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Dr. K Sekarbabu

Assistant Professor,

Department of Physical

Education, Annamalai

University, Chidambaram,

Tamil Nadu, India

Y Wise Blessed Singh

Assistant Professor,

Department of Physical

Education, Annamalai

University, Chidambaram,

Tamil Nadu, India

Impact of yogic practices on mean arterial pressure among men and women of different age groups

Dr. K Sekarbabu and Dr. Y Wise Blessed Singh

Abstract

The purpose of the study was to analyze the changes on mean arterial pressure in response to yogic practices among middle aged men and women of different age groups. To achieve the purpose of this study sixty middle aged people were selected, in which 30 subjects were men and remaining 30 subjects were women. They were further categorized into four sub-groups of 15 subjects each. The first one is 40-44 age groups of men and women separately and another one 45-49 age groups of men and women separately. Random group design was used for the study, as it was most appropriate technique. The mean arterial pressure was selected as dependent variable for the study. During the training period, the experimental groups underwent yoga training six days a week for twelve weeks. Three-way analysis of variance was used to find out the influence of each factor independently and also their combined influence on each of the selected variables. The level of confidence was fixed at 0.05 for significance. The result of the study reveals that due to the effect of yoga training the mean arterial pressure of 40-44 and 45-49 age category men and women were significantly decreased. It also confers the existence of insignificant difference on mean arterial pressure among gender in relevance to different age categories during pre and post-tests.

Keywords: Yogic practices, mean arterial pressure

Introduction

Healthy men and women altogether constitutes wealthy mankind. The body of a woman is definitely very different from the body of a man as it has more duties to perform and greater weight to sustain. In fact, nature has given the woman's body a greater purpose to fulfill. A woman has to become a mother, and for that reason, nature has designed a special system for her. Men have more chances of going out, playing sports and games, and taking a morning or evening walk. Most women are completely tied to their household duties and remain in the same environment all the time. They do not get as much time or as many opportunities for exercise as men do. Moreover, the system of a man is less complicated than the system of a woman.

Good health means that all organs of the body are working efficiently. The important proverb is, 'Health is wealth', 'if health is lost everything is lost', and is realized more in its absence than by its presence. Youth is not a time of life it is a state of mind. The importance of health is more than education, money and other material comforts. Happiness is intimately concerned more with good physical and mental health than other outside factors. At this stage, we need to know the essential conditions to keep ourselves healthy (Dev, 1999) [2].

One of the most studied areas of the health benefits of yoga is its effect on heart disease. Yoga has long been known to lower blood pressure and slow the heart rate. A slower heart rate can benefit people with high blood pressure, heart disease, and stroke. On a biochemical level, studies point to a possible anti-oxidant effect of yoga. The yoga has been associated with decreased cholesterol and triglyceride levels as well as a boost to immune system function.

Yoga has tremendous health benefits for our heart. The gentler forms of yoga lower blood pressure because the Asanas (yoga poses, postures, and yoga positions) keep blood flowing evenly throughout our body while we focus on our breathing. People suffering from hypertension can benefit through yoga tremendously, doing hatha yoga can lower heart rate and blood pressure. Many practitioners claim that power yoga is an excellent form of cardio

Correspondence

Dr. K Sekarbabu

Assistant Professor,

Department of Physical

Education, Annamalai

University, Chidambaram,

Tamil Nadu, India

conditioning, which strengthens core muscles while it keeps blood and oxygen circulating throughout your body.

Regular practice of Asanas, pranayama and meditation can help such diverse ailments such as diabetes, blood pressure, digestive disorders, arthritis, arteriosclerosis, chronic fatigue, asthma, varicose veins and heart conditions. Laboratory tests have proved the yogi's increased abilities of consciously controlling autonomic or involuntary functions, such as temperature, heartbeat and blood pressure.

The relaxation and exercise components of yoga have a major role to play in the treatment and prevention of high blood pressure (hypertension). A combination of biofeedback and yogic breathing and relaxation techniques has been found to lower blood pressure and reduce the need for high blood pressure medication in people suffering from it. Physicians and scientists are discovering brand new health benefits of yoga every day. By considering the above literature, in this study, an attempt has been made to analyze the changes on mean arterial pressure due to the effect of performing selected yogasanas.

Methodology

Selection of the Subjects and Variables

The purpose of the study was to analyze the changes on mean arterial pressure in response to yogic practices among men and women of different age groups. To achieve the purpose of this study sixty middle aged people were selected, in which 30 subjects were men and remaining 30 subjects were women. They were further categorized into four sub-groups of 15 subjects each. The first one is 40-44 age groups of men and women separately and another one 45-49 age groups of men and women separately. The selected participants were in the age group of 40 to 49 years. Random group design was used for the study, as it was most appropriate technique. As for as this study is concern the yoga training is an independent variable and mean arterial pressure is a dependent variable

and it was assessed by using digital blood pressure monitor.

Training Programme

The training programmes were scheduled for one session a day, each session lasted between one hour to one and half hours approximately including preparation and relaxation. During the training period, the experimental groups underwent yoga training six days a week for twelve weeks. The yoga Sana exercise included in this training programme were Sugasana, Vajrasana, Viparitarani, Sarvangasana, Bhujangasana, Matsyasana, Ardha matsyendrasana, Trikonasana, Vrksasana, and Savasana respectively. The training programme was conducted in the evening sessions from 5`O`clock onwards.

Collection of the Data

The pre-test data was collected prior to the experimental treatment and post test data was collected after twelve weeks of yoga training from the different age categories of men and women groups on mean arterial pressure.

Experimental Design and Statistical Technique

The application of dependent` t` test, to eliminate the influence of pretest, the net mean gains are computed separately. The paired mean gains of groups are tested for significance by applying independent` t` test. Three-way analysis of variance is used to find out the influence of each factor independently and also their combined influence on each of the selected variables. Data were calculated with the help of SPSS package.

Result

The descriptive analysis of the pre and post test data showing mean and standard deviation and `T` ratio on mean arterial pressure of men and women of different age groups is presented in table-1.

Table 1: Descriptive Analysis of the Data and `T` Ratio on Mean Arterial Pressure of Men and Women of Different Age Groups

Gender	Age Category	Test	Mean	Standard Deviation	Mean Differences	`T` ratio
Men	40-44 years	Pre test	99.03	3.92	4.43	6.32*
		Post-test	94.60	2.65		
	45-49 years	Pre test	98.10	4.49	3.07	3.52*
		post-test	95.02	3.61		
Women	40-44 years	Pre test	96.40	4.08	2.77	7.35*
		post-tests	93.62	3.69		
	45-49 years	Pre test	93.90	2.89	1.97	7.41*
		post-tests	91.93	2.38		

The table value required for significant for DF 14 is 2.14; *Significant at 0.05 level

Table-1 shows the mean gain for different age category of men groups as a result of yoga training are 99.03 and 94.60 respectively. It resulted with a` t` ratio of 6. 32 and it is higher than the table value of 2.05 required for significant at 0.05 level to the DF 28. Hence, it is concluded that significant differences exists between different age categories of men groups in decreasing the mean arterial pressure.

The mean gain for different age category of women groups as a result of yoga training are 98.10 and 95.02 respectively. It resulted with a` t` ratio of 3. 52 and it is higher than the table value of 2.05 required for significant at 0.05 level to the DF 28. Hence, it is concluded that significant differences exists between different age category women groups in decreasing the mean arterial pressure.

Table-1 also shows the mean gain for 40 to 44 age category men and women groups as a result of yoga training are 96.40 and 93.62 respectively. It resulted with a` t` ratio of 7. 35 and

it is higher than the table value of 2.05 required for significant at 0.05 level to the Df 28. Hence, it is concluded that significant differences exists between 40 to 44 age category of men and women groups in decreasing the mean arterial pressure.

The mean gain for 45 to 49 age category men and women groups as a result of yoga training were 93.90 and 91.93 respectively. It resulted with a` t` ratio of 7. 41 and it is lesser than the table value of 2.05 required for significant at 0.05 level to the DF 28. Hence, it is concluded that the no significant decrease on mean arterial pressure between 45 and 49 age category of men and women.

The pre and post test data collected from the different age category men and women on mean arterial pressure was statistically analyzed by three factor factorial analysis and the results are presented in table-2.

Table 2: Comparison of Mean Gain on Mean Arterial Pressure between Men and Women of Different Age Groups

Gender	Age Category	Mean	S.D	SE	t-ratio
Men	40-44 Age	4.43	2.72	1.04	0.96
	45-49 Age	3.43	2.98	1.04	
Women	40-44 Age	2.77	1.46	0.46	1.73
	45-49 Age	1.97	1.03	0.46	
Men	40-44 Age	4.43	2.71	0.82	1.95
Women		2.82	1.49	0.82	
Men	45-49 Age	3.43	2.98	0.81	1.79
Women		1.97	1.03	0.81	

*Significant at 0.05 level the table value required for significance for DF 28 is 2.05

Table-2 shows the mean gain for different age category of men groups as a result of yoga training are 4.43 and 3.43 respectively. It resulted with a 't' ratio of 0.96 and it is lesser than the table value of 2.05 required for significant at 0.05 level to the DF 28. Hence, it is concluded that no significant differences exists between different age categories of men groups in decreasing the mean arterial pressure.

The mean gain for different age category of women groups as a result of yoga training are 2.77 and 1.97 respectively. It resulted with a 't' ratio of 1.73 and it is lesser than the table value of 2.05 required for significant at 0.05 level to the DF 28. Hence, it is concluded that no significant differences exists between different age category women groups in decreasing the mean arterial pressure.

Table-2 also shows the mean gain for 40 to 44 age category men and women groups as a result of yoga training are 4.43 and 2.82 respectively. It resulted with a 't' ratio of 1.95 and it

is lesser than the table value of 2.05 required for significant at 0.05 level to the DF 28. Hence, it is concluded that no significant differences exists between 40 to 44 age category of men and women groups in decreasing the mean arterial pressure.

The mean gain for 45 to 49 age category men and women groups as a result of yoga training were 3.43 and 1.97 respectively. It resulted with a 't' ratio of 1.79 and it is lesser than the table value of 2.05 required for significant at 0.05 level to the DF 28. Hence, it is concluded that the no significant decrease on mean arterial pressure between 45 and 49 age category of men and women.

The pre and post test data collected from the different age category men and women on mean arterial pressure was statistically analyzed by three factor factorial analysis and the results are presented in table-3.

Table 3: Three Factor Factorial Analysis on Mean Arterial Pressure

Source	Sum of Squares	df	Mean Squares	'F' ratio
Gender	222.49	1	222.49	17.76*
Age	56.30	1	56.30	4.50*
Test	281.52	1	281.52	22.49*
Gender & Age	25.39	1	25.39	2.02
Gender & Tests	14.28	1	14.28	1.14
Age & Tests	8.74	1	8.74	0.69
Gender, Age & Tests	8.58	1	8.58	0.68
Error	1401.85	112	12.51	

*Significant at .05 level of confidence (Table values required for significance at .05 level with DF 1 and 112 is 3.92)

Table-3 reveals that men and women differ significantly on mean arterial pressure irrespective of age and tests, since the obtained f ratio value of 17.76 is greater than the required table value of 3.92 for the degrees of freedom 1 and 112.

It also proved that significant differences exist between age categories irrespective of gender and tests, since the obtained f ratio value of 4.50 is greater than the required table value of 3.92 for the degrees of freedom 1 and 112.

Further, it reveals that significant differences exist between tests irrespective of gender and age, since the obtained f ratio value of 22.49 is greater than the required table value of 3.92 for the degrees of freedom 1 and 112.

1. The obtained 'F' ratio value for interaction of gender and age irrespective of testing conditions is 2.02, which is lesser than the table value of 3.92 for the degrees of freedom 1 and 112 required for significance at 0.05 level of confidence. The result of the study shows that no significant difference exists for the interaction of gender at different age categories on mean arterial pressure irrespective of testing conditions.

2. The results of the study also show that the obtained 'F' ratio value for the interaction of age and testing conditions irrespective of gender is 1.14, which is lesser than the table value of 3.92 for the degrees of freedom 1

and 112 required for significance at 0.05 level of confidence. It reveals no significant difference that exists on mean arterial pressure among different age categories at pre and posttests irrespective of gender.

3. The obtained 'F' ratio value for interaction of gender and tests irrespective of age categories is 0.69, which is lesser than the table value of 3.92 for the degrees of freedom 1 and 112 required for significance at 0.05 level of confidence. The result of the study shows that no significant difference exists for the interaction of gender at different age categories on mean arterial pressure irrespective of testing conditions.

4. It is observed that the obtained 'F' ratio value for the interaction of gender, age and testing conditions is 0.68, which is lesser than the table value of 3.92 for the degrees of freedom 1 and 112 required for significance at 0.05 level of confidence. It confers the existence of insignificant difference on mean arterial pressure among gender in relevance to different age categories during pre and posttests.

The pre and post-test mean value on mean arterial pressure among men and women of different age groups are graphically represented in figure-1 table.

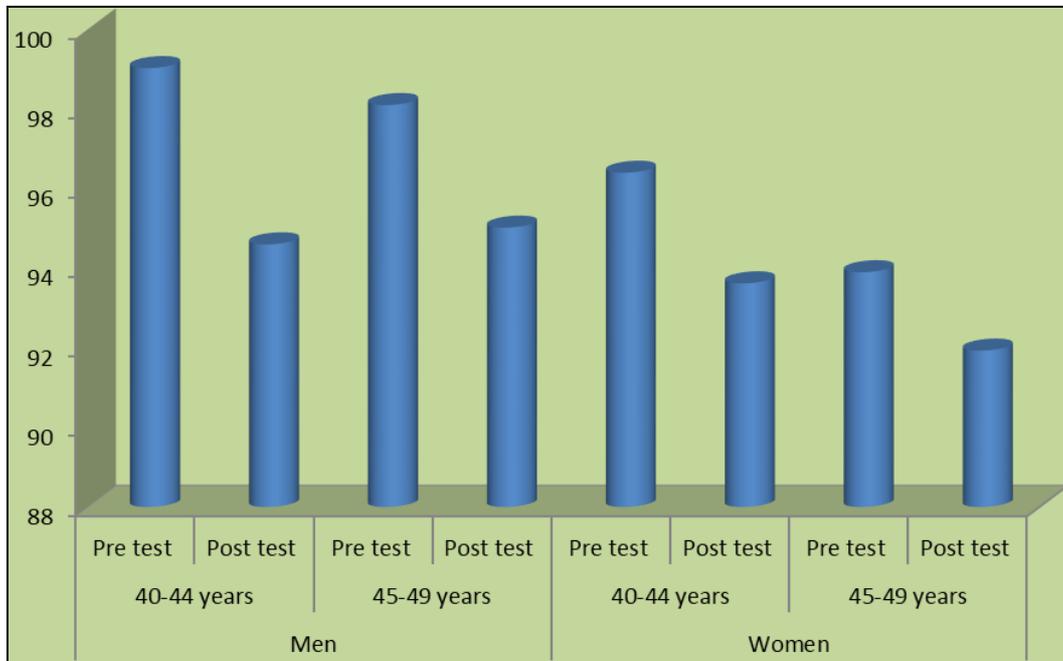


Fig 1: Diagram Showing the Pre and Post Test Mean Value on Mean Arterial Pressure among Men and Women of Different Age Groups

Discussion

The positive effect of yoga practices on high blood pressure has been confirmed in various studies. Yoga was found to be equal or superior to progressive relaxation in lowering blood pressure (Cusumano & Robinson, 1993) ^[1]. A randomized controlled study says that a reduction in both systolic and diastolic blood pressure by 16% after ten days' of add -on integrated approach to yoga therapy (IAYT) in patients with chronic neck pain (Yogitha *et al.*, 2010) ^[9]. Ebnezar *et al.*, (2012) ^[3] found similar reduction of 16% in both systolic and diastolic BP after 90 days of intervention.

Yoga can be preliminarily recommended as an effective intervention for reducing blood pressure (Hagins, States, Selfe & Innes, 2013) ^[5]. Kanojia *et al.*, (2013) ^[6] found higher percentage of decrease in HR, SBP and DBP in yoga group during both pre and post phases of menstrual cycle in healthy young female subjects. Okonta (2012) ^[8] 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) ^[4] analyzed the most recent review of the effects of exercise training on patients with hypertension.

Furthermore, a study that focused on the effect of yoga on stress, body mass index, heart rate, and blood pressure among hypertensive patients found that yoga practices were associated with decreased blood pressure (McCaffrey, Ruknui, Hatthakit, & Kasetsoomboon, 2005) ^[7]. All the evidence suggested that the yoga is an effective treatment for hypertension. The studies summarized above support the claims that the hypertension was greatly influenced by stress, and stress reduction via yoga practices reduces the effects of the disease.

Conclusion

The result of the study reveals that due to the effect of twelve weeks of yoga training the mean arterial pressure of 40 to 44 and 45 to 49 age category men and women were significantly changed. In altering the mean arterial pressure no significant difference exists between 40 to 44 and 45 to 49 age category men and also no significant difference was found between

these two age categories of women subjects. It is also concluded that no significant differences exists between 40-44 age category of men and women groups and also between 45-49 age category of men and women groups in decreasing the mean arterial pressure. The result of the study also confers the existence of insignificant difference on mean arterial pressure among gender in relevance to different age categories during pre and posttests.

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