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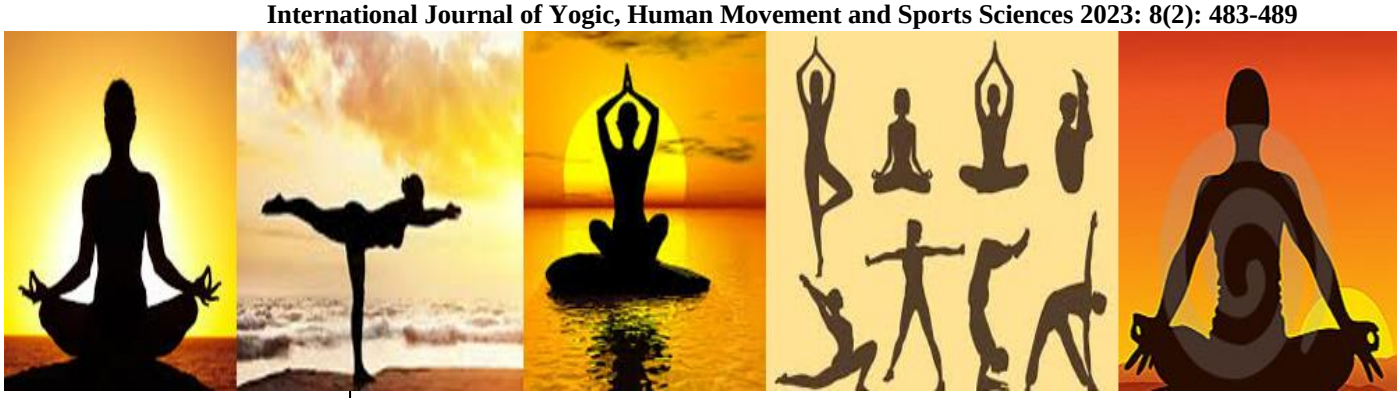

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Efficacy of yogic practices on blood pressure and resting pulse rate among hypertensive middle-aged men of 35-50

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Abstract
High blood pressure is a major risk factor for coronary heart disease, and the risk of cardiovascular disease doubles for each incremental increase of 20/10 mmHg of blood pressure, starting as low as 115/75 mmHg. In addition to coronary heart diseases and stroke, complications of raised blood pressure include heart failure, peripheral vascular disease, renal impairment, retinal haemorrhage, and visual impairment. Blood pressure can be regularised with yoga management, which includes selective asana, pranayama, and meditation. The associated symptoms like stress, depression, anxiety, etc. can also be treated along with hypertension. The present study was done to assess the efficacy of selected yoga practices for reducing high blood pressure to a minimum among middle-aged men. The study was performed to study the influence of yogic management on patients with hypertension. Hypertension or high blood pressure often produces no symptoms, but it can increase the risk of heart disease, stroke, and other serious health conditions. Medication and lifestyle choices can help manage hypertension. A person with hypertension may not notice any symptoms. Without detection, hypertension can damage the heart, blood vessels, and other organs, such as the kidneys. Long-term hypertension can cause complications through atherosclerosis, where plaque develops on the walls of blood vessels, causing them to narrow. This narrowing worsens hypertension because the heart must pump harder to circulate the blood.
Objectives: To observe the blood pressure variations among hypertensive middle-aged men in experimental and controlled groups, and to propose the yogic management for bringing down the hiked systolic and diastolic blood pressure to the required level.
Materials and Methods: 30 patients with essential hypertension between the ages of 35-50 years were selected. After a rest of 15-20 minutes in a comfortable posture their baseline physiological parameters such as Heart rate (HR) and Respiratory rate (RR). Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were recorded by an automated digital Sphygmomanometer.
Conclusion: It is evident from the results that yoga plays a vital role in the lifestyle diseases, especially to balance the blood pressure and the resting pulse rate and its ability to reduce the hypertension.

Keywords: Yoga, blood sugar level, hypertension, respiratory rate

Introduction
The ancient medical treatment method, YOGA proved its efficacy to prevent and cure many lifestyle diseases. Hypertension is one of the main causes of cardiovascular disorders at the beginning and ends up in disaster after becoming a serious victim of high blood pressure. The term systolic refers to the pressure of blood in the vessels when the heart beats. Diastolic refers to the pressure between beats. If a person has a blood pressure reading of, for example, 120/80 millimeters of mercury (mm Hg), systolic pressure is the first number, and diastolic pressure is the second. Blood pressure is the force with which flowing blood presses on the walls of the arteries as it travels from the heart to all of the body's tissues and organs. It is normal for blood pressure to fluctuate throughout the day. However, if blood pressure consistently remains high, it can have serious health consequences. High blood pressure is also known as hypertension.
A blood pressure reading is given in millimeters of mercury (mm Hg). It has two numbers. The first (systolic) number represents the pressure in blood vessels when the heart contracts or beats. The second (diastolic) number represents the pressure in the vessels when the heart rests between beats.

Both numbers in a blood pressure reading are important. But after age 50, the systolic reading is even more important. Isolated systolic hypertension is a condition in which the diastolic pressure is normal (less than 80 mm Hg) but systolic pressure is high (greater than or equal to 130 mm Hg). This is a common type of high blood pressure among people older than 65. Hypertension is diagnosed if, when it is measured on two different days, the systolic blood pressure readings on both day's are≥140 mmHg and/or the diastolic blood pressure readings on both days are≥90 mmHg. For most adults, there's no identifiable cause of high blood pressure. Primary (essential) hypertension, tends to develop gradually over many years. Secondary hypertension, tends to appear suddenly and cause higher blood pressure than primary hypertension. Various conditions and medications can lead to secondary hypertension, including obstructive sleep disorders, Kidney diseases, Adrenal gland tumors, Thyroid problems, Congenital state in blood vessels, certain medications, such as birth control pills, cold remedies, decongestants, over-the-counter pain relievers, and some prescription drugs, Illegal drugs, such as cocaine and amphetamines. The excessive pressure on your artery walls caused by high blood pressure can damage your blood vessels as well as your organs. The higher your blood pressure and the longer it goes uncontrolled, the greater the damage.

It may be an attractive option for people who want to get into the habit of exercising. Yoga is a spiritual path that may reduce blood pressure (BP) by reducing stress, increasing parasympathetic activation, and altering baroreceptor sensitivity; however, despite reviews on yoga and cardiovascular disease, diabetes, metabolic syndrome, and anxiety that suggest. Yoga can improve health; this study prefers to enrich the knowledge of more yogic tools to reduce high blood pressure among the age groups of 35 to 50 years. Although, they are continuing various medications, the application of yoga for eight to ten weeks for two hours can definitely get rid of all the medicines and can regularise the rhythm of the heart and lungs by strengthening the cardiovascular muscles, smoothening respiratory and circulatory system, we can retain our health and can improve the lifestyle.

Most people with high blood pressure have no signs or symptoms, even if blood pressure readings reach dangerously high levels. A few people with high blood pressure may have headaches, shortness of breath or nosebleeds, but these signs and symptoms aren't specific and usually don't occur until high blood pressure has reached a severe or life-threatening stage. Hypertension is called a "silent killer". Most people with hypertension are unaware of the problem because it may have no warning signs or symptoms. For this reason, it is essential that blood pressure is measured regularly. When symptoms do occur, they can include early morning headaches, nosebleeds, irregular heart rhythms, vision changes, and buzzing in the ears. Severe hypertension can cause fatigue, nausea, vomiting, confusion, anxiety, chest pain, and muscle tremors. The only way to detect hypertension is to have a health professional measure blood pressure. Having blood pressure measured is quick and painless. Although individuals can measure their own blood pressure using automated devices, an evaluation by a health professional is important for the assessment of risk and associated conditions.

The evaluation procedure for reducing high blood pressure

The blood pressure generally should be measured in both arms to determine if there is a difference. The Normal blood pressure. Your blood pressure is normal if it's below 120/80 mm Hg. Elevated blood pressure is a systolic pressure ranging from 120 to 129 mm Hg and a diastolic pressure below (not above) 80 mm Hg. Elevated blood pressure tends to get worse over time unless steps are taken to control blood pressure. Elevated blood pressure may also be called prehypertension.

- **Stage 1 hypertension:** Stage 1 hypertension is a systolic pressure ranging from 130 to 139 mm Hg or a diastolic pressure ranging from 80 to 89 mm Hg.
- **Stage 2 hypertension:** More-severe hypertension, stage 2 hypertension is a systolic pressure of 140 mm Hg or higher or a diastolic pressure of 90 mm Hg or higher.
- **Hypertensive crisis:** A blood pressure measurement higher than 180/120 mm Hg is an emergency situation that requires urgent medical care. If you get this result when you take your blood pressure at home, wait five minutes and retest. If your blood pressure is still this high, contact your doctor immediately. If you also have chest pain, vision problems, numbness or weakness, breathing difficulty, or any other signs and symptoms of a stroke or heart attack, call 911 or your local emergency medical number.

Because blood pressure normally varies during the day and may increase during a doctor visit (white coat hypertension), your doctor will likely take several blood pressure readings at three or more separate appointments before diagnosing you with high blood pressure. Blood pressure and pulse are two measurements that a doctor may use to monitor your heart and overall health. While they're similar, they can each say very different things about what's happening in your body.

Pulse, also called heart rate, refers to the number of times your heart beats in one minute. Typical pulse measurements range from 60 to 100 beats per minute.

Blood pressure is an estimate of the force your blood is exerting on your blood vessels. A typical value for blood pressure is 120/80. Doctors consider blood pressure to be elevated when it's between 130 and 139 systolic (the top number) over 80 to 89 diastolic (the bottom number).

If you have high blood pressure with a low pulse, it means your blood is putting increased pressure on your blood vessels, but your heart's beating fewer than 60 times per minute. Read on to learn more about what this combination means for your health.

The following are the instruments used to evaluate the hypertension:-

- Ambulatory monitoring. This 24-hour blood pressure monitoring test is used to confirm if you have high blood pressure. The device used for this test measures your blood pressure at regular intervals over a 24-hour period and provides a more accurate picture of blood pressure changes over an average day and night.
- Sphygmomanometer.
- Lab tests. Your doctor may recommend a urine test (urinalysis) and blood tests, including a cholesterol test.
- Electrocardiogram (ECG or EKG). This quick and painless test measures your heart's electrical activity.
- Echocardiogram. Depending on your signs and symptoms and test results, your doctor may order an echocardiogram to check for more signs of heart disease. An echocardiogram uses sound waves to produce images of the heart.

The system of yoga encourages strength and flexibility of the associated organs, and its function in a rhythmic way. The

asanas like Padahasthana and ardha chandrasana or arda chakrasana, dhanurasan, gomukhasan, Padma parvatasan, bhujangasana, surya namaskar, and the restricted kapalbhati, nadi shudhi pranayam, and chakra meditation followed by savasan are the few selective practices for the hypertension.

The goal of yoga therapy for reducing high blood pressure

Yoga – The word "yoga" means unity or oneness and is derived from the Sanskrit root "yuj", which means to join. It is the union of individual consciousness with universal consciousness. Yoga is a means of balancing and harmonizing the body, mind, and emotions through the practices of asana, pranayama, mudra, bandha, shatkarma, and meditation and must be achieved before union can take place with the higher reality. Yoga Therapy. It is the professional application of the principles and practices of yoga to promote health and well-being within a therapeutic relationship that includes personalized assessment, goal setting, and lifestyle management. Blood pressure is the force exerted by circulating blood against the walls of the body's arteries, the major blood vessels in the body. Hypertension is when blood pressure is too high. Blood pressure is determined both by the amount of blood your heart pumps and the amount of resistance to blood flow in your arteries. The more blood your heart pumps and the narrower your arteries, the higher your blood pressure.

On understanding briefly about hypertension, it is time for setting up a goal for the therapy. The ultimate aim of Yoga therapy is the complete happiness of a practitioner, mentally and physically free from diseases. Adapting the essential and important yogic management conveniently and comfortably, one can easily get into the flow chart. Various sukshma vyayams, asanas with proper inhale/exhale sequences, pranayam, antar kumbaka, bahir kumbaka, meditation, and Savasana are included in the training program for the hypertensive volunteers. The environment, dress code, food habits, etc are also a part of the training activities. The time schedule is also mandatory for the therapy. The scientific methodology and testing methods are being followed by addressing all the factors affecting the individual and the disease as well.

Reasons for implementing therapeutic yoga for reducing high blood pressure

When we look around, it is evident from the recent cardiac arrests, and heart attacks leading to a great loss of dependents even after medication. Yoga can do much more than medicine can reach. The union of mind and the body is the aspect that plays a vital role in curing any disease. While doing the sukshma vyayams with synchronized breathing itself starts massaging the internal organs, and muscles, allowing more concentration of blood cells. Asana are one of the important parts of stretching and relaxing internal and external core muscles engaged in particular postures. The expansion and relaxation of cardiovascular muscles with breathing techniques definitely strengthen the system. Antar kumbaka and bahir kumbaka focuses on the vital capacity. Anterior neck muscles, the apex of lungs, pectoralis major, and pectoral minor/major are directly involved in certain asanas. Backward bending asanas improves the strengthening of cardiac muscles. With the help of kapalbhati we can exhale toxins. In the pranayama process, as the ratio and duration increases the breadth becomes very light and subtle. Nadi shodhana pranayam is the practice to purify the nadis. The yogic breathing, and the engagement of chest and the diaphragm muscles will enhance the rhythmic breathing. The physical movement or the postures will be tuning the external and internal muscles and the pranayam techniques, or wherein the breath is involved, the cardiac muscles will become stronger and will allow smooth functioning of the system. Once the breathing becomes natural, our body gets relaxed, the entire system gets enough supply of energy, and heartbeats become smooth and steady, thereby the blood pressure is maintained. Adoption of chin mudra pranayam and followed by the Savasana, makes the body feel the sympathized relaxation of entire limbs and organs. The conscious, subconscious state of mind becomes one, the pulse rate becomes, normal without any misleading.

Findings

The statistical analysis, scientific observation, and verifications of the subjective data.

Table 1: Showing the mean, standard deviation and t - value of the Systolic

Group	N	Mean	Std. Deviation	t-value	p-value
Pre - test	16	1.60	11.86	1.66	0.10 NS
Post - test	16	1.53	12.50		

NS-Not Significant

From the above table it is seen that in the pre-test, respondents scored of means value (1.60) than the post-test respondents are means value (1.53). This mean difference is statistically proved by the obtained t-value (1.66), the p-value is not significant. Therefore the framed research hypothesis that there is no significant difference in systolic level among the respondents between pre and post-test is rejected.

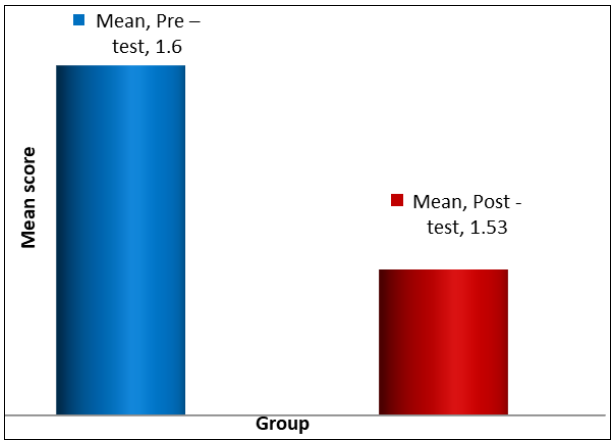

Fig 1

Table 2: Showing the mean, standard deviation and t - value of the Diastolic

Group	N	Mean	Std. Deviation	t-value	p-value
Pre - test	16	91.31	5.46	2.04	0.05 S
Post - test	16	87.06	6.26		

S-Significant

It is inferred from the above table result reveals that in the pre-test, respondents are higher mean value (91.31) than the post-test respondents scored of means value (87.06). This mean difference is statistically proved by the obtained t-value (2.04), which is significant at 0.05 level. Therefore the framed research hypothesis that there is a significant difference in Diastolic level among the respondents between pre and post-test is accepted.

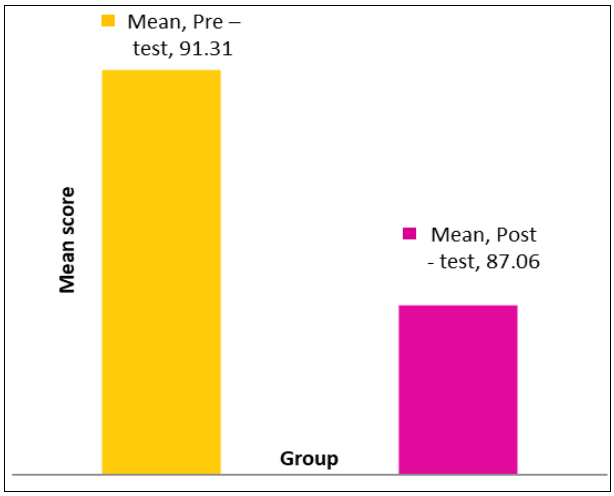

Fig 2

Table 3: Showing the mean, standard deviation and t - value of the Pulse rate

Group	N	Mean	Std. Deviation	t-value	p-value
Pre - test	16	85.06	7.11	0.157	0.87 NS
Post - test	16	84.68	6.34		

NS-Not Significant

It is inferred from the above table result shows that in the pre-test, respondents scored of means value (85.06) than the post-test respondents scored of means value (84.68). This mean difference is statistically proved by the obtained t-value (0.157), the p-value is not significant. Therefore the framed research hypothesis that there is no significant difference in pulse rate level among the respondents between pre and post-test is rejected.

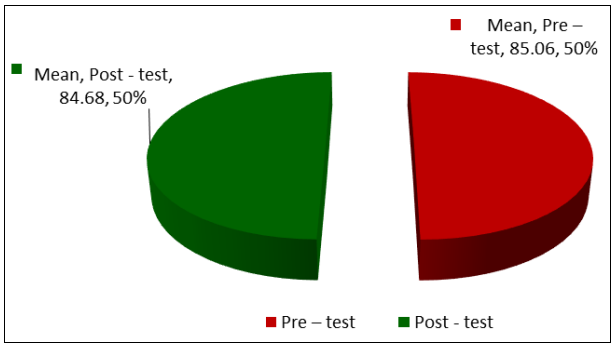

Fig 3

Table 4: Showing the mean, standard deviation and t - value of the Blood sugar

Group	N	Mean	Std. Deviation	t-value	p-value
Pre - test	16	1.07	15.28	0.115	0.91 NS
Post - test	16	1.06	16.62		

NS-Not Significant

From the above table it is seen that in the pre-test, respondents scored of means value (1.07) than the post-test respondents are means value (1.06).
This mean difference is statistically proved by the obtained t-value (0.115), the p-value is not significant. Therefore the framed research hypothesis that there is no significant difference in blood sugar level among the respondents between pre and post-test is rejected.

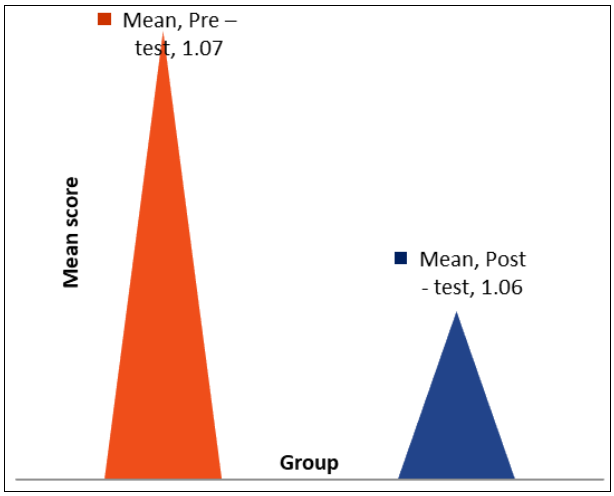

Fig 4

Table 5: Showing the mean, standard deviation and t - value of the Triglycerides

Group	N	Mean	Std. Deviation	t-value	p-value
Pre - test	16	1.74	18.15	0.532	0.59 NS
Post - test	16	1.71	16.34		

NS-Not Significant

From the table 5 result proved that in the pre-test, respondents scored of means value (1.74) than the post-test respondents are means value (1.71). This mean difference is statistically proved by the obtained t-value (0.532), the p-value is not significant. Therefore the framed research hypothesis that there is no significant difference in triglycerides level among the respondents between pre and post-test is rejected.

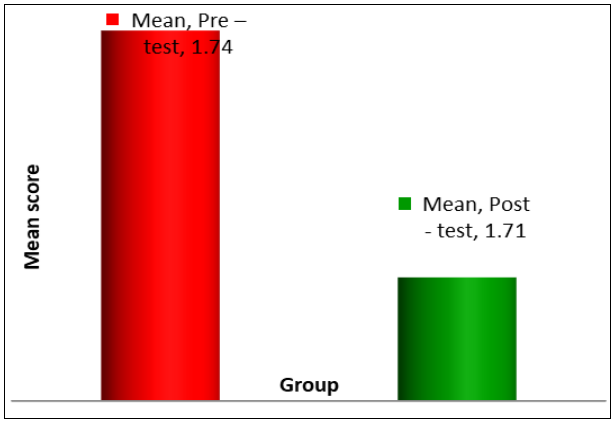

Fig 5

Table 6: Showing the mean, standard deviation and t - value of the LDL

Group	N	Mean	Std. Deviation	t-value	p-value
Pre - test	16	83.68	26.24	3.209	0.001 S
Post - test	16	1.125	24.50		

S- Significant

From the table 6 it is evident that in the pre-test, respondents are higher mean value (83.68) than the post-test respondents scored of means value (1.125). This mean difference is statistically proved that in the obtained t-value (3.209), which is significant at 0.001 level. Therefore the framed research hypothesis that there is a significant difference in LDL level among the respondents between pre and post-test is accepted.

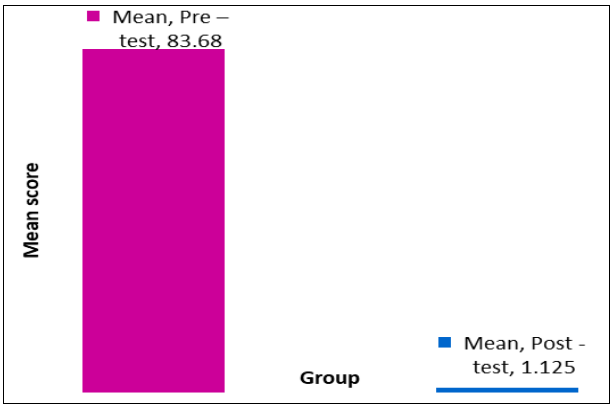

Fig 6

Table 7: Showing the mean, standard deviation and t - value of the HDL

Group	N	Mean	Std. Deviation	t-value	p-value
Pre - test	16	65.81	16.69	1.552	0.13 NS
Post - test	16	57.97	11.82		

NS-Not Significant

From the above table it is seen that in the pre-test, respondents scored of higher mean value (65.81) than the post-test respondents are means value (57.97). This mean difference is statistically proved by the obtained t-value (1.552), the p-value is not significant.

Therefore the framed research hypothesis that there is no significant difference in HDL level among the respondents between pre and post-test is rejected.

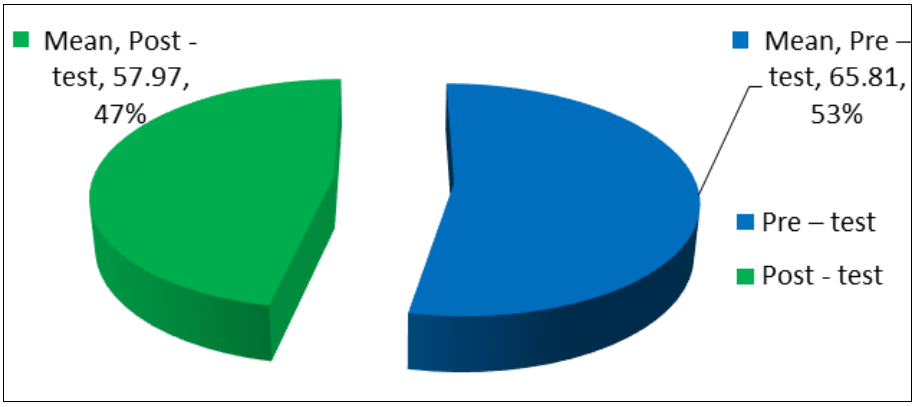

Fig 7

Table 8: Showing the mean, standard deviation and t - value of the Cortisole

Group	N	Mean	Std. Deviation	t-value	p-value
Pre - test	16	9.705	2.62	1.293	0.20 NS
Post - test	16	10.81	2.19		

NS-Not Significant

It is inferred from the above table result shows that in the pre-test, respondents scored of means value (9.705) than the post-test respondents scored of means value (10.81). This mean difference is statistically proved by the obtained t-value (1.293), the p-value is not significant. Therefore the framed research hypothesis that there is no significant difference in Cortisole level among the respondents between pre and post-test is rejected.

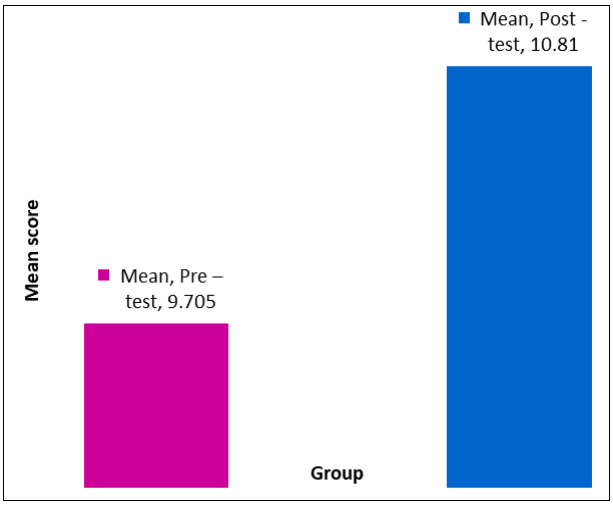

Fig 8

Structuring the Therapy, and the Methods

The principles of scheduling of sukshma vyayams, physical practicing of the body, Skelton relaxation, timing & duration, and influence of poses provide a framework to structure the progression and content of therapy. Sequencing refers to the deliberate progression of sukshma vyayams, postures selected to specifically target a group of muscles, with variations of postures that gradually release muscle tension, open up joint spaces, increase circulation, decrease inflammation, smooth function of our respiratory systems, by ensuring correct alignment and movement in the postures. The pranayam is to be commenced once they get mastery over the selective asanas. The rounds on each nostril, by focussing on the left/right hemisphere; in between proper kumbaka can also be carried out under correct supervision. Surya bedha and Chandra beda, the mudra pranayams.

Timing refers to the length of time each pose or âsana is held, depending on the capacity of the participant, to optimize the release of tension and “opening” of joints while minimizing pain. The synchronization of breath with the movement will definitely affect the target muscles and the respiratory system as well. When mobility is the goal, more active stretching is involved and poses are held for short time periods (15–20 seconds) and repeated up to 3 times. Once mobility is achieved, the participants are advised to stay longer in the pose (1–2 minutes) with less repetition according to their capacity to regain proper anatomical alignment, flexibility, and strength.

These movements are “intricate” and highlight the mind-body nature of Yoga that emphasizes awareness, concentration, and bidirectional communication between the mental, nervous, skeletal, and muscular systems. Yoga is not a passive activity that simply occurs by itself; it instead requires an active mind and body integration to assure the anatomically correct pose

occurs that stimulates all muscles and tissues to achieve proper alignment, strengthening, flexibility, stability, and physiological function of the surrounding tissues and organs. The intricacy that occurs allows practitioners to stay in the pose for longer periods of time, at first with effort. As they practice and progress they can remain in the pose with lightness and ease. Sustaining the posture in a dynamic state permits positive physical and psychological changes to occur, and intricacy is thus central to the healing of musculoskeletal imbalances.

Once they gain mastery over the asanas, the pranayam will be taught in order to expand the lungs, and the exhalation procedures emitting maximum carbons, and toxins help them to breathe easily before the bhastrika. The Kapal Bhati and bhastrika pranayam will be given to them alternatively in order to enhance lung capacity. Continuing the calm and rhythmic breath through the nostrils, observe the throat, and feel the breath passing through the throat. With the beginning of this UJJAYI breath, the entire nervous system will be smoothened. It has a profoundly relaxing effect on the psychic level. It can slow down the beneficial for the heart rate, high blood pressure patients. If experienced, they can adopt jalandhara badha, moola badha. Further, the pranayam chin mudra and hridaya mudra are being practiced for the health and strength of our HEART. Meditation also can be done in continuation to the pranayam and then savasan.

The method of Yoga therapy for hypertension includes a scheduled training program. Sukshma vyayams, each asana individually of suryanamaskar, recommended asanas like Pada hasthasan, ardha kati chakra asana, shasankasan, bhujangasana, dhanurasan, gomukhasan. The kapalbhati, bhastrika, ujjayi breath, mudra pranayam followed by medition and savasan.

Sample size

30 Hypertensive middle-aged Men volunteers aged between 35-50 yrs. They are divided into two groups Experimental groups (15) and Controlled group (15). Experimental group practises Yoga while the Controlled group did not do any yoga practice, and the study structures are as follows:

a) Study Design: Simple Random Group Design.
b) Study Duration: 5 days in a week for 8 weeks.
c) Study Instrument: Systolic, diastolic blood pressure and Resting Pulse Rate.

Interventional Modules

Sukshma vyayams. Tadasana, Utkatasana, Marjari asana, Vakrasana, Shasankasana, bhujangasana, Ardha Halasana, Dhanurasana, Gomukhasana, Brahmari Pranayama, chandrabedha, and Nadi sudhi pranayama, Ujjayi breathing, Meditation. Application of Apana vayu mudra, focusing on the breath and inner silence. Savasana regularizes the resting pulse rate and improves abdominal and crevicular, adham pranayama breathing patterns in addition to complete relaxation at a very conscious state. (References are Asana-Pranayama-Mudra-and-Bandhas-Bihar-School, Gheraṇḍa saṃhita)

Inclusion criteria

a) Male Volunteers with Hypertension
b) Subject aged between 35 to 50 years
c) Subjects willing to participate in the study regularly.

Exclusion criteria

a) Subjects already practice yoga
b) Subjects who has undergone surgery
c) Pacemaker and high-risk personnel

Statistical Analysis

‘t’ ratio.

Study Instruments

Sphygmomanometer, Oximeter.

Statistical Technique

Analysis of Variance

Measures

Psychological, Bio chemical, Physiological variables

Findings and discussions

The present study was aimed at studying the effect of practicing yoga in patients with hypertension for three months. The practice of yoga in these patients resulted in a decrease in hypertension or the increased systolic and diastolic blood pressure and the pule rate to the required parameters of minimum level, tabulated the biostatics report. Alternately, carefully controlled treatment measures with yogic asanas, pranayama, and meditation focussing more on the breathing pattern in order to achieve the target and thereby reduced the number of tablets and the dosages.

The sukshma vyayams and the asanas synchronised with the breathing shown drastically improvement in their resting pulse rate. It is, however, seen that the BP patients usually cannot sustain the levels of recommended physical activity for them due to varied breathing patterns. Compliance and motivation for performing activity at 50 to 70% of maximum breathing oriented activities. Various breathing exercises, Ujjayi pranayama and the adham pranayama, followed by meditation and Savasana were systematically trained and monitored. Patient’s experiences were recorded and with the guidance of the consulted doctors, they have stopped taking drugs.

Various symptoms like partial headaches, numbness, irregular chest pain, disturbing mind-set, and tensions were deteriorated gradually with the second week of training. Built up confidence and increased patience and gained positive energy by the subject. Yoga has been reported to lower levels of sympathetic hormones and reduce cortisol. Pranayama reduces sympathetic tone, increases parasympathetic activity and also helps an individual reduce stress.

Meditation also brings about a hypometabolic state and reduces stress induced sympathetic over activity. Better ability to overcome stress resulting in lowered cortisol levels can be cited as possible mechanism for improvement in lipid profile in patients practicing yoga. Yoga practice is also proved to affect mental balance of an individual allaying apprehension, stress and bringing about hormonal balance and feelings of wellbeing. This sense of wellbeing is attributed to its ability to increase endogenous melatonin secretion. This can explain the probability of greater compliance with its practice even in long-term and its use as an effective intervention in control of the disease

Conclusion

The present study has shown an efficacy of selective yogic practices on resting pulse rate and blood pressure among hypertensive middle aged men. Yoga, being a lifestyle incorporating Ashtanga yoga, managing stress and thereby creating positive attitude towards life. Hypertension is a

common cause for cardiac disorders and by adapting yogic measures, we can easily control our heart rate and can increase our life span.

Strength of study

The yoga package was designed after extensive literature review by yoga experts and guides, and was a perfect combination of asana and pranayama targeted at the disease under study. Excellent compliance of study sample and there were no drop outs. Experimental group patients voluntarily reported to Holistic medicine department and were self-motivated for the practice of yoga. The control group was also under constant surveillance.

Limitations of the study

Direct supervision of the patients was not possible for the entire period of the study. Dietary data were not recorded. Long-term study was not possible due to threat of noncompliance of the patients.

Conflicts of interest

All authors have none to declare.

References.

1. Whelton PK, *et al*. 2017 ACC/ AHA/ AAPA/ ABC/ ACPM/ AGS/ APhA/ ASH/ ASPC/ NMA/ PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol; c2017-2018.
2. Cramer H, Ward L, Steel A, Lauche R, Dobos G, Zhang Y. Prevalence, patterns, and predictors of yoga use: results of a US nationally representative survey. American journal of preventive medicine. 2016 Feb 1;50(2):230-5.
3. Ekkekakis P. Honey, I shrunk the pooled SMD! Guide to critical appraisal of systematic reviews and meta-analyses using the Cochrane review on exercise for depression as example. Mental health and physical activity. 2015 Mar 1;8:21-36.
4. Chudyk AM, *et al*. Systematic review of hip fracture rehabilitation practices in the elderly. Arch Phys Med Rehabil; c2009.
5. Hegde SV, Adhikari P, Shetty S, Manjrekar P, D'Souza V. Effect of community-based yoga intervention on oxidative stress and glycemic parameters in prediabetes: a randomized controlled trial. Complementary therapies in medicine. 2013 Dec 1;21(6):571-6.
6. Kanaya AM, Araneta MR, Pawlowsky SB, Barrett-Connor E, Grady D, Vittinghoff E, *et al*. Restorative yoga and metabolic risk factors: the Practicing Restorative Yoga vs. Stretching for the Metabolic Syndrome (PRYSMS) randomized trial. Journal of diabetes and its complications. 2014 May 1;28(3):406-12.
7. Kim HN, Ryu J, Kim KS, Song SW. Effects of yoga on sexual function in women with metabolic syndrome: a randomized controlled trial. The journal of sexual medicine. 2013 Nov;10(11):2741-51.
8. Mizuno J, Monteiro HL. An assessment of a sequence of yoga exercises to patients with arterial hypertension. Journal of bodywork and movement therapies. 2013 Jan 1;17(1):35-41.
9. Hegde SV, Adhikari P, Subbalakshmi NK, Nandini M, Rao GM, D'Souza V. Diaphragmatic breathing exercise as a therapeutic intervention for control of oxidative stress in type 2 diabetes mellitus. Complementary therapies in clinical practice. 2012 Aug 1;18(3):151-3.
10. Lakkireddy D, Atkins D, Pillarisetti J, Ryschon K, Bommana S, Drisko J, Vanga S, Dawn B. Effect of yoga on arrhythmia burden, anxiety, depression, and quality of life in paroxysmal atrial fibrillation: the YOGA My Heart Study. Journal of the American College of Cardiology. 2013 Mar 19;61(11):1177-82.
11. Jani HA, Bhanderi PC, Sharma C, Padalia M. Comparative study of serum lipid profile between pre-hypertensive and normotensive; c2014.
12. Goyal R, Sarwate N. A correlative study of hypertension with lipid profile. Int J Res Appl Nat Soc Sci. 2014;2:143-50.
13. Nayak DM, Gupta DG, Nayak R. Clinical study of essential hypertension with reference to lipid profile. International Journal of Medical Research and Pharmaceutical Sciences. 2017;4(3):26-34.
14. Tundwala V, Gupta RP, Kumar S, Singh VB, Sandeep BR, Dayal P, Prakash P. A study on effect of yoga and various asanas on obesity, hypertension and dyslipidemia. Int J Basic Appl Med Sci. 2012 Jan;2(1):93-8.
15. Patel C, North WRS. Randomized controlled trial of *yoga* and bio-feedback in the management of hypertension. The Lancet; c1975.
16. Chauhan A, Semwal DK, Mishra SP. *Yoga* practice improves the body mass index and blood pressure: A randomized controlled trial. International journal of yoga; c2017.
17. McCaffrey R, Ruknui P, Hatthakit U. The effects of *yoga* on hypertensive persons in Thailand. Holistic nursing; c2005.
18. Murthy SN, Rao NSN, Nandkumar B. Role of naturopathy and *yoga* treatment in the management of hypertension. Therapies in clinical; c2011.
19. Dhungana RR, Pedisic Z, Joshi S, Khanal MK, Kalauni OP, Shakya A, *et al*. Effects of a health worker-led 3-month yoga intervention on blood pressure of hypertensive patients: A randomised controlled multicentre trial in the primary care setting. BMC Public Health. 2021 Dec;21(1):1-1.
20. Sieverdes JC, Mueller M, Gregoski MJ, Brunner-Jackson B, McQuade L, Matthews C, *et al*. Effects of Hatha yoga on blood pressure, salivary α-amylase, and cortisol function among normotensive and prehypertensive youth. The Journal of Alternative and Complementary Medicine. 2014 Apr 1;20(4):241-50.
21. Parikh S, Mahida P, Vaghela N, Shah H. Effect of home based yoga on blood pressure and quality of life in patients with hypertension. Int J Clin Exp Physiol. 2021;8(1):26-30.