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Effect of yogasana pilates and calisthenics training on selected physical and physiological variables among metabolic syndrome diagnosed women

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Abstract
This research aims to assess the Effect of Yogasana Pilates and Calisthenics Training on Selected Physical and Physiological Variables among Metabolic Syndrome Diagnosed Women. To achieve the purpose of the current study sixty women who were diagnosed metabolic syndrome age ranged from 30 to 40 years old randomly selected from Chennai Metropolitan city (Housing Board Communities). They were randomly divided and employed into four equal groups, consist of 15 members each. Group-I had given yoga practice, Group-II had given Pilates training, Group-III had given calisthenics training and Group-III was control which had not received any unique pieces of exercise apart from the regular activities. The Yogasana, Pilates and calisthenics training has selected as the independent variable. Cardiovascular Endurance and Resting Heart Rate have chosen as dependent variables, and all dependent variables measured by standardized test items as 3-minute step test and heart rate monitor. Analysis of Covariance (ANCOVA) was applied to find out the significant mean differences. In all the cases, the 0.05 level of significance has fixed to test the Alpha level. The results of the study exposed that the experimental groups had finished a significant difference in all the selected variables such as Cardiovascular Endurance and Resting Heart Rate to compare the control group. Hence it was concluded that Yogasana, Pilates and calisthenics training increased cardiovascular endurance and reduced Resting Heart Rate among the participants.

Keywords: yoga, calisthenics, cardiovascular endurance, resting heart rate

Introduction
Indian womenfolk measured as the perfect homemaker in the world. They need balanced health for homemaking. But, they face a lopsided amount of life challenges which condense their ability to achieve their fair health. Regular physical activity is vital for good physical and mental health. It helps to enhance their general health and fitness, maintain a healthy weight, reduce their risk for many chronic diseases and promote good mental health.

Lifestyle changes and physical activity are significantly more effective than drugs for preventing and reversing Metabolic Syndrome. It is a cluster of conditions increased blood pressure, high blood sugar, excess body fat around the waist, and abnormal cholesterol or triglyceride levels that occur together, increasing your risk of heart disease, stroke, and diabetes.

Yogasana is an ancient form of exercise which developed in India at Indus-Sarasvati civilization of North India over 5,000 years ago, and it designed as a path to spiritual enlightenment. It is based on a regular set of physical exercises in a balanced manner to develop the body, mind, and spirit. The practice of yoga will make you complete peace, physical and emotional well-being. Nowadays it is known as one of the best medicine for curing and preventing diseases.

Calisthenics is an exercises programme having a variation of gross motor activities like running, standing, grasping, pushing, etc. It is often performed rhythmically and generally without equipment or apparatus. Calisthenics training involves any exercises performed using no added weight, and is commonly referred to as body-weight training. Calisthenics training can be done as a stand-alone routine, or programmed into any weight loss, bodybuilding or fitness workout. It has many benefits and is convenient, and it can be tailored to suit beginner, intermediate or advanced trainees.

Methodology
The primary purpose of the study was to determine the effect of Yogasana, Pilates and calisthenics training on selected physical and physiological variables among metabolic syndrome diagnosed women in Chennai metropolitan city. There are sixty women randomly chosen from Chennai Metropolitan city (Housing Board Communities), who volunteered participated in conducting the study and the purpose of the study had explained. The method of performing the test on cardiovascular endurance and resting heart rate described to the subjects before the test. The age ranged from the subjects between 30 to 40 years. The selected subjects randomly assigned to experimental and control groups of 15 each. Experimental Group I underwent Yogasana practice, Group II underwent Pilates training, Group III underwent calisthenics Training, and Group IV was control which had not given any particular pieces of training apart from the regular activities. The experimental groups underwent Yogasana, Pilates and Calisthenics training for five days per week for 12 weeks. The selected dependent variables such as cardiovascular endurance and resting heart rate were assessed

using standard tests and procedures, before and after the training regimen. The data collected from the three groups before and post experimentation on selected dependent variables were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). The test of significance had fixed at 0.05 level of significance.

Independent Variables

1	Experimental Group - I	Yogasana Training
2	Experimental Group - II	Calisthenics Training
3	Experimental Group - III	Pilates Trainig
4	Control Group	No Training

Dependent Variables

Physical	Physiological
✓ Cardiovascular Endurance	✓ Resting Heart Rate

Results

The subjects were tested on selected criterion variables such as cardiovascular endurance and resting heart rate at before and immediately after the training period. The analysis of covariance on cardiovascular endurance and resting heart rate of Yogasana, Pilates and calisthenics group and control group are analyzed and presented in given below tables respectively.

Table 1: Analysis of Covariance on Cardiovascular Endurance of Yogasana, Pilates, Calisthenics and Control Group

Test	Yogasana	Pilates	Calisthenics	Control	Source of variance	Sum of square	Df	Mean square	"F''
Pre	115.53	115.25	115.16	115.54	B	1.715	3	0.572	0.24
					W	129.2	56	2.309	
Post	113.20	111.87	110.00	115.93	B	280.1	3	93.39	20.18*
					W	259.0	56	4.626	
Adjusted	113.03	111.99	110.22	115.75	B	238.4	3	79.47	37.71*
					W	115.8	55	2.107	

* Significant 0.05 level of significance

(The table values required for significance at 0.05 level with df 3 and 56, 3 and 55 were 2.76 and 2.77 respectively).

Table-I showed that the pre-test means values of cardiovascular endurance for Yogasana, Pilates, calisthenics and control group were 115.53, 115.25, 115.16 and 115.54 respectively. The obtained 'F' ratio value of 0.24 for pre-test scores of Yogasana, Pilates, calisthenics and control group on cardiovascular endurance was less than the required table value of 2.76 for significance with df 3 and 56 at 0.05 level of significance.

The post-test means values for cardiovascular endurance for Yogasana, Pilates, calisthenics and control group were 113.20, 111.87, 110.00 and 115.93 respectively. The obtained 'F' ratio value of 20.18 for post-test scores of Yogasana, Pilates, calisthenics and control group was higher than the required table value of 2.76 for significance with df 3 and 56 at 0.05 level significance.

The adjusted post-test means values of cardiovascular endurance for Yogasana, Pilates, calisthenics and control group were 113.03, 111.99, 110.20 and 115.75 respectively. The obtained 'F' ratio value of 37.71 for adjusted post-test scores of Yogasana, Pilates, calisthenics and control group was greater than the required table value of 2.77 for significance with df 3 and 55 at 0.05 level of significance. The results of this study have shown that there was a significant difference between Yogasana, Pilates, calisthenics and control group on cardiovascular endurance.

The mean values of Yogasana, Pilates, calisthenics and control group on cardiovascular endurance were graphically represented in Figure-I.

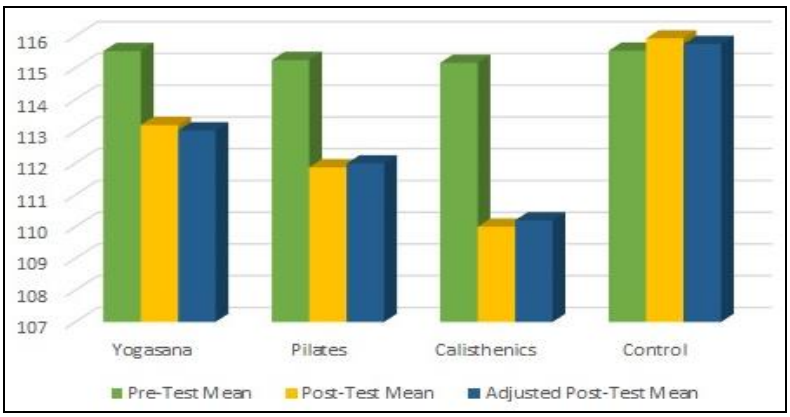

Fig 1: Bar Diagram Showing the Mean Values of Yogasana, Pilates, Calisthenics Group and Control Group on Cardiovascular Endurance

Table 2: Analysis of Covariance on Resting Heart Rate of Yogasana, Pilates, Calisthenics and Control Group

Test	Yogasana	Pilates	Calisthenics	Control	Source of variance	Sum of square	Df	Mean square	"F''
Pre	78.31	79.15	79.03	79.56	B	12.18	3	4.060	1.02
					W	221.4	56	3.955	
Post	76.53	76.27	75.27	79.67	B	162.8	3	54.26	11.05*
					W	274.9	56	4.910	
Adjusted	77.16	76.14	75.25	79.16	B	126.5	3	42.18	25.11*
					W	92.39	55	1.680	

* Significant 0.05 level of significance

(The table values required for significance at 0.05 level with df 3 and 56, 3 and 55 were 2.76 and 2.77 respectively).

Table-II showed that the pre-test means values of resting heart rate for Yogasana, Pilates, calisthenics and control group were 78.31, 79.15, 79.03 and 79.56 respectively. The obtained 'F' ratio value of 1.02 for pre-test scores of Yogasana, Pilates, calisthenics and control group on resting heart rate was less than the required table value of 2.76 for significance with df 3 and 56 at 0.05 level of significance.

The post-test means values for resting heart rate for Yogasana, Pilates, calisthenics and control group were 76.53, 76.27, 75.27 and 79.67 respectively. The obtained 'F' ratio value of 11.05 for post-test scores of Yogasana, Pilates, calisthenics and control group was higher than the required table value of 2.76 for significance with df 3 and 56 at 0.05 level significance.

The adjusted post-test means values of resting heart rate for Yogasana, Pilates, calisthenics and control group were 77.16, 76.14, 75.25 and 79.16 respectively. The obtained 'F' ratio value of 25.11 for adjusted post-test scores of Yogasana, Pilates, calisthenics and control group was greater than the required table value of 2.77 for significance with df 3 and 55 at 0.05 level of significance. The results of this study have shown that there was a significant difference between Yogasana, Pilates, calisthenics and control group on resting heart rate.

The mean values of Yogasana, Pilates, calisthenics and control group on resting heart rate were graphically represented in Figure-II.

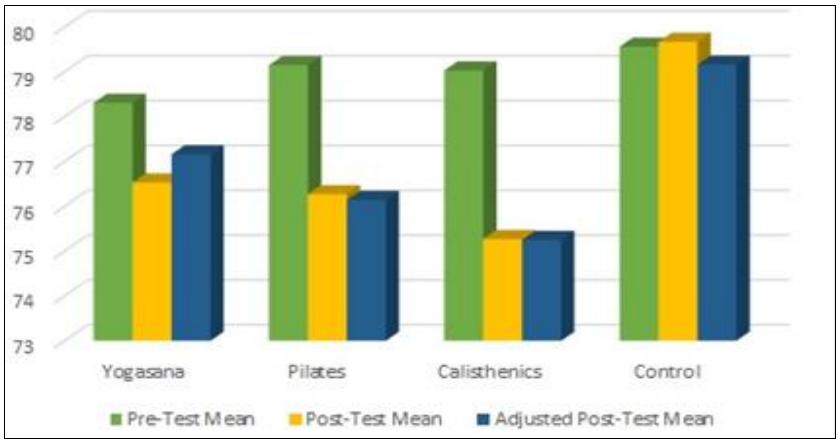

Fig 2: Bar Diagram Showing the Mean Values of Yogasana, Pilates, Calisthenics Group and Control Group on Resting Heart Rate

Conclusions

The results of the study showed that there was a significant difference between Yogasana, Pilates, calisthenics and control group on selected criterion variables such as Cardiovascular Endurance and Resting Heart Rate. Hence, it was concluded from the results of the study Yogasana, Pilates and calisthenics training programme has enhanced and reduced the criterion variables such as Cardiovascular Endurance and Resting Heart Rate. Furthermore, calisthenics evidenced more effective in enhancing cardiovascular endurance and Pilates showed more effective in reducing Resting Heart Rate.

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