

IMPACT OF YOGIC PRACTICES ON SYSTOLIC AND DIASTOLIC BLOOD PRESSURE AMONG MIDDLE AGED OBESE WOMEN

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Abstract

The intention of this study was to examine the impact of yogic practices on systolic and diastolic blood pressure among middle aged obese women. This study was conducted in a convenience sampling technique to select the sample from Pondicherry state. The sample consisted of 80 middle aged obese women among the 80 middle aged obese women, 60 subjects were selected by using convenience sampling techniques out of which 30 subjects were selected for experimental group and remaining 30 subjects were assigned to the control group. In this study, the dependent variables selected were systolic and diastolic blood pressure. Pre tests data was collected on selected dependent variables prior to the training and post tests data was collected after twelve week of experimental treatment on selected dependent variables. The paired 't' test was applied to find out the pre and post test mean differences. Further, to nullify the initial mean differences the pre and post test data of all chosen dependent variables were statistically analyzed by applying the analysis of the covariance (ANCOVA) with the help of SPSS package. For the purpose of the study statistical significance was set at $P < 0.05$ level. As a result of yogic intervention the systolic and diastolic blood pressure of the middle aged obese women were significantly altered.

Keywords: *Yogic practices, Systolic and diastolic blood pressure, Middle aged obese women*

INTRODUCTION

Women constitute one half of the total population. Thus, their health is the keystone of families' and societies' health. In other words, women's problems affect the health of their families, societies, and future generations. Consequently, women's QOL has received considerable attentions (Bayat, 2010). Lee et al. (2006) reported that health-promoting behaviors such as physical activity, stopping alcohol consumption, and regular blood pressure measurement can significantly improve OQL (Lee, Ko & Lee, 2006). Moreover, lifestyle components can significantly predict the prevalence of chronic conditions as well as mortality rate. On the contrary, smoking, physical inactivity, weight gain, and poor nutrition can increase the risk of developing chronic conditions (Mahalik, Burns & Syzdek, 2007; VanDam et al., 2008; Rafiee, Doostifar & Tavasoli, 2013).

In recent years, assessment of health and the effects of illnesses on daily activities and behaviors have been the center of attention. Such an assessment is generally known as QOL assessment (Bayat, 2010). World Health Organization defines QOL as perfect physical, mental, and social health and well-being as perceived by an individual or a group of individuals that is affected by different factors. According to this definition, QOL is not just the standard level of living and having the minimum level of well-being; rather, it also

includes the quality of interpersonal and social relationships (Rimaz & Dastoorpoor, 2014). QOL is now so much important that health authorities named the present century as the “century of QOL and health improvement” and referred to QOL as a main health outcome (Nooraliey et al., 2016). One of the main factors affecting QOL is lifestyle habits and behaviors. Health-promoting lifestyle (HPL) is a significant predictor of health. HPL is a contextual factor in disease prevention and health promotion (Keshavarz, Simbar & Ramezankhani, 2014). Thus, HPL should be considered as a main strategy for maintaining and improving health.

Obesity is a major public health challenge across the globe. Urbanization, economic growth, changing lifestyle and dietary habits have posed a “double burden” of diseases in rapidly developing low- and middle-income countries like India (Tanumihardjo et al., 2007). It is well known that availability of high-calorie foods, decreased physical activity and loss of healthy habits are associated with urban living. During the last decade, the percentage of overweight and obesity increased from 12.6 to 20.7 in India.

The World Health Organization (WHO) defines them as excessive fat accumulation that may harm health. In 2022, approximately 250 crore adults were overweight, with 89 crore suffering from obesity, worldwide. Understanding obesity requires recognizing its complex nature, including genetic factors, lifestyle choices and medication impacts. Genetic predisposition influences obesity, with certain DNA profiles making individuals more prone to weight gain. Unhealthy lifestyles and consuming high-calorie diets significantly contribute to the obesity crisis. Some medications, like steroids and certain psychiatric drugs, can lead to weight gain as a side effect.

Effectively managing weight involves implementing a multifaceted approach that incorporates lifestyle modifications. By integrating strategies such as regular physical activity, balanced nutrition, and stress management techniques, individuals can achieve sustainable weight management goals. Engage in regular physical activity, aiming for at least 30-45 minutes of moderate exercise per day to promote calorie expenditure and improve overall health. Incorporate stress management techniques such as meditation, yoga, or deep breathing exercises to reduce emotional eating and promote healthier coping mechanisms. Monitor portion sizes and practice mindful eating to avoid overconsumption and promote better control over calorie intake. Prioritize adequate sleep, aiming for 7-8 hours per night, as insufficient sleep can disrupt hormones involved in appetite regulation and contribute to weight gain. Adopt dietary changes that emphasize whole grains, fruits, vegetables, lean proteins, and healthy fats, while minimizing intake of sugars and unhealthy fats to support

weight loss and maintenance. Addressing the obesity epidemic requires a global response that integrates public health initiatives, awareness about proper weight management, and individual lifestyle changes. This is essential for improving health and quality of life.

METHODOLOGY

Selection of Subjects

This study was conducted in a convenience sampling technique to select the sample from Pondicherry state. The sample consisted of 80 middle aged obese women among the 80 middle aged obese women, 60 subjects were selected by using convenience sampling techniques out of which 30 subjects were selected for experimental group and remaining 30 subjects were assigned to the control group.

Selection of Variables and Tests

The investigator reviewed the available scientific literature pertaining to yogic practices form books, Journals periodicals, magazines, research articles, resorting form the review of literature and discussion with the experts and considering the feasibility criteria of the study and the relevance of the variables of the present study the following dependent variables and tests were chosen.

Table – I: Variables and Tests

SI. No	Variables	Tool used	Unit
1.	Systolic blood pressure	Digital blood pressure monitor	mmHg
2.	Diastolic blood pressure	Digital blood pressure monitor	mmHg

Training Program

The training programmes were scheduled for one session a day, each session lasted one hour approximately excluding warming up and warming down. During the training period, the experimental groups underwent yoga training six days a week for twelve weeks. The training programme was conducted in the morning sessions between 6.00 -7.00 pm. Yoga training programme was not given to the control group. The yoga training programme consisted of Suriya Namaskar, Asanas, Pranayama, DRT and Dhyana. Validation of the intervention (yoga training programme) as suggested by the experts in the field of yoga.

Table – I: Description of the Intervention

SI NO	Name of the events	Meaning	Time
1	Suriya Namaskar	Sunsalutation	10min
2	Asanas	Posture	20 min
3	Pranayama	Breathing	10 min
4	DRT	Relaxation	10 min
5	Dhyana	Meditation	10 min

Statistical Technique

The data collected from the training groups was statistically analyzed by paired ‘t’ test to find out the variation between the pre and post test. Further, percentage of changes was calculated to find out the impact of experimental treatment. Further, Analysis of Covariance (ANCOVA) was used to find out the influence of each factor independently and also their combined influence. The level of confidence was fixed at 0.05 level for significance.

RESULTS

The result of ‘t’ test and also changes in percentage on systolic Blood pressure of the chosen 2 groups (YPG & CG) are mentioned in table-I.

Table-I: Dependent ‘T’ Test Output on Systolic Blood Pressure

Group	Test	N	Mean(M)	SD	MD	‘T’ test	Percentage (%)
Yogic Practices Group(YPG)	Pre	30	122.5667	2.23889	2.4333	6.31*	1.99%
	Post		120.1333	2.09652			
Control(CG)	Pre	30	123.3000	2.60172	0.2333	0.87	0.19%
	Post		123.5333	3.32942			

* Table value: [df 29=1.699 (0.05 level)]

The yoga group’s pre and post test scores on systolic Blood pressure (YPG =122.5667&120.1333) vary noticeably because the dependent‘t’ test results of yogic practices (6.31) group was better than the needed table value [df 29=1.699 (0.05 level)]. After 12 weeks of yogic practices of yoga (YPG) 1.99% of decrease in systolic Blood pressure was observed. The analysis of covariance results on systolic Blood pressure of middle aged obese women is presented in table-II.

Table – II: Analysis of Covariance Result on SBP of Yoga and Control Groups

Tests of groups	Exp-Group (YPG)	Control group	SoV	Sum of squares	df	Mean square	F Ratio
Pre- test Mean&SD	122.5667± 2.23889	123.3000± 2.60172	B	8.067	1	8.067	1.369
			W	341.667	58	5.891	
Post- test Mean &SD	120.1333± 2.09652	123.5333± 3.32942	B	173.400	1	173.400	22.402*
			W	448.933	58	7.740	
Adjusted post test	120.454	123.213	B	111.498	1	111.498	33.916*
			W	187.389	57	3.288	

*Significant (0.05 level).

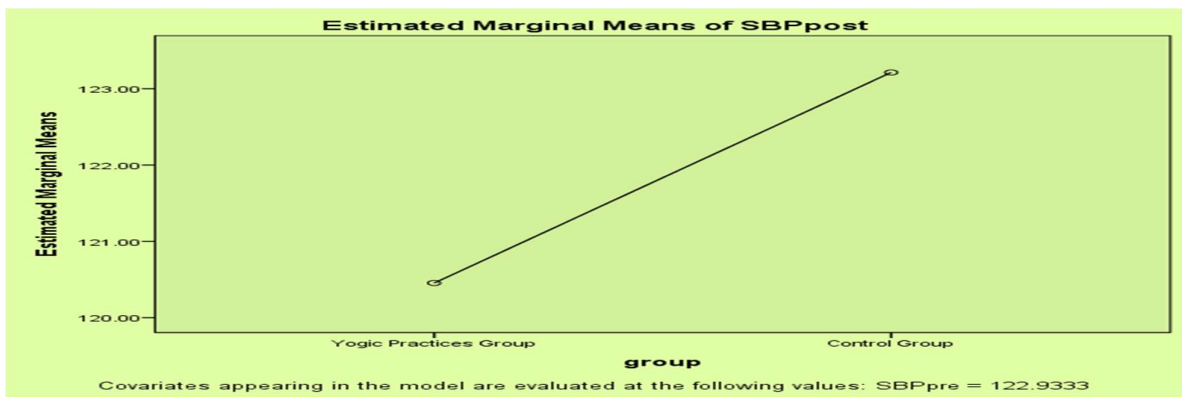
[Table values for df 1 & 58 and 1 & 57 are 4.007& 4.011]

Table-II shows that the pre – test means and SD on systolic Blood pressure of yoga and CG are 122.5667±2.23889 and 123.3000±2.60172 respectively. It resulted in the “F” ratio of 1.369 which indicates statistically insignificant difference between the pre test means

on SBP of YPG and CG at 0.05 level (df 1&58=4.007). The post- test means and SD on SBP of yoga and CG are 120.1333±2.09652 and 123.5333±3.32942 respectively resulted in the F ratio of 22.402 which indicates statistically significant difference between the post test means at 0.05 level (df 1&58=4.007).

The adjusted post- test means in SBP of yoga and CG are 120.454 and 123.213 which resulted in obtained F ratio value of 33.916. It proved significant difference among the adjusted post-test means of yoga and CG. It proved that due to 12 weeks of yogic practices the systolic Blood pressure of middle aged obese women was reduced considerably. The means values on SBP of yoga and control groups are presented in figure- I.

Figure- I: Graph Showing the Mean Values on SBP of Yoga and Control Groups



The result of ‘t’ test and also changes in percentage on diastolic Blood pressure of the chosen 2 groups (YPG & CG) are mentioned in table-III.

Table-III: Dependent ‘T’ Test Output on Diastolic Blood Pressure

Group	Test	N	Mean(M)	SD	MD	‘T’ test	Percentage (%)
Yogic Practices Group(YPG)	Pre	30	82.0667	2.51789	2.3334	13.87*	2.84%
	Post		79.7333	2.37709			
Control(CG)	Pre	30	81.9667	2.41380	0.0667	0.26	0.001%
	Post		82.0333	2.52550			

* Table value: [df 29=1.699 (0.05 level)]

The yoga group’s pre and post test scores on diastolic Blood pressure (YPG =82.0667&79.7333) vary noticeably because the dependent‘t’ test results of yogic practices (13.87) group was better than the needed table value [df 29=1.699 (0.05 level)]. Subsequent to 12 weeks of yoga (YPG) 2.84% of decrease in diastolic Blood pressure was observed. The analysis of covariance on diastolic Blood pressure of middle aged obese women is presented in table-IV.

Table – IV: Analysis of Covariance on Diastolic Blood Pressure

Test mean	Exp-Group (YPG)	Control group	SoV	Sum of squares	df	Mean square	Obtained F ratio
Pre- test Mean&SD	82.0667± 2.51798	81.9667± 2.41380	B	0.150	1	0.150	0.025
			W	352.833	58	6.083	
Post- test Mean &SD	79.7333±2.37709	82.0333± 2.52550	B	79.350	1	79.350	13.193*
			W	348.833	58	6.014	
Adjusted post test	79.689	82.077	B	85.503	1	85.503	64.578*
			W	75.470	57	1.324	

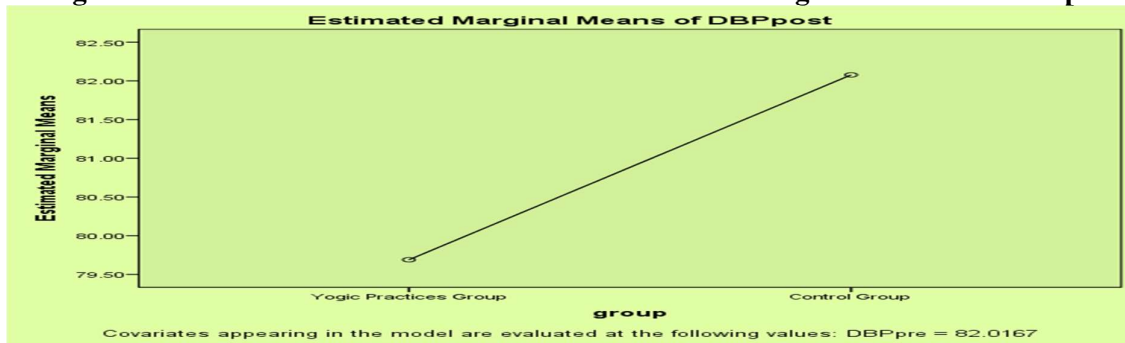
*Significant (0.05 level).

[Table values for df 1 & 58 and 1 & 57 are 4.007& 4.011]

The table-IV shows the pre – test means and SD on diastolic blood pressure of yoga and control group are 82.0667± 2.51798 and 81.9667± 2.41380 which resulted in the F ratio of 0.025 which indicates statistically insignificant deference found between the pre test means. The post test means and SD of yoga and control group were 79.7333±2.37709 and 82.0333±2.52550 which resulted in the F ratio of 13.193 which indicates statistically significant difference between the post test means.

The adjusted post- test means of yoga and control groups were 79.689 and 82.077respectively. The obtained F- ratio value was 64.578 which were higher than the table value of 4.011 (df=1&57) required for significance (0.05 level). It indicates statistically significant difference among the adjusted post – test means on diastolic blood pressure of both groups (YPG & CG). The means values on diastolic blood pressure of middle aged obese women belong to yoga and control groups (YPG & CG) is represented in figure- II.

Figure- II: Mean Values on Diastolic Blood Pressure of Yoga and Control Groups



Discussion

Due to 12 weeks of yogic practices the systolic and diastolic blood pressure of middle aged obese women was reduced considerably. The positive effect of yoga practices on high blood pressure has been confirmed in various studies. Hagins, States, Selfe and Innes (2013) systematically reviewed the effectiveness of yoga for reducing blood pressure in adults with

hypertension and recommended that Yoga can be an effective intervention for reducing blood pressure. Okonta (2012) presented an evidence-based integrative research review that validates yoga therapy as an effective complementary treatment in the management of high blood pressure (BP). Hagberg, Park and Brown (2000) analyzed the most recent review of the effects of exercise training on patients with hypertension. These results continue to indicate that exercise training decreases blood pressure (BP) in approximately 75% of individuals with hypertension, with systolic and diastolic BP reductions averaging approximately 11 and 8mm Hg, respectively. Women may reduce BP more with exercise training than men, and middle-aged people with hypertension may obtain greater benefits than young or older people.

Yogic practices can be used as psychophysiological stimuli to increase endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being (Harinath et al., 2004). Yoga significantly decreases heart rate and systolic and diastolic blood pressure (Damodaran, *et al.*, 2002). Substantial changes in blood pressure have been reported in most of the yoga studies conducted previously. Balaji, Varne and SadatAli (2012) observed considerable health benefits, including reduced cardiovascular risk and blood pressure due to yogic practices. McCaffrey and others (2005) found significantly decreased mean stress scores, blood pressure and heart rate as a result of yoga training. Blom and others (2012) suggested that stress reduction using Mindfulness meditation and Yoga is an effective intervention for lowering BP in early unmedicated hypertensives. Bhavanani, Sanjay and Madanmohan (2011) concluded that sukha pranayama at the rate of 6 breaths/minute can reduce HR and BP in hypertensive patients within 5 minutes of practice.

CONCLUSION

As a result of twelve weeks of yogic practices the systolic Blood pressure of middle aged obese women was reduced considerably. After 12 weeks of yogic practices of yoga (YPG) 1.99% of decrease in systolic Blood pressure was observed. Due to 12 weeks of yogic practices the diastolic Blood pressure of middle aged obese women was reduced considerably. Subsequent to 12 weeks of yoga (YPG) 2.84% of decrease in diastolic Blood pressure was observed.

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