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Effectiveness of deep breathing exercise on hypertension among women at a selected community

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Abstract
Deep breathing exercise means to take a large amount of the lungs and exhale it out. It is done by contracting the diaphragm. Hypertension is a condition that is, increased blood pressure in which the force of blood against the artery walls will be too high. The normal blood pressure is 120/80mmhg and blood pressure in hypertension is above 140/90mmhg.The study aims to assess the effectiveness of deep breathing exercise on hypertension among at a selected community. A quantitative research approach pre experimental pretest, posttest design was conducted among 60 hypertensive women. Convenient sampling technique was used to select samples. Self structured questions was used to collect the data and effectiveness of breathing exercise. Pretest was conducted assess the level of hypertension among hypertensive women followed by deep breathing exercise. After 7 days post test was conducted. The study findings revealed that after the administration of deep breathing exercise there is a significant difference between pretest and posttest among hypertension women and hypothesis was accepted. The calculated paired 't' test value of t= 4.862 was found to be satisfically highly significant at $p<0.001$. The pretest, 33(55%) had Stage I hypertension, 24(40%) had pre-hypertension and 395%) were normal. Whereas in the post test, 26(43.3%) had pre-hypertension, 19(31.7%) had Stage I hypertension and 15(25%) were normal.

Keywords: Deep breathing exercise, hypertensive women

Introduction
Hypertension, a "psychological classical silent killer," is the hallmark of various cardiovascular disorders Health and holistic health is closely related, which gives importance to physical, mental, social, spiritual, and sexual health as a whole. Hypertension has a direct relationship with the circulation, respiration, and function of vital organs. Similarly, complementary therapy such as alternate nostril breathing exercise has a direct effect on mental and physical health. Hence, alternate nostril breathing exercise emphasizes on the promotive, preventive, and curative measures and helps to maintain normal BP. Alternative therapy in nursing is a valuable aspect of health-care system. It is mainly based on the promotion, maintenance, prevention, and rehabilitation of diseases [1]. Hypertension (HTN or HT), also known as high blood pressure (HBP), is a long-term medical condition in which the blood pressure in the arteries is persistently elevated [2] Based on the 2020 international guidelines, HTN can be diagnosed when there is a persistent rise in the systolic and diastolic pressure above the normal range ≥of 140/ ≥90 mmHg [3]. 6 There are many risk factors for essential hypertension such as advance in age, sex and family history of hypertension, obesity and atherosclerosis [4]. It was consistent with previous study mentioned that slow deep breathing technique may decrease blood pressure in patients with primary hypertension [5]. Hypertension is an important worldwide public health problem because of its high frequency and serious complications [6].Blood pressure is the pressure exerted on the walls of the arteries. It is also named as silent killer because many of the people don't know they are hypertensive [7]. Early use of antihypertensive drugs and lifestyle changes have been recommended for adults with hypertension and prehypertension, to reduce the morbidity and mortality associated with hypertension. Controlling high blood pressure (BP) can reduce cardiovascular risks Evidence shows that pharmacological treatment has limitations in the control of high BP and prevention of complications [8]. One common practice in many of these therapeutic measures is the use of breathing exercises of different depth and frequency. Voluntarily controlling the breathing is likely to bring about alterations in the autonomic responses. The frequency of respiration differentially affects the cardiovas-cular system.

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Slow breathing is generally believed to de-crease the basal heart rate, heart rate response to standing [9].

Methods and Material

A quantitative research approach pre experimental pretest design was adopted for the present study. The study was conducted in Thiruvannamalai (Vadamathimangalam). An authorized setting permission was obtained from the Panchayat President of vadamathimangalam. The population of the study is a total of 60 samples by using convenient sampling method. The inclusion criteria for the sampling are the women between the age of 30 - 60 years. Women free from liver disease, cancer, cardiac disease etc, & hypertension women who are able to understand Tamil. The exclusion criteria for the sampling are unconscious patient, women who are not interested in breathing exercise. The purpose of the study was explained by the investigation to each of the study participants. The data collection includes collecting demographic data by using self - structured questionnaire. Blood pressure was recorded using spygmomanometer following standard technique. After the pretest the investigation Dave instruction about deep breathing exercise. For 30 out of 60 sample. At the end of teaching. 10 - 15 minutes we're allotted for discussion to clear their doubts. After 7 days post test was conducted using spygmomanometer. The data were analysed using descriptive and inferential statistics. the pretest mean score of systolic BP was 136.50 ± 7.98 and the posttest mean score of systolic BP was 131.67 ± 9.24. The calculated paired 't' test value of t = 4.862 was found to be statistically highly significant at $p < 0.001$ level. This clearly infers that administration of Deep Breathing Exercise on lowering of blood pressure level among women was found to be effective in lowering of systolic BP in the post test.the pretest mean score of diastolic BP was 79.0 ± 8.77 and the post test mean score of diastolic BP was 76.67 ± 7.52. The calculated paired 't' test value of t = 2.076 was found to be statistically highly significant at $p < 0.05$ level. This clearly infers that administration of Deep Breathing Exercise on lowering of blood pressure level among women was found to be effective in lowering of diastolic BP in the post test.

Result and Discussion
Section A: Description of the demographic variables of women.

Table 1: Frequency and percentage distribution of demographic variables of women at a selected community N = 60

Demographic Variables	No.	%
Age in years		
30 – 40	35	58.3
40 – 50	15	25.0
50 – 60	10	16.7
Sex		
Male	60	100.0
Female	-	-
Education		
Higher secondary	25	41.7
Graduate	23	38.3
Illiterate	12	20.0
Occupation		
Private	39	65.0
Government	6	10.0
	15	25.0
Marital status		
Married	58	96.7
Unmarried	2	3.3
Type of family		
Nuclear	59	98.3
Joint family	1	1.7
Family income		
Less than 10,000	44	73.3
10,000 – 20,000	12	20.0
More than 20,000	4	6.7
Diet pattern		
Vegetarian	6	10.0
Non-vegetarian	-	-
Both	54	90.0

The table 1 shows that most of the women, 35(58.3%) were aged between 30–40 years, 60(100%) were male, 25(41.7%) had higher secondary education, 39(65%) were privately employed, 58(96.7%) were married, 44(73.3%) had a family income of less than 10,000, 54(90%) were both vegetarian and non-vegetarian.

Section B: Assessment of level of blood pressure among women at a selected community

Table 2: Frequency and percentage distribution of level of systolic blood pressure among women at a selected community N = 60

Systolic BP	Normal (<120)		Pre-Hypertension (121 – 139)		Hypertension Stage I (140 – 159)		Hypertension Stage II (>160)	
	No.	%	No.	%	No.	%	No.	%
Pretest	3	5.0	24	40.0	33	55.0	-	-
Post Test	15	25.0	26	43.3	19	31.7	-	-

The above table 2 shows that in the pretest, 33(55%) had Stage I hypertension, 24(40%) had pre-hypertension and 395%) were normal.

Where as in the post test, 26(43.3%) had pre-hypertension, 19(31.7%) had Stage I hypertension and 15(25%) were normal.

Percentage distribution of level of systolic blood pressure among women at a selected community

Table 3: Frequency and percentage distribution of level of diastolic blood pressure among women at a selected community N = 60

Diastolic BP	Normal(<80)		Pre-Hypertension (81 – 89)		Hypertension Stage I (90 – 99)		Hypertension Stage II (>100)	
	No.	%	No.	%	No.	%	No.	%
Pretest	43	71.7	-	-	17	28.3	-	-
Post Test	51	85.0	-	-	9	15.0	-	-

The above table 3 shows that in the pretest, 43(71.7%) were normal and 17(28.3%) had Stage I hypertension.
Whereas in the post test, 51(85%) were normal and 9(15%) had Stage I hypertension.

Percentage distribution of level of diastolic blood pressure among women at a selected community
Section C: Effectiveness of deep breathing exercise on hypertension among women at a selected community.

Table 4: Comparison of pretest and posttest level of blood pressure among women in a selected community N = 60

Blood Pressure	Test	Mean	S.D	Paired 't' test Value
Systolic BP	Pretest	136.50	7.98	t = 4.862
	Post Test	131.67	9.24	p = 0.0001 S***
Diastolic BP	Pretest	79.0	8.77	t = 2.076
	Post Test	76.67	7.52	p = 0.042 S*

***$p<0.001$, *$p<0.05$, S – Significant

The table 4 shows that the pretest mean score of systolic BP was 136.50±7.98 and the posttest mean score of systolic BP was 131.67±9.24. The calculated paired 't' test value of t = 4.862 was found to be statistically highly significant at $p<0.001$ level. This clearly infers that administration of Deep Breathing Exercise on lowering of blood pressure level among women was found to be effective in lowering of systolic BP in the post test.
The table 4 also shows that the pretest mean score of diastolic BP was 79.0±8.77 and the posttest mean score of diastolic BP was 76.67±7.52. The calculated paired 't' test value of t = 2.076 was found to be statistically highly significant at $p<0.05$ level. This clearly infers that administration of Deep Breathing Exercise on lowering of blood pressure level among women was found to be effective in lowering of diastolic BP in the post test.

Section D: association of level of blood pressure with selected demographic variables.

Table 5: Association of post level of systolic blood pressure among women in a selected community with their selected demographic variables. N = 60

Demographic Variables	Normal		Pre-hypertension		Stage I hypertension		Stage II hypertension		Chi-Square Value
	No.	%	No.	%	No.	%	No.	%	
Age in years									$\chi^2=1.272$ D.f=3 P = 0.736 N.S
30 – 40	13	21.7	14	23.3	8	13.3	-	-	
40 – 50	1	1.7	8	13.3	6	10.0	-	-	
50 – 60	1	1.7	4	6.7	5	8.3	-	-	
Sex									-
Male	15	25.0	26	43.3	19	31.7	-	-	
Female	-	-	-	-	-	-	-	-	
Education									$\chi^2=10.336$ D.f=4 P = 0.035 S*
Higher secondary	5	8.3	10	16.7	10	16.7	-	-	
Graduate	3	5.0	12	20.0	8	13.3	-	-	
Illiterate	7	11.7	4	6.7	1	1.7	-	-	
Occupation									$\chi^2=0.945$ D.f=4 P = 0.918 N.S
Private	10	16.7	16	26.7	13	21.7	-	-	
Government	2	3.3	3	5.0	1	1.7	-	-	
	3	5.0	7	11.7	5	8.3	-	-	
Marital status									$\chi^2=0.758$ D.f=2 P = 0.685 N.S
Married	15	25.0	25	41.7	18	30.0	-	-	
Unmarried	0	0	1	1.7	1	1.7	-	-	
Type of family									$\chi^2=1.330$

Nuclear	15	25.0	25	41.7	19	31.7	-	-	D.f=2
Joint family	0	0	1	1.7	0	0	-	-	P = 0.514 N.S

Family income									χ^2=2.386
Less than 10,000	12	20.0	20	33.3	12	20.0	-	-	D.f=4
10,000 – 20,000	2	3.3	4	6.7	6	10.0	-	-	P = 0.665
More than 20,000	1	1.7	2	3.3	1	1.7	-	-	N.S

Diet pattern									χ^2=1.496
Vegetarian	1	1.7	4	6.7	1	1.7	-	-	D.f=2
Non-vegetarian	-	-	-	-	-	-	-	-	P = 0.473
Both	14	23.3	22	36.7	18	30.0	-	-	N.S

*p<0.05, S – Significant, N.S – Not Significant

The table 5 shows that the demographic variable education had shown statistically significant association with post test level of systolic blood pressure among women at p<0.05 level. The other demographic variables had not shown statistically significant association with post test level of systolic blood pressure among women at a selected community.

Table 6: Association of post level of diastolic blood pressure among women in a selected community with their selected demographic variables N = 60

Demographic Variables	Normal		Pre-hypertension		Stage I hypertension		Stage II hypertension		Chi-Square Value
	No.	%	No.	%	No.	%	No.	%	
Age in years									χ^2=1.139
30 – 40	29	48.3	-	-	6	10.0	-	-	d.f=2
40 – 50	14	23.3	-	-	1	1.7	-	-	p = 0.566
50 – 60	8	13.3	-	-	2	3.3	-	-	N.S
Sex									
Male	51	85.0	-	-	9	15.0	-	-	-
Female	-	-	-	-	-	-	-	-	
Education									**χ^2=6.588**
Higher secondary	19	31.7	-	-	6	10.0	-	-	**d.f=2**
Graduate	23	38.3	-	-	0	0	-	-	**p = 0.037**
Illiterate	9	15.0	-	-	3	5.0	-	-	**S***
Occupation									χ^2=0.050
Private	33	55.0	-	-	6	10.0	-	-	d.f=2
Government	5	8.3	-	-	1	1.7	-	-	p = 0.975
	13	21.7	-	-	2	3.3	-	-	N.S
Marital status									χ^2=1.988
Married	50	83.3	-	-	8	13.3	-	-	d.f=1
Unmarried	1	1.7	-	-	1	1.7	-	-	p = 0.159 N.S
Type of family									χ^2=0.179
Nuclear	50	83.3	-	-	9	15.0	-	-	d.f=1
Joint family	1	1.7	-	-	0	0	-	-	p = 0.672 N.S
Family income									χ^2=3.850
Less than 10,000	35	58.3	-	-	9	15.0	-	-	d.f=2
10,000 – 20,000	12	20.0	-	-	0	0	-	-	p = 0.146
More than 20,000	4	6.7	-	-	0	0	-	-	N.S
Diet pattern									χ^2=1.176
Vegetarian	6	10.0	-	-	0	0	-	-	d.f=1
Non-vegetarian	-	-	-	-	-	-	-	-	p = 0.278
Both	45	75.0	-	-	9	15.0	-	-	N.S

*p<0.05, S – Significant, N.S – Not Significant

The table 6 shows that the demographic variable education had shown statistically significant association with post test level of diastolic blood pressure among women at p<0.05 level. The other demographic variables had not shown statistically significant association with post test level of diastolic blood pressure among women at a selected community.

Conclusion
The results of the present study revealed that there was significant improvement in the post test level of blood pressure.

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