IMPACT OF VARIOUS PHYSICAL TRAINING ON FITNESS VARIABLES AMONG ADULT GIRLS

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Abstract

The present study is to find out the influence of core strength training, mobility training and combined training on physical fitness variables among college girls. For this study the subjects were selected from the Alagappa College of arts and sciences, Karaikudi. Forty girl students of age group between 18 – 20 years were selected as subjects and they were divided into four equal groups namely control group, core strength training group, mobility training group and combined training group. The subjects were tested in order to find out cardio respiratory endurance, muscular strength endurance, and flexibility and body composition. The Pre test scores and Post test Scores were Statistically Calculated by Analysis of Covariance. The level of confidence set for the analysis was 0.05 level of confidence. The study showed that the initial and final data of Experimental groups were greater than the Control group.

Keywords: Core strength training, Mobility training, Cardiovascular Endurance, Muscular Strength Endurance, Flexibility & Body composition.

Introduction

The prime responsibility of every welfare state is the promotion of the physical fitness of its subjects as human resource is the very basic resources of any country **(Astrand,** Per-Olof and Karre Rodhal). Physical fitness is the very basic foundation of most of the activities undertaken by an individual in his daily walk of life. **Bosen, Ken. O (**1972) states, “The primary aim of physical education is not to develop star athletes, winning team of expert performance, but a natural vitality with character values of physical fitness. It aims to develop youth into citizens; who have the capacity to enjoy with vigor and interest in life”. Physical fitness is the very basic foundation of most of the activities undertaken by an individual in his daily walk of life. If a person is physically fit he is an asset to the nation**Loken, Neton. C** and **Robert. J, Willoughby** says that the main objective of sports training is to develop physical fitness level of the sportsperson. Physical fitness consists of mainly strength, speed, endurance, flexibility, and other coordinative abilities.

Objectives of the Study

The objective of the study is to find out the influence of core strength training, mobility training and combined training, and also to study the Physical Fitness standards and performance of college girl's students.

Hypothesis

- It is hypothesized that the Core Strength training may improve the Development on Selected Physical Fitness Variables.
- It is further hypothesized that the Mobility Training may improve the Development on Selected Physical Fitness Variables.
- It is also hypothesized that the combined training of core strength training and mobility training improve the Development on Selected Physical Fitness Variables significantly.

Experimental Design

The study was formulated as a random group design. The forty college girls students of Alagappa Government Arts College were randomly assigned into four equal groups namely control group, core strength training group (Experimental group – I), mobility training group (Experimental group – II) and combined training group (Experimental group – III). The subjects were tested in order to find out cardio respiratory endurance, muscular strength endurance, flexibility and body composition. The data were collected from four groups before and after the experimental period. The test was statistically examined by Analysis of Covariance (ANCOVA) to find out significant differences. In all cases 0.05 was fixed as level of significance which was considered as appropriate.

Table I - Mode of Training Program

Control group	Experimental group I	Experimental group II	Experimental Group III
Initial Measurement	Initial Measurement	Initial Measurement	Initial Measurement
There is no Core strength training and Mobility training program. Normal activity	Core strength training	Mobility Training	Combined Training (Core strength training and Mobility training)
Final Measurement	Final Measurement	Final Measurement	Final Measurement

Independent Variable

- core strength training
- mobility training
- combination of core strength and mobility training

Dependent Variable

- Cardio Respiratory Endurance
- Muscular strength endurance
- Flexibility
- Body composition

Table II - Test Selection

S. NO	VARIABLES	TEST
1	Cardio respiratory endurance	Cooper 12 min run/walk test
2	Muscular strength endurance	Crunch sit up
3	Flexibility	Sit and reach test
4	Body composition	Body Composition Analyzer

Table 3.Computation of analysis of covariance of cardio vascular endurance for control group, core strength training group, mobility training group and combined training group (100mts = 1 unit)

Sources of Variance	Sum of square	df	Mean square	F ratio
Between	14.748	3	4.916	8.019
Within	21.472	35	0.613	
Total	36.22	38		

Table (3, 35) = 2.87 at 0.05 level

Table 4.Ordered Adjusted Mean and Differences between Means for Experimental Groups

Experimental group I	Experimental Group II	Experimental Group III	Mean Differences
17.6	10		7.6
17.6		16.4	1.2
	10	16.4	6.4

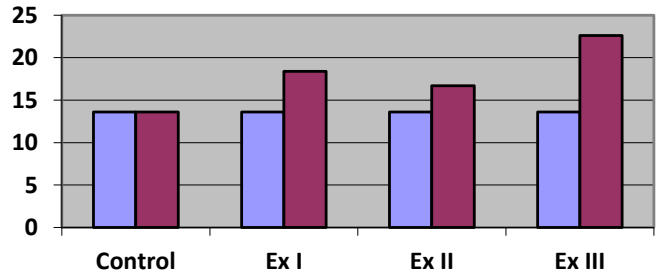
Results of Cardio Vascular Endurance

The cardiovascular fitness was measured by 8 minute run-walk test of Control group was lower than the experimental groups. Experimental group III (Combined Training) had higher mean differences in Cardiovascular fitness to compare with Experimental group I(Core Strength training group) and Experimental group II(Mobility Training group). In Cardio Vascular Endurance the

obtained F ratio of 8.019 was greater than the required table F Value 2.87. The Scheffe's test may be used for testing the significant between paired adjusted means. However, the Scheffe's test method can also be expressed as an F ratio, as Experimental Group I (7.27), Experimental Group II (5.43) and Experimental Group III (24.22).The difference between the means of experimental groups was significant.

CHART I

THE MEAN DIFFERENCES OF CONTROL GROUP AND EXPERIMENTAL GROUPS ON CARDIO RESPIRATORY ENDURANCE



The chart I shows that the difference between the Pre and Post Test mean differences of control group was 0.2 , experimental group I(Core strength training group) was 1.8 , Experimental group II (Mobility training group) was 1.00, Experimental group III(Combined Training group) 2.9.The Combined training group had higher mean differences than the other groups.

Discussion on Findings

- The combined training group had higher mean differences than the other three groups. The obtained F ratio of 8.019 was greater than the required table value of 2.87 (3, 35).And the study was significant at o.o5 level of confidence.
- The combined training group had high mean value due to strengthen the core Region Muscles and increasing the quality of muscles by proper stretching.

Table 5.Computation of Analysis of covariance of Muscular Strength Endurance For control group, Core strength training group, Mobility training group and combined training group (Scores in number)

Sources of Variance	Sum of square	df	Mean square	F ratio
Between	13.839	3	4.6136	3.455
Within	46.793	35	1.335	
Total	56.632	38		

Table (5, 35) = 2.87 at 0.05 level

Table 6.Ordered Adjusted Mean and Differences Between Means for Experimental Groups

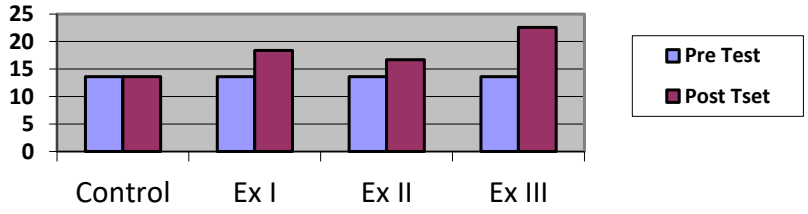
Experimental group I	Experimental Group II	Experimental Group III	Mean Differences
18.4	16.7		1.7
18.4		22.6	4.2
	16.7	22.6	5.9

Results of Muscular Strength Endurance

The Muscular strength endurance was measured by Bend Knee Sit-ups test of Control group was lower than the experimental groups. Experimental group III (Combined Training) had higher mean differences in Muscular strength endurance to compare with Experimental group I(Core Strength training group) and Experimental group II(Mobility Training group). In Cardio Vascular Endurance the obtained F ratio of 3.455 was greater than the required table F Value 2.87. The Scheffe's test may be used for testing the significant between paired adjusted means. However, the Scheffe's test method can also be expressed as an F ratio, as Experimental Group I (7.57), Experimental Group II (4.54) and Experimental Group III (17.24). The difference between the means of experimental groups was significant.

CHART II

THE MEAN DIFFERENCES OF CONTROL AND EXPERIMENTAL GROUPS ON MUSCULAR STRENGTH ENDURANCE



The chart II shows that the difference between the Pre and Post Test mean differences of control group had no difference in scores , experimental group I(Core strength training group) was 4.8 , Experimental group II (Mobility training group) was 3.1, Experimental group III(Combined Training group) 9.00.The Combined training group had higher mean differences than the other groups.

Discussion on Findings

- The combined training group had higher mean differences than the other three groups. The obtained F ratio of 3.455 was greater than the required table value of 2.87 (3, 35).And the study was significant at o.o5 level of confidence.
- The combined training group had high mean value. Strength and flexibility were increases the ability of muscular systems of Trunk Region.

Table 7.Computation of Analysis of covariance of Flexibility For control group, Core strength training group, Mobility training group and combined training group (Scores in Centimeters)

Sources of Variance	Sum of square	df	Mean square	F ratio
Between	8.18	3	2.73	5.39
Within	17.71	35	0.506	
Total	25.89	38		

Table (7, 35) = 2.87 at 0.05 level

Table.8. Ordered adjusted mean and differences between means for experimental groups

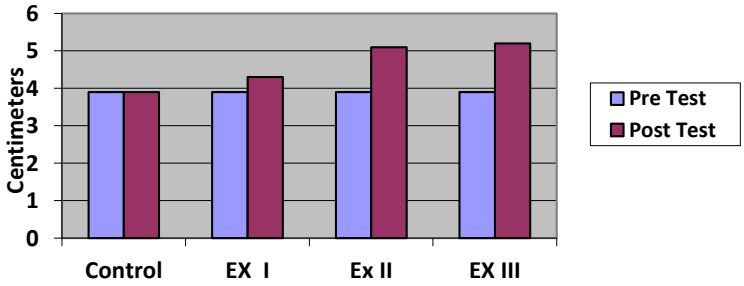
Experimental group I	Experimental Group II	Experimental Group III	Mean Differences
5.9	6.2		0.3
5.9		7.3	1.4
	6.2	7.3	1.1

Results of Flexibility

The Flexibility was measured by Sit and reach test of Control group was lower than the experimental groups. Experimental group III (Combined Training) had higher mean differences in Flexibility to compare with Experimental group I (Core Strength training group) and Experimental group II (Mobility Training group). In Flexibility the obtained F ratio of 5.39 was greater than the required table F Value 2.87. The Scheffe's test may be used for testing the significant between paired adjusted means. However, the Scheffe's test method can also be expressed as an F ratio, as Experimental Group I (4.32), Experimental Group II (5.22) and Experimental Group III (7.32). The difference between the means of experimental groups was significant.

CHART -III

THE MEAN DIFFERENCES OF THE CONTROL GROUP AND EXPERIMENTAL GROUPS ON FLEXIBILITY



The chart III shows that the difference between the Pre and Post Test mean differences of control group had no difference in scores , experimental group I(Core strength training group) was 0.4 , Experimental group II (Mobility training group) was 1.2, Experimental group III(Combined Training group) 1.3 .The Combined training group had higher mean differences than the other groups.

Dicusion on Findings

- The combined training group had higher mean differences than the other three groups. The obtained F ratio of 5.39 was greater than the required table value of 2.87 (3, 35).And the study was significant at o.o5 level of confidence.

- The combined training group had high mean value. The flexibility and Strengthening of muscles throughout the limb's entire range of motion helps in enhancing muscle tension and elasticity.

Table 9.Computation of Analysis of covariance of Body Composition For control group, Core strength training group, Mobility training group and combined training group (Scores in Percentage)

Table (9, 35) = 2.87 at 0.05 level

Sources of Variance	Sum of square	df	Mean square	F ratio
Between	9.22	3	3.073	3.146
Within	34.21	35	0.977	
Total	43.43	38		

Table 9. Ordered adjusted mean and differences between means for experimental groups

Table 10. Ordered adjusted mean and differences between means for experimental groups

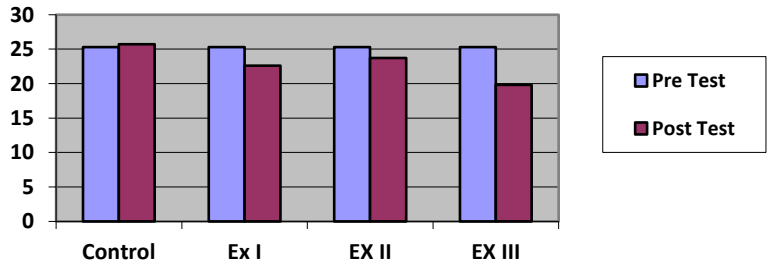
Experimental group I	Experimental Group II	Experimental Group III	Mean Differences
25.7	22.6		3.1
25.7		23.7	2.0
	22.6	23.7	1.1

Results of Body Composition

The Body Composition was measured by Body Composition Analyzer of Control group was lower than the experimental groups. Experimental group III (Combined Training) had higher mean differences in Percentage of body fat to compare with Experimental group I (Core Strength training group) and Experimental group II(Mobility Training group). In Flexibility the obtained F ratio of 3.146 was greater than the required table F Value 2.87.The Scheffe's test may be used for testing the significant between paired adjusted means. However, the Scheffe's test method can also be expressed as an F ratio, as Experimental Group I (18.23), Experimental Group II (7.9) and Experimental Group III (5.32).The difference between the means of experimental groups was significant.

CHART- IV

THE MEAN DIFFERENCES OF CONTROL AND EXPERIMENTALS GROUP ON BODY COMPOSITION



The chart 4 shows that the difference between the Pre and Post Test mean differences of control group was 0.4 , experimental group I(Core strength training group) was 2.7 , Experimental group II (Mobility training group) was 1.6 , Experimental group III(Combined Training group) 5.5 .The Combined training group had higher mean differences than the other groups.

Discussion on Findings

- The combined training group had higher mean differences than the other three groups. The obtained F ratio of 3.146 was greater than the required table value of 2.87 (3, 35).And the study was significant at o.o5 level of confidence.
- The combined training group had high mean value. The flexibility and core strength training helps in reducing the excess of fat storage in the body. Mainly in hip region of women's was greatly reduced by the proper combined training influence of core strength and flexibility.
- The cardiovascular fitness was measured by 8 minute run-walk test of Control group was lower than the experimental groups. Experimental group III (Combined Training) had higher mean differences in Cardiovascular fitness to compare with Experimental group I(Core Strength training group) and Experimental group II(Mobility Training group). In Cardio Vascular Endurance the obtained F ratio of 8.019 was greater than the required table F Value 2.87 and it was significant at o.o5 level of confidence.

- The strength endurance was measured by sit up test of Control group was lower than the experimental groups. Experimental group III (Combined Training) had higher mean differences in strength endurance to compare with Experimental group I(Core Strength training group) and Experimental group II(Mobility Training group). In strength endurance the obtained F ratio of 3.455 was greater than the required table value of 2.87 (3, 35) and it was significant at o.o5 level of confidence.

- The Flexibility was measured by Sit and Reach test of Control group was lower than the experimental groups. Experimental group III (Combined Training) had higher mean differences in Flexibility to compare with Experimental group I(Core Strength training group) and Experimental group II(Mobility Training group). In Flexibility the obtained F ratio of 5.39 was greater than the table F Value 2.87 and it was significant at o.o5 level of confidence.

- The body composition was measured by body composition analyzer of Control group was lower than the experimental groups. Experimental group III (Combined Training) had higher mean differences in body composition to compare with Experimental group I(Core Strength training group) and Experimental group II(Mobility Training group).In body composition the obtained F ratio of 3.146 was greater than the required table value of 2.87 (3, 35) and it was significant at o.o5 level of confidence.

Conclusion

The study showed that the initial and final data of Experimental groups were greater than the Control group. It had been found that the mean gain achieved by core strength training group, mobility training group and combined training group were significant at 0.05 levels. Combined Training had higher mean differences in cardiovascular fitness to compare with Core Strength training group and Mobility Training group. Combined Training had higher mean differences in Flexibility to compare with Core Strength training group and Mobility Training group. The obtained F ratio of 3.146 was greater than the required table value of 2.87 (3, 35).And the study was significant at o.o5 level of confidence.

Major Recommendations

- Core strength training group may be possible to increase in Physical Fitness of College girls Students due to the proper training of core Musculature.

- Mobility Training group may be possible increase in Physical Fitness of College girls Students due to the Proper Flexibility training.

- The Combined Training group had higher mean differences in the Physical fitness variables duo to the combined training of Core Strength Training and Mobility Training.

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