EFFECTIVENESS OF ABDOMINAL BREATHING EXERCISE ON BLOOD PRESSURE AMONG HYPERTENSIVE PATIENTS

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ABSTRACT

INTRODUCTION: Hypertension is reported to be the fourth reason of early death in developed countries and the seventh in developing countries. Treatment for hypertension includes lifestyle modifications and drug therapy. Since the antihypertensive drugs have many side effects and non-compliance. There is need to use some alternative treatment to manage hypertension.

AIM: Present study aimed to assess the effectiveness of abdominal breathing exercise on blood pressure among hypertensive patients.

MATERIALS AND METHODS: Quasi-experimental with two group pre and post test design was used. Sixty primary hypertensive subjects were selected (30 subjects each in experimental and control group). Experimental group had done abdominal breathing exercise twice a day for continuous 10 days. The socio-demographic and clinical data of the patient was collected through interview schedule. Sphygmomanometer and Stethoscope were used to assess the blood pressure. Descriptive statistics, t test and ANOVA were used to analyze the data.

RESULTS: There was significant reduction in blood pressure in experimental group (p = 0.00). The study showed that there was significant association between blood pressure and age of hypertensive patients.

CONCLUSION: Abdominal breathing exercise is an effective complementary therapy in reducing blood pressure among hypertensive patients.

INTRODUCTION

The past few decades, there has been a reawakening that health is a fundamental human right and a worldwide social goal, that is essential to the satisfaction of basic human need and to an improved quality of life; and that it is to be attained by all people. The most common hereditary diseases which are prevailing in Indian population are diabetes mellitus, cardiac diseases, bronchial asthma and tuberculosis. Among these, hypertension is most widely seen.[1]

It has been estimated that hypertension accounts for 6% of deaths worldwide. A report by WHO (world health organization) states that there are 42% people with pre –hypertension. Fifteen percent are with newly diagnosed hypertension and 31% of people are known case of hypertensive. 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.[2]

Hypertension is the term used to describe high blood pressure. Blood pressure is a measurement of the force against the walls of the arteries as the heart pumps blood through the body. Normal blood pressure is 120 mmHg systolic blood pressure and 80 mmHg diastolic blood pressure. If blood pressure numbers are 120/80 mmHg or higher, but below 140/90mmHg, it is called pre-hypertension, above 140/90mmHg is called as hypertension.[1]

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Blood pressure levels, the rate of age related blood pressure increase, and the prevalence of hypertension vary among countries and among sub-population within a country. Hypertension is present in all populations. [2]

Treatment for hypertension includes lifestyle modifications and drug therapy. Lifestyle modifications include losing weight, having regular physical activity, eating a healthy diet, low salt and caffeine intake, quit smoking and alcohol intake. [3]

Since the antihypertensive drugs have, as many as side effects and complications, the rate of non-compliance is high. As complementary therapy is proved to be one of the effective treatments for most of the disease conditions, there are many different types of complementary and alternative treatment which are believed to be effective for treating hypertension also. Among these complementary therapies, abdominal breathing exercise is considered to be most beneficial effect in reducing blood pressure among the hypertensive patients. [4]

Recent studies have shown that abdominal breathing exercise patients have stopped taking anti-hypertensive drugs and stick on the exercise regimen. [5]

Various studies regarding the effect of abdominal breathing exercise and slow breathing exercise on Hypertension are conducted and it is found that there is a significant reduction in the blood pressure after exercise. [6-9]

Breathing can be trained for both positive and negative influences on health. Chronic stress can lead to a restriction of the connective and muscular tissue in the chest resulting in a decrease range of motion of the chest wall. Due to rapid, shallow breathing, the chest does not expand as much as it would with slower deeper breaths and much of the air exchange occurs at the top of the lungs. This results in chest breathing. Chest breathing is inefficient because the greatest amount of blood flow occurs in the lower lobes of the lungs, areas that have limited air expansion in chest breathers. Rapid, shallow chest breathing results in less oxygen transfer to the blood. Abdominal breathing is slow and deep breathing and it can help lower blood pressure. It relaxes the body and lowers the heart rate, reduces chronic stress and tension that raises the blood pressure. [10]

The statistical information on hypertension has been an alarming sign to control the pace of the occurrence as well as complication. It was also found that the continuous treatment for prolonged period leads to non-compliance due to the cost of treatment. So, it is necessity and need for finding and implementing the therapy which is cost effective as well as effective in controlling Hypertension. So, investigator selected this topic to address. The main objectives of the study were to find the effectiveness of abdominal breathing exercise on hypertension among patients and to find the association between blood pressure and selected demographic and clinical characteristics of hypertensive patients.

METHODOLOGY

A quasi- experimental study with quantitative approach was done to assess the effectiveness of abdominal breathing exercise on blood among hypertensive patients and to find the association between blood pressure and selected Socio-demographic and clinical characteristics of hypertensive patients. The present study was conducted at medicine OPD (Outpatient department) of G.G.S. Medical Hospital, Faridkot. The population of this study was 60 patients diagnosed as primary hypertensive and were conveniently selected at G.G.S. Medical Hospital, Faridkot. The group included patients who were diagnosed as primary hypertensive and who were willing to participate in the study. The patients who had COPD and who were not able to cooperate were excluded from the study. After the selction of study subjects, identification profile of study ubject was filled in the record performa. Total two measures were used to collect data from the subjects.

Tool 1 (a): Socio demographic data sheet: It was developed by researchers which consist of 9 items to measure demographic data of the subjects. These items were age, gender, place of residence, monthly earnings of family, level of education, occupation, nature of physical activity, hours of sleep and dietary habits and data was collected using interview schedule. Content validity of tool was determined by experts in the field of medical-surgical nursing and medicine respectively. Content appropriateness, clarity and relevance were ascertained by language expert. Reliability of the tool was determined by test-retest method and it was found to be r =1.

Tool 1 (b): Clinical data sheet: It was developed by researchers which consist of 5 items to measure

Table No. 1:- Baseline comparison of experimental and control group according to Socio-demographic characteristics. (N=60)

Characteristics	Exp. f (%)	Control f (%)	χ^2 (df)	P
Age				
30-40 years	8 (13.3)	4(6.7)		
41-50 years	9(15.0)	9(15.0)	1.918	0.751[NS]
51-60 years	8(13.3)	11(18.3)	(4)	
61-70 years	4(6.7)	5(8.3)		
71 above	1(1.7)	1(1.7)		
Gender				
Male	15(25)	16(26.7)	0.67	0.796[NS]
Female	15(25)	14(23.3)	(1)	
Place of residence				
Urban	16(26.7)	12(20)	1.071	0.301[NS]
Rural	14(23.3)	18(30)	(1)	
Monthly earnings of family				
Upto 10,000	0(0)	0(0)		
10,001-15,000	1(1.7)	1(1.7)	0.000	1.000[NS]
15,001-20,000	8(13.3)	8(13.3)	(1)	
Above 20,000	21(35)	21(35)		
Level of Education				
Illiterate	2(3.3)	2(3.3)		
Primary/elementary	8(13.3)	10(16.7)	1.915	0.590[NS]
Higher secondary	5(8.3)	8(13.3)	(3)	
Graduate &above	15(25)	10(16.7)		
Occupation				
Labour	0(0)	0(0)		
Agriculture	5(8.3)	5(8.3)	1.044	0.791[NS]
Serviceman	8(13.3)	7(11.7)	(3)	
Business man	4(6.7)	2(3.3)		
Others	13(21.7)	16(26.7)		
Nature of physical activity				
Low activity	15(25)	15(25)	0.000	1.000[NS]
Moderate activity	15(25)	15(25)	(1)	
High activity	0(0)	0(0)		
Hours of sleep				
Upto 6 hrs	3(5)	1(1.7)		
7-8 hrs	21(35)	23(38.3)	2.182	0.536[NS]
9-10 hrs	5(8.3)	6(10)	(3)	
≥10 hrs	1(1.7)	0(0)		
Dietary habits				
Vegetarian	12(20)	13(21.7)	3.165	0.205[NS]
Non –vegetarian	15(25)	17(28.3)	(2)	
Eggtarian	3(5)	0(0)		

[NS] **= Non Significant at p value <0.05**

demographic data of the subjects. These items were BMI, smoking habits, alcohol consumption, restriction of salt intake, exercise and data was collected using interview schedule. Content validity of tool was determined by experts in the field of medical-surgical nursing and medicine respectively.

Content appropriateness, clarity and relevance were ascertained by language expert. Reliability of the tool was determined by test-retest method and it was found to be r =1.

Tool No. 2

Sphygmomanometer, Stethoscope, Blood pressure monitoring sheet and Recording sheet for home intervention were used. The blood pressure recording sheet consists of 3 columns to record the date, blood pressure of the patient before intervention and blood pressure of the patient after the intervention. Inter – rater reliability was used to test the reliability of sphygmomanometer and

stethoscope and it was found to be r = 0.96.

The pilot study was conducted in medicine OPD at GGSMH, Faridkot to ensure the feasibility of the study and the study was found to be feasible. In this, Patient was asked to place one hand on the chest and the other on the abdomen right beneath the rib cage. Inhale slowly and deeply through the nose into the bottom of the lungs. The chest should move only slightly, while the stomach rises, pushing the hand up. The hand on the abdomen should rise higher than the one on the chest. This insures that the diaphragm was pulling air into the bases of the lungs. After full inhalation and hold it for as long he

Table No. 2: Baseline comparison of control and experimental group according to Clinical characteristics (N =60)

Characteristics	Exp. f (%)	Control f (%)	χ2 (df)	P
BMI				
Up to 18.5	1(1.7)	1(1.7)		
18.6-24.9	9(15)	8(13.3)	2.303	0.512^{NS}
25.0-29.9	16(26.7)	20(33.3)	(3)	
≥30	4(6.7)	1(1.7)		
Duration of hypertension				
from diagnosis				
Up to 2 years	13(21.7)	15(25)		
2-4 years	15(25)	7(11.7)	3.760	0.078^{NS}
5-8 years	2(3.3)	7(11.7)	(3)	
More than 8 years	0(0)	1(1.7)		
Smoking consumption				
Never used	30(50)	28(46.7)		
Current user	0(0)	0(0)		
Past user	0(0)	2(3.3)	2.069	0.150^{NS}
Occasional	0(0)	0(0)	(1)	
Others	0(0)	0(0)		
Alcohol consumption				
Never used	18(30)	18(30)		
Current user	0(0)	1(1.7)	1.048	0.790^{NS}
Past user	11(18.3)	10(16.7)	(3)	
Occasional	1(1.7)	1(1.7)		
Others	0(0)	0(0)		
Restriction of salt intake				
Yes	20(33.3)	20(33.3)	0.000	1.000^{NS}
No	10(16.7)	10(16.7)	(1)	
Exercise				
Cycling	0(0)	0(0)		
Walking	5(8.3)	6(10)	1.174	0.556^{NS}
Yoga	0(0)	0(0)	(2)	
Nil	25(41.7)	23(38.3)		
Others	0(0)	1(1.7)		

^{NS} **= Non Significant at p value <0.05**

was able. Slowly exhale through the mouth and all the air was released with relaxation. The exercise was to be performed for 10 minutes.

ETHICAL CONSIDERATIONS

Study approval was taken from ethical committee of the University College of Nursing, Baba Farid University of Health Sciences, Faridkot and written permission was taken to conduct the study from competent authority of Guru Gobind Singh Medical Hospital, Faridkot. Study procedure was explained and written information was given to the subjects. Informed written consent from the subjects was taken. Participants who were willing to participate were included in the study. Anonymity of study subjects and confidentiality was maintained.

STATISTICAL ANALYSIS

Statistical analysis was performed using SPSS version 16.0 statistical packages. The descriptive statistics (percentage, mean, standard deviation) and in inferential statistics (paired and unpaired t test, ANOVA test) was used for statistical analysis. The t-test and ANOVA were used to assess the effectiveness of abdominal breathing exercise on

control group, maximum of the study subjects belongs to age group 51-60 years, belongs to rural population, having monthly earnings of above 20,000 and had 7-8 hours of sleep per day. Half of the study subjects were males, graduate, belongs to other category, doing mild physical activity and non-vegetarian. Both the groups were comparable as per socio –demographic variables as per chi –square test. ($p > 0.05$)

As shown in table 2, in experimental group, majority of the study subjects were having overweight, had never consumed alcohol, used restricted salt intake, were not doing any exercise. All of the study subjects never used smoking. Half of the study subjects had hypertension from 2-4 years. In control group, majority of the study subjects were having overweight, had hypertension from 2-4 years, never used smoking, had never consumed alcohol, used restricted salt intake and were not doing any exercise. Both the groups were comparable as per clinical variables as per chi –square test. ($p > 0.05$)

As shown in table 3, The mean blood pressure at day 1 in experimental group was 123.60(7.47) and in control group, it was 119.40(8.01). As per paired t

Table No. 3: Baseline comparison of blood pressure in experimental and control group on day 1.

Pre test observation	Exp. Mean (S.D)	Control Mean (S.D)	E-C Mean diff.(S.D)	t (df)	p
Day1	123.60 (7.47)	119.40 (8.01)	4.20 (2.00)	2.099 (58)	0.040*

[*] = Significant at $p < 0.05$

blood pressure among hypertensive patients and to find the association between the blood pressure and socio- demographic and clinical variables. The p value at < 0.05 was considered is as statistically significant.

RESULTS

As shown in table 1, in experimental group, majority of the study subjects belongs to the age group 41 -50 years, having monthly earnings of above 20,000, worked in other category and had 7-8 hours of sleep per day. Half of the study subjects were males, belongs to urban population, graduate, doing mild physical activity and non-vegetarian. In

test, there was significant difference (t = 2.099 and p = 0.040) between both groups at day 1 with baseline blood pressure score at p value < 0.05.

As shown in table 4, while comparing the pre and post-test mean score of blood pressure in experimental group on day 1, 2, 3 and 11 and as per independent t test, it was found that there was significant difference within the experimental group with regard to blood pressure score on day 1, 2, 3 and 11 at p value < 0.05. Hence, it can be concluded that there was significant difference between pre and post test blood pressure score at day 1, day 2, day 3, and day 11.

Table No. 4: Comparison of pre and post –test mean score of blood pressure in the experimental group on day 1, 2, 3 and 11. (N=30)

Attribute under study		Mean (S.D)	t	df	p
Blood pressure Day 1	Pre-test	123.60 (7.47)	9.664	29	0.00***
	Post-test	119.96 (7.35)			
Blood pressure Day 2	Pre-test	118.10 (6.09)	12.592	29	0.00***
	Post-test	113.63 (6.22)			
Blood pressure Day 3	Pre-test	113.13 (4.80)	13.320	29	0.00***
	Post-test	108.16 (4.14)			
Blood pressure Day11	Pre-test	109.66 (4.35)	14.491	29	0.00***
	Post-test	104.63 (3.69)			

*** = **Significant at p<0.01**

Table No. 5: Comparison of pre and post –test mean score of blood pressure in the control group on day 1, 2, 3 and 11. (N =30)

Attribute under study		Mean (S.D)	T	df	P
Blood pressure Day 1	Pre-test	119.16 (8.39)	1.000	29	0.326[NS]
	Post-test	118.96 (8.37)			
Blood pressure Day 2	Pre-test	117.26 (6.05)	1.278	29	0.211[NS]
	Post-test	117.13 (6.11)			
Blood pressure Day 3	Pre-test	114.90 (5.37)	1.409	29	0.169[NS]
	Post-test	114.73 (5.32)			
Blood pressure Day11	Pre-test	116.50 (6.32)	-1.000	29	0.326[NS]
	Post-test	116.56 (6.33)			

[NS] = **Non-significant at p<0.05**

As shown in table 5, while comparing the pre and post-test mean score of blood pressure in control group on day 1, 2, 3 and 11 and as per independent t test, it was found that there was no significant difference within the control group with regard to blood pressure score on day 1, 2, 3 and 11 at p value >0.05. Hence, it can be concluded that there was no significant difference between pre and post test blood pressure score at day 1, day 2, day 3, and day 11.

As shown in table 6, The mean score of blood pressure at day 1 in experimental group was 119.96(7.35) and in control group, it was 118.96(8.37), at day 2 in exp group the mean blood pressure score was 113.63(6.22) and in control group it was 117.13(6.11), at day 3 in exp group it was 108.16(4.14) and in control group 114.73(5.32) and at day 11 in experimental group it was 104.63(3.69) and in control group it was 116.56(6.33).As per t-test, there was no significant difference in experimental and control group according to post- test mean score of blood pressure at day 1(t = 0.491 and p = 0.625) but there was significant difference in experimental and control group according to post- test mean score of blood pressure on day 2(t = -2.293 and p = 0.026), day 3(t = -6.567 and p = 0.000) and day 11(t = -8.905 and p = 0.000).

Table No. 6: Comparison of post test mean score of blood pressure in experimental and control group on day 1, 2, 3, and 11.

Post test observation	Exp. Mean (S.D)	Control Mean (S.D)	E-C Mean diff.(S.D)	t (df)	p
Day1	119.96 (7.35)	118.96 (8.37)	1.00 (2.03)	0.491 (58)	0.625[NS]
Day2	113.63 (6.22)	117.13 (6.11)	-3.63 (1.58)	-2.293 (58)	0.026*
Day3	108.16 (4.14)	114.73 (5.32)	-6.56 (1.23)	-5.331 (58)	0.000***
Day11	104.63 (3.69)	116.56 (6.33)	-11.93 (1.34)	-8.905 (58)	0.000***

[NS] **Non-significant at $p < 0.05$**
* **Significant at $p < 0.05$**
*** **Significant at $p < 0.01$**

As shown in table 7, there was significant association of blood pressure with age and it was interpreted that blood pressure was more in the age group 61-70 years of age whereas there was no significant association of blood pressure with gender, place of residence, monthly earnings of family, level of education, occupation, nature of physical activity, hours of sleep per day and dietary habits.

As shown in table 8, there was no significant association of blood pressure with BMI, duration of hypertension from diagnosis, smoking habits, alcohol consumption, restriction of salt intake, exercise.

DISCUSSION

The present study shows that post- test mean score of blood pressure in the experimental group was significantly less than that of control group. This shows that abdominal breathing exercise was effective in reducing blood pressure among hypertensive patients.

It is supported by the study conducted by Samson [8] who reported that abdominal breathing exercise is found to be very effective in reducing the blood pressure. Also, it was supported by study conducted by Mourya M. [11] et al who concluded that both slow and fast breathing exercises benefit patients with hypertension but slow breathing had a stronger effect. Chacko N. Joseph et al [12] concluded that slow breathing reduces blood pressure and enhances baroreflex sensitivity in hypertensive patients.

Pramanik T. et al [13] conducted a study to assess the immediate effect of slow pace bhastrika pranayama, a slow breathing exercise for 5 minutes on blood pressure and heart rate and the findings reported that both the systolic and diastolic blood pressure were found to be decreased with a slight fall in heart rate. Mori H. et al [14] to evaluated the effect of deep breathing on blood pressure and pulse rate and concluded that blood pressure and pulse rate were significantly reduced after deep breathing compared with the baseline measurements.

The probable reason for the effectiveness of abdominal breathing exercise is that it helps in improving the baroreflex sensitivity and reduces sympathetic activity which ultimately leads to decrease in blood pressure in hypertensive patients.

The probable reason for the acceptance of abdominal breathing exercise is that it is simple, non – invasive, easy to learn and implement, does not cause any harm or increase the financial burden of the patient and is non-pharmacological method for reducing blood pressure.

The findings of the present study revealed that there was significant difference (p= 0.006) in blood pressure with regard to age at p value <0.05. This finding is strongly supported by the study conducted by Mungreiphy N.K. et al [15] to find the association between blood pressure and age among the Tangkhul Naga tribal males and it was concluded that there was association between age and blood pressure.

The present study reveals that there is no association of blood pressure with other socio-demographic and clinical variables. But in some studies it is found that there is association of blood pressure with other socio-demographic and clinical variables also.

Sidhu S. et al [16] conducted a study to assess the socio-demographic variables of hypertension among

Table No. 7:- Association of blood pressure with selected Socio - demographic Characteristics. (N=60)

Chracteristics	Mean (S.D) B.P	df	F/t	P
Age				
30-40 years	119 (7.59)			
41-50 years	118 (7.69)	4	3.995	0.006[*]
51-60 years	122.36 (7.36)			
61-70 years	128.66 (6.00)			
71 above	127.50 (0.70)			
Gender				
Male	123 (1.43)	58	1.524	0.133[NS]
Female	119.89 (1.44)			
Place of residence				
Urban	120.28 (8.57)	58	-1.106	0.273[NS]
Rural	122.56 (7.37)			
Monthly earnings of family				
Upto 10,000	0 (0)			
10,001-15,000	125.50 (3.53)	2	0.670	0.516[NS]
15,001-20,000	119.81 (6.86)			
Above 20,000	121.95 (8.47)			
Level of education				
Illiterate	127.50 (1.00)			
Primary/elementary	121.05 (7.75)			
Higher secondary	119.38 (8.08)	3	1.113	0.351[NS]
Graduate &above	121.96 (8.48)			
Occupation				
Labour	0 (0)			
Agriculture	122.40 (5.33)			
Serviceman	120.80 (10.05)	3	0.859	0.468[NS]
Business man	117.00 (5.51)			
Others	122.48 (7.93)			
Nature of physical activity				
Low activity	121.93 (7.84)			
Moderate activity	121.06 (8.20)	1	0.175	0.677[NS]
High activity	0(0)			
Hrs of sleep				
Up to 6 hrs	124.00 (4.54)			
7-8 hrs	120.59 (8.39)	3	1.746	0.168[NS]
9-10 hrs	122.82 (5.79)			
>=10 hrs	137.00 (0)			
Dietary habits				
Vegetarian	122.60 (8.67)			
Non –vegetarian	120.81 (7.66)	2	0.428	0.654[NS]
Eggtarian	119.66 (5.77)			

[*]**Significant at $p < 0.05$**
[NS]**=Non-significant at $p < 0.05$**

adult Punjabi females and concluded that age, income, education and caste were significantly related with hypertension. Another study conducted by Khadikar HA et al [17] to assess the prevalence of hypertension and sociodemographic factors in a rural community of Maharashtra and reported that there was a significant increase in the blood pressure with increasing age in both sexes, increase in socio-economic status and literacy status.

Table No. 8: Association of blood pressure and Clinical Characteristics. (N=60)

Characteristics	Mean (S.D) B.P	df	F / t	P
BMI				
Up to 18.5	122.00(7.07)			
18.6-24.9	121.29(9.14)	3	1.027	0.388[NS]
25.0-29.9	120.75(7.81)			
≥30	127.40(2.70)			
Duration of HTN from diagnosis				
Up to 2 years				
2-4 years	119.25(8.23)			
5-8 years	122.95(8.30)	2	2.339	0.106[NS]
More than 8 years	124.77(4.76)			
	123.00(0)			
Smoking Habits				
Never used	121.65(7.84)			
Current user	0(0)			
Past user	117.00(14.14)	1	0.655	0.421[NS]
Occasional	0(0)			
Others	0(0)			
Alcohol Consumption				
Never used	120.91(8.88)			
Current user	120.00(0)			
Past user	123.23(6.21)	3	0.829	0.483[NS]
Occasional	115.00(11.31)			
Others	0(0)			
Restriction of Salt Intake				
Yes	122.00(8.18)	58	0.684	0.497[NS]
No	120.50(7.62)			
Exercise				
Cycling	0(0)			
Walking	123.09(8.53)	2	0.398	0.674[NS]
Yoga	0(0)			
Nil	121.22(7.94)			
Others	117.00(0)			

[NS] **Non-significant at p<0.05**

Another study conducted by Nagpal S. et al [18] concludes that there was significant association of blood pressure with age, life style, smoking habits, dietary pattern, BMI and gender. Brar S. et al [19] conducted a study on the epidemiology of blood pressure in relation to certain quantitative traits among urban Punjabi adolescents and she reported that BMI is a significant predictor of blood pressure in adolescent age groups. Another study conducted by Alderman MH [20] concluded that there was significant association of blood pressure with sodium intake.

The probable reason for the association of blood pressure with age is that as age increases, the walls of the arteries become atherosclerotic i.e. less elastic and clogged with buildup from fats and lipids and heart is forced to work harder which can result in abnormally high blood pressure.

The probable reason for no association of other socio-demographic and clinical variables in this study is due to small study sample i.e. (60 patients), single study setting and only primary hypertensive patients are included and patients having COPD are excluded from the study.

IMPLICATIONS AND RECOMMENDATIONS

Abdominal breathing exercise is an effective complementary therapy in reducing blood pressure among hypertensive patients. It can be widely used for hypertensive patients as it is time saving, cost-effective and easily practiced by the patients. Nurse administrator can conduct in service education and training programme for nurses on various complementary therapies for reducing blood pressure. Findings of the study will act as a catalyst to carry out more extensive research in a large sample and in other settings.

Similar study could be replicated on large sample to validate and generalize its findings in different settings. A comparative study can be conducted with more than one intervention. Similar study could be undertaken using different type of breathing exercises other than abdominal breathing exercise.

CONCLUSION

Abdominal breathing exercise is an effective complementary therapy in reducing blood pressure among hypertensive patients. There was significant association between blood pressure and age of the hypertensive patients. And there was no significant association between blood pressure and gender, educational status, occupation, monthly earnings of family, place of residence, activity level, hours of sleep, dietary habits, BMI, duration of hypertension from diagnosis, smoking consumption, alcohol consumption, restriction of salt intake, exercise.

LIMITATIONS

In this, convenient sampling was used to select the subjects.

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