



Effect Of Yogic Practices On Cardio-Respiratory Endurance Among Kabaddi Women Players

Kadithi Radha, Ph.D. (Full time) Research Scholar, Department of Physical Education and Sports Sciences, S.K. University, Ananthapuramu.

Prof. M.V. Srinivasan, Head and Chairman, BoS, Department of Physical Education and Sports Sciences, S.K. University, Ananthapuramu.

Abstract

The purpose of this study was to find out the effects of the yogic practices (yogasanas and pranayama) to improve the cardio-respiratory endurance ability among the college women kabaddi players. The data on selected variable was collected by using Harward Step Test. The data collected from the two groups before and after the experimental period were statistically examined for significant improvement by dependent 't' test. To make adjustments for difference in the initial means and to test the adjusted post test means for significant differences between two groups, the analysis of covariance (ANCOVA) was used. In all the cases 0.05 level was fixed as significant level to test the hypothesis. The results proved that the practice of selected yogasanas and pranayama for twelve weeks by experimental group, the cardio-respiratory endurance ability was improved significantly. There was no improvement of cardio-respiratory endurance in the control group because they did not do additional practice of yogasanas and pranayama.

Key words: Yogic Practices, Cardio-respiratory Endurance, Harward Step Test.

Introduction

Yoga is the subject derived from ancient Indian tradition, which effected devotional wisdom, ethics, spiritual, moral, physical and psychological effect on human mind and body. Yoga is a way of life, a conscious act and not merely a set or series of learning principles. The dexterity, grace, poise cultivated, as a matter of course, is the natural outcome of regular practice. It requires no major physical effort. In fact trying hard will turn practices into a humdrum, painful, even injurious to routine and will eventually slow down our progress. Subsequently and interestingly, the therapeutic effect of yoga is the direct result of involving the mind totally in inspiring the body to be awakened.

The word "Yoga" was derived from the Sanskrit root "Yujir Yogey" means to unite, to yoke, to join or to put together. Yoga is not about mind or body. On the other side, yoga is about developing harmony between them. In yoga practice, the mind is used to perceive (diagnose) and guide (heal) our body.

Yoga is in the spiritual sense of human being, balancing and harmonizing the body, mind and emotions. This is done through the practice of asana, pranayama, mudra, bandha, shatkarma and meditation.

The Bhagavad Gita explains the term of yoga that work alone is the privilege and never the fruits thereof. One must work in the name of the Lord, abandoning selfish desires, not being effected by success or failure. This equipoise is called yoga (**Iyengar BKS, 1979**).

Yogasana and Pranayama

The basic definition of yoga asana, derived from the Sanskrit word “to sit,” in anyone of the various positions of the body performed in yogic exercise.

Karmadhenu Tantra discusses the etymology of the word Asana: where ‘A’ stands for Atma samadi, ‘sa’ for Sarvaroga pratibandha and ‘na’ for Siddhiprati.

Raghavendra Saraswati uses the term ‘Yoga Asanas’ to refer any positioning of the body for sitting that succeeds in providing steadiness and comfort to the practitioner.

Yoga positions are not about how far you can reach to touch your toes or how many repetitions you can perform. It is all about paying attention to how your body feels, how it moves without that excruciating pain or agony. Yoga is all about breathing correctly and about integrating that breath into your being.

Pranayama

The word ‘pranayama’ is formed by two words i.e., ‘Prana’ and ‘Ayama’. ‘Prana’ means life force, which provides energy to different organs (including mind) and also controls many vital life processes, like respiration and circulation of blood. ‘Ayama’, on the other hand, signifies the voluntary action to control and direct this prana. Breathing is one of the vital activities governed by prana. This is the only pranic activity, which, the human beings can voluntarily regulate. Secondly, the breathing system is linked with the nervous system (base of the mental activity) on one hand and the mind (consciousness) on the other. Yoga has taken best advantage of this situation, considering that the mind could be controlled effectively with the voluntary regulation over breathing.

According to Patanjali, a slightest change brought in the normal speed of breathing is pranayama. Also systematically controlled and prolonged inhalation and exhalations constitute pranayama. Obviously to do this a voluntary control is necessary. In normal breathing also, there is a pause between inhalation and exhalation that may be only for a few milliseconds. Therefore, voluntary control brought on any one of the three, i.e., inhalation, exhalation and the pause or on all three, is called pranayama.

Cardio-respiratory Endurance

Cardio-respiratory endurance is your body's ability (heart, lungs, blood vessels, muscles) to efficiently supply oxygen during sustained, moderate-to-high intensity exercise, indicating overall fitness and allowing you to perform activities longer without fatigue, improved by aerobic exercises like running, swimming, or cycling. It's a key fitness component, often called aerobic fitness, showing how well your body uses oxygen for energy, benefiting heart health, blood pressure, and daily stamina.

Circulatory-respiratory endurance has been defined by Mathews and Fox as the ability of the lungs and heart to take in transporting adequate amounts of oxygen to the working muscles, allowing activities that involve large muscle masses, to be performed over long periods of time. Cardio-respiratory endurance has an additional implication as to recover from severe exercise” (**Donald K Mathews and Edward L Fox, 1976**).

Statement of the Problem

The researcher has selected the topic which is stated as, impact of yogic practices on cardio-respiratory endurance among women kabaddi players.

Hypotheses

The systematic practice of yogasanas and pranayama have been undertaken and the following hypotheses are formulated.

There may be significant improvement exist on cardio-respiratory endurance by practicing yogasanas and pranayama among women kabaddi players.

Selection of Kabaddi Players

The purpose of the study was to find out the effect of yogic practices on selected hormones and bio-motor variables. To achieve the purpose of this research study, the investigator recruited a total of thirty two women Kabaddi players ($N=32$) randomly who represented at inter-collegiate level / district level / zonal level / state level Kabaddi tournaments. Among 32 Kabaddi players, the investigator selected sixteen (16) Kabaddi women players from Ananthapuramu District, Andhra Pradesh, India and sixteen (16) women Kabaddi players from Kurnool District, Andhra Pradesh, India. The women Kabaddi players were randomly selected from the both districts separately, sixteen in each district. The age, height and weight of the subjects ranged from 17 to 19 years age, 160 to 170 centimeters and 45 to 55 kilograms respectively. The means were 18 years, 165 centimeters and 50 kilograms respectively. Kurnool District Kabaddi players were treated as a control group and Ananthapuramu District Kabaddi players were treated as an experimental group. Control group subjects did not perform any type of yogasanas and pranayama rather than their regular kabaddi practice. Experimental group, i.e. Ananthapuramu District women Kabaddi players who were the subjects of experimental group underwent practice of yogasanas and pranayama daily one hour in the morning, 6 days in a week till 12 weeks in addition to their regular kabaddi practice, along with regular coaching. The Experimental group Kabaddi players voluntarily and actively engaged in specific training for twelve weeks.

Training Programme

During the training period, the experimental group underwent yogasanas and pranayama training programmes three days per week on alternate days for twelve weeks in addition to their regular college activities and practice of kabaddi.

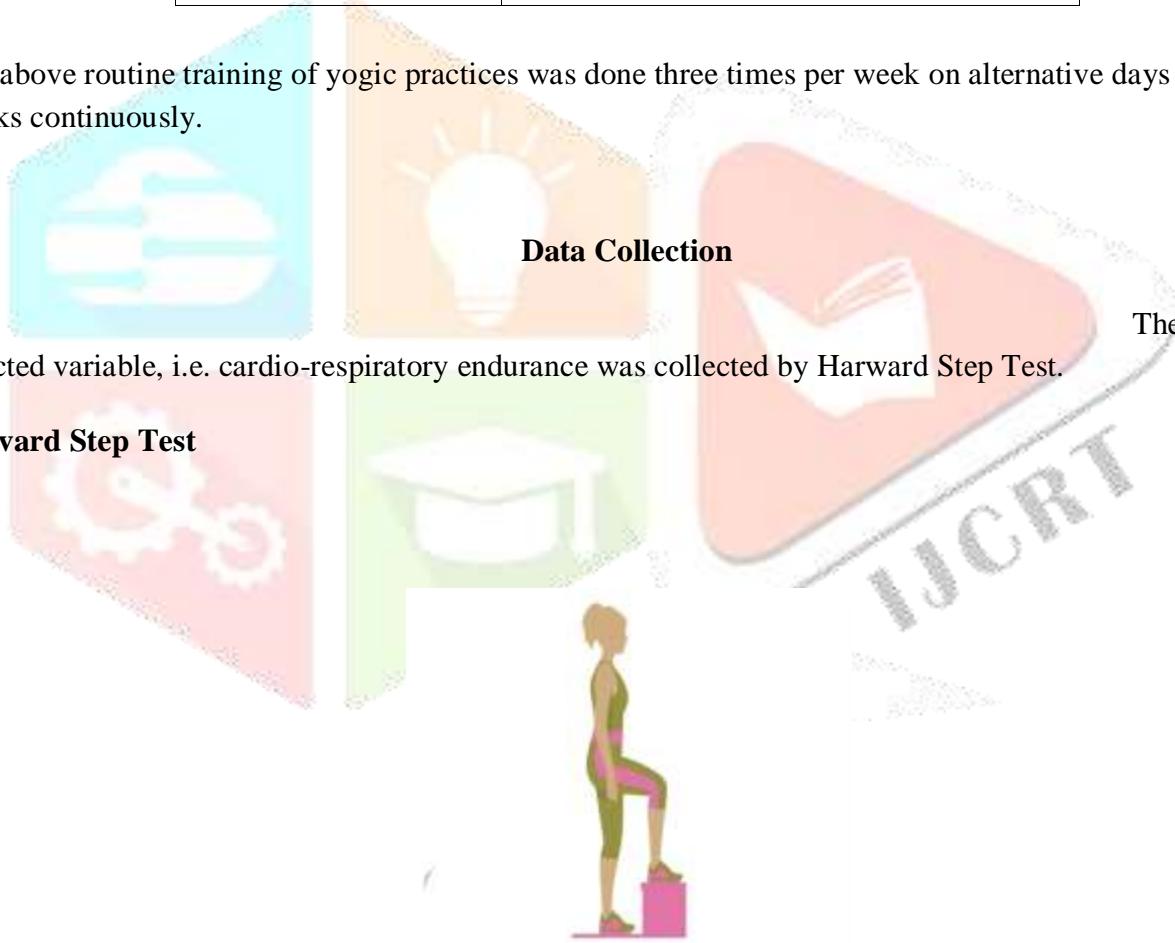
Yogic Practices Training

Yoga and pranayama have been incorporated into modern medicine during recent days. For the purpose of yogic practices training, various yoasanas including suryanamaskar, which are given below in Table I and the following different types of pranayama techniques were selected as training protocols:

Table I
LIST OF YOGASANAS

Yogasanas	Suryanamaskara Artha Padmasana Patchimottanasana Sarvangasana Chakrasana Halasana Uttana Padasana Janu Sirshasana Shalabasana Savasana
Pranayama Techniques	Anuloma Viloma Pranayama Kapalbathi Pranayama

The above routine training of yogic practices was done three times per week on alternative days for twelve weeks continuously.



Harvard Step Test

Purpose

The purpose of the test was to measure the cardio-respiratory endurance.

Equipment

Stop watch, 18 inches height stool used for this purpose.

Description

The body should be erect when the subject steps on to the bench. The subject continues to exercise at the prescribed condition that for five minutes, unless in feels that she must stop before that because of exhaustion. As soon as he stops exercising, he sits down and remains seated and quiet throughout the pulse count. The pulse rate taken at the radial artery at the wrist, in such a manner that palpitation was clearly felt by the finger tips. The measurement of palpitation was counted $\frac{1}{2}$ minutes.

Scoring

Pulse rate for $\frac{1}{2}$ minutes (30 seconds) recorded; sum of pulse count in recovery are taken, 1 to $\frac{1}{2}$ min., 2 to $2\frac{1}{2}$, 3 to $3\frac{1}{2}$ minutes after exercise.

The three resting pulse count is taken and physical efficiency index is calculated aging the formula.

$$P.E.I. = \frac{\text{Duration of exercise in seconds} \times 100}{2 \times \text{sum of pulse count in recovery}}$$

Statistical Techniques

The data was collected from control group and experimental group prior and after experimentation training on cardio-respiratory endurance were statistically examined for significant difference by dependent 't' test. No attempt was made to equate the groups in any manner. To test the adjusted post means for significant differences between two groups, the analysis of covariance (ANCOVA) statistical method was applied. In all the cases the criterion for statistical significance was set at 0.05 level of confidence. The data was analysed by computer using statistical packages.

Analysis of the Data and Results of the Study

The subjects of two groups were tested on selected criterion variable, i.e. cardio-respiratory endurance prior and after training period.

Cardio-respiratory Endurance

The mean and dependent 't' test values on Cardio-respiratory Endurance of control and yoga (experimental) groups have been analysed and the results are given in the Table II.

Table II

SUMMARY OF MEANS, STANDARD DEVIATIONS AND DEPENDENT 'T' TEST FOR THE PRE, POST AND ADJUSTED POST TESTS ON CARDIO-RESPIRATORY ENDURANCE OF CONTROL AND EXPERIMENTAL GROUPS

(Cardio-respiratory Endurance scores are expressed in pulse count)

Tests / Groups		Control Group	Experimental Group
Pre test	Mean	70.896	72.128
	SD	7.007	5.884
Post test	Mean	71.122	77.903
	SD	6.921	7.045
Adjusted Post test	Mean	71.750	77.275
't' test		0.784	7.909*

*Significant at .05 level. The table value required for .05 level of significance with df 15 is 1.753.

The Table II shows that the obtained dependent t-ratio between the pre and post test means on cardio-respiratory endurance of control and experimental groups are 0.784 and 7.909 respectively. The table value required for significant difference with df 15 at .05 level is 1.753. Since, the obtained 't' ratio between pre and post tests of experimental group is greater than the table value, it implies that yoga training group has significantly improved on the cardio respiratory endurance. However, the control group did not improved significantly as the obtained 't' value is less than the table value, because they were not subjected to any specific training.

The analysis of covariance on cardio-respiratory endurance of control and yoga groups have been analysed and presented in Table III.

Table III

**ANALYSIS OF COVARIANCE FOR THE DATA ON CARDIO- RESPIRATORY ENDURANCE
BETWEEN CONTROL AND EXPERIMENTAL GROUPS**

Groups	Sources of Variance	Sum of Squares	df	Mean Squares	F-Ratio
Pre test	Between	12.140	1	12.140	0.290
	Within	1255.981	30	41.866	
Post test	Between	367.883	1	367.883	7.545*
	Within	1462.819	30	48.761	
Adjusted Post test	Between	241.896	1	241.896	44.587*
	Within	157.332	29	5.425	

* Significant at .05 level of confidence. The table value for significance at 0.05 with df 1 and 30 and 1 and 29 are 4.17 and 4.18 respectively.

Table III shows that the F-ratio for pre test of cardio-respiratory endurance is 0.290 against the table value 4.17 (df 1 and 30) which is less than the .05 level of confidence. It implies that there is no significant difference between the pre test mean scores of control and experimental groups on cardio- respiratory endurance.

From the above table it infers that the F-ratio for post test of cardio-respiratory endurance is 7.545 against the table value 4.17 (df 1 and 30) which is significant at .05 level of confidence. Since the obtained F-ratio is greater than the table value, it implies that there is significant difference between the post test mean scores of control and experimental groups on cardio-respiratory endurance.

The Table III also reveals that the F-ratio for adjusted post test of cardio-respiratory endurance is 44.587 against the table value 4.18 (df 1 and 29) which is significant at.05 level of confidence. Since the obtained 'F ratio is greater than the table value, it implies that there is significant difference between the adjusted post test mean scores of control and experimental groups on cardio-respiratory endurance. It reveals the experimental group (77.275) is significantly proved better performance than the control group (71.750) on cardio-respiratory endurance.

The pre test, post test and adjusted post test mean values of yogic practices (experimental) group and control group on cardio-respiratory endurance are graphically presented in figure-I

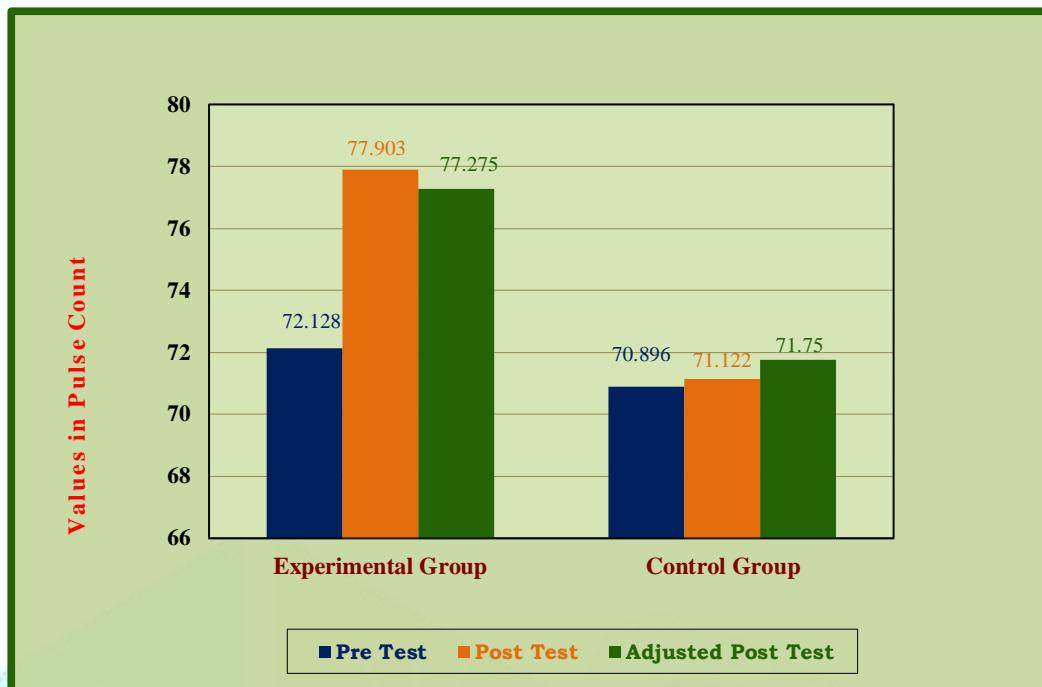


Figure I : MEAN VALUES OF PRE, POST AND ADJUSTED POST TESTS OF YOGIC PRACTICES (EXPERIMENTAL) GROUP AND CONTROL GROUP ON CARDIO-RESPIRATORY ENDURANCE

Discussion on Findings

Cardio-respiratory Endurance

The results of the study proved that there was significant difference between control group and experimental group in Cardio-respiratory Endurance. Experimental group was significantly higher than the control group.

This finding was supported by **Harinath K, et al., (2014)** experimental training among two groups randomly, Group I served as control group, Group II served as experimental group. Group I go flexibility and shorten duration game. Group II underwent yoga (posture) in addition practice. The results of study proved that the plasma melatonin also showed an increase and cardio-respiratory performance and psychological profile were improved.

According to **Telles S, et al., (2010)** there was a significant decrease in the amount of oxygen consumed and in breath rate and increase in breath volume in yoga trained group than non-trained group. The final results of this experiment, cardio-respiratory capacity (breath volume increased 29%) increased when practice of yoga.

According to **Bera T K and Rajapurkar M V (2013)** a significant improvement in ideal body weight, body density, cardio-vascular endurance and anaerobic power.

According to **Madanmohan, et al., (2012)** effect of yoga training on 12 weeks, there improvement on visual and auditory reaction times (RTs), maximum expiratory pressure (MEP), maximum inspiratory pressure

(MIP), 40 mmHg test, breath holding time after expiration (BHTexp), breath holding time after inspiration (BHTinsp), and handg rips strength (HGS).

Conclusions

From the analysis of the data in this study, the following conclusions were drawn. The practice of selected yogasanas and pranayama for twelve weeks by experimental group, the cardio-respiratory endurance was improved significantly. There was no improvement of cardio-respiratory endurance in control group.

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