
**AN IMPACT OF INTERMITTENT TRAINING WITH AND WITHOUT MASSAGE
MANIPULATION ON CARDIO RESPIRATORY ENDURANCE PERFORMANCE
AMONG UNIVERSITY WOMEN VOLLEYBALL PLAYERS**



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Abstract:

The main objective of the study was to find out the impact of intermittent training with and without massage manipulation on cardio respiratory endurance performance among university women volleyball Players. For the purpose of the study, forty five (N=45) women volleyball players who participated in Tamilnadu sports University intercollegiate volleyball tournaments during the year 2015-2016 were selected as subjects. The age of the subjects ranged between 18 to 21 years. The subjects were divided at random into three groups of fifteen each (n=15). Group-I underwent Intermittent Training with Massage Manipulation, Group II underwent Intermittent Training without Massage Manipulation, and Group III acted as Control. The duration of the training period was restricted to twelve weeks and the number of sessions per week was confined to three. Cardio Respiratory Endurance only selected as the dependent variable for this study and it was assessed by Cooper's 12 Minutes Run/walk Test. The data were collected prior to and immediately after the training period of twelve weeks. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases. The Experimental groups namely, Intermittent training with massage group and Intermittent training without massage group had significantly improved in Cardio Respiratory Endurance and Muscular Endurance. Further the results of the study were favor to the Intermittent training with massage manipulation group.

Keywords: Massage Manipulation, Cardio Respiratory Endurance & Volleyball Players.

Introduction:

Intermittent exercise is a term used to describe a variety of different physical training types. The term "intermittent," which means to stop and start at intervals, and the term

"interval," as in interval training, is used somewhat interchangeably. In most circumstances, interval training will be conducted as a high intensity exercise activity.

By its nature, exercise is not aimless; it involves physical exertion that is directed towards the development, increase, or maintenance of physical fitness. Intermittent exercise is a description of the intensity of the activity as well as its nature.

Intermittent exercises of various types are best known where they have been employed as components to endurance sports. Disciplines such as distance running, road cycling racing, and mountain biking require the body to produce the energy necessary for physical performance through the aerobic energy system, which primarily utilizes stores of carbohydrate products, in the form of glycogen reduced, as energy is required, to the sugar glucose. To generate energy, the body through the cardiovascular system transports oxygen and other nutrients essential for muscle function. The greater the ability of the heart to pump blood volume to the muscles, the more efficient the production of energy and the removal of wastes such as carbon dioxide will be (Aguiar et al., 2008).

Intermittent exercise programmes will tend to increase the oxygen transporting capacity of the body, often referred to as by the shorthand VO_{2max} . As a further general rule, the greater the intensity of the intermittent period of training, the greater the VO_{2max} will be. By illustration, suppose two equally athletically talented and physically fit cyclists are monitored over a training period of six months. One cyclist maintains a set exercise programme of 60 minutes per day. The other cyclist rides the same distances at the same speed as the first for four days per week; his or her remaining three workouts are of higher intensity, intermittent workouts of four 15-minute segments—each separated by rest intervals of five minutes from the intermittent training, the cyclist would expect to obtain an increase in measured VO_{2max} levels in the range of 5-15%.

Massage is the systematic manipulation of the body's tissue. It is one of the oldest healing techniques still used in modern medicine. Massage is a very effective treatment method for promoting local and systematic relaxation, increasing local blood flow and encouraging venous return.

In all types of massage, the therapist has specific aims in mind, and in sport we focus on the individual needs of the athlete. With the ever growing number of people taking part in sport, combined with the increasing competitiveness and intensity of physical exercise, the demand for sports massage is also increasing and becoming more and more recognized as a skill which may aid recovery and enhance performance (Dawson et al., 2004).

Sports massage does have some aims in common with other forms of massage and it is especially important to have a thorough understanding of anatomy and physiology, in

particular the muscular and skeletal systems. By understanding these systems and the effects of exercise, we may also appreciate how massage may benefit the sports person and becomes an integral part of the athlete's training programme. Athletes who are looking to improve performance and increase their competitive edge do so by adopting a training schedule to enhance their skill, strength, stamina, suppleness and speed. The degree to which they develop and utilize these qualities will depend on other factors such as the level of competition, the sport played, and possibly their position in a team. However, no matter which sport, the aim is nearly always to increase the level of training and thereby subject the body to gradual and controlled overuse.

Objective of the Study:

The main objective of the study was to find out the impact of intermittent training with and without massage manipulation on cardio respiratory endurance performance among university women volleyball Players.

Methodology:

The study was conducted on forty five (N=45) women volleyball players who participated in Tamilnadu sports University intercollegiate volleyball tournaments during the year 2015-2016 were selected as subjects. The age of the subjects ranged between 18 to 21 years. The subjects were divided at random into three groups of fifteen each (n=15). Group-I underwent Intermittent Training with Massage Manipulation, Group-II underwent Intermittent Training without Massage Manipulation, and Group-III acted as Control. The duration of the training period was restricted to twelve weeks and the number of sessions per week was confined to three. Cardio Respiratory Endurance only selected as the dependent variable for this study and it was assessed by Cooper's 12 Minutes Run/walk Test. All the subjects were tested prior to and immediately after the training period of twelve weeks for all the selected variables. The data collected data from the three groups prior to and immediately after the training programme on the selected criterion variables were statistically analyzed with Analysis of Covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, Scheffe's post hoc test was followed to determine which of the paired mean differences was significant. In all the cases .05 level of confidence was fixed to test.

Results and Discussion:

The results of the dependent 't'-test on the data obtained for Cardio Respiratory Endurance of the subjects in the pre-test and post-test of the experimental groups and control group have been analyzed and presented in Table No -I.

Table No – I

Summary of Mean Standard Deviation and dependent ‘t’ test for the pre and post tests on Cardio Respiratory Endurance of Experimental groups and Control group (Cardio Respiratory Endurance is expressed in Seconds)

Test	Descriptive Statistics	Intermittent Training with Massage Manipulation Group	Intermittent Training without Massage Manipulation Group	Control Group
Pre Test	Mean	2105.33	2164.00	2160.00
	SD (±)	80.79	62.88	80.49
Post Test	Mean	2486.00	2374.67	2161.33
	SD (±)	105.82	100.56	81.32
Adjusted Post Test	Mean	2511.90	2360.60	2149.50
“t” Test		11.07*	6.88*	0.02

*Significant at 0.05 level.

The table value required for 0.05 level of significance with df 14 is 2.15.

Table No-I shows that the pre-test mean and standard deviation of Cardio Respiratory Endurance on Intermittent Training with Massage Manipulation group, Intermittent Training without Massage Manipulation and Intermittent training group and Control group are 2105.33 ±80.79, 2164.00 ± 62.88, and 2160.00 ± 80.49 respectively. The post-test mean and standard deviation are 2486.00 ± 105.82, 2374.67 ± 100.56, and 2161.33 ± 81.32 adjusted post-test means are 2511.90, 2360.60, and 2149.50 respectively.

The obtained dependent t-ratio values between the pre and post test means on Cardio Respiratory Endurance of Intermittent Training with Massage Manipulation group, Intermittent Training without Massage Manipulation Intermittent training group and Control group are 11.07, 6.88, and 0.02 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. It was concluded that Intermittent Training with Massage Manipulation group and Intermittent Training without Massage Manipulation had registered significant improvement in Cardio Respiratory Endurance.

The results of the Analysis of Covariance on Cardio Respiratory Endurance of the pre, post, and adjusted test scores of Intermittent Training with Massage Manipulation group, Intermittent Training without Massage Manipulation group and Control group are presented in Table No - II.

Table – II
Analysis of Covariance of the Data on Cardio Respiratory Endurance of Pre, Post and Adjusted Scores of Experimental Groups and Control Group

Test	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	Between Groups	32573.33	2	16287.00	2.88
	Within Groups	237426.67	42	5653.00	
Post-Test Mean	Between Groups	816573.33	2	408287.00	43.87*
	Within Groups	390906.67	42	9307.30	
Adjusted Post-Test Mean	Between sets	920055.77	2	460028.00	67.22*
	Within Sets	280607.89	41	6844.10	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23

Table-II shows that the obtained F-ratio value of 2.88 for pre test mean of Intermittent training with Massage Manipulation group, Intermittent training without Massage Manipulation group and Control group on Cardio Respiratory Endurance is less than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 43.87 for post test mean of Intermittent training with Massage Manipulation group, Intermittent training without Massage Manipulation group and Control group on Cardio Respiratory Endurance is more than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 67.22 for adjusted post test mean of Intermittent training with Massage Manipulation group, Intermittent training without Massage Manipulation group and Control group on Cardio Respiratory Endurance is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicate that there is a significant difference between the adjusted post-test means of Intermittent training with Massage Manipulation group, Intermittent training without Massage Manipulation group and Control group on Cardio Respiratory Endurance.

Since three groups are compared and whenever the obtained 'F' ratio for adjusted post test is

found to be significant, Scheffe's test is used to find out the paired mean difference and it is presented in Table No-III.

Table No - III

Scheffe's Test for the Difference between Paired Means on Cardio Respiratory Endurance

Intermittent Training with Massage Manipulation Group	Intermittent Training without Massage Manipulation Group	Control Group	Mean Difference	Confident Interval Value
2511.90	2360.60	---	151.30*	76.78
2511.90	---	2149.50	362.40*	
---	2360.60	2149.50	211.10*	

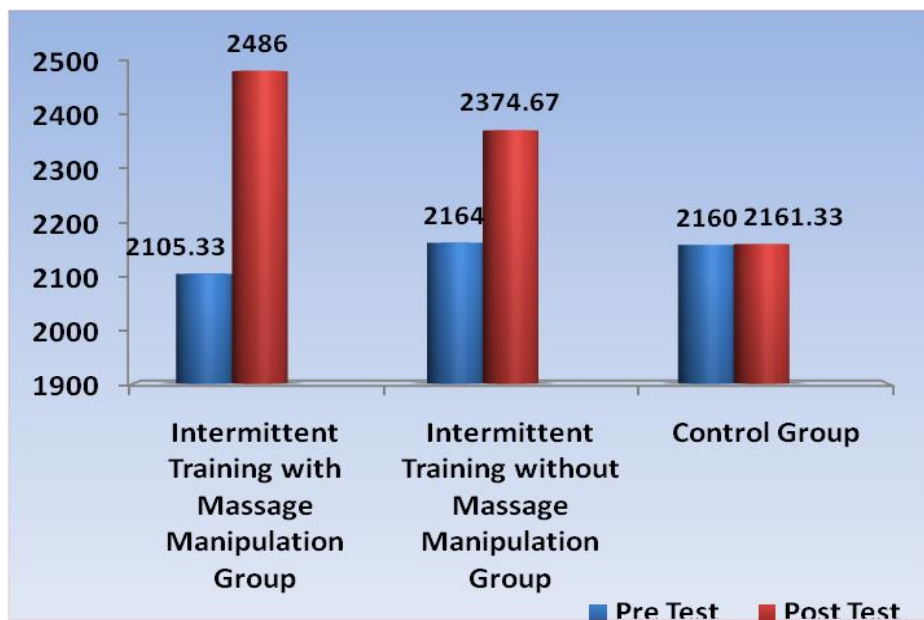
***Significant at 0.05 level of confidence.**

Table No-III shows that the mean difference values of Intermittent training with Massage Manipulation group and Intermittent training without Massage Manipulation group, Intermittent training with Massage Manipulation group and Control group and Intermittent training without Massage Manipulation group and Control group are 151.30, 362.40, and 211.10 respectively, which are greater than the confidence interval value of 76.78 on Cardio Respiratory Endurance at 0.05 level of confidence. The results of the study showed that there was a significant difference between Intermittent training with Massage Manipulation group and Intermittent training without Massage Manipulation group, Intermittent training with Massage Manipulation group and Control group and Intermittent training without Massage Manipulation group and Control group.

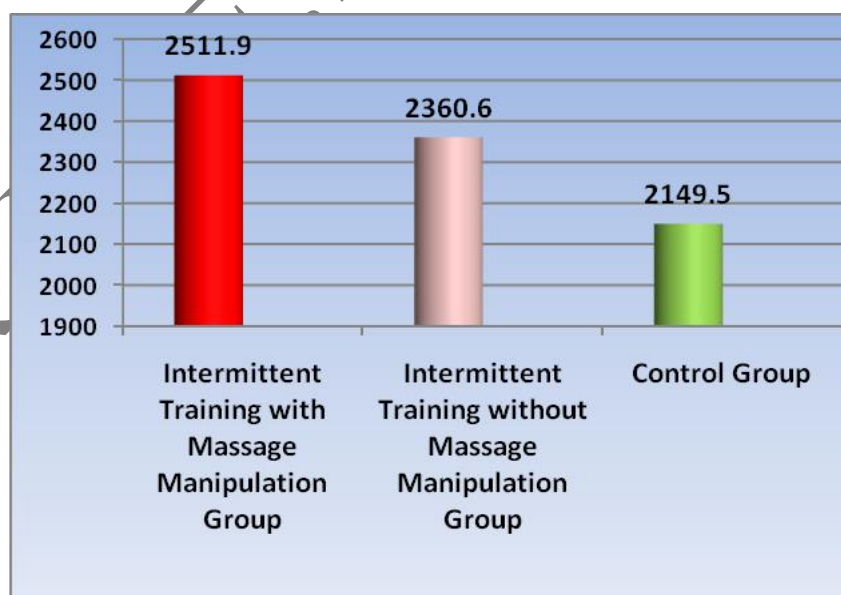
The above data also reveal that Intermittent training with Massage Manipulation group had shown better performance in Cardio Respiratory Endurance. The pre and post mean values of Intermittent training with Massage Manipulation group, Intermittent training without Massage Manipulation group and Control group on Cardio Respiratory Endurance are graphically represented in the Figure -I. The adjusted post mean values of Intermittent training with Massage Manipulation group, Intermittent training without Massage Manipulation group and Control group on Cardio Respiratory Endurance are graphically represented in the Figure –II

Figure No: 1

The Pre and Post test Mean Values of Intermittent Training with Massage Manipulation group, Intermittent Training without Massage Manipulation group and Control group on Cardio Respiratory Endurance (In Seconds)



The Adjusted Post Mean Values of Intermittent Training with Massage Manipulation group, Intermittent Training without Massage Manipulation group and Control group on Cardio Respiratory Endurance (In Seconds)



Conclusion:

From the analysis of the data, the following conclusions were drawn:-

The Experimental groups namely, Intermittent training with massage group and Intermittent training without massage group had significantly improved in Cardio Respiratory Endurance. Significant differences in achievement were found among Intermittent training with massage group and Intermittent training without massage group in Cardio Respiratory Endurance. The Intermittent training with massage group was found to be better than the Intermittent training without massage group and Control Group in developing Cardio Respiratory Endurance.

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