Assessment of the Effect of yoga practice and Control of hypertension Among KSRP 10th Battalion Gangibhavi, Shiggoan

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Abstract:

The present study aimed to find out the impact of Yogic practices and Control of hypertension. The sample consists of 36, police staff in Experimental group, and 36 police staff in control group, randomly selected from police staff, Superintendent office, Shiggoan. The study was conducted for a period of 45 Days. The parameters used for the present study are Hypertension (BP), Sistolic BP, Diostolic BP, and Lipidprofils. These tests were done before and after the yoga therapy. For the present study, a student't'test is used to assess the effect of Yoga on Hypertension. It is hypothesised that the practice of Yoga helps to enhance the Police staff's capacity to reduce Hypertension problem.

Showed significant improvement among experimental group when compared to control group. In experimental group individuals with average BMI of 26.92 kg/m^2± 2.91kg/m^2 before yoga and individuals shows average BMI of 26.21 kg/m^2 ± 2.86 kg/m^2 after yoga. Individuals with average BMI of 25.40 kg/m^2± 2.85 kg/m^2 before and individuals shows average BMI of 25.75 kg/m^2 ± 2.93 kg/m^2 after period of control group. Lipid Profiles, as p <0.05 the result is significant in Experimental group & non significant in Control group

Keywords: ***Yoga Therapy, Systolic Blood Pressure, Diastolic Blood Pressure, Lipid Profiles. Paired 't' test, ANOVA Test.***

Introduction

Hypertension can be defined as a consistent blood pressure recording of over 140/90 mmHg in patients less than 50 years of age. The normal B.P is 120/80. There are two types of hypertension-primary and secondary. It is called silent killer also. Hypertension is not a disease by itself, but a sign that there are underlying problems in the management of internal environment and balance of the body at physical; emotional and mental levels. It is tension of the whole body / mind complex, resulting in

imbalance of the nervous system. 90% cases are primary and 10% are secondary COMPLICATIONS: (RISK FACTORS) **heart diseases:** the heart as it becomes more and more strained, increases in size, damaging its internal components such as the valves. The heart also becomes more prone to heart attack as higher blood pressure is associated with hardening of the arteries. **The brain:** oxygen supply to the brain is reduced so that it cannot function at optimum level. **The eyes:** blurring of the vision and sudden, progressive loss of vision or other defects. **Kidney:** dysfunction occurs which may result in the inability to build up and death can result. Things that increase the risk of having high blood pressure include: older age, genetics, being overweight or obese, not being physically active, high-salt diet, drinking too much alcohol, consumption of tobacco,WHO (2012) estimated that one in three adults worldwide are affected with raised blood pressure – a condition that causes around half of all deaths from stroke and heart disease. This report is further evidence of the dramatic increase in the conditions that trigger heart disease and other chronic illnesses, particularly in low - and middle-income countries **[1]**.WHO (2013) stated that in Worldwide, high blood pressure is estimated to affect more than one in three adults aged 25 and over, or about one billion people. The theme of the World Health Day 2013 is "Measure your Blood pressure, reduce your risk" for calling for intensified efforts to prevent and control Hypertension **[2].** Deepa T. et al. conducted a study to evaluate the Effect of yoga andmeditation on 15 mild to moderate essential hypertensives treated withantihypertensive drugs along with yoganidra. The study showed a significant fall ofmean blood pressure after 3 months of yoganidra ($p < 0.01$) [**3].** Naik Aconducted a study to evaluate the effect of left nostril breathingon 30 hypertensive patients to evaluate the heart rate and blood pressure. The resultshowed that the mean pulse rate dropped from 84.73 ± 1.89 per minute to 81.80 ±1.84per minute. Systolic blood pressure dropped from 144.50 ± 3.68 mmHg to133.83 ± 3.66 mmHg. Diastolic blood pressure dropped from 100.96 ± 2.48 mmHgto 94.83 ± 2.41 mmHg **[4].** Braun TD et al. carried out a study to determine the increasing prevalenceof overweight and obesity in humans in the United States. Thirty-sevenoverweight/obese program participants (age 32-65, BMI<25) were undergone a5-day residential weight loss program, which was multifaceted and based on Kripaluyoga, on health behaviors, weight loss, and psychological well-being inoverweight/obese individuals. Self-report weight loss at 1 year (n = 19, 51%retention) was significant. The study concluded that a Kripalu yoga-based, residential weight loss program may foster psychological well-being and weightloss [**5].**Madanmohan assessed the effect of yoga therapy on reaction time, biochemical parameters and wellness score of 15 peri and post-menopausal diabeticpatients. A

comprehensive yoga therapy program comprising of three times a weeksessions for six weeks was conducted. Yoga training reduced auditory reaction time (ART) from right as well as left hand, the decrease being statistically significant(P<0.05) for ART from the right hand. There was a significant (P<0.01) decrease infasting and postprandial blood glucose levels as well as low density lipoprotein. Thedecrease in total cholesterol, triglycerides, and very low-density lipoprotein andincrease in high density lipoprotein was also statistically significant (P<0.05). Allthe lipid ratios showed desirable improvement with a decrease (P<0.01) of TC/HDLand LDL/HDL ratios and increase (P<0.05) in the HDL/LDL ratio **[6].**Aekplakorn et al. explained the changes in prevalence, awareness, treatment and control of hypertension and their metabolic risk factors in Thaipopulation between 2004 and 2009 conducted by Thai National Health ExaminationSurvey (NHESThe high blood pressure control rates improved from 4.8 to 14.4% formen and from 10.8 to 27.2% for women, respectively (*P*<0.05). Strengtheningmeasures to control high blood pressure and metabolic risk factors, especiallyobesity and hypercholesterolemia, inindividuals with hypertension areneeded **[7].**

MATHODS AND PROCEDURE

HYPOTHESIS:

To study the Effect of Yogic practices on Hypertension in KSRP Police.

It is hypothesised that the practice of Yoga helps to enhance the Police staff's capacity to handle stressful situation and Control of Hypertension problem.

WORK METHOD:

The Research design adopted for the study is experimental in nature. All the subjects were married. All the subjects of the study were of the age group of 29 to 59 years. The subjects were divided into two groups, experimental and control group, consisting of eleven members in each group. The yogic therapy was given to experimental group and their results were compared with control group. The study was conducted for the period of 45 days from 1thFebruary to 15 March. The practices were taught all days in a week. Daily sessions of classes were taken in the morning for one and halp hour from 6.00 AM to 7.30 AM. The Yogic practice includes a series of Asana, Pranayama, and Meditation and followed by the relaxation method of Yoga Nidra. Asanas were carried for 30 minutes, Pranayama for 20 minutes, Meditation for 10 minutes and Yoga Nidra for 30 minutes. Before starting the yoga practice, the case histories of the subjects were taken and at the end of 45 days the individual improvement were noted.

The blood pressure of the subjects was recorded using sphygmomanometer and that has been done in pre and post manner. I.e., before starting

the practice of yoga and after 45 days practice of yoga.

The blood pressure was recorded in the supine position. In order to prevent the variation of blood pressure with time, the readings were taken at the same time Lipidprofile blood sample i.e. Inbetween 6a.m to 7.30 a.m. To prevent the instrumental error, the B.P readings were noted using the same instrument throughout the study.

The weight of the subjects was measured by using a weighting machine before and after the study.

Inclusion criteria:

- Age between 29-59 years
- Subjects having with hypertension.

Exclusion criteria:

- Surgery done within 6 months.
- Sick (having saviour health problems)

PARAMETERS:

The following parameters were undertaken for the study. **1**. Lipid Profile: The test mainly includes Total Cholesterol, triglyceride, HDL; LDL; VLDL Cholesterol levels. The blood pressure of the subjects was recorded using Sphygmomanometer, before and after the experiment. It was done to know the changes that were brought after the yoga therapy. **2.** Systolic pressure: when the left ventricles contracts and pushes blood into the aorta the pressure produced with in the arterial system is called the systolic blood pressure. In adults, it is about 120mmhg or 16kpa. **3.** Diastolic pressure: - when the heart is resting following the ejection of blood, the pressure with in the arteries is called diastolic blood pressure. In an adult, this is bout 80mmHg or 11kPa. These figures vary according to the time of day, the posture, gender and age of the person. It increases with age and is usually higher in women than in men. In adult males, the average systolic pressure is 120-140 mmHg and an average diastolic pressure is 70-90 mmHg. Blood pressure is measured by sphygmomanometer. It is usually expressed in the following manner B. P=120/80 mmHg.

When the blood pressure exceeds the normal value then it is called as Hypertension and if it is less than normal value then that is called as Hypotension**. 4.** B.M.I: The weights of the subjects were measured using a weighing machine with minimal clothing. The weight was measured before yoga therapy and after 45 days of yoga therapy. Weight is being measured by using weighing machine.

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B.M.I is calculated by using the formula $\frac{\text{Weight in Kg}}{\text{Height in (Meter)}^2}$

B.M. I=Body-Mass Index Calculation5 and Interpretation

INTERPRETATION	B.M.I(KG)
Underweight	<18.5
Normal	18.5 to 24.9
Overweight	25.0 to 29.9
Obese	30.0 to 34.9
Severely Obese	35.0 to 39.9
Extreamely Obese	>40

LIST OF YOGIVCC PRACTICES:

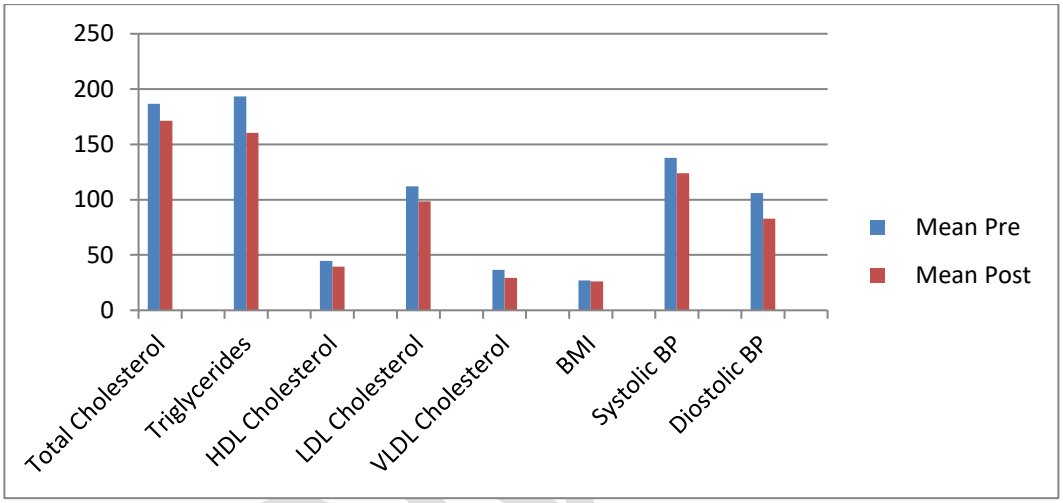
1.ASANAS (30 minuts): Svastikasana, Vajrasana, Suptavajrasana, Tadasana I, Trikonasana, Parsvakonasa, Prasaritapadottanasana, Purvothanasana, Pavanamuktasana, Bhujangasana, Shalabhasana, Dhanurasana, Janushirshasana, Mahamudra, Viparitakarani, Uttanapadasana **2**. PRANAYAMAS **(**20 minuts)**:** Ujjayee, AnulomaViloma, Chandrabhedana-(12), Bhastrika, Bhrammary. **3.** MEDITATION (10 minuts): Pranava-(12), **4.** RELAXATION TECHNIQUE (30 minuts): Yoga Nidra.

Result of Statistical Analysis of Experimental Group

S.N	Parameters	Mean		SD		t-value	p-value	Significance
		Pre	Post	Pre	Post			
1.	**Total Cholesterol**	186.72	171.36	33.66	24.95	4.135749	<0.000105	S
2.	**Triglycerides**	193.33	160.44	72.82	52.35	5.736022	<0.0001	S
3.	**HDL Cholesterol**	44.55	39.3	6.67	4.7	9.379582	<0.0001	S
4.	**LDL Cholesterol**	111.91	98.47	22.73	19.66	9.29004	<0.0001	S
5.	**VLDL Cholesterol**	36.63	29.22	7.46	5.22	8.911465	<0.0001	S

6.	**BMI**	26.92	26.21	2.91	2.86	15.57	<0.0001	S
7.	**Systolic BP**	137.94	123.89	7.37	8.28	9.06	<0.0001	S
8.	**Diostolic BP**	105.89	82.83	10.95	2.59	12.30	<0.0001	S

EXPERIMENTAL GROUP VERIATION SCALE



The above table shows that individuals with average Total Cholesterol, Triglycerides Cholesterol, HDL Cholesterol, LDL Cholesterol and VLDL Cholesterol are high in case of before yoga compared to after yoga.

Correlation of Variables before Yoga - Cholesterol

	TC	**TRI**	**HDL**	**LDL**	**VLDL**
TC	1				
TRI	0.262	1			
HDL	0.544***	0.391*	1		
LDL	0.399*	-0.218	0.583***	1	
VLDL	0.424*	0.476**	0.453**	0.168	1

TC- Total Cholesterol; TRI- Triglycerides Cholesterol; HDL- HDL Cholesterol; LDL- LDL Cholesterol; VLDL- VLDL Cholesterol

Above table shows that

i) Total Cholesterol is positively associated with HDL Cholesterol, LDL Cholesterol and VLDL Cholesterol.

ii) Triglycerides Cholesterol is positively associated with HDL Cholesterol and VLDL Cholesterol.

iii) HDL Cholesterol is positively associated with LDL Cholesterol and VLDL Cholesterol.

Correlation of Variables after Yoga - Cholesterol

	TC	**TRI**	**HDL**	**LDL**	**VLDL.**
TC	1				
TRI	0.115	1			
HDL	0.346*	0.292	1		
LDL	0.156	-0.390*	0.405*	1	
VLDL	0.178	0.521**	0.111	-0.261	1

Above table shows that

i) Age is positively associated with Total Cholesterol.

ii) Total Cholesterol is positively associated with HDL Cholesterol.

iii) Triglycerides Cholesterol is positively associated with VLDL Cholesterol and negatively associated with VLDL Cholesterol.

iv) HLDL Cholesterol is positively associated with LDL Cholesterol.

Two-way ANOVA Test Results for studying impact of age group on the all types Cholesterol before yoga.

Variables	F value	P value
Total Cholesterol vs Age group	1.797	0.182
Triglycerides Cholesterol vs Age group	1.445	0.25

HDL Cholesterol vs Age group	2.727	0.0801
LDL Cholesterol vs Age group	3.852	0.0314*
VLDL Cholesterol vs Age group	0.353	0.705

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '

Age group	p-values
30-40 v/s 40-50	0.440487
30-40 v/s 50-60	0.034378
40-50 v/s 50-60	0.152433

There is significant difference between averages of before LDL Cholesterol between 30-40 and 50-60 age groups.

Two-way ANOVA Test Results for studying impact of age group on the all-types Cholesterol after yoga.

Variables	F value	P value
Total Cholesterol vs Age group	1.574	0.222
Triglycerides Cholesterol vs Age group	1.546	0.228
HDL Cholesterol vs Age group	1.275	0.293
LDL Cholesterol vs Age group	3.406	0.0452*
VLDL Cholesterol vs Age group	0.346	0.71

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '

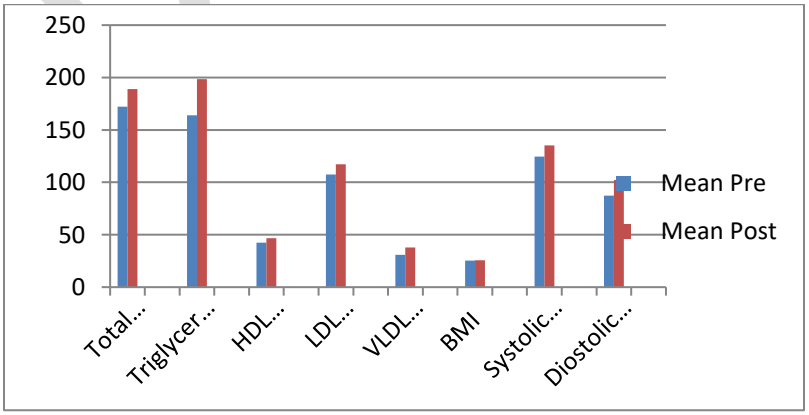
Age group	p-values
30-40 v/s 40-50	0.48454
50-60 v/s 30-40	0.044378
50-60 v/s 40-50	0.123241

There is significant difference between averages of after LDL Cholesterol between 30-40 and 50-60 age groups.

Result of Statistical Analysis of Control Group

S. N	Parameters	Mean		SD		t-value	p-value	Significance
		Pre	Post	Pre	Post			
1.	Total Cholesterol	172.25	188.9722	23.9707	23.0732	7.70869	<0.0001	N.S
2.	Triglycerides	163.9167	198.3333	37.977	41.6749	7.76157	<0.0001	N.S
3.	HDL Cholesterol	42.58333	46.63889	6.8259	5.42562	6.31365	<0.0001	N.S
4.	LDL Cholesterol	107.3611	117.2778	15.8622	15.5004	5.5541	<0.0001	N.S
5.	VLDL Cholesterol	30.75	37.77778	5.89612	6.15101	9.1892	<0.0001	N.S
6.	BMI	25.40	25.75	2.85	2.93	-1.74	<0.089	N.S
7.	Systolic BP	124.44	135.33	7.12	6.77	8.55	<0.0001	N.S
8.	Diostolic BP	87.44	102.27	15.47	12.10	8.52	<0.0001	N.S

CONTROL GROUP VERIATION SCALE



The above table shows that individuals with average Total Cholesterol, Triglycerides Cholesterol, HDL Cholesterol, LDL Cholesterol and VLDL Cholesterol are high in case of after period compared to before period

.**Correlation of Variables before period - Cholesterol**

	TC	**TRI**	**HDL**	**LDL**	**VLDL**
TC	1				
TRI	0.14	1			
HDL	0.413*	-0.071	1		
LDL	0.599***	0.139	0.314	1	
VLDL	0.107	0.504**	0.096	0.227	1

TC- Total Cholesterol; TRI- Triglycerides Cholesterol; HDL- HDL Cholesterol;

LDL- LDL Cholesterol; VLDL- VLDL Cholesterol

Above table shows that

i) Total Cholesterol is positively associated with HDL Cholesterol and LDL Cholesterol.

ii) Triglycerides Cholesterol is positively associated with VLDL Cholesterol.

Correlation of Variables after period - Cholesterol

	TC	**TRI**	**HDL**	**LDL**	**VLDL.**
TC	1				
TRI	0.032	1			
HDL	0.21	0.084	1		
LDL	0.235	0.195	0.403*	1	
VLDL	0.001	0.508**	0.358*	0.249	1

Above table shows that

i) HDL Cholesterol is positively associated with LDL Cholesterol and VLDL Cholesterol.

ii) Triglycerides Cholesterol is positively associated with VLDL Cholesterol.

Two-way ANOVA Test Results for studying impact of age group on the all-types Cholesterol before period of control group

Variables	F value	P value
Total Cholesterol vs Age group	9.21	0.00459 **
Triglycerides Cholesterol vs Age group	0.221	0.641
HDL Cholesterol vs Age group	0.042	0.838
LDL Cholesterol vs Age group	0.182	0.672
VLDL Cholesterol vs Age group	0.364	0.55

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '

There is significant difference between averages of before Total Cholesterol between 30-40 and 50-60 age groups.

Two-way ANOVA Test Results for studying impact of age group on the all-types Cholesterol after period of control group

Age group	p-values
30-40 v/s 40-50	0.46487
30-40 v/s 50-60	0.02368
40-50 v/s 50-60	0.18446

Variables	F value	P value
Total Cholesterol vs Age group	4.814	0.0352 *
Triglycerides Cholesterol vs Age group	0.016	0.91
HDL Cholesterol vs Age group	0.137	0.714

LDL Cholesterol vs Age group	1.442	0.238
VLDL Cholesterol vs Age group	0.025	0.875

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '

Age group	p-values
30-40 v/s 40-50	0.36554
50-60 v/s 30-40	0.03178
50-60 v/s 40-50	0.12454

There is significant difference between averages of after Total Cholesterol between 30-40 and 50-60 age groups.

DISCURSSION PART:

Showed significant improvement among experimental group when compared to control group. In experimental group individuals with average BMI of 26.92 kg/m^2± 2.91kg/m^2 before yoga and individuals shows average BMI of 26.21 kg/m^2 ± 2.86 kg/m^2 after yoga. Individuals with average BMI of 25.40 kg/m^2± 2.85 kg/m^2 before and individuals shows average BMI of 25.75 kg/m^2 ± 2.93 kg/m^2 after period of control group. Lipid Profiles, as p <0.05 the result is significant in Experimental group & non significant in Control group. Experimemtal group scale show that Since p value of two tailed test is less than 0.05, As there is significant difference between Total Cholesterol, Triglycerides Cholesterol, HDL Cholesterol, LDL Cholesterol and VLDL Cholesterol, before and after, one taled test is carried out to identify the same. P values of one tailed test is less than 0.05, we reject null hypothesis and concluded that average all types of cholesterol levels before yoga is greater than all types of Cholesterol after yoga which confirms the effectiveness of yoga in reducing all types of Cholesterol. Control group Compare to Experimental group, Control group have non signipikent Result show that Control group Scale.

OBSERVATION:

The subject was undertaken with the view that Yogic practices strengthen the muscles, relax the body systems. From the observation it was seen that many symptoms of the stress and hypertension. There was an improvement in the hunger levels, sleeping pattern. Most of the subjects were more relaxed and out of the stress symptoms. Just by performing, the systematic practices of Asanas, Pranayama, and Relaxation techniques made them a feeling of relaxation and comfort.

CONCLUSION:

As per the result of present study, it can be concluded that yoga practices can improve the sleep level and reduced the Stress response. So, on this basis yoga practices can be usful at curative, promotive and preventive aspect irrespective to age, sex, religion, region and profession. It works at allover personality of an individual and brings an optimistic attitude at every level of life to take problems as a challenge

and deals with them confidentially. If proper lifestyle and food habits included in this kind of study. The much better results can be obtained.

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