



Short Communication

Impact of yogic practices and aerobic training on systolic blood pressure among middle aged women

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Available online at: www.isca.in

Received 25th September 2017, revised 30th November 2017, accepted 20th December 2017

Abstract

The study mainly focused on assessing the impact of yogic practices and aerobic training on systolic blood pressure among middle aged women. To reach the goal of the investigation, 45 middle-aged women were selected subjects randomly. Their age ranges from 35 to 45 years. Subjects were teachers of several schools in Ananthapuramu, Ananthapuramu (Dist.), Andhra Pradesh, India and therefore there were no differences in the routine life model and are therefore considered as a homogeneous group. Systolic blood pressure has been selected as a dependent variable for the study. Selected subjects were subdivided into 2 experimental groups and one control group with 15 subjects each ($n = 15$). Experimental Group I (YPG) has undergone yogic practices, Group II (ATG) has been subjected to aerobic training and Group III served as a control group (CG) during the 12-week training period. Data on the dependent variable selected for pre and post tests were collected two days before and two days after the training program, respectively. Data on systolic blood pressure was collected utilizing stopwatch, Electronic Sphygmomanometer, and nose clip. Analysis of covariance (ANCOVA) was used to evaluate the data collected from the three groups to find out the significant improvement. If F-ratio was relevant Scheffe test was utilized as post Hoc test to discover which coupled means differed significantly. In every case, the significance statistical criterion was set as 0.05 confidence level ($P < 0.05$). From the outcomes of the work it was conclude that two experimental groups, namely the yogic practices group (YPG) and the aerobic training group (ATG), achieved significant improvements over the control group (CG) to improve systolic blood pressure. It has also been shown that the yogic practice group was found better than the aerobic training group in improving systolic blood pressure in middle-aged women.

Keywords: Yogic Practices, Aerobic Training, Middle Aged Women, Systolic Blood Pressure.

Introduction

God, in His infinite, created man as the highest form of creation, and provided us with everything we need for our sustenance and well-being. It is the duty of man to safeguard the health of all human beings and to make them strong by providing good food, adequate physical activity, an environment without disease and a peaceful life. The prevalence of scientific evidence indicates that exercise stimulates the process of growth and maintenance of health. For every single physical activity it is essential for the harmonious physical, physiological and mental development. Consistent physical movement enhances functional status and limits disability during middle and late adult years. In today's society, with computers, televisions, cars, smart phones, etc., the vast majority of people do not have adequate physical activity to maintain sufficient health. In fact, many people have become sedentary to the point; that their way of life has become a real risk to their health and their lack of exercise has begun to cause a wider decline in human health and regularly to an untimely disease and premature death.

Health is considered as a result of good wellness management and a proper follow-up in this direction. Physical wellness has

been strongly emphasized among all the dimensions of wellness and human health. Physical fitness is the ability of an individual to live and lead a balanced life. It includes physical, mental, emotional and spiritual factors and capacity for their healthy knowledge¹. In modern times people are more eager to be healthy and would like to lead a quality life. This state of a healthy life during childhood causes the individual to develop the correct attitude towards the health and fitness concepts most desired in relation to health. Research in the field of health related physical fitness indicates that several physiological variables are responsible for maintaining the desired health related physical fitness. These physiological variables in turn depend on several components of health related physical fitness. Numerous scientists strongly strengthen the vision that normal physical activity maintains a solid and healthy body and prevents various diseases. Therefore, each nation has the duty to promote the physical and physiological wellness of its citizens, based on the fact that physical fitness is the fundamental requisite for utmost companies to be tested by a person in their everyday lives.

The word Yoga is derived from Sanskrit root 'Yuj' means to bind and yoke. Yoga means to "yoke" to "unite" to "link" to

connect or to “merge”². As yoke joins two bulls, yoga consolidates together the mind and body. According to Patanjali's great essay, withdraw of sense organs from their inconsequential items and their control is yoga. Yoga utilizes static pose or asana and breathing or pranayama regulates. It has officially shown its incentive in enhancing oxidative anxiety and enhancing the glycemic condition of diabetics through the neuroendocrine system³. Yoga is an ancient form of relaxation and exercise has many health benefits, including lowering cholesterol. When the cells work in unison, they bring back harmony and health to the system. 20 to 25 minutes (every morning or evening) of pranayama practice increases lung capacity, breathing efficiency, circulation, cardiovascular efficiency, helps to normalize blood pressure, strengthens and tones the nervous system, combats anxiety and depression, improves sleep, digestion and excretory functions, provides mass ATGe to the internal organs, stimulates the glands, enhances endocrine functions, normalizes body weight, provides great conditioning for weight loss, improves skin tone and complexion⁴. The current era of human life style increased strains and tensions. It translates into lifestyle-related health problems such as obesity, diabetes mellitus, hypertension, and coronary heart disease⁵.

Aerobic exercise (also known as cardio) is physical exercise of low to high intensity that depends primarily on the aerobic energy-generating process and it is a new work, but not a new Idea⁶. Aerobics refers to a variety of activities such as walking, jogging and running for a measured time. These produce beneficial changes in the body, in particular the action of the lungs, heart, and blood circulation⁷. "Aerobics" is an uncommon type of oxygen consuming activity. Vigorous exercise classes more often than exclude quick, music-based models with the signs gave by an educator. This type of aerobic activity has turned out to be extremely prevalent and delivered videos or created television programs that promote this type of aerobic exercise⁸. The gathering's aerobic exercises can be separated into two principle sorts: pre-choreographed aerobics and freestyle aerobics⁹. Aerobic exercise is essential for good cardiac vascular health. In short, aerobic exercises are activities that can be maintained for a long time without creating a lack of oxygen in the muscle. It is the type of activity that overloads the lungs and heart and makes them more difficult to do when the person is at rest. The fundamental points of interest of oxygen consuming activity are more grounded and more proficient than the working of the lungs and heart, more energy, physical flexibility, conditioned muscles, proper use of fat, and effective calorie burning. The increased oxygen flow gained through aerobics re-energies by giving any one of the energy and a “re-awakening” of his senses¹⁰.

Aerobic training involves repetition of movements while yogic practices include very few movements and only postures are kept up for a specific timeframe. Aerobic training has underlined strong muscular movements while yoga opposes violent movements. Aerobic training has repetitive movements,

while yoga practices include very few movements and many positions that should be kept up for a specific timeframe. Yogic practices keep the body and mind as aerobic training primarily affects the human body. Postures include focus in specific parts of the body and the outcome is a conditioning of the mind and body. The caloric requirement in yogic practices ranges from 0.8 to 3 calories per minute, while the calorie requirement for aerobic training ranges from 3 to 30 calories per minute. Systolic blood pressure is the blood pressure, which represents the level of pressure created by the heart that contract and push blood through the arteries. When the heart beats and pumps blood, the pressure is high. It is especially the highest blood pressure during the contraction of the left ventricle of the heart. The systolic is called the time when ventricular contraction occurs. Systolic blood pressure is normally the main number recorded at a reading of blood pressure. A systolic blood pressure of 140 or more, repeatedly measured, is considered high blood pressure or hypertension.

Number of studies carried out in various fields of Physical Education and Sport Sciences. But there was a comprehensive treatise on issues, in particular on the impact of aerobic training and yogic practices on systolic blood pressure associated with middle-aged women. The present study is useful to create awareness about physical activity, especially on yogic practices and aerobic training, and significantly improve health, physical fitness and work ability. From the above, it is presumed that yogic practices and aerobic training practices are particularly required to maintain a general level of physical fitness, particularly as it improves cardiorespiratory strength and resistance. As a result, the researcher makes an attempt to study the impact of aerobic training and yogic practices on systolic blood pressure in middle-aged women.

Methodology

The present work aimed at understanding the impact of yogic practices and aerobic training on systolic blood pressure among middle-aged women. To reach the goal of this study, 45 middle-aged women were randomly selected as subjects. Its age ranges from 35 to 45 years. The subjects were teachers from several schools in Ananthapuramu, Andhra Pradesh, India, and therefore there was no differences in routine life model and are therefore considered as a homogeneous group. Selected subjects were subdivided into two experimental groups and one control group with 15 subjects each (n = 15). Experimental Group I (YPG) was subjected to yogic practices, Group II (ATG) has been subjected to aerobic training and Group III served as a control group (CG) during the 12-week training period. The subjects of the control group were not allowed to participate in any training program, with the exception of routine activities. Among the various physiological variables, systolic blood pressure was selected as a dependent variable for the study.

During the training period, experimental groups had undergone their training program 3 days a week on alternate days for 12

weeks in addition to normal daily work. Before the start of the experimentation of the training period (after the sixth week), the investigator recorded the target heart rate middle for subjects in the aerobic training group. Data on the dependent variables selected for pre and post tests were collected 2 days prior and 2 days later the training program, respectively. Data on systolic blood pressure was collected by using the Electronic Sphygmomanometer, stopwatch and nose clips. Analysis of covariance (ANCOVA) was used to evaluate the data collected from the three groups to find out the significant improvement. If F-ratio was relevant Scheffe test was utilized as post Hoc test to discover which coupled means differed significantly. In every case, the statistical significance criterion was set as 0.05 confidence level ($P < 0.05$).

Results and discussion

The influence of independent variables (yogic practices and aerobic training) on systolic blood pressure was determined by subjects the data collected using appropriate statistical techniques and the results are reported below. The analysis of covariance at the date obtained for systolic blood pressure pre-test, post-test and adjusted post-test of yogic practices, aerobic training and control groups is given in Table-1.

The statistical analysis in the Table-1 shows that the yogic practice group, the aerobic training group and the control group are 127.73, 128.68 and 129.13 correspondingly. The F ratio obtained 0.33 for the pre-test is less than value of the Table-1 for df 2 and 57 required for significance at a level of 0.05. The post-test means of the yoga practice group, the aerobic training group and the control group are 122.48, 122.23 and 127.23 correspondingly. The F ratio of 4.37 for the post test is greater than value of the Table-1 for df 2 and 57 required for significance at a level of 0.05. The means after the yogic practices group, aerobic training group and control group were 121.04, 123.75 and 126.86 correspondingly. The F ratio obtained for adjustment post test 7.04 is also greater than the

value of Table-1 for df 2 and 56 required for significance at 0.05. The previous analysis of the study indicates that there is a significant difference between the adjusted post-test means of the yogic practice group, the aerobic training group and the control group.

In addition, to determine which of the three pairs of means had a significant difference, Scheffe post hoc was applied as a post hoc test and the results are presented in Table-2.

From the Table-2, we can see that the average difference between the yogic practice group and aerobic training group was 2.71 ($P > 0.05$) and the calculated F value was 2.53 ($P > 0.05$). The mean variance between the yogic practice group and the control group was 5.82 ($P < 0.05$) and the calculated F value was 15.059 ($P > 0.05$). The average variance among the aerobic training group and the control group was 3.11 ($P > 0.05$) and the calculated F value was 4.97 ($P > 0.05$). From this it can be clearly seen that the yogic practice group responded to the further helpful influences of systolic blood pressure compared to the aerobic training group and the control group. The aerobic training group responded better to the control group. Figure-1 shows the values of the yogic practice groups, the aerobic training group and the systolic blood pressure control group.

Conclusion

In the current investigation, as a result of two training programs, namely yogic practices and aerobic training, the following improvements in the systolic blood pressure of middle-aged women occurred. The results of the study concluded that the namely the yogic practice group (YPG) and the aerobic training group (ATG), (Experimental Groups) achieved significant improvements over the control group (CG) to improve systolic blood pressure. We conclude that the yogic practice group (YPG) was better than the aerobic training group (ATG) in improving systolic blood pressure.

Table-1: Analysis of covariance for the pre test, post test and adjusted post test data on Systolic Blood Pressure of Yogic Practices, Aerobic Training and Control Groups.

Tests / Groups		Yogic practices group	Aerobic Training Group	Control Group	SOV	Sum of Squares	df	Mean Squares	F ratio
Pre Test	Mean	127.73	128.68	129.13	B	65.08	2	32.53	0.33
	Standard Deviation	12.09	7.43	9.25	W	5472.49	57	96.01	
Post Test	Mean	122.48	122.23	127.23	B	270.81	2	135.41	4.37*
	Standard Deviation	4.71	2.20	8.07	W	1762.48	57	30.91	
Adjusted Post Test	Mean	121.04	123.75	126.86	B	234.73	2	117.35	7.04*
					W	932.47	56	16.64	

*Significant at 0.05 confidence level. SOV: Source of Variance; B: Between, W: Within

Table-2: Scheffe's Post Hoc Test for differences between the Adjusted Post Test paired means of Systolic Blood Pressure.

Adjusted Post Test Means			Mean Differences	F Value
Yogic practices group	Aerobic Training Group	Control Group		
121.04	123.75	--	2.71	2.53
121.04	--	126.86	5.82	15.059*
--	123.75	126.86	3.11	4.97

*Significant level at 0.05. Table F (0.05) = 6.32.

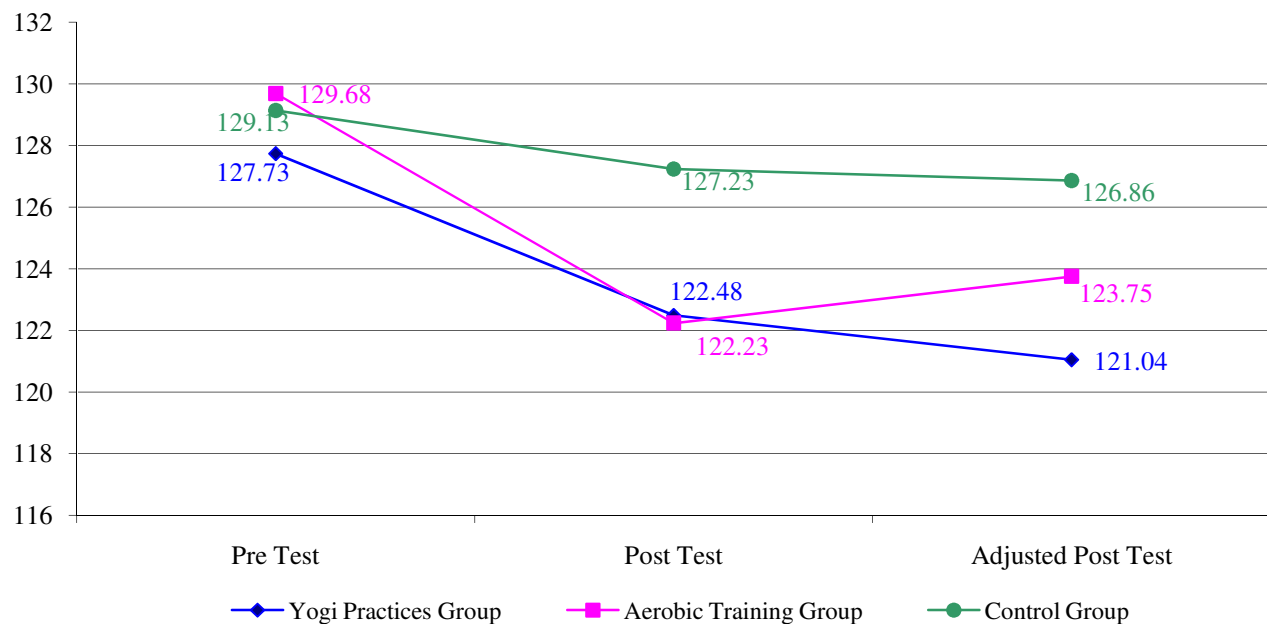


Figure-1: Line graph showing pre test, post test and adjusted post test means of Yogic Practices Group, Aerobic Training Group and Control Group on Systolic Blood Pressure in mm/Hg.

References

1. Bucher Charles A. (1963). Administration of School Health and Physical Education Programme. Saint Louis, The C. V. Mosby Company, 1-156. ASIN: B001IOMWZ8
2. Kolata Gina (2002). Why Some People won't be fit despite Exercise. *The New York Times*. <http://www.nytimes.com/2002/02/12/health/why-some-people-won-t-be-fit-despite-exercise.html>. Feb 12, 2002.
3. Deshpande S., Nagendra H.R. and Raghuram N. (2008). A Randomized Control Trial of the Effect of Yoga on Gunas (Personality) and Health in Normal Healthy Volunteers. *Int. J. Yoga*, 1(1), 2-10.
4. Vinu W. (2015). Effect of Yogic Practices on flexibility of men students. *STAR Res. J.*, 10(2), 7-9.
5. Yadav R.K., Ray R.B., Vempati R. and Bijlani R.L. (2005). Effect of a Comprehensive Yoga Based Life Style Modification Program on Lipid Peroxidation. *Indian. J. Physiol. Pharmacol.*, 49(3), 358-362.
6. Sharon Plowman A. and Denise Smith L. (2007). Exercise Physiology for Health, Fitness, and Performance. Lippincott Williams & Wilkins, 1-750. ISBN: 9780781779760
7. Meyer P., Kayser B. and Mach F. (2009). Stair use for cardiovascular disease prevention. *Eur. J. Cardiovasc. Prev. Rehabil.*, 16(2), S17.
8. Cooper Kenneth H. (1968). Aerobics, M. Evans, distributed in association with Lippincott. Philadelphia, 1-253. ISBN: 0553125400
9. World Book (1992). The World Book Encyclopedia. Inc., Sydney, 10, 1-536. ISBN: 0716600927
10. B.K.S. Iyengar's (1996). Light on the Yoga Sutras of Patanjali, London. 1-384.