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Effect of yoga Pilates and iron yoga training on agility, strength and cardio vascular endurance among sports school students

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Abstract

Forty girl's students studying in St Anne's Girls High school Changanacherry, Kottayam (Dist) Kerala was selected randomly as subjects. The age of the subjects ranged from 10 to 15 years. They were randomly divided into four groups. Group I underwent yogic practices, group II underwent pilates, group III underwent iron yoga training and group IV acted as control group. Each group consists of 10 subjects each. The training schedule was for a period of 12 weeks. The criterion variables selected for the study were agility strength and Cardio vascular endurance. The data collected for the pre, mid and post tests were analysed by using one way (ANOVA) and analysis of co-variance (ANCOVA). The result of the study reveals that all the criterion variables had significant improvement in all the three experimental groups when compared to control group, except in strength in yogic practice group.

Keywords: Underwent, endurance, significant

Introduction

Health is the level of functional or metabolic efficiency of a living being. Systematic activities to prevent or cure health problems and promote good health in humans are undertaken by health care benefactors. In addition to health care interventions and a person's surroundings, a number of other factors are known to influence the health status of individuals, including their background, lifestyle, and economic and social conditions; these are referred to as "determinants of health".

"Physical activity is an important ingredient in the quality of life because it increases energy and promotes the physical, mental and psychological wellbeing in addition to conferring worthy health habits".

Patanjali defined Yoga as "a control of thought waves in the mind." It is as wisdom in work or skilful living amongst activities of harmony and moderation. (Ravi, 1988)

Y- Yearning for mental peace and all-round fitness.

O- Organized scheme of physical movements.

G- General and specific workout involving total body – mind – spirit.

A- Advanced stage of concentration for mental alertness and total body homeostasis.

Pilates called method of Contrology (from *control* and Greek *-λογία, -logia*); is a method in which the mind controls the muscles. The program focuses on the core postural muscles which help keeping the body balanced and which are essential to provide support to the spine. In particular, Pilate's exercise teaches awareness of breath and alignment of the spine, and aim to strengthen the deep torso muscles.

Iron yoga training is a combination of yoga and weight training for strength training for developing the strength and size of skeletal muscles. It uses the force of gravity (in the form of weighted bars, dumbbells or weight stacks) to oppose the force generated by muscle through concentric or eccentric contraction. Iron yoga training uses a variety of specialized equipment to target specific muscle groups and types of movement. Iron yoga training however, is often part of the athlete's training regime.

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Methodology

To achieve this purpose, forty girls studying in St Anne's Girls High school Changanacherry, Kottayam (Dist) Kerala were selected randomly as subjects. The age of the subjects ranged from 10 to 15 years. They were randomly divided into four groups. Group I underwent yogic practices, group II underwent Pilates, group III underwent iron yoga training and group IV acted as control group. Each group consists of ten subjects. The experimental groups were subjected to the yogic practices in the morning and pilates and iron yoga training in the evening for alternative days for a period of 12 weeks except on Sunday. The data were collected two days before the training schedule (pre-test); 6 weeks after the training

schedule (mid test) and after the training schedule (post- test). The criterion variables selected for the study are agility, strength and Cardio vascular endurance; and were assessed by the following standardized test items such as: shuttle run test, sit ups test and resting pulse rate test respectively. The descriptions of independent variables are as follows

1. List of yogic practices

Padmasana, Bhujangasana, Shalabhasana, Matsyasana, Vajrasana, Dhanurasana, Charasana, Sarvangasana, Vrikasana, Halasana & Shavasana.

2. List of Pilates Exercises

1. Roll up	17. Shoulder bridge
2. Roll over with legs spread (both ways)	18. Spine twist
3. One leg circle (both ways)	19. Jack knife
4. Rolling back	20. Side kick
5. One leg stretch	21. Teaser
6. Double leg stretch	22. Hip twist with stretched arms
7. Spine stretch	23. Swimming
8. Rocker with open legs	24. Leg-pull
9. Cork-screw	25. Side kick kneeling
10. Saw	26. Side bend
11. Swan-dive	27. Boomerang
12. One leg kick	28. Seal
13. Double kick	29. Crab
14. Neck pull	30. Rocking
15. Scissors	31. Control balance
16. Bicycle	32. Push up

3. List of Iron yoga training Exercises

- Dumbbell Exercises
- Ball Exercises
- Band Exercises
- Barbell Exercises
- Strengthen Exercises
- Cross bow Exercises

selected were examined and analysed using the Statistical Package for the Social Science Version 18 (SPSS) using one way repeated measure (ANOVA) for finding the significance difference within the group (pre, mid and post- test). In order to find the significance difference between the groups (yogic practices, pilates, iron yoga training and control groups) ANCOVA were used and results are presented in the following tables.

Analysis of the data and results of the study

The data pertaining to the study from the criterion variables

Agility

Table 1: One-way repeated measure anova on agility of experimental and control groups

Group	Source of Variance	Sum of Squares	D.f	Mean Squares	F-ratio
Yoga practices	Test (Between)	1.97	2	0.99	12.81
	Error	0.62	8	0.08	
Pilates	Test (Between)	1.02	2	0.51	5.25
	Error	0.78	8	0.10	
Iron yoga training	Test (Between)	0.79	2	0.39	4.26
	Error	0.74	8	0.09	
Control group	Test (Between)	0.00	2	0.00	0.00
	Error	0.01	8	0.00	

*Significant at 0.05 level of confidence

Table 1.1 reveals the analyzed data on agility within the group. The obtained F- ratio values are, 12.81, 5.25 & 4.26 of yoga practices, pilates and iron yoga training group respectively. The table value required for significance at 0.05

level of confidence with 2 and 8 were 1.75. Based on F-ratio value yoga practices group training proves to be the most significant and yoga practices iron yoga training was the least significant among the three experimental groups.

Table 2: Analysis of covariance of experimental and control groups on agility

Adjusted Posttest Mean				Source of variance	Sum of squares	D.f	Mean squares	F – ratio
Yogic practices	Pilates training	Iron yoga training	Control group					
9.54	9.46	9.37	9.69	b	2.19	3	0.73	8.67*
				Error	3.03	36	0.08	

*Significant at 0.05 level of confidence

Table 1.2 reveals that all the three experimental groups had shown significant improvement in strength among the groups. The obtained ANCOVA (F- ratio) value 8.67 shows that the entire experimental groups are significant amongst them and is higher than the table value 3.87 of 3 and 36.

Strength

Table 2.1 reveals the analyzed data on abdominal strength

within the group. The obtained F- ratio values are 1.44; 11.10 & 18.98 of yoga practices, pilates and iron yoga training group respectively. The table value required for significance at 0.05 level of confidence with 2 and 8 were 3.55. Based on F-ratio value iron yoga training group training proves to be the most significant, yoga practices were the least significant among the three experimental groups and yoga practices was not significant.

Table 3: One way repeated measure anova on strength of experimental and control groups

Group	Source of Variance	Sum of Squares	D. f	Mean Squares	F-ratio
Yoga practices	Test (Between)	10.07	2	5.03	1.44
	Error	27.93	8	3.49	
Pilates	Test (Between)	63.22	2	31.61	11.10
	Error	22.78	8	2.85	
Iron yoga training	Test (Between)	234.02	2	117.01	18.98
	Error	49.32	8	6.16	
Control group	Test (Between)	0.00	2	0.00	0.00
	Error	47.48	78	0.61	

*Significant at 0.05 level of confidence

Table 4: Analysis of covariance of experimental and control groups on strength

Adjusted Posttest Mean				Source of variance	Sum of squares	D.f	Mean squares	F-ratio
Yogic practices	Pilates training	Iron yoga	Control group					
26.26	27.35	28.95	25.42	Between	279.53	3	93.18	12.13*
				Error	199.77	26	7.68	

*Significant at 0.05 level of confidence.

Table 2.2 reveals that all the three experimental groups had shown significant improvement in strength among the groups. The obtained ANCOVA (F- ratio) value 12.13 shows that the entire experimental groups are significant amongst them and is higher than the table value 2.87 of 3 and 35.

Cardio vascular endurance

Table 3.1 reveals the analyzed data on Cardio vascular

endurance within the group. The obtained F- ratio values are 4.78; 13.86 & 14.83 of yoga practices, pilates and iron yoga training group respectively. The table value required for significance at 0.05 level of confidence with 2 and 8 were 3.32. Based on F-ratio value iron yoga training group training proves to be the most significant and yoga practices were the least significant among the three experimental groups.

Table 5: One way repeated measure anova on cardio vascular endurance of experimental and control groups

Group	Source of Variance	Sum of Squares	D.f	Mean Squares	F-ratio
Yoga practices	Test (Between)	57822.92	2	28911.46	4.78
	Error	48427.08	8	6053.39	
Pilates	Test (Between)	252218.75	2	126109.38	13.86
	Error	72781.25	8	9097.66	
Iron yoga training	Test (Between)	692093.75	2	346046.88	14.83
	Error	186656.25	8	23332.03	
Control group	Test (Between)	510.42	2	255.21	0.02
	Error	129906.25	8	16238.28	

*Significant at 0.05 level of confidence.

Table 6: Analysis of covariance of experimental and control groups on cardio vascular endurance

Adjusted Post test Mean				Source of variance	Sum of squares	D.f	Mean squares	F - ratio
Yogic practices	Pilates training	Iron yoga training	Control group					
2534.37	2572.95	2648.73	2453.32	Between	319.55	3	106.52	17.28
Error	228.08	35	6.52					

*Significant at 0.05 level of confidence.

Table 3.2 reveals that all the three experimental groups had shown significant improvement in Cardio vascular endurance among the groups. The obtained ANCOVA (F- ratio) value 17.28 shows that the entire experimental groups are significant amongst them self and are higher than the table value 2.92 of 3 and 35.

Conclusion

From the analysis of the data, the following conclusions were

drawn.

1. The experimental groups' namely yoga practices group, pilates group and iron yoga training group and control group achieved significance improvement on selected criterion variables such as agility, strength and Cardio vascular endurance when compared to control group.
2. Significant differences were found among yoga practices, pilates and iron yoga training groups improving selected criterion variables such as agility, strength and cardio

vascular endurance.

3. It was concluded that iron yoga training group was found to be better than yoga practices group and pilates group in developing selected criterion variables such as strength and Cardio vascular endurance; pilates group was found to be better than yoga practices group in developing agility, strength and cardio vascular endurance.

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