

EFFECTIVENESS OF LAUGHTER THERAPY ON BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION**PUNITHA JOSEPHINE S*, JEMMI PRIYA J**Department of Medical Surgical Nursing, Karpaga Vinayaga College of Nursing, Kancheepuram - 603 308, Tamil Nadu, India.
Email: punirhythm2004@yahoo.co.in

Received: 10 April 2017, Revised and Accepted: 30 May 2017

ABSTRACT**Objective:** Hypertension is a major non-communicable disease prevailing globally. This study was conducted to determine the effectiveness of laughter therapy on blood pressure among patients with hypertension at a selected hospital, in Kancheepuram District.**Methods:** A quantitative approach of pre-experimental one group pre- and post-test design was chosen for this study. A total of 50 samples were included in the study using purposive sampling technique. Pre-test was done using the structured instrument, and laughter therapy was implemented following which post-test was done for all the study group participants. Both descriptive and inferential statistics were used for analysis.**Results:** The distribution of demographic variables depicted that each 17 (34%) study participants were aged from 39-42 to 43-45 years, respectively. On the count of gender, male and female study participants were equal in numbers that is each 25 (50%). The distribution of level of blood pressure in pre- and post-test disclosed that all the 50 (100%) study group participants had Stage I systolic and diastolic hypertension in the pre- test whereas in post-test 45 (90%), had pre-hypertension systolic and diastolic, only 5 (10%) had Stage I systolic and diastolic hypertension. There was a statistically significant difference between pre- and post-test systolic and diastolic blood pressure within study group participants at level $p < 0.001$.**Conclusion:** This study findings implied that laughter therapy was effective to sustain the blood pressure within the optimal level among patients with hypertension.**Keywords:** Hypertension, Laughter therapy, Blood pressure.© 2017 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>) DOI: <http://dx.doi.org/10.22159/ajpcr.2017.v10i9.19076>**INTRODUCTION**

The human race has one really effective weapon, and that is laughter.

- Mark Twain

Hypertension is an important medical and public health issue. It exists worldwide at epidemic rates affecting an estimated 1 billion people. Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths WHO [1]. The prevalence of hypertension in Indians is 25% in urban and 10% in the rural population. According to estimates, there are nearly 31.5 million hypertensive in rural and 34 million in urban populations. Projections show that by 2030, an additional 27 million people could have hypertension. Hypertension is directly responsible for 57% of stroke deaths and 24% of coronary artery disease deaths in India according to Bhushan *et al.* [2].

Laughter is a natural part of life and is the best medicine. Laughter is a powerful antidote to stress, pain, and conflict. Laughter lightens the burden, inspires hopes, connects someone to others, and keeps the individual, focused and alert. With so much power to heal and renew, the ability to laugh easily and frequently is a tremendous resource for surmounting problems, enhancing relationships, and supporting both physical and emotional health. Laughter helps to control blood pressure by reducing the release of stress-related hormones and bring relaxation. As far as lowering the blood pressure, studies showed that people who laugh heartily on a regular basis have lower standing blood pressure than the average person. Hence, a study was conducted to identify the effectiveness of laughter therapy on blood pressure among patients with hypertension at a selected hospital in Kancheepuram District. The objectives of the study were the identification of the

effectiveness of laughter therapy on blood pressure among patient with hypertension and association of demographic, health and clinical variables with the level of blood pressure in the post-test among patients with hypertension.

METHODS

A quantitative research approach of pre-experimental one group pre- and post-test design was used for this study. Ethical Committee approval was obtained from the institutional ethical committee. The hypothesis H1: "There is a significant difference in the systolic and diastolic blood pressure between pre and post test among patients with hypertension who were subjected to laughter therapy."

A total of 50 study participants were recruited for the study using purposive sampling technique. The inclusion criteria were patients of both male and female diagnosed to have primary hypertension with the blood pressure ranging from 140-180 to 90-110 mm of Hg, aged between 35 and 45 years and who were able to talk and understand Tamil or English.

Patients with mental illness, either visual or hearing impairment, disorientation, unable to follow the instructions, diagnosed to have Ischemic heart disease, aneurysm, cerebrovascular accident and tuberculosis, and with a history of recent pelvic or abdominal surgery, who experience acute orthopedic distress such as rib or shoulder fracture, were excluded from the study.

The structured instrument was developed by the investigator included Part I-IV.

Part-I was demographic variables which included age, sex, marital status, religion, educational status, occupational status, and income.

Part-II was health variables which encompassed body height, weight, BMI, sleeping pattern, dietary pattern, history of smoking, history of alcoholism, and history of chewing tobacco.

Part-III was clinical variables that consisted of comorbidity, time since diagnosis, use of anti-hypertensive medication, and duration of treatment.

Part-IV was assessment and classification of blood pressure as shown in Table 1.

Data collection procedure

The data were collected using structured instruments Part I-IV. Pre-test was performed for all study participants. During the pre-test, demographic, health variables were collected by interview method, except height and weight by anthropometric measurements and clinical variables were obtained from the clinical records. The blood pressure was measured using calibrated sphygmomanometer and stethoscope. The design was divided into pre-test on day 1 and practice of laughter therapy for 2 weeks from day 2 to 15 which was taught for the patients with hypertension to maintain the blood pressure within normal limit. Post-test was done on day 15 for all study participants. Teaching was done by lecture cum demonstration method with audio-visual aids which included general information about hypertension and demonstration of laughter therapy after pre-test on day 1. Each bout of laughter should last for 30-40 seconds, followed by relaxation. It consists of 10 steps and two deep breaths are encouraged after every laughter exercise. This was practiced by the study participants along with routine care which was only antihypertensive medications.

Total duration: 20 minutes.

Initiation: Bend forward swing your hands in front of your body, inhale and exhale fully (2 minutes).

- Step 1: Deep breathing with inhalation through the nose and prolonged exhalation (3 times). (1 minute 30 seconds)
- Step 2: Hearty laughter - Laughter by raising both the arms in the sky with the head tilted a little backward. Feel as if laughter is coming right from your heart while laughing chant "Aaa" (1 minute 30 seconds)
- Step 3: Hearty laughter - Laughter by raising both the arms in the sky with the head tilted a little backward. Feel as if laughter is coming right from your heart while laughing chant "Eee" (1 minute 30 seconds)
- Step 4: Hearty laughter - Laughter by raising both the arms in the sky with the head tilted a little backward. Feel as if laughter is coming right from your heart while laughing chant "Uuu" (1 minute 30 seconds)
- Step 5: Silent laughter (with mouth closed) - Laughter with closed mouth and a humming sound, while humming keep on moving in the group and shaking hands with different people. (1 minute 30 seconds)
- Step 6: Greeting laughter - Joining both the hands and greeting in Indian style (namaste) or shaking hands in Western style with at least 4-5 people in the group. (1 minute 30 seconds)
- Step 7: Appreciation laughter - Join your pointing finger with the thumb to make a small circle while making gestures as if you are appreciating your group members and laughing simultaneously. (1 minute 30 seconds)
- Step 8: Swinging laughter - Stand in a circle and move toward the center by chanting Aee...Eeee...Oooo...Uuuu... (1 minute 30 seconds)
- Step 9: Lion laughter: Extend the tongue fully with eyes wide open and hands stretched out like the claws of lion and laugh from tummy. (1 minute 30 seconds)
- Step 10: Argument laughter - Laugh by pointing fingers at different group members as if arguing. (1 minute 30 seconds).

Relaxation: Sitting calmly. (3 minutes).

Table 1: Classification of blood pressure

Classification of blood pressure	Systolic (mm of Hg)	Diastolic (mm of Hg)
Normal	<120	And <80
Prehypertension	120-139	Or 80-89
Stage 1 hypertension	140-159	Or 90-99
Stage 2 hypertension	≥160	Or ≥100

*National institute of health, seventh report of the national committee (2008), AHA.[3] AHA: American Heart Association

Table 2: Distribution of demographic variables among study group (n=50)

S. No.	Demographic variables	n (%)
1	Age (years)	
	35-38	16 (32)
	39-42	17 (34)
2	43-45	17 (34)
	Gender	
	Male	25 (50)
3	Female	25 (50)
	Marital status	
	Unmarried	2 (4)
	Married	35 (70)
4	Widow/widower	8 (16)
	Separated	5 (10)
	Religion	
	Hindu	39 (78)
5	Muslim	6 (12)
	Christian	5 (10)
	Educational status	
	Primary school	14 (28)
	High school	12 (24)
	Higher secondary school	10 (20)
	Graduate	7 (14)
6	Post-graduate	5 (10)
	Vocational training	2 (4)
	Occupational status	
	Labor	12 (24)
	Former	17 (34)
7	Government employee	5 (10)
	Private employee	14 (28)
	Business	2 (4)
	Income per month (Rs.)	
<5000/-	17 (34)	
5001-7500/-	12 (24)	
>7500/-	21 (42)	

Statistical analysis

The data were analyzed by the statistical package for social sciences version 16. Both descriptive and inferential statistics were used for analysis. The paired *t*-test was computed to test the differences in the blood pressure within study group participants between pre- and post-test. The hypothesis H1: "There is a significant difference in the systolic and diastolic blood pressure between pre and post-test among patients with hypertension who were subjected to laughter therapy" was tested in this study.

RESULTS

The distribution of demographic variables as per Table 2 revealed that each 17 (34%) study participants were aged from 39-42 to 43-45 years, respectively. On the count of gender, male and female study participants were equal in numbers that is each 25 (50%). With regard to marital status, most of the 35 (70%) study group participants are married 8 (16%) were widow/widower, 5 (10%) were separated, and only 2 (4%) were unmarried. The majority of 39 (78%) study participant were Hindus, 6 (12%) were Muslims and only 5 (10%) were Christians. On the account of educational status 14 (28%),

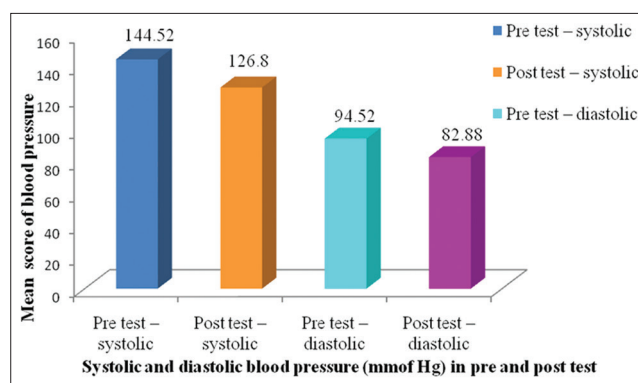
Table 3: Distribution of health variables among study group (n=50)

S. No.	Health variables	n (%)
1	Height (cm)	
	140-150	8 (16)
	151-160	17 (34)
	>160	25 (50)
2	Body weight (kg)	
	<45	5 (10)
	45.1-55	15 (30)
	55.1-65	19 (38)
	>65	11 (22)
3	Body mass index	
	18.5-24.9	18 (36)
	25-24.9	26 (52)
	30-34.9	4 (8)
	35-39.9	2 (4)
	>40	-
4	Sleeping pattern (h/day)	
	>6	7 (14)
	6-8	22 (44)
	>8	21 (42)
5	Dietary pattern	
	Vegetarian	14 (28)
	Nonvegetarian	36 (72)
6	History of smoking	
	Never	25 (50)
	Occasional	8 (16)
	Always	17 (34)
7	History of alcoholism	
	Never	25 (50)
	Occasional	13 (26)
	Always	12 (24)
8	History of chewing tobacco	
	Never	29 (58)
	Occasional	15 (30)
	Always	6 (12)

Table 4: Distribution of clinical variables among study group (n=50)

S. No.	Clinical variables	n (%)
1	Comorbidity	
	Yes	31 (62)
	No	19 (38)
2	Comorbid illness	
	No comorbid illness	19 (38)
	Diabetes mellitus	12 (24)
	Hypothyroidism	6 (12)
	Bronchial asthma	6 (12)
	Diabetes mellitus with bronchial asthma	4 (8)
	Diabetes mellitus with hypothyroidism	3 (6)
3	Time since diagnosis (years)	
	<1	14 (28)
	1-5	24 (48)
	>5	12 (24)
4	Use of anti-hypertensive medication	
	Yes	50 (100)
	No	-
5	Duration of treatment (years)	
	Since 1	14 (28)
	1-5	24 (48)
	>5	12 (24)

12 (24%), 10 (20%), and 7 (14%) study participants had primary school, high school, higher secondary school, and graduate level of education, respectively. The distribution of occupational status revealed that 17 (34%), 14 (28%), and 12 (24%) study participants were formers, private employees, and labors, respectively. Out of 50 study participants, 21 (42%) had the income of Rs. >7500/- month,

**Fig. 1: Comparison of pre- and post-test mean blood pressure among study group**

whereas 17 (34%) and 12 (24%) had Rs. < 5000 and Rs. 5001-7500 per month, respectively.

The distribution of health variables as illustrated in Table 3 among study group participants disclosed that 8 (16%), 17 (34%), and 25 (50%) study participants had the height with the range of 140-150, 151-160, and more than 160 cms, respectively. With regard to the body weight 19 (38%), study group participants were between 55.1 and 65 kg, whereas 15 (30%) were between 45.1 and 55 kg. However, 11 (22%) study participants had the body weight of more than 65 kg and only 5 (10%) had >45 kg. On calculation of body mass index, 26 (52%), 18 (36%), 4 (8%), and 2 (4%) study group participants had between 25-29.9, 18.5-24.9, 30-34.9, and 35-39.9, respectively. On the account of sleeping pattern (hours/day) 22 (44%), 21 (42%), and 7 (14%) had 6-8 more than 8 and <6 hours/day. Most of the 36 (72%) study participants were non-vegetarians and only 14 (28%) were vegetarians. With respect to the history of smoking 17 (34%) were used to smoke "always" and 8 (16%) used it "occasionally." Most of the 25 (50%) study group participants "never" used to smoke and drink alcohol. The distribution of history of alcoholism unveiled that 13 (26%) and 12 (24%) study participants used the alcohol "always" and "occasional," respectively. Out of 50 (100%) study group participants, 29 (58%) did not have the history of chewing tobacco whereas 15 (30%) and 6 (12%) used it "occasionally" and "always."

The distribution of clinical variables as shown in Table 4 disclosed that 31 (62%) study group participants had comorbid illness, among which 12 (24%), 6 (12%), 6 (12%), 4 (8%), and 3 (6%) had diabetes mellitus, hypothyroidism, bronchial asthma, diabetes mellitus with bronchial asthma, and diabetes mellitus with hypothyroidism, respectively.

Out of 50 (100%) study group participants 24 (48%), 14 (28%), and 12 (24%) were diagnosed to have hypertension since 1-5 years, <1 year and more than 5 years, respectively. All the 50 (100%) study group participants were on treatment, among these 24 (48%), 14 (28%), and 12 (24%) were on treatment for 1-5 years, for 1 year and more than 5 years, respectively.

The distribution of level of blood pressure in pre- and post-test as mentioned in Table 5 disclosed that all the 50 (100%) study group participants had Stage I systolic and diastolic hypertension in the pre-test whereas in post test 45 (90%) had pre-hypertension systolic and diastolic, only 5 (10%) had Stage I systolic and diastolic hypertension.

The comparison of pre- and post-test blood pressure within study group as shown in Table 6 and Fig. 1 disclosed that there was a statistically significant difference between pre- and post-test systolic and diastolic blood pressure within study group participants at level $p < 0.001$.

DISCUSSION

The distribution of level of blood pressure in pre- and post-test unveiled that all the 50 (100%) study group participants had Stage-I systolic

Table 5: Distribution of level of blood pressure in pre- and post-test among study group (n=50)

S. No.	Level of blood pressure (mm of Hg)	Study group			
		Pretest, n (%)		Post-test, n (%)	
		Systolic	Diastolic	Systolic	Diastolic
1	Normal	-	-	-	-
2	Prehypertension	-	-	45 (90)	45 (90)
3	Stage-I hypertension	50 (100)	50 (100)	5 (10)	5 (10)
4	Stage-II hypertension	-	-	-	-

Table 6: Comparison of pre- and post-test blood pressure within study group (n=50)

S. No.	Observation (mm of Hg)	Study group	
		Mean±SD	Paired t and p
1	Pre-test - systolic	144.52±5.37	17.785***
2	Post-test - systolic	126.80±5.17	p=0.000 (SS)
3	Pre-test - diastolic	94.52±2.93	17.956***
4	Post-test - diastolic	82.88±3.13	p=0.000 (SS)

The comparison of pre- and post-test blood pressure within study group disclosed that there was a statistically significant difference between pre- and post-test systolic and diastolic blood pressure within study group participants at $p < 0.001$. ***Significant at level $p < 0.001$. SS: Statistically significant, SD: Standard deviation

and diastolic hypertension, whereas in the post-test 45 (90%) had pre-hypertension systolic and diastolic blood pressure. The paired "t" value on a comparison of pre and post-test systolic and diastolic blood pressure within study group participants were 17.785 and 17.956 respectively which revealed the statistically significant difference at level $p < 0.001$.

These study findings are further supported by another study conducted by Angeline and Madhavi [4]. The findings disclosed that the practice of laughter therapy for 20-30 minutes (one session per day for 5 days) by the patients with hypertension reduced the blood pressure to 125.15/82.25 mm of Hg, which was statistically significant at $p < 0.05$.

These findings are substantiated by the study conducted by Nagoor and Dudekula which unveiled that laughter therapy reduced the systolic and diastolic blood pressure and there was a statistically significant difference between pre- and post-test at $p < 0.01$ [5]. Another study carried out by Jalali *et al.* to evaluate the effect of laughter therapy on blood pressure among patients with hypertension disclosed that there was a statistically significant difference between pre- and post-test on blood pressure at $p < 0.05$ [6].

All the above evidences proved that laughter therapy is very effective to reduce the blood pressure among patients with hypertension.

Non-pharmacological interventions are proved to be effective to maintain the blood pressure within normal limit. A study conducted by Sujatha and Judie on the effectiveness of a 12-week yoga program on psychophysiological parameters in patients with hypertension revealed that there was a significant reduction of blood pressure ($p < 0.001$). This signifies the importance of nonpharmacological therapy to maintain the blood pressure within normal limit among patients with hypertension [7].

Hence H1 "There is a significant difference in the systolic and diastolic blood pressure between pre and post test among patients with hypertension who were subjected to laughter therapy" is accepted.

Hypertension and its treatment increase the economic burden (EB) and psychological burden which is evident from the study conducted by Ramanna *et al.* The result revealed that the cost of therapy was

higher for DM+HTN and DM. The percentage of expenditure was higher in low-income group and burden of therapy was directly proportional to the number of tablets, poor educational and occupational status; and inversely proportional to income [8]. These study findings are substantiated by another study done by Nachiya *et al.* revealed that direct and indirect nonmedical costs have incurred high when compared with the other costs of prescription involved in the treatment of hypertension in rural inpatients at tertiary care teaching hospital. The annual average total direct (medical and non-medical) costs per patient and total cost of illness were ₹1,417,253.8 and ₹27,993,470.0, respectively [9].

It is evident from the above findings that prevention and control of hypertension is vital to reduce the cost of treatment and EB. This is further supported by the study conducted by Suhadi *et al.* which disclosed that the total therapy expenditure was likely to be influenced by hypertension comorbidity. The findings denoted that preventing hypertension comorbidity has the benefit to reduce total therapy expenditure. Thus, it proved that prevention is better than cure which has to be emphasized among people who is at risk to hypertension. Laughter therapy is very simple to practice by all age group of people which requires only attitude to adhere to it that will prevent hypertension [10].

CONCLUSION

Laughter therapy is an effective intervention to reduce the blood pressure among patients with hypertension. Since hypertension is a chronic disease, the regular practice of laughter therapy helps the patients with hypertension to sustain the blood pressure within normal limit throughout their survivorship. This will reduce the complications related to hypertension and cost of health care.

REFERENCES

1. World Health Organisation. A Global Brief on Hypertension. World Health Day, WHO/DCO/WHD; 2013. Available from: http://www.ish-world.com/downloads/pdf/global_brief_hypertension.pdf.
2. Bhushan B, Gupta K, Arya H. Comparison of different standard guidelines with Indian guidelines in achievement of hypertension goal. *Int J Pharm Res Biosci* 2014;3(4):305-10. Available from: <http://www.ijprbs.com/issuedocs/2014/8/IJPRBS%20778.pdf>.
3. National Institute of Health, Seventh Report of the National Committee, American Heart Association (AHA); 2008. Available from: <https://www.nhlbi.nih.gov/files/docs/guidelines/express.pdf>.
4. Angeline AK, Madhavi R. Effect of laugh therapy on patients with hypertension. *Int J Recent Sci Res* 2015;6(10):7078-83. Available from: <http://www.recentscientific.com/sites/default/files/3670.pdf>.
5. Nagoor K, Dudekula R. Effect of laughter therapy on blood pressure and pulse rate in south Indian population. *Int J Health Sci Res* 2015;5(6):269-74. Available from: http://www.ijhsr.org/archive_ijhsr_vol.5_issue6.html.
6. Jalali SF, Kheirkhah F, Ahmadi MH, Seifi-Zarei B. Effect of laughter therapy on blood pressure patients with essential hypertension. *J Babol Univ Med Sci* 2015;10(5):35-40. Available from: http://www.jbums.org/browse.php?a_id=3099&slc_lang=en&sid=1&printcase=1&hbnr=1&hmb=1.
7. Sujatha T, Judie A. Effectiveness of a 12-week yoga program on psychophysiological parameters in patients with hypertension. *Int J Pharm Clin Res C* 2014;6(4):329-35. Available from: <http://www.impactfactor>.

- org/PDF/IJPCR/6/IJPCR,Vol6,Issue4,Article9.pdf.
8. Ramanna MK, Ruckmani A, Janti SS, Eerike M, Prabu RL. Burden of therapy in patients suffering from diabetes mellitus and hypertension. *Int J Pharm Pharm Sci* 2017;9(5):210-5. Available from: <https://www.innovareacademics.in/journals/index.php/ijpps/article/view/17484>.
 9. Nachiya RA, Parimalakrishnan S, Rao MR. Cost analysis of antihypertensive agents in rural population: A prospective study. *Int J Pharm Pharm Sci* 2016;8(3):225-30. Available from: <https://www.innovareacademics.in/journals/index.php/ijpps/article/view/10299>.
 10. Suhadi R, Thobari J, Irawan B, Dwiprahasto I. The blood pressure and therapy expenditure change due to hypertension comorbidity: An analytical prospective study in secondary care hospitals in Jogjakarta Indonesia. *Int J Pharm Pharm Sci* 2016;8(12):78-83. Available from: <https://www.innovareacademics.in/journals/index.php/ijpps/article/view/14646>.