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## Effectiveness of calisthenics exercise on physiological parameter among hypertensive clients attending the out-patient department (OPD) in urban primary health center, Sakthi Nagar, Porur

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### Abstract

Hypertension is the one of the leading causes of cardiovascular disease. In India, hypertension has become a major health problem. The prevalence of hypertension was 59.9 and 69.9 per 1000 in males and females, respectively in the urban population and 35.5 and 35.9 per 1000 in males and females respectively in the rural population. Regular physical activity reduces the blood pressure of hypertensive clients. Calisthenics are a form of dynamic exercise which is proved to be effective in hypertensive patients. The main objective of this study was conducted to assess the effectiveness of calisthenic exercise among hypertensive clients in urban primary health center, Porur. Quasi experimental approach and one group pre and post-test research design were adopted. The sample size was 30 clients with hypertension selected by using purposive sampling technique from urban primary health center; Porur. Pre-test was conducted to assess the physiological parameters. After that demonstrate the calisthenic exercise and instructed the client to do it for 2 weeks. After 2 weeks post-test was conducted and assess the same physical parameters. The study finding revealed that after following the calisthenic exercise among hypertensive clients post-test mean score of hypertension was 127.5 with standard deviation 11.352 was higher than the pre-test mean score of hypertension was 148.7 with standard deviation 9.090 hence there was statistically significant difference between pre-test and post-test. The calculated paired t test value of  $t = 7.971$  was found to be statistically highly significant at ( $p < 0.05$ ) association between post-test and socio demographic variables. This clearly infers there is significantly the blood pressure is reduced in the post-test among clients with hypertension.

**Keywords:** Hypertension, calisthenic exercise, hypertensive clients, blood pressure

### Introduction

Hypertension is the one of the leading causes of cardiovascular disease. Hypertension also known as high blood pressure is a long term medical condition in which the blood pressure in the arteries is persistently elevated. Hypertension has a major economic impact ranging from medical costs to human capital loss and decrease in productivity<sup>[1]</sup>. Hypertension is an Iceberg disease. Hypertension or high blood pressure is a condition in which the blood pressure in the arteries is chronically elevated. If the pressure is too high, the heart has to work harder to pump, and this could lead to organ damage and several illnesses such as heart attack, stroke, heart failure, aneurysm, or renal failure<sup>[2]</sup>. In India, hypertension has become a major health problem. Studies of hypertension in the general population have shown that secondary hypertension with high BP is present in 1.1% to 5.7% of subjects<sup>[2]</sup>. According to World Health Organization hypertension is the one of the leading causes of premature death worldwide. In 2015, 1 in 4 men and 1 in 5 women had hypertension. Of the estimated 1.13 billion people who have hypertension, fewer than 1 in 5 have it under control. The main contributors to the rise in hypertension are unhealthy diets, physical inactivity and the consumption of alcohol and tobacco. To achieve the global target to reduce the prevalence of hypertension by 25% by 2025, World Health Organization and the United States centers for disease control and prevention launched the global hearts initiative in 2016<sup>[3]</sup>. There appears to be a steady increase in hypertension prevalence in India over the last 50 years, more in urban than in rural areas. This is the converse to findings reported from developed countries

Calisthenics is a form of dynamic exercise which is proved where there is a significant decrease in its prevalence. Hypertension is 25-30% in urban and 10-15% in rural subjects [4]. to be effective in hypertensive patients. It consists of a variety of simple, often rhythmical, movements, generally using minimal equipment or apparatus. They are intended to increase body strength and flexibility with movements such as bending, jumping, swinging, twisting or kicking, using only one's body weight for resistance. They are usually conducted in concert with stretches. Calisthenics can be done anywhere [5].

Calisthenics can influence or can make a change in the physiological parameters in such a way to enhance health and also it helps in the treatment of hypertension and many other diseases [6]. Calisthenics a form of resistance training, continue to increase in popularity; however the effectiveness of muscle strength improvement and physical activities [7]. Hypertension is a fetal yet preventable risk factor for cardiovascular disease and is responsible for cardiovascular mortality. Physical activity or exercises are shown to delay development of hypertension. Both aerobic and resistance exercise has been proven to reduce blood pressure effectively [8]. Calisthenic exercises are the part of various rehabilitation programs. In previous studies the disease related positive effects of calisthenic exercises on physiological parameters such as functionality, balance, quality of life, fatigue and psychological state. Binoy Thomas (2015) a study had conducted to assess the effectiveness of calisthenic on physiological parameters among hypertension patients in Bangalore. The correct follow ups and this calisthenic is more effective and help to reduce blood pressure levels [10].

The present study to assess the effect of calisthenic exercise to reduce the blood pressure levels among hypertensive clients.

### Objectives of the study

1. To assess the demographic variables among hypertensive patients attending the Out Patient Department in Urban Primary Health Center.
2. To assess the pretest and posttest values of physiological parameters among hypertensive patients attending the Out Patient Department in Urban Primary Health Center.
3. Compare the pretest and posttest values of physiological parameters among clients attending the Out Patient Department in Urban Primary Health Center.
4. To assess the effectiveness of calisthenics on physiological parameters of hypertensive clients by comparing the post-test values of physiological parameters among clients attending the Out Patient Department in Urban Primary Health Center.
5. To find the association between post-test values of physiological parameters of clients attending the out Patient Department and their selected demographic variables.

### Materials and Methods

A quasi experimental approach and one group pre and post-test research design were used to conduct the study. The study was conducted in Urban Primary Health Centre,

Porur. After obtaining permission from the Medical officer, the data were collected from 30 samples by using purposive sampling technique who met the inclusion criteria. The inclusion criteria for the sampling are clients with hypertension who are all willing to participate and are available at the time of data collection. The investigator introduced and explained the purpose of the study to the samples and obtains the written informed consent. The nature and purpose of the study were explained to the hypertensive clients. The sample's characteristics were described using frequency and percentage. Pre and post-test method was adopted. Data were collected by using structured questionnaire and bio physiological assessments. Pretest was done by measuring physiological parameters (BP, BMI, stress level). Followed by Samples are taught the Calisthenic exercises by a demonstration method that includes Walking, Running, Lunges, Sit-ups, Push-ups, Squats and Calf-raises and instruct to do it for 2 weeks. After 2 weeks post-test was done by measuring same physiological parameters. Then compare the pre and post-test measurements and discussed the effectiveness of calisthenics among hypertensive clients. Pre-test was done by measuring physiological parameters (BP, pulse, respiration, weight, BMI, stress level). After the measurement demonstrate Calisthenic Exercise. Instruct the clients to do this exercise for 2 weeks. After 2 weeks post-test was done by measuring same physiological parameters. Then compare the pre and post-test measurements and discussed the effectiveness of calisthenics among hypertensive clients.

### Results and Discussion

Frequency and distribution of the Demographic variables among clients with Hypertension regarding age out of 30 samples 10 (33.33%) samples were come under 30-40 years, 09 (30%) were under the age group of 40-50 years, 11 (36.67%) were under the age group of above 50 years. Regarding sex out of 30 samples 16 (53%) were male, 14 (47%) was female. Regarding religion out of 30 samples 23 (76.67%) were Hindus, 04 (13.33%) were Christians, 03 (10%) were Muslims. Regarding marital status out of 30 samples 5 (16.67%) were singles / unmarried, 25 (83.33%) was married. Regarding educational qualification out of 30 samples 15 (50%) were completed primary school, 10 (33.33%) were completed secondary school, 05 (16.67%) were completed degree. Regarding occupation out of 30 samples 15 (50%) were housewives/retired, 15 (50%) were employee. Regarding income out of 30 samples 7 (23.33%) were belongs in Rs. 10,000 – 20,000, 6 (20%) were belongs to Rs. 20,000 – 30,000, 3 (10%) were belongs to above Rs. 30,000, 14 (46.67%) were coming under none. Regarding the type of family out of 30 samples 20 (66.67%) were a nuclear family, 10 (33.33%) were joint family. Regarding the duration of hypertension out of 30 samples 8 (26.67%) were under below 2 years, 12 (40%) were under 3-5 years, 10 (33.33%) were under above 5 years. Regarding attendance to urban primary health center out of 30 samples 5 (16.67%) were coming under daily attendance, 25 (83.33%) were coming under a monthly attendance to urban primary health center. Regarding diet out of 30 samples 4 (13.33%) were vegetarian, 26 (86.67%) were non vegetarian.

**Table 1:** Frequency and distribution of the Demographic variables among clients with Hypertension

S. No	Demographic variables	Frequency (N=30)	Percentage %
1	<b>AGE (in years)</b>		
	a) 30 to 40 years	10	33.33%
	b) 40 to 50 years	09	30%
	c) Above 50 years	11	36.67%
2	<b>Sex</b>		
	a) Male	16	53.33%
	b) Female	14	46.67%
3	<b>Religion</b>		
	a) Hindu	23	76.67%
	b) Christian	04	13.33%
	c) Muslim	03	10%
	d) Others	0	
4	<b>Marrital Status</b>		
	a) Single	05	16.67%
	b) Married	25	83.33%
	c) Widowed/separated	0	
5	<b>Education</b>		
	a) Primary	15	50%
	b) Secondary	10	33.33%
	c) Graduate	05	16.67%
	d) None	0	0%
6	<b>Occupation</b>		
	a) None/Retired	15	50%
	b) Employed	15	50%
	c) Self employed	0	0%
7	<b>Monthly Income</b>		
	a) 10,000 -20,000	7	23.33%
	b) 20,000-30,000	6	20%
	c) Above 30,000	3	10%
	d) None	14	46.67%
8	<b>Type of Family</b>		
	a) Nuclear family	20	66.67%
	b) Joint family	10	33.33%
9	<b>Duration of HTN</b>		
	a) Below 2 year	8	26.67%
	b) 3- 5 years	12	40%
	c) Above 5 years	10	33.33%
10	<b>Attendance to UPHC</b>		
	a) Daily	0	0
	b) Weekly once	5	16.67%
	c) Monthly once	25	83.33%
11	<b>Diet</b>		
	a) Vegetarian	4	13.33%
	b) Non vegetarian	26	86.67%

**Table 2:** Frequency and Percentage Distribution of Hypertension Levels in Pre-test and Post-test among Clients with Hypertension. N=30

Hyper Tension	Normal BP <120/80 mmHg		Pre hypertension 120/80 - 139/90 mmHg		Stage 1 140/90 -159/100 mmHg		Stage 2 >160/100mmHg	
	No.	Percentage%	No.	Percentage%	No.	Percentage%	No.	Percentage%
Pre-test	0	0	4	13.33%	21	70%	5	16.67%
Post-test	11	36.67%	15	50%	04	13.33%	0	0

The above Table 2 shows that in the pre-test out of 30 samples, 0 (0%) had normal blood pressure, 4 (13.33%) had pre hypertension, 21 (70%) had stage 1 hypertension and 5 (16.67%) had stage 2 hypertension. Whereas in the post-test out of 30 samples, 11

(37%) had normal blood pressure, 15 (50%) had pre hypertension, 04 (13.33%) had stage 1 hypertension and 0 (0%) had stage 2 hypertension among clients with hypertension

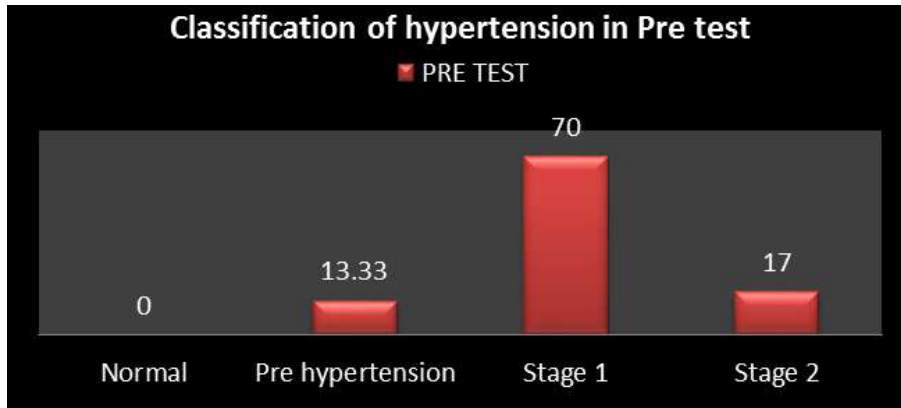


Fig 3: Shows that percentage distribution of classification of hypertension in pre-test

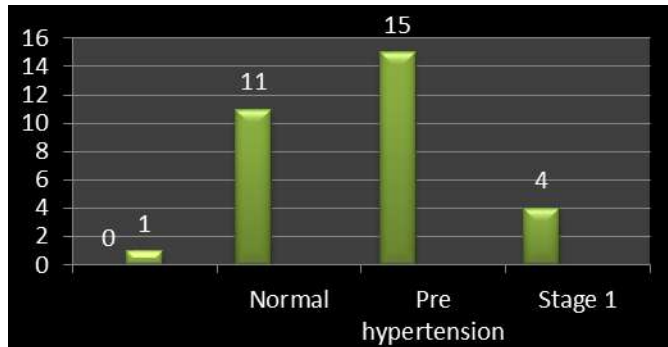


Fig 4: Shows that percentage distribution of classification of hypertension in post-test

Table 3: Mean and standard deviation of pre-test and post-test among clients with hypertension. N = 30

Blood pressure	Mean	Standard deviation	Paired 't' test value
Pre-test	148.7	9.090	t = 7.971 p value <.00001 s***
Post-test	127.5	11.352	

\*\*\*P<0.05, S- Significant.

Table 5: Frequency and percentage distribution of pre-test and post-test level of stress level among hypertensive patients

Stress level	Mild stress		Moderate stress		High perceived stress	
	Freq	%	Freq	%	Freq	%
Pre-test	4	13.3%	25	83.3%	1	3.3%
Post-test	6	20%	23	76.6%	1	3.3%

The above Table 5 shows that in the pre-test out of 30 samples 4 (13.3%) had mild stress, 25(83.3%) had moderate stress and 1(3.3%) had high perceived stress. Whereas in the

post-test out of 30 samples 6(20%) had mild stress, 23(76.6%) had moderate stress and 1(3.3%) had high perceived stress.

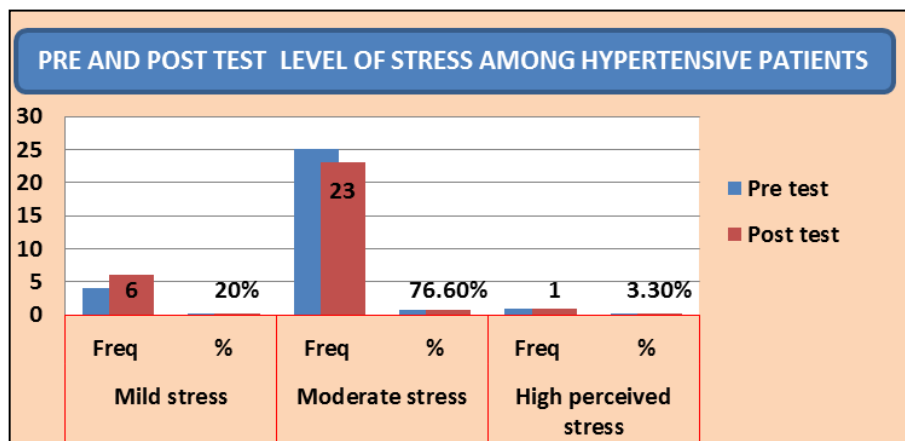


Fig 3: shows that distribution of frequency and percentage of stress level in pre and post-test among hypertensive patients



The objective 5 results shown that none of the demographic variables had shown statistically significant association with post-test level of Hypertension among clients with hypertension attending the OPD in UPHC.

### Discussion

The aim of the study is to assess the effectiveness of calisthenics on physiological parameters among hypertensive clients attending the Out Patient Department (OPD) in Urban Primary Health Center, Sakthi Nagar, Porur. 30 samples were selected by using purposive sampling; The collected data were analyzed and discussed by using interventional statistics. Regarding the duration of hypertension out of 30 samples 8 (26.67%) were under below 2 years, 12 (40%) were under 3-5 years, 10 (33.33%) were under above 5 years. In the present study was supported with Filiz Colakoglu (Dec, 2008) had conducted the study to assess the effect of callisthenic exercise on physical fitness values of sedentary workers. During the period of 12 weeks, 172 subjects' age, height and body weight were determined. All subjects attended the study, 50 minutes per session, three sessions per week, aerobic and callisthenic exercise programs. There were significant differences in increase among aerobic power, sit-up, push-up, and hand grip strength values in Groups I, II and III. There was a significant difference between Group I, II and III in decreased blood pressure. It was determined that physical fitness values had decreased as the age increased. As a result, it can be said that the long-term callisthenic exercises cause the similar positive changes on workers at different ages. In the present study was supported by Mats Borjesson *et al.*, (2016) had conducted the study to find the regular physical activity reduces the blood pressure of individuals with hypertension. The Second objective of the study is To assess the pretest and posttest values of physiological parameters and compare the pretest and posttest values of physiological parameters among clients attending the outpatient department in Urban Primary Health Center. The result reveals that in the pre-test out of 30 samples, 10 (33%) had pre hypertension, 15 (30%) had stage 1 hypertension and 05 (17%) had stage 2 hypertension. Whereas in the post-test out of 30 samples, 11 (37%) had normal blood pressure, 17 (56%) had pre hypertension, and 02 (07%) had stage 1 hypertension among clients with hypertension in urban primary health center, Sakthi Nagar, Porur. In this table, it reveals that the level of hypertension is decreased after the post-test. The mean and standard deviation of pre-test and post-test among clients with hypertension. Results reveal that the pre-test mean among clients with Hypertension was 148.7 and standard deviation 9.090; the post-test mean, among client with Hypertension was 127.5 and standard deviation 11.352. The calculated paired 't' test value of  $t = 7.971$  was found to be statistically highly significant at  $p < 0.05$ . In the present study was supported by S R Collier *et al.* Had conducted the study to find out the effect of 4 weeks of aerobic or resistance exercise training on arterial stiffness, blood flow and blood pressure in pre and stage-1 hypertensive. Although both RE and AE training decreased BP, the change in pressure may be due to different mechanisms. The above table reveals that none of the demographic variables had shown statistically significant association with the post-test level of Hypertension among clients with hypertension attending the Out Patient Department in Urban Primary Health Center.

### Conclusion

Hypertension was associated with age, life style modifications and genetic causes, which demonstrates the needs to make the target population aware about Hypertension as well as the etiological factors involved and way to prevent the ongoing process through local actions involving in both Urban and Rural community areas. On the basis of the findings of the study the following conclusions are drawn the effectiveness of calisthenic exercise on hypertensive clients. In pre-test the clients ranging from pre hypertension to Stage 1 hypertension; after the intervention the clients blood pressure was reduced from stage 1 hypertension to pre hypertension and normal range after post-test. The study revealed that the calisthenic exercise was highly effective in reducing hypertension among the clients with hypertension.

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