



Effects Of Aerobics Training And Circuit Training On Selected Physical Fitness Components And Physiological Variables Among College Women Volleyball Players

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ABSTRACT

The purpose of the study was to investigate the effect of aerobics training and circuit training on selected physical fitness components and physiological variables among college women volleyball players. It was hypothesized that there was a significant difference on selected physical fitness components and physiological variables due to the effect of aerobics training and circuit training among college women volleyball players. For the present study the 30 female college volleyball players from volleyball players in Sri Ramakrishna College of Arts and Science for Women were selected at random and their age ranged from 18 to 25 years. For the present study pretest & posttest random group design, which consists of control group and experimental groups was used. The subjects at random assigned to three equal groups of fifteen each and named as Group 'A', Group 'B' and Group 'C'. Group 'A' underwent aerobics training, Group 'B' underwent circuit training, and Group 'C' have not undergone any training. The physical fitness component variables is cardio respiratory endurance and physiological variables is resting pulse rate were assessed by cooper '12' minutes run and walks test & digital pulse monitor respectively. The data were collected before and after six weeks of training. The data were analyzed by applying Analysis of Co-Variance (ANCOVA). The level of significance was set at 0.05. The experimental group showed better improvement on cardio respiratory endurance and resting pulse rate among college women volleyball players than the control group.

Key Words: Volleyball, Aerobics Training, Circuit Training, Physical Fitness Components, Physiological, Cardio Respiratory Endurance and Resting Pulse Rate.

INTRODUCTION

Physical Education (PE) improves the physical abilities, skills, awareness, principles and attitudes required for establishing and enjoying an active and healthy lifestyle. Physical Education also creates student self-confidence and fitness in facing challenges as individuals and in groups or teams, through a wide range of learning activities. Sport includes all variety of competitive physical activity or games which, through casual or organized participation, aim to use, maintain or improve physical ability and skills.

AEROBICS TRAINING

Aerobic exercise refers to a form of physical activity that engages the large muscle groups of the body in a rhythmic and repetitive manner. This type of exercise elevates the heart rate and enhances the body's oxygen consumption. Common examples of aerobic activities include walking, cycling, and swimming. Engaging in aerobic exercise can significantly lower the risk of developing heart disease, diabetes, hypertension, and high cholesterol levels. The term "aerobic" signifies "with oxygen," indicating that during such exercises, breathing plays a crucial role in delivering oxygen to the muscles, thereby facilitating energy expenditure and movement. The intensity of aerobic workouts can be modified, allowing individuals to adjust the level of exertion according to their fitness goals.

CIRCUIT TRAINING

Circuit training offers a systematic method of exercising that integrates various workouts into a single session. Participants undertake a sequence of exercises, each designed to enhance different components of physical fitness, including strength and endurance. This approach, referred to as a circuit, includes a diverse array of exercises targeting multiple muscle groups while also promoting cardiovascular health. A thorough understanding of circuit training encompasses its definition, various forms, and extensive benefits, providing a well-rounded perspective on this exercise technique. Numerous examples illustrate its adaptability, demonstrating its relevance to a wide range of fitness levels and objectives. Circuit training merges resistance and aerobic exercises, aimed at improving both strength and cardiovascular fitness. Each exercise, or "station," is part of the overall circuit, with participants transitioning through these stations to engage in distinct activities. The exercises are executed with minimal rest intervals, resulting in an efficient and intense workout that challenges multiple facets of physical fitness. The significance of circuit training is evident in its holistic approach to physical activity. Its goals range from enhancing muscle strength and endurance to improving cardiovascular health, all within a single workout session. By organizing exercises in a sequence that reduces rest and sustains elevated heart rates, circuit training can maximize fitness results and deliver a comprehensive, multifaceted workout experience.

VOLLEYBALL

Volleyball is a team sport that involves a ball, with the primary objective being to send the ball over the net to land in the opponent's court or to induce an error from the opposing team. Each team is permitted to make a maximum of three consecutive touches of the ball during a single offensive play. The origins of volleyball trace back to the late 19th century, specifically in 1895, when it was created by William G. Morgan at the Young Men's Christian Association (YMCA). A standard volleyball match is played in sets, typically ranging from three to five. Each set is played until one team reaches 25 points, although if the score difference is less than two points, play continues until a two-point lead is established. A match concludes when one team secures victory in three sets, with the fifth set being played to a maximum of 15 points. Each team can have a roster of up to 14 players, but only six players are allowed on the court at any given time. The game begins with a serve, which is determined by a coin toss to decide which team serves first. Following each change of service, players rotate positions in a clockwise manner. The serve must be executed from behind the end line, and if the server steps over the line, sends the ball out of bounds, or hits the net, the serving team forfeits the serve and the

opposing team is awarded a point. Any player can serve, although it is typically performed by a front row player. The serve cannot be blocked, while front row players are allowed to execute spikes over the net. Back row players may attack from a distance of three meters. Blocking occurs at the net to prevent the ball from crossing, and players may extend their hands over the net as long as they do not interfere with the opponents.

METHODOLOGY

The purpose of the study was to investigate the effect of aerobics training and circuit training on selected physical fitness components and physiological variables among college women volleyball players. It was hypothesized that there was a significant difference on selected physical fitness components and physiological variables due to the effect of aerobics training and circuit training among college women volleyball players. For the present study the 30 female college volleyball players from volleyball players in Sri Ramakrishna College of Arts and Science for Women were selected at random and their age ranged from 18 to 25 years. For the present study pretest & posttest random group design, which consists of control group and experimental groups was used. The subjects at random assigned to three equal groups of fifteen each and named as Group 'A', Group 'B' and Group 'C'. Group 'A' underwent aerobics training, Group 'B' underwent circuit training, and Group 'C' have not undergone any training. The physical fitness component variables is cardio respiratory endurance and physiological variables is resting pulse rate were assessed by cooper '12' minutes run and walks test & digital pulse monitor respectively. The data were collected before and after six weeks of training. The data were analyzed by applying Analysis of Co-Variance (ANCOVA). The level of significance was set at 0.05. The experimental group showed better improvement on cardio respiratory endurance and resting pulse rate among college women volleyball players than the control group.

S.No	Variables	Tests	Measurements units
1.	Physical Fitness Components	Cooper 12 minutes run / walk test	Meters
2.	Physiological	Digital Pulse Monitor	Counts

Table: 1

Analysis of Co-variance for the Pre, Post and Adjusted Post Test Mean Values for Aerobics Training, Circuit Training, and Control Group on Cardio Respiratory Endurance

Tests	Aerobics Training Group	Circuit Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
Pre Test Mean	2740.7	2735.2	2732.3	B	50887.78	2	25452.89	.976
				W	1132150.0	42	26947.19	
Post Test Mean	2841.3	2856.5	2740.0	B	241443.33	2	120731.67	14.38*
				W	349696.67	42	8334.40	
Adjusted Post Test Mean	2837.6	2849.8	2738.1	B	271047.39	2	135537.70	53.12*
				W	103329.89	41	2520.22	

*Significant at 0.05 level of confidence. The Required table for df (2&42) at 0.05 level of confidence = 3.22 (2&41) at 0.05 level of confidence = 3.21. **Table:1** The pre-test means on cardio respiratory endurance of the experimental and control groups is 2740.7, 2735.2 and 2732.3 respectively. The obtained 'F' ratio value 0.976 for the pre-test mean is lesser than the required table value 3.22 for 2 & 42 degrees of freedom at 0.05 level of confidence. There is no significant difference between the experimental and the control groups on cardio respiratory endurance for the pre-test data. The post-test means on cardio respiratory endurance of the

experimental and the control groups are 2841.3, 2856.5 and 2740.0 respectively. The obtained ‘F’ ratio value 14.38 for the post test data is greater than the required table value 3.22 for 2 & 42 degrees of freedom at 0.05 levels of confidence. It shows that there is significant difference between the experimental and the control groups on cardio respiratory endurance following the experimental training. The adjusted post test means on cardio respiratory endurance of the experimental and the control groups are 2837.6, 2849.8 and 2738.1 respectively. The obtained ‘F’ ratio value of 53.12 for the adjusted post test data is greater than the required table value 3.21 for 2 & 41 degrees of freedom at 0.05 level of confidence. It reveals that there is significant change on cardio respiratory endurance as a result of the experimental training. Since the result revealed that there is a significance difference, among the three groups. Since the difference exists in the adjusted post-test mean, further multiple comparison tests were applied.

Figure I : Cone Diagram Showing the Pre, Post and Adjusted Mean for Aerobics Training, Circuit Training, and Control Group on Cardio Respiratory Endurance

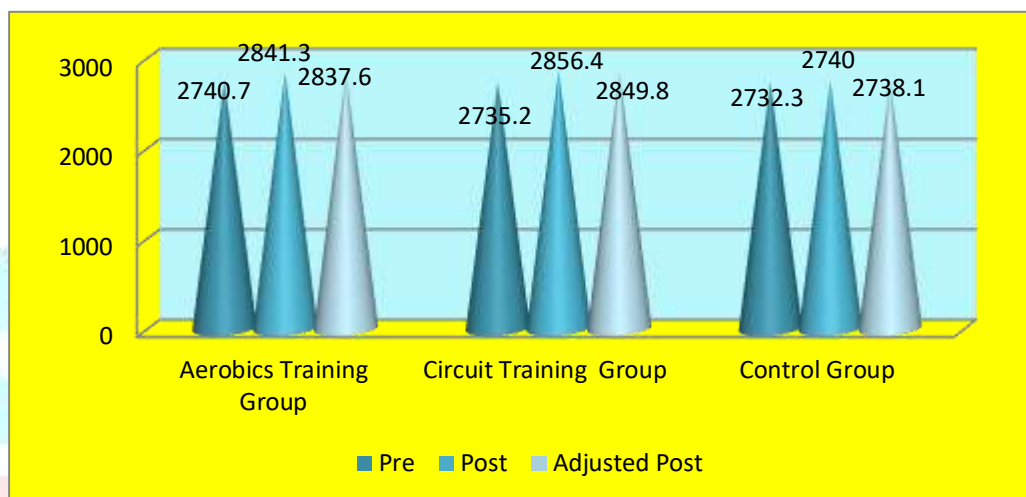


Table: 2

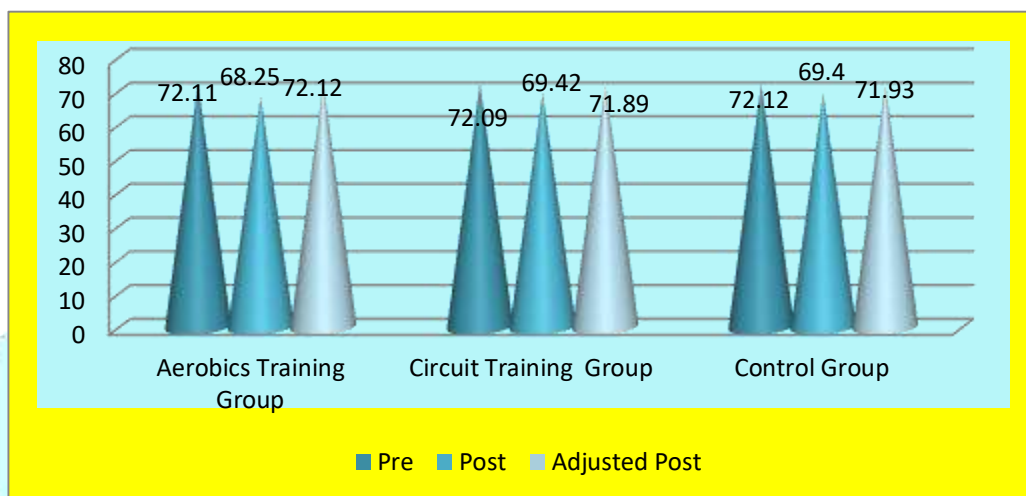
Analysis of Co-variance for the Pre, Post and Adjusted Post Test Mean Values for Aerobics Training, Circuit Training, and Control Group on Resting Pulse Rate

Tests	Aerobics Training Group	Circuit Training Group	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	72.11	72.09	72.12	BG	0.18	2	0.07	0.17
				WG	22.96	42	0.53	
Post-Test Means	68.25	69.42	71.89	BG	102.86	2	50.70	68.61*
				WG	30.72	42	0.72	
Adjusted Post-Test Means	68.29	69.40	71.93	BG	101.43	2	50.28	67.35*
				WG	29.66	41	0.77	

***Significant at 0.05 level of confidence.** (Table Value for 0.05 Level for df 2 & 42 =3.21), (Table Value for 0.05 Level for df 2 & 41=3.22). **Table – 2** reveals that the indicated that the obtained ‘F’-ratio for the pre-test means among the groups on resting pulse rate were 72.11 for experimental group – I, 72.09 for experimental group – II and 72.12 for control group. The obtained ‘F’ ratio value 0.976 for the pre-test mean is lesser than the required table value 3.21 for 2 & 42 degrees of freedom at 0.05 level of confidence. The post-test means were 68.25 for experimental group – I, 69.42 for experimental group – II and 71.89 for control group. The

obtained 'F'-ratio 68.61 was higher than the table 'F'-ratio 3.21. Hence the post-test mean 'F'-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. The adjusted post-test means were 68.29 for experimental group – I, 69.40 experimental group – II and 71.93 for control group. The obtained 'F'-ratio 67.35 was higher than the table 'F'-ratio 3.22. Hence the adjusted post-test mean 'F'-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. It reveals that there is significant change on resting pulse rate as a result of the experimental training. Since the result revealed that there is a significance difference, among the three groups. Since the difference exists in the adjusted post-test mean, further multiple comparison tests were applied.

Figure II : Cone Diagram Showing the Pre, Post and Adjusted Post Mean Values for Aerobics Training, Circuit Training, and Control Group on Resting Pulse Rate



DISCUSSION AND FINDINGS

In case of physical fitness components and physiological i.e. cardio respiratory endurance and resting pulse rate is the results between pre and post (6 weeks) test has been found significantly higher in aerobics training and circuit training in comparison to control group. the findings of the present study strongly indicates that aerobics training and circuit training for six weeks have significant effect on selected physical fitness components and physiological variables i.e., cardio respiratory endurance and resting pulse rate of college women volleyball players.

CONCLUSIONS

Based on the analysis of data, the following conclusions are drawn: -

This study concludes that, due to the aerobics training and circuit training, there is a significant effectiveness and improvement in selected physical fitness components and physiological variables like cardio respiratory endurance and resting pulse rate among college women volleyball players.

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