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A Study to Assess the Effectiveness of Abdominal Breathing Exercise in Reduction of Blood Pressure Among Hypertensive Patients in Selected Hospitals at Bhopal

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ABSTRACT

Background: Abdominal breathing exercise is one among these. It reduces blood pressure by increasing baroreflex sensitivity and reducing sympathetic activity and chemo reflex activation. In India, it is reported that there are around 42% people are with pre hypertension, 15% are newly diagnose to have Hypertension and 31% are with known case of hypertension, and it kills nearly 8 million people every year worldwide. The noncompliance with treatment, stress and life style are found to be major reason for this doubling of disease within a decade, there "arises need for new therapies 'and' remedies. **Objectives:** The study aimed to assess the effectiveness of abdominal breathing exercise in reducing mean blood pressure among hypertensive patients. **Methods:** Pre-experimental one group pre-test – post-test design was adopted for the study. 60 hypertensive patients from male and female medical general ward had been selected by convenient sampling. Tool comprised of Demographic proforma contained 9 items and sphygmomanometer, stethoscope and blood pressure monitoring table contained 3 items to record the readings. The reliability of the tool was tested by inter-rater method and it was found to be r = 0.99. Abdominal breathing exercise was administered to the samples after pre-assessment of mean blood pressure for ten minutes and post assessment of mean blood pressure is done at the gap of 5 minutes which is repeated 3 times a day and monitored for minimum of 3 days. 't' test was used for finding the effectiveness, and Chi square test was used for finding out the association between mean blood pressure and selected demographic variables. **Results**: It revealed that the mean differences in pre and post assessment was5.61 and 't' value was 19.39 which is more than the 't' table value. The overall findings of the study revealed that the **Conclusion:** the study concluded that abdominal breathing exercise is found to be very effective in reducing the mean blood pressure.

KEYWORDS: *Hypertension, Mean Blood Pressure, Abdominal Breathing Exercise*

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INTRODUCTION

The most common hereditary diseases which are prevailing in Indian population are diabetes mellitus, hypertension, cardiac diseases, bronchial asthma and tuberculosis. Among these diseases hypertension is the most widely seen.

Hypertension is present in all populations. From the age group of 20- 64years men are found to be more in percentage whereas 64 years and above women percentage is high up to 80.2%. It infers that as the age progresses women are more prone to be hypertensive.

Treatment includes a change in lifestyle. The risk factors where these can be improved - losing weight if you are overweight, regular physical activity, a healthy diet, cutting back if you drink a lot of alcohol, stopping smoking, and a low salt and caffeine intake. If needed, medication can lower blood pressure.

Complementary therapy is proved to be one of the effective treatments for most of the disease conditions. Complementary therapies such as yoga exercises, homeopathy, acupuncture, herbs & oils can boost the immune system, help eliminate toxins, and help relieve pain, improve circulation, improve sleep patterns, increase energy levels, induce deep relaxation, reduce stress and tension and restore balance to body systems.

Abdominal breathing exercise is considered to be the most beneficial effect in reducing the blood pressure

among the hypertensive patients. Recent studies have shown that abdominal breathing exercise patients have stopped taking antihypertensive drugs and stick on the exercise regimen.

With regular practice you will breathe from the abdomen most of the time, even while asleep. Breathing deeply can help lower blood pressure. It relaxes the body and lowers the heart rate, reducing the chronic stress and tension that raises the blood pressure. Deep breathing may also help the body to process the salt that contributes to high blood pressure more effectively.

Need For the Study:

A report states that in India there are 42% people with pre-hypertension, 15% are with newly diagnosed hypertensive and 31% of people are known case of hypertensive**.** In Karnataka it was reported that 54% of people are with pre-hypertension, 10% of people are newly diagnosed hypertension and 23% of people are known case of hypertension.

In a study it has been reported that 26.4% of the overall global population had hypertension in 2000, a number that was projected to increase to 29.2% by 2025.

According to Indian statistics there are 195,785,036 people suffering with hypertension. Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries.

Hypertension related cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to double by the year 2020. Hypertension kills 8 million people every year, worldwide and nearly 1.5 million people in the South East Asia region.

Complications of hypertensions are kidney disease, heart disease and hardened arteries. The measures to control hypertension include antihypertensive drugs, diet control and exercise. Among these measures a complementary therapy is also considered to be effective in reducing blood pressure. Many researchers have been done and proved to be effective and worldwide people are adopting this complimentary therapy. High Blood pressure is largely preventable by adopting lifestyle modifications at early stages. Reduces and manage mental stress through yoga, meditation and other relaxation techniques.

An experimental study regarding the effect of abdominal breathing exercise on hypertension was done 40 hypertensive patients and it was found that there was a significant reduction in post-test means systolic blood pressure and diastolic pressure after abdominal breathing exercise between experimental group that control group.

PROBLEM STATEMENT:

A study to assess the effectiveness of abdominal breathing exercise in reduction of blood pressure among hypertensive patients in selected hospitals at Bhopal.

OBJECTIVES:

1. To assess the effectiveness of abdominal breathing exercise in reducing mean blood pressure among hypertensive patients.
2. To test the association between the mean blood pressure and selected demographic factors of hypertensive patients.

HYPOTHESIS:

- **H1:** There will be a significant difference in pre assessment mean blood pressure and post assessment mean blood pressure among hypertensive patients.
- **H2:** There will be a significant association between mean blood pressure and selected demographic factors of hypertensive patients.

OPERATIONAL DEFINITIONS:

- **Effectiveness:** refers to the reduction in blood pressure due to abdominal breathing exercise measured bycomparing the mean blood pressure.
- **Abdominal breathing exercise:** abdominal breathing is the act of breathing deep into one's lungs by flexing one's diaphragm, which is marked by expansion of the abdomen rather than the chest while breathing.
- **Reduction of Blood pressure**: It refers to decrease in the blood pressure after abdominal breathing exercise.
- **Hypertensive patients:** Refers to those patients whose blood pressure is >120/80 mmHg.

MATERIAL AND METHODS:

Research approach:

- Evaluative research approach.

Research design:

Pre-Experimental with one group pre-test post-test design.

Variables:

Dependent variable- blood pressure among hypertensive patients.

Independent variable- Abdominal breathing exercise

Demographic variable- Such as Age, gender, education, occupation, physical activity, antihypertensive drugs, exercise, hours of sleep per day, quality of sleep.

Research setting:

- The study was conducted in RKDF medical college and research centre Hospital, Bhopal, and BMHRC, Bhopal.

Population:

- **Target population:** Patients who had diagnosed as hypertensive
- **Accessible population:** Patients who is admitted for three days

Sample:

patients who had been diagnosed as hypertensive.

Sample size: 60 hypertensive patients.

Sample techniques:

Non probability convenient sampling.

Criteria for sample selection:

Inclusion criteria:

1. Patients whose blood pressure were >120/80mmHg.
2. Patients who were diagnosed as hypertensive.
3. Both male and female patients.

Exclusion criteria:

1. Patients who were not willing to participate in the

study
2. Patients who had severe respiratory problems and critically ill patients.

Tool and method of data collection:
Section A. Demographic variable.

Section B. Blood pressure recording table, sphygmomanometer, and stethoscope

Selection and development of tool: In this study Demographic Performa, blood pressure monitoring table, sphygmomanometer and stethoscope were used to measure and observe accurately. The tool was developed after extensive review of literature, internet search and expert advice.

Description of the tool: The tool comprised of two sections:

SECTION A: Demographic data- consisted of 9 items, which comprised of Age of the patient, gender, education, occupation, physical activity, hypertensive drugs, exercise, hours of sleep per day, quality of sleep.

SECTION B: Blood pressure recording table, sphygmomanometer, and stethoscope- In this section sphygmomanometer, stethoscope and blood pressure monitoring table are included. The blood pressure recording table consisted of four columns to record the time, pre assessment mean arterial blood pressure, intervention and post assessment of mean blood pressure. Researcher records the blood pressure and enters the mean blood pressure readings in the specified column. Maximum of three mean readings are recorded per day.

Reliability of tool: Inter-rater method was used to test reliability of the sphygmomanometer and stethoscope. The tool was administered to 6 samples and was rated by two people. The reliability coefficients found to be high r = 0.99. Hence the tool was found reliable.

Data collection procedure-:

- Formal administrative permission was obtained from the RKDF medical college and research center Bhopal, BMHRC Bhopal to conduct the study.
- Total 60 patients were selected by using convenient sampling for the intervention. The intervention was administered to 30 samples in RKDF medical college hospital and research center Bhopal,30 samples in BMHRC Hospital.
- The intervention was administered for three days. Three observations were done each day dividing in the morning, afternoon and evening before the meal.
- The procedure followed by pre assessment of mean blood pressure and providing the intervention for ten minutes followed by post assessment of mean blood pressure at five minutes gap.
- An informed consent was also obtained from the subjects. The investigator gathered the information through interview method and blood pressure recording table to collect the necessary data.

Ethical consideration:
Formal permission was obtained from the directors of the hospitals. Confidentiality was ensured. An informed consent was obtained from the individual hypertensive patients. The individual had rights to refuse to participate in the study. No physical and psychological pain was caused.

Plan for data analysis:
The plan for data analysis includes-

- Demographic variables would be analyzed by using Frequency and percentage.
- 't-test' will be used for the significance.
- Chi squire test used for association between the mean blood pressure and demographic variables.

RESULTS:

Table-1: Distribution of subjects according to their demographic variables n = 60

Sl. No.	Demographic factors	Frequency		Percentage
1	Age	35-45	3	5
		46-55	20	33.33
		56-60	17	28.33
		>60	20	33.33
2	Gender	Male	40	66.66
		Female	20	33.33
3	Education	Graduate	19	31.66
		PUC	6	15
		Elementary	17	28.33
		Illiterate	18	25
4	Occupation	Heavy worker	4	6.66
		Moderate worker	16	26.66
		Sedentary worker	40	66.66
5	Physical activity	Sitting	42	70
		Walking	18	30
6	Anti hypertensive drugs	Yes	55	95.66
		No	5	8.33
7	Exercise	Cycling	0	0
		Walking	21	35
		Swimming	0	0
		Yoga	9	15
		Nil	30	50

8	**Hours of sleep per day**	< 5 hrs	36	60
		5-6hrs	16	26.66
		6-7hrs	5	8.33
		7-8hrs	3	5
		>8hrs	0	0
9	**Quality of sleep**	Sound	13	21.66
		Disturbed	47	78.33

Table 1 described about the frequency, percentage distribution of demographic variable. Distribution of the subject by age revealed that majority of the subject, i.e. The patients between 35-45 years of age group are very less representing only 5% and the patients between 46-55 and > 65 years of age group are more representing 33.33%, whereas the patients between 56-60 years of age represents 28.33% in the total sample size. With regards to gender. Male gender is widely suffering from hypertension with 66.66% as compare to female gender with 33.33%. With regards to education 31.66% of the patients were graduate, 10% of the patients are PUC, 28.33% of the patients and 30% of the patients are illiterate. With regards to the occupation majority of patients suffering with hypertension are sedentary worker with 66.66%, 26.66% of the patient are moderate worker and 6.66% of the patients are heavy worker. As per the finding of the study 70% of the hypertensive patients were sitting and doing their physical activities where as 30%of the patients were walking and doing their physical activity. With regards to the medication. It revealed that 91.66% of patients are on anti-hypertensive medications and 8.33% of the patients are not taking any anti-hypertensive drugs. According to the exercise 50% of the patients are not doing any exercise, 35% of the patients are on walking, and 15% of the patients are going for yoga classes. With regards to the hours of sleep per day 60% of the patients sleep < 5 hours, 26%of the patients sleep for 5-6 hours, 8.33% of the patients sleep for 6-7 hours, 5% of the patients sleep for 5 hours per day. According to the quality of sleep. It reveals that 78%of the patients have disturbed sleep and 21% of the patients have sound sleep.

Table 2- describes the data on Mean, SD, & pre-test, post-test & paired' test scores.

	Pretest		Post test		Mean difference	Paired 't' test values
Overall Pre-test and Post-test mean blood pressure	Mean	SD	Mean	SD	5.61	't' = 19.39 p = 0.0001 (S)
	116.77	7.57	111.16	7.41		

S – Significant

Table 2: Shows that the mean value of pre-test of is 116.77, the SD is 7.57 and mean value of post test of is 111.16, the SD is 7.41 and the 't' value t =19.39. The obtained 't' value is greater than table value of $t_{(59)} = 2.001$. Since the obtained 't' value is more than 't' table value, so that the research hypothesis **H1** is accepted. By this, it is inferred that there will be significant difference in the blood pressure after doing abdominal breathing exercise.

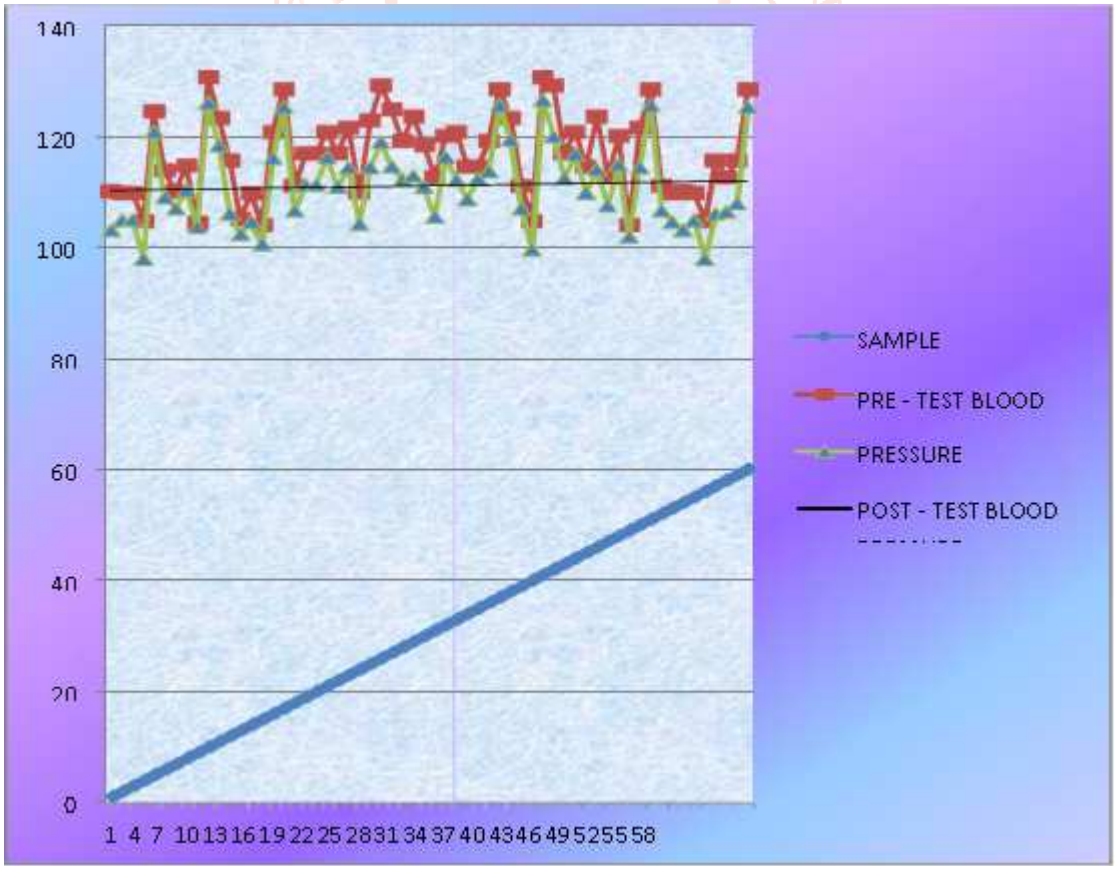

Fig: The line diagram above shows that there is a decrease in post blood pressure comparing to pre-test blood pressure.

Table: 3 Data on association of mean blood pressure with demographic factors.
n = 60

Sl. No.	Demographic factors	Frequency		Median		Chi square Value
				Less than or equal to median	Greater than Median	
1	Age	35-45	3	3	0	χ^2= 4.53 df = 3 p= 0.210 **NS**
		46-55	20	9	11	
		56-60	17	10	7	
		>60	20	8	12	
2	Gender	Male	40	21	19	χ^2 = 0.300 df = 1 p= 0.584 **NS**
		Female	20	9	11	
3	Education	Graduate	19	10	9	χ^2 = 1.18 df = 3 p= 0.757 **NS**
		PUC	6	2	4	
		Elementary	17	10	7	
		Illiterate	18	9	9	
4	Occupation	Heavy worker	4	2	2	χ^2= 0.334E-01 df = 2 p= 0.983 **NS**
		Moderate Worker	16	8	8	
		Sedentary worker	40	21	19	
5	Physical activity	Sitting	42	25	17	χ^2= 3.46 df = 1 p= 0.063 **NS**
		Walking	18	6	12	
6	Anti hypertensive drugs	Yes	55	29	26	χ^2 = 0.974E-01 df = 1 p= 0.755 **NS**
		No	5	3	2	
7	Exercise	Cycling	0	0	0	χ^2 = 3.33 df = 2 p= 0.189 **NS**
		Walking	21	13	8	
		Swimming	0	0	0	
		Yoga	9	6	3	
		Nil	30	12	18	
8	Hours of sleep per day	< 5 hrs	36	20	16	χ^2= 1.84 df = 3 p= 0.605 **NS**
		5-6hrs	16	6	10	
		6-7hrs	5	3	2	
		7-8hrs	3	2	3	
		>8hrs	0	0	0	
9	Quality of sleep	Sound	13	5	8	χ^2= 1.16 df = 1 p= 0.282 **NS**
		Disturbed	47	26	21	

NS- Not significant

The obtained chi square value is less than the table value and so research hypothesis (H2) is rejected. Therefore, it is inferred that there are no selected demographic factors associated with mean difference of blood pressure.

DISCUSSION:

Data on effectiveness of abdominal breathing exercise in reducing blood pressure.

In this study Data shows that the mean value of pre-test of is 116.77, the SD is 7.57 and mean value of post-test is 111.16 the SD is 7.41 and the 't' value is 19.39. The obtained 't' value is greater than table value of $t_{(59)} = 1.96$. Therefore, the abdominal breathing exercise is effective in reducing blood pressure among hypertensive patients.

These findings were strongly supported by study on the effect of abdominal breathing exercise on hypertension. There was a significant reduction in post-test mean systolic blood pressure (t=3.45, p=0.001) and diastolic pressure (t=3.5, p=0.001) after abdominal breathing exercise between experimental group that control group. This study tested that the abdominal breathing exercise can be used as a part of nursing management of hypertensive patients.

Conclusion: This study was aimed to help the hypertensive patients to reduce the high blood pressure through an abdominal breathing exercise. Since the abdominal breathing exercise is easy to perform and cost effective, the nurses who provide secondary care to the hypertensive patients should implement to provide the comprehensive nursing care.

Recommendations:

- A similar study can be replicated on a large sample in a different setting to strengthen the findings.
- Further research could be carried out to identify the occurrence of increased blood pressure by adopting probability random sampling of all hypertensive patients.
- A study can be conducted to assess the factors which influence in hypertension.

Conflict of interest: No

Financial support: Self

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