Effect of Yogic Practices and Physical Exercises on Muscular Endurance Anxiety and Blood Pressure

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Abstract

The aim of the study was to find out whether yogic practices or physical exercises enhancing the physical fitness, mental and physiological fitness, i.e. muscular endurance, anxiety and blood pressure (both systolic and diastolic) of middle aged women. Forty-five middle aged women between 35 and 40 years in and around Annamalainagar, Chidambaram were selected as subjects. They were divided into three equal groups, each group consisted of fifteen subjects, in which group – I underwent yogic practices, group – II underwent physical exercises and group – III acted as control which did not participate any training apart from their day to day activities. The period of training for the present study was six days (Monday to Saturday) in a week for thirteen weeks. Prior to and after the training period the subjects were tested on muscular endurance, anxiety and blood pressure (systolic and diastolic). The muscular endurance was measured by administering sit – ups test, anxiety was assessed by using Taylor's Manifest Anxiety Scale and blood pressure (both systolic and diastolic) was measured by using sphygmomanometer. The analysis of covariance (ANCOVA) was applied as statistical tool and whenever the 'F' ratio for adjusted post-test means were significant, the Scheffé *S* test was used as post-hoc test to find out any significant difference between the training groups. It was concluded from the result of the study that yogic practices and physical exercises groups have improved ($P > 0.05$) all the criterion variables, such as, muscular endurance and decreased the anxiety level and blood pressure (both systolic and diastolic). Moreover there was no significant difference ($P < 0.05$) was found between the experimental groups on selected criterion variables.

KEYWORDS: Yogic practices, physical exercise, muscular endurance, anxiety, blood pressure.

INTRODUCTION

Yoga is a complete science of life that originated in India many thousands of years ago. It is the oldest system of personal development in the world, encompassing body, mind and spirit.[1] Yoga is not an ancient myth buried in oblivion. It is the most valuable inheritance of the present. It is the essential need of today and the culture of tomorrow.[2] The yoga postures (known as asanas), help to stretch and relax the muscles and skeletal system. The physical release through these soothing movements can help create a sense of calmness and well-being.[3]

Physical exercise is any bodily activity that develops and maintains physical fitness and overall health.[4] Frequent and regular aerobic exercise has been shown to

help prevent or treat serious and life-threatening chronic conditions such as high blood pressure, obesity, heart disease, Type 2 diabetes, insomnia, and depression.[5]

This observation is supported strongly by ***Rasch and Burkey (1978)*** [6] in their book, they stated that "muscular endurance is not a general factor but is highly specific to each joint. Anxiety is a psychological and psychological state characterized by cognitive, somatic, emotional and behavioral components [7] Blood pressure (BP) is a force exerted by circulating blood on the walls of blood vessels, and is one of the principal vital signs.

METHODS

This study under investigation involves the experimentation of yogic practices and physical exercises on muscular endurance, anxiety and blood pressure (systolic and diastolic). Forty five middle aged women those who were living around Annamalainagar, Chidambaram with age between 35 and 40 years were selected as subjects. The selected forty five subjects were randomly divided into three groups of fifteen each, out of which group - I (n = 15) underwent yogic practice, group - II (n = 15) underwent physical exercise training and group - III (n = 15) remained as control. The training programme was carried out for six days (Monday to Saturday) per week during morning session only (6 am to 8 am) for thirteen weeks. Muscular endurance was assessed by administering sit – ups test, anxiety was measured by using Taylor's Manifest Anxiety Scale and blood pressure was measured by using sphygmomanometer. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the experimental groups on selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. Since, there were three groups involved, the Scheffé *S* test was applied as post hoc test

ANALYSIS OF DATA

The data collected prior to and after the experimental periods on muscular endurance, anxiety and blood pressure (systolic and diastolic) on yogic practices group, physical exercises group and control group were analysed and presented in the following table -I.

Table – I

Analysis of Covariance and 'F' ratio for Muscular Endurance, Anxiety and Blood Pressure (systolic and diastolic) for Yoga Practice Group, Physical Exercise Group and Control Groups

Variable Name	Group Name	Yoga Practice Group	Physical Exercise Group	Control Group	'F' Ratio
Muscular endurance (in Nos./min)	**Pre-test Mean ± S.D**	25.89 ± 1.22	25.16 ± 1.87	25.45 ± 1.47	0.871
	Post-test Mean ± S.D.	28.57 ± 2.09	28.33 ± 1.73	25.11 ± 1.39	29.35*
	Adj. Post-test Mean	28.993	28.761	25.083	33.761*
Anxiety (in points)	**Pre-test Mean ± S.D**	16.00 ± 1.02	16.12 ± 1.11	16.10 ± 1.14	1.112
	Post-test Mean ± S.D.	14.41 ± 1.60	15.10 ± 1.08	16.11 ± 1.51	31.22*
	Adj. Post-test Mean	14.21	15.29	16.65	54.03*

Systolic Blood Pressure (mmHg)	**Pre-test Mean ± S.D**	128.31 ± 5.20	128.22 ± 5.02	127.53 ± 6.50	0.112
	Post-test Mean ± S.D.	120.11 ± 4.99	122.21 ± 4.10	128.12 ± 6.56	12.53*
	Adj. Post-test Mean	120.18	122.75	128.54	73.94*
Diastolic Blood Pressure (mmHg)	**Pre-test Mean ± S.D**	83.07 ± 3.22	83.17 ± 3.21	83.88 ± 3.02	0.22
	Post-test Mean ± S.D.	80.13 ± 4.11	81.70 ± 4.98	83.6 ± 4.74	4.22*
	Adj. Post-test Mean	80.81	81.26	83.37	12.22*

* Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 43 and 2 and 42 were 3.21 and 3.22 respectively).

The data are presented in the above table – I and the result shows that there was a significant improvement was occurred on all criterion variables such as, muscular endurance, anxiety, systolic and diastolic blood pressure after the yogic practices and physical exercises when compared with the control group. Further to determine which of the paired means has a significant improvement, Scheffĕ *S* test was applied as post-hoc test. The result of the follow-up test is presented in Table - II.

Table – II: Scheffĕ S Test for the Difference Between the Adjusted Post-Test Mean of Muscular Endurance, Anxiety and Blood Pressure (systolic and diastolic)

Adjusted Post-test Mean of Muscular Endurance				
Yoga Practice Group	**Physical Exercise Group**	**Control Group**	**Mean Difference**	**Confidence interval at .05 level**
28.993		25.083	3.91*	0.899
28.993	28.761		0.232	0.899
	28.761	25.083	3.678*	0.899
Anxiety				
14.21		16.65	2.44*	1.256
14.21	15.29		1.08	1.256
	15.29	16.65	1.36*	1.256
Systolic Blood Pressure				
120.18		128.54	8.36*	4.481
120.18	122.75		2.57	4.481
	122.75	128.54	5.79*	4.481
Diastolic Blood Pressure				
80.81		83.37	2.56*	1.189
80.81	81.26		0.45	1.189

	81.26	83.37	2.11*	1.189

* Significant at 0.05 level of confidence.

Results

Before applying the experiment all the subjects of the yoga practice, physical exercise and control groups were attended the pre-test, which was conducted a day prior to the commencement of the training and the data were collected on muscular endurance, anxiety and blood pressure (systolic and diastolic). After thirteen weeks of training the post-test was conducted one day after the training period to find out any changes in the criterion variables.

The analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the experimental groups and control group on selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate. Since there was three groups were involved in this study, the Scheffė *S* test was used as pos-hoc test and it was shown in Table - II.

After applying the analysis of covariance, the result of this study showed that there was a significant difference among yoga practice, physical exercise and control groups on the changes in muscular endurance, anxiety and blood pressure after thirteen weeks of training. The criterion variables such as, muscular endurance was improved for yoga practice group and physical exercise group and anxiety, systolic and diastolic blood pressure has significantly decreased after the yoga practice and physical exercise period. Further, comparing the adjusted post-test means of all the criterion variables, such as, muscular endurance, anxiety, systolic and diastolic blood pressure both the training groups were significantly altered after their respective training periods, when compared with the control group.

Conclusions

Muscular endurance and anxiety has improved for both the experimental groups, such as yogic practice group and physical exercise group, when compared with the control group. The blood pressure has also decreased in yogic practice group and physical exercise group when compared with the control group. But there was no significant difference was found between the experimental groups on selected criterion variables. There are so many evidences shows that selected yogasana practices and physical exercises has enhanced the health related physical fitness such as, muscular strength, endurance, muscular endurance, body composition and pulmonary function.[8,9,12,15,18] Moreover performing yogasana postures which helps to reduction in anxiety.[10,11,17] It is also evident that both physical exercises and yogic practices were reduced the anxiety level.[16] Blood pressure was also reduced significantly after the selected yogic practices which will avert the hyper or hypotension for normal human beings who were attained the above 40 years of age.[13] Involving the physical activity improves the muscle strength, balance and endurance for people who were attained 40 years of age.[14]

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