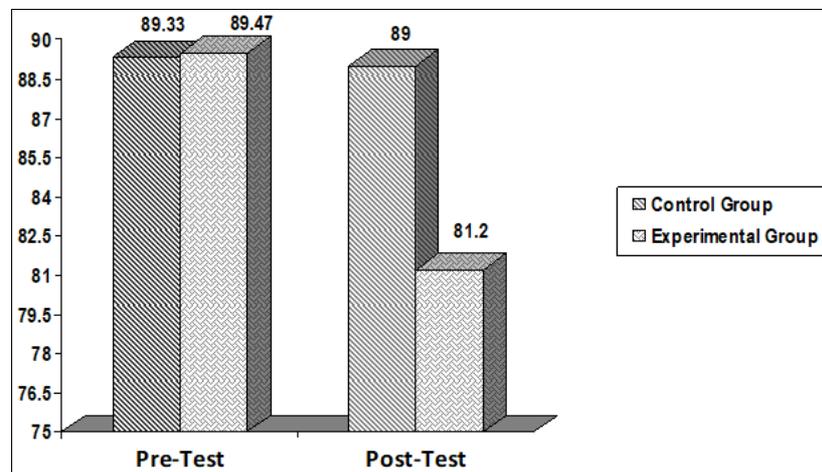


Fig 2: The Pre & Post Tests Mean Values of Control and Experimental Groups on Diastolic Blood Pressure

Discussion

The results of the study showed that the experimental group that practiced pranayama reduced the systolic and diastolic pressure. This may be due to the nature of the pranayama programme that was advocated in regular practice. The following confirmations of Murugesan., *et al.*, (2000) [5] proved that the selected yogic practices improved the management of hypertension, Herrmann (2002) [2] stated that the yoga exercises reduced hypertension and stress, McCaffrey *et al.*, (2005) [7] specified that the Yoga practices enriched condition of hypertensive patient, Mourya *et al.*, (2009) [4] has revealed that the effect of slow-and-fast breathing exercises increased autonomic functions in patients with essential hypertension. Subbalakshmi *et al.*, (2001) [8] evidenced that the nadi shodhana pranayama improved cardiovascular functions of brain, Malhotra and Tandon, (2005) [3] has studied that the individuals asanas maintain the blood pressure in middle aged people and Prasad (2006) [6] concluded that the positive impact of pranayama and yoga on lipid Profile in normal healthy volunteers.

Conclusions

Within the limitation of the present study, it is concluded. that, the experimental group showed significant reduction in systolic and diastolic blood pressure of middle aged

hypertensive women. Thus’, integration of pranayama practices in day to day lifestyle of hypertension patients can be beneficial in controlling and preventing the progression of the disease and its associated complications.

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