



BHARATHIAR NATIONAL JOURNAL OF
PHYSICAL EDUCATION AND EXERCISE SCIENCES
BNJPEES

DOUBLE – BLIND REFERRED JOURNAL



From the Editors' Desk

Whilst we are striving hard to manage the new normal post Covid pandemic, there is a great realisation on health fitness and wellness. The department of Physical Education, Bharathiar university with societal responsibility publishes this 11th volume of 'The Bharathiar National Journal of Physical Education and Sports Sciences'. In spite of the pandemic break the editorial team had put in tremendous efforts to bring out this volume of research works and articles.

The Bharathiar National Journal of Physical Education and Exercise Science (BNJPEES) is an open access quarterly journal, double blind refereed journal with ISSN – 0976-3678 which publishes original articles, commentary, editorials, review articles and case reports covering recent innovative high quality researches on sports published by the Department of Physical Education, Bharathiar University Coimbatore since June 2010. The purpose of this journal is to enrich the field of physical education and sport with literary base dynamic latest research and articles. The field of sport and physical education with its dynamic nature needs a literary back up to keep the masses informed of the latest changes that are happening across this field. Since the Sports Climate is experiencing a wide range of change and is very much essential that we stretch ourselves to meet the key challenges on sports and games. Since the inception of the new editorial team from 2019, the journal has been upgraded online to increase the vicinity across the globe and provide a wider citation opportunity scaling up research heights. The journal has been indexed with google scholar, world cat, core and road.

We appreciate the research scholars for stepping forward to get their works published in our university journal. After thorough plagiarism check using Ithenticate and Turnitin, the articles are subjected to a double blind referee system for review. Based on the reviewers report the articles are accepted. Being We are also working hard towards quality control of the articles in par with the international standards.

From the editorial desk we submit to you that BNJPEES, with immense pleasure is working for the development of research in the field of Physical education and sports sciences which is the need of the hour. We encourage the authors to submit evidence based realtime research results which would benefit the society.



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Publisher's Desk

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S. No	Author and Title	Page.No
1.	Impact of circuit training on selected physical fitness parameters of women football players R.G.Giridharaprasath & A.S. Logeswaran	01-05
2.	Effect of aerobic training program on agility and cardio respiratory endurance of college men M. Rajkumar & G. Tamilselvan	06-10
3.	Cardio respiratory endurance response to the effect of aerobic dance training of college men C.Guruvupandian, & R.G.Giridharaprasath	11-17
4.	Performance Analysis of Grappling Techniques of Judo Used By Men judokas In 35th National Games 2015 Arun S	18-21
5.	Impact of yogic practices on physical and physiological, performance related variables of men volleyball players S. Muneeswaran	22-27



IMPACT OF CIRCUIT TRAINING ON SELECTED PHYSICAL FITNESS PARAMETERS OF WOMEN FOOTBALL PLAYERS

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Abstract

*This study was designed to investigate the impact of circuit training on selected physical fitness parameters of women football players. To achieve the purpose of the study 30 Inter-Collegiate women football players were selected from Nirmala College for women, Coimbatore. The subjects was randomly assigned to two equal groups (n=15). Group- I underwent circuit training (CTG) and Group - II was acted as control group (CG). The training was given to the experimental group for 3 days per week (Monday, Wednesday and Friday) for the period of eight weeks. The control group was not be given any sort of training except their routine work. The physical fitness parameters were speed (50m dash test), agility (4*10m shuttle run) and muscular strength (modified sit ups). The data collected from the subjects was statistically analyzed with 't' ratio to find out significant improvement if any at 0.05 level of confidence. The result of the speed, agility and muscular strength improved significantly due to impact of circuit training with the limitations of (diet, climate, life style) status and previous training the result of the present study coincide findings of the investigation done by different experts in the field of sports sciences. Circuit training significantly improved vertical jump, leg explosive power and kicking ability of inter-collegiate male football players.*

Keywords: Circuit training, speed, agility and muscular strength.

INTRODUCTION

Circuit training was originally developed in 1953 by Morgan and Anderson in England at the University of Leeds (Sorani, 1966). The original purpose of circuit training was to allow individuals to work out at their own level of intensity while still working out together as a group. An original circuit was made up of nine to twelve stations. An individual would work out

at a station for a set period of time before moving on to the next station with little or no rest. Traditionally, a fifteen second to three-minute aerobic station will be added between works out stations. This kept the aerobic system pumping and ready to go so that the individual burns fatter during their work out. Another variation of this that has been used in the past is having a group run around a gym or open area in a circle, with a trainer calling out bodyweight exercises at intervals.

The hypothesis argued in this paper is that inter collegiate women football players can significantly increase the physical fitness parameters of speed, agility and muscular strength by combining normal technical and tactical sessions with a circuit training program over a consecutive 8 weeks period. Therefore, the object of this study was to investigate the changes in the parameters produced during 8 weeks of circuit training in 15 women football players.

METHODS

Experimental Approach to the Problem

In order to address the hypothesis presented herein, we selected 30 Inter-Collegiate women football players from Nirmala College for women, Coimbatore. The subjects were randomly assigned in to two equal groups, namely, circuit training group (n=15) and control group (n=15). The respective training was given to the experimental group the 3 days per week (alternate days) for the training period of eight weeks. The control group was not given any sort of training except their routine.

DESIGN

The evaluated physical fitness parameters were speed height was assessed by 50m dash test and the unit of measurement was in sec, agility were assessed by 4*10m shuttle run the unit of

measurement was in sec and muscular strength was assessed by modified sit ups test the unit of measurement was in counts. The parameters were measured at baseline and after 8 weeks of circuit training were examined.

Training programme

The training programme was lasted for 45 minutes for session in a day, 3 days in a week for a period of 8 weeks duration. These 45 minutes included 10 minutes warm up, 15 circuit training for 25 minutes and 10 minutes warm down. Every three weeks of training 5% of intensity of load was increased from 65% to 80% of work load. The volume of circuit training is prescribed based on the number of sets and repetitions. The plyometric training is the length of the time each action is held for and the number action in total 3 day per weeks (Monday, Wednesday and Friday). The selected subjects underwent regular physical exercise on other 3 days (Tuesday, Thursday, and Saturday).

STATISTICAL ANALYSIS

The collected data on above said variables due to the impact of circuit training was statistically analyzed with 't' test to find out the significant Improvement between pre and post test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. (P < 0.05)

TABLE- I
COMPUTATION OF T RATIO ON SELECTED PHYSICAL FITNESS
PARAMETERS OF WOMEN FOOTBALL PLAYERS ON EXPERIMENTAL GROUP

Experimental Group		Mean	N	Std. Deviation	Std. Error Mean	T ratio
SPEED	Pre test	6.96	15	0.19	0.05	6.20*
	Post test	6.45	15	0.16	0.043	
AGILITY	Pre test	14.16	15	0.93	0.24	9.91*
	Post test	14.04	15	0.93	0.24	
MUSCULAR STRENGTH	Pre test	22.46	15	3.50	0.33	6.85*
	Post test	24.73	15	3.39	0.31	

*significant level 0.05 level (degree of freedom 2.14,1 and 14)

TABLE- II
COMPUTATION OF T RATIO ON SELECTED PHYSICAL FITNESS
PARAMETERS OF WOMEN FOOTBALL PLAYERS ON CONTROL GROUP

Control Group		Mean	N	Std. Deviation	Std. Error Mean	T ratio
SPEED	Pre test	6.93	15	0.20	0.05	0.94
	Post test	6.87	15	0.24	0.06	
AGILITY	Pre test	12.21	15	0.60	0.15	1.19
	Post test	12.04	15	0.56	0.14	
MUSCULAR STRENGTH	Pre test	12.66	15	2.63	0.17	1.14
	Post test	12.86	15	2.55	0.16	

*significant level 0.05 level (degree of freedom 2.14,1 and 14)

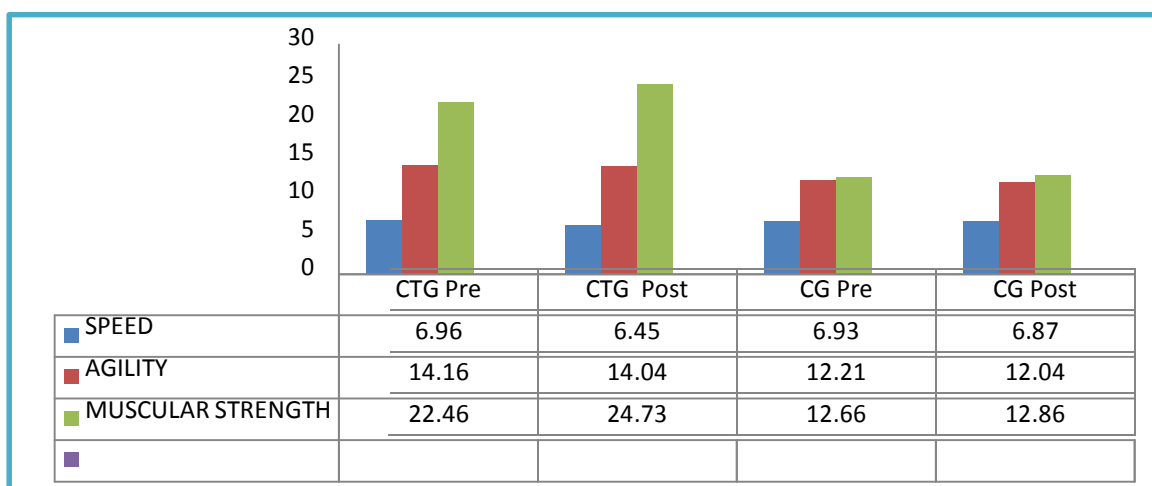


FIGURE- I BAR DIAGRAM SHOWING THE MEAN VALUE ON SELECTED PHYSICAL FITNESS PARAMETERS OF WOMEN FOOTBALL PLAYERS ON EXPERIMENTAL AND CONTROL GROUP

Table I reveals the computation of mean, standard deviation and 't' ratio on selected physical fitness parameters, namely speed, agility and muscular strength of experimental group. The obtained 't' ratio on speed, agility and muscular strength were 6.20, 3.11 and 2.65 respectively. The required table value was 2.14 for the degrees of freedom 14 at the 0.05 level of significance. Since the obtained t values were greater than the table value it was found statistically significant.

Table II reveals the computation of mean, standard deviation and 't' ratio on selected physical fitness parameters, namely speed, agility and muscular strength of experimental group. The obtained 't' ratio on speed, agility and muscular strength were 0.94, 1.19 and 1.14 respectively. The required table value was 2.14 for the degrees of freedom 14 at the 0.05 level of significance. Since the obtained t values were lesser than the table value it was found statistically not significant.

DISCUSSION AND FINDINGS

The present study experimented the impact of 8 weeks circuit training significantly improved the selected Physical fitness parameters of women football players. The results of this study indicated that circuit training is more efficient to bring out desirable changes over the speed, agility and muscular strength of women

football players. The finding of the present study had similarity with the findings of the investigators referred in this study. **Gettman (2011)** reported that the circuit weight training programme was most specific in improving strength and changing body composition and produced only a small aerobic effect measured on the treadmill running test. **Kaikkonen (2004)** suggested that circuit weight training was beneficial on muscular fitness. This type of exercise can be recommended for beginners because of its multilevel effects. **Daris et.al, (2007)** indicated that circuit training may be an effective starter programme to reduce fat deposits and improve insulin resistance in lattice youth who are overweight/obese. **Marcinik et.al, (1991)** reported that circuit weight training programme produced greater dynamic muscular strength and muscular endurance. **Patricia (1994)** determined the effects of 12 Weeks of Aerobic Circuit Training on Aerobic Capacity, Muscular Strength, and Body Composition in College-Age Women. **Jacobs's et.al (2001)** Circuit training provides cardio respiratory and strength benefits in persons with paraplegia

CONCLUSIONS

It was concluded that 8 weeks circuit training significantly improved the speed, agility and muscular strength of the women football players. From the findings it is postulated that the circuit is suitable mode to

bring out desirable changes over physical fitness parameters of women football players.

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EFFECT OF AEROBIC TRAINING PROGRAM ON AGILITY AND CARDIO RESPIRATORY ENDURANCE OF COLLEGE MEN

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Abstract

The term aerobic is a new word but not a new idea. Aerobics is a progressive physical conditioning programme that stimulates cardio respiratory activity for a period sufficiently long to produce beneficial changes in the body. This study was designed to effect of aerobic training program on agility and cardio respiratory endurance of college men. To achieve the purpose of the study 30 college men were selected from Bharathiar University Departments. Their age ranged between 21 and 25 years and they were divided into two equal groups consists of 15 each. Group I underwent the aerobic training program and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. The data were collected from the subjects and it was statistically analyzed with dependent 't' test to find out significant improvement if any at 0.05 level of confidence. The results speculated that the agility and cardio respiratory endurance of college men improved significantly due to the influence of aerobic training program with the limitations.

Keywords: Aerobic Training Program, Agility and Cardio Respiratory Endurance.

INTRODUCTION

Aerobic exercise can be defined as the ability to perform cardio vascular exercise, whether it is cross-country skiing, spinning, running, aerobic exercise or swimming, for an extended period of time. (Robergs and Roberts, 1997).

Aerobic exercise is essential to healthy cardio vascular fitness. Aerobic exercise produces beneficial changes in the body, especially the action of the lungs, heart and blood circulation. Some of the benefits of aerobic exercises include the

ability to utilize more oxygen during strenuous exercise, a lower heart rate at rest, the production of less lactic acid and greater endurance. Also, many exercise physiologists have found that it reduces blood pressure and changes blood chemistry. (Mitchell and Dale, 1980)

Regular aerobic training is associated with a reduced risk of atherosclerotic vascular disease and acute cardiovascular events in middle aged men and older adults. (Wing and Hill, 2001). Aerobic exercise requires the heart rate atleast sixty Percent of the maximal heart rate for an extended

period of time. It is the activity that can be sustained for an extended period of time without developing an oxygen deficit. It is characterized by one simple requirement the necessary to sustain repeated muscle contraction. This criterion is fulfilled through two basic functions, the ability to consume enough oxygen and an adequate fuel provision. The capacity for oxygen consumption is reliant upon the physiological parameters. As far as effect of aerobic exercises on cardiac system is concerned it facilitates the flow of air in and out of the lungs by strengthening the muscles involved in respiration, increase storage of energy molecules such as carbohydrates and fats within the muscles allowing increased endurance and blood flow through the muscles. (Bucker. 1983)

METHODOLOGY

Purpose of the study was to find out the effect of aerobic training program on agility and cardio respiratory endurance of college men. To achieve the purpose of the study 30 college men were selected from Bharathiar University Departments. Their age ranged between 21 and 25 years and they were divided into two equal groups consists of 15 each. Group I underwent the aerobic training program and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control

group was not given any sort of training except their routine work. The data were collected from the subjects and it was statistically analyzed with dependent 't' test to find out significant improvement if any at 0.05 level of confidence. In all cases the criterion for statistical significance was set 0.05 level of confidence.

TRAINING PROGRAMME

During the training period of the experimental groups underwent their respective training programme in addition to their daily regular activities as per the schedule. Experimental group underwent aerobic training program on three alternate days per week (Tuesday, Thursday and Saturday 6.30 am to 7.30 am) for twelve weeks. The experimental training Programme was designed based on the resources collected from books, periodicals, e-materials and discussions with the experts. The duration of experimental training were planned for 60 minutes. All the subjects involved in this study were carefully monitored throughout the training programme, none of the reported with tear and muscle soreness.

Table I shows that the pre test mean values of experimental group and control group 14.68, 2279.46 and 14.72, 2252.44 respectively and the post test mean values are 14.16, 2407.62 and 14.78, 2250.78 respectively. The obtained dependent t-test

between the pre and post test means on confidence is 2.14. The obtained 't' test value agility and cardio respiratory endurance of of experimental group was greater than the experimental group and control group are table value. The results clearly indicated that 10.96, 8.76 and 1.97, 1.51 respectively. The the agility and cardio respiratory endurance table value required for significant difference of the experimental group improved due to with degrees of freedom 14 at 0.05 level of the aerobic training program of college men.

TABLE - I
ANALYSIS OF 'T' RATIO FOR AGILITY AND CARDIO RESPIRATORY ENDURANCE

Variables	Group	Test	Mean	SD	DM	t-ratio
AGILITY	Experimental Group	Pre test	14.68	0.46	0.55	10.96*
		Post test	14.16	0.47		
	Control Group	Pre test	14.72	0.78	0.05	1.97
		Post test	14.78	0.82		
CARDIO RESPIRATORY ENDURANCE	Experimental Group	Pre test	2279.46	232.97	128.16	8.76*
		Post test	2407.62	185.14		
	Control Group	Pre test	2252.44	218.16	1.66	1.51
		Post test	2250.78	218.63		

(Significance at 0.05 level of confidence for df of 14 is 2.14)

AGILITY

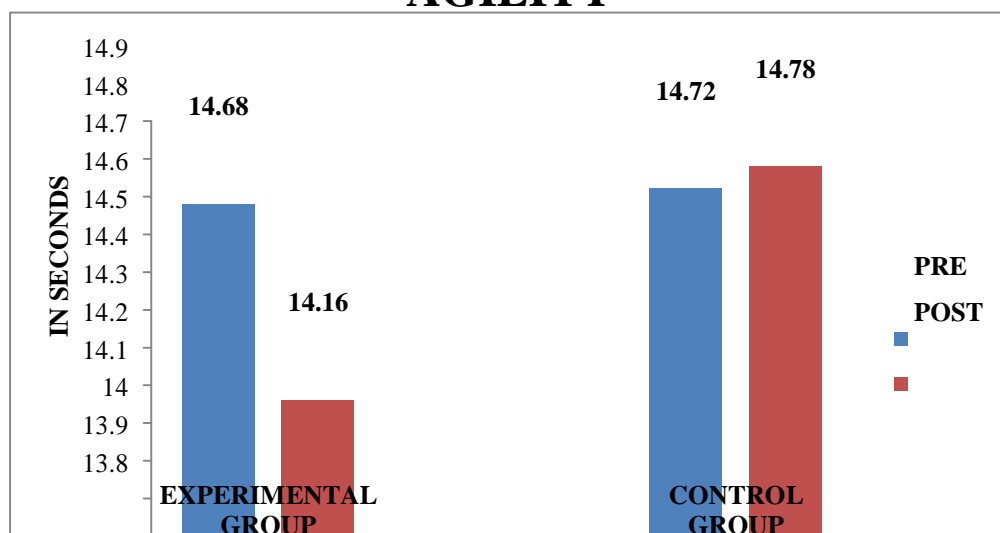
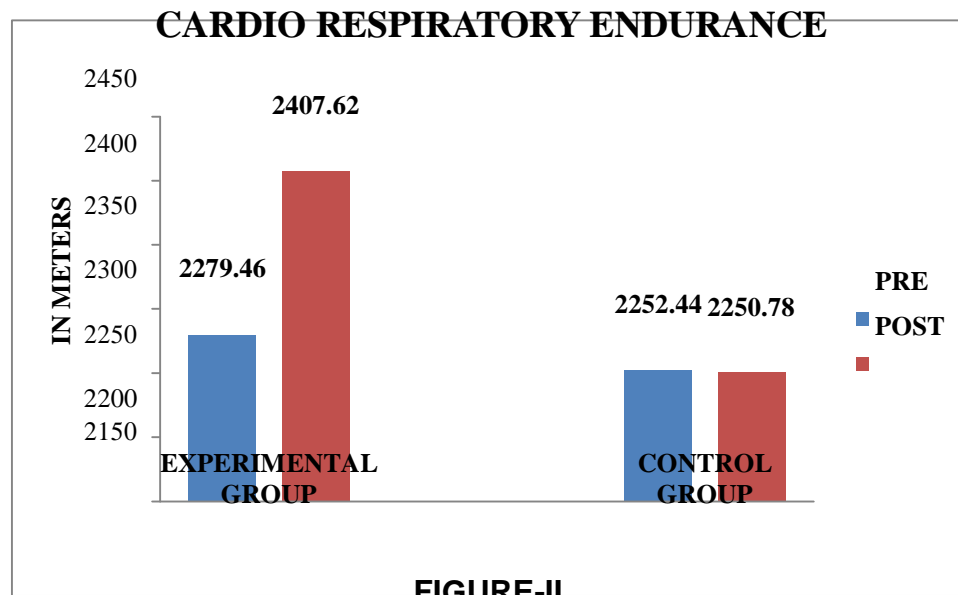


FIGURE -I

BAR DIAGRAM OF EXPERIMENTAL AND CONTROL GROUP ON AGILITY



BAR DIAGRAM OF EXPERIMENTAL AND CONTROL GROUP ON CARDIA RESPIRATORY ENDURANCE

DISCUSSIONS ON FINDINGS

The results of the study on selected agility and cardio respiratory endurance indicates experimental group (aerobic training program) caused significant improvement after the aerobic training program. supported the mean , the experimental group was found in better increasing on agility (**Miller et al.,(2006)**) and cardio respiratory endurance (**Radovanovic et al.,(2009)**) when compared to the control group.

CONCLUSION

The result of the study indicates that the aerobic training program group had significant improvement on agility and cardio respiratory endurance when compared to

the control group.

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Cardio respiratory endurance response to the effect of aerobic dance training of college men

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Abstract

This study was designed to investigate the effect of aerobic dance training on cardio respiratory endurance of college men. To achieve the purpose of the study, thirty college men were randomly selected from SMS College sivakasi. Their age ranged from 18 to 25 years. They were divided into two equal groups. (n=15). Group- I underwent Aerobic dance training (ADTG) and group - II was acted as control group (CG). Aerobic dance training was given to the experimental group for 3 days per week (Monday, Wednesday and Friday) for the period of eight weeks. The control group was not given any sort of training except their routine work. Cardiorespiratory endurance were assessed by Coopers 12 minutes run or walk, before and after training period. The data collected from the subjects were statistically analysed using 't' test to find out whether significant mean difference existed at 0.05 level of confidence. The result of the cardio respiratory endurance speculated significant improvement due to Aerobic dance training with the limitations of diet, climate, life style status and previous training. The results of the present study are in confirmatory with the findings of (Review). Thus it is concluded that Aerobic dance training significantly improves cardio respiratory endurance of college men.

Keywords: Cardiorespiratory endurance, Aerobic dance training.

Introduction

A system of exercise combining aerobics with dance steps and usually done to music. Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines. The goal is to improve all elements five of fitness (flexibility, muscular strength, muscular endurance and cardio-vascular fitness & body composition). It is usually performed to music and may be practiced in a group setting led by an instructor (fitness professional), although it can be done solo and without musical accompaniment. With the goal of preventing illness and promoting physical fitness, practitioners perform various routines comprising a number of different dance-like exercises. Formal aerobics classes are divided into different levels of intensity and complexity. Aerobics classes may allow participants to select their level of participation according to their fitness level. Many gyms offer a variety of aerobic classes. Each class is designed for a certain level of experience

and taught by a certified instructor with a specialty area related to their particular class. Aerobic dance mixes exercises and different kinds of dance like ballet and jazz into the routine. They are often considered low-impact exercises and slower paced in contrast to other aerobic programs, although there's also fast-paced programs. Because of these characteristics, they're suitable for many who need low-impact workouts such as the elderly, obese and those who are expecting a baby.

What makes aerobic dance an appealing program is, of course, its music. You'll find different types of music which may be used for different aerobic dances, there can be different speed and style variations of aerobic dances. There are rules for aerobic music. In most cases about 120 to 124 beats per minute for step aerobics. Regarding low-impact routines, it is usually about 136 to 148 beats per minute.

Beginners would dance or sweat it out with slower beats.

Aerobic dance could possibly be classified into high-impact, low-impact, step aerobics and water dance aerobics. High impact exercises, should include intensive exercises which includes jumping actions synchronized with the music. Step aerobics employs the step bench, and the water aerobics is conducted in both deep and waist-deep water. Besides from the movements along with the music, aerobic dance can also be coupled with fast or aerobic breathing. This pumps additional oxygen into the blood stream, reviving the body. Aerobic dance routines are usually 20 to 40 minutes in length, conducted 3 times a week. The routine is implemented much like rhythmic dances, with counts significant in laying down the beat. Before proceeding with the routine, getting warmed-up is important. It typically lasts for 10 to 15 minutes. Stretching exercises will certainly reduce risks of injury and simultaneously prepare the body for just about any extensive movement. Following the workout, cooling down exercises for another 5 to 15 minutes shall be performed to assist the heart and also the muscles relax.

Aerobic dancing has many benefits although they were done or practiced in a enjoyable way. This type of aerobic workout is a fantastic method to shed weight and at the same time, tone body muscles.

Similar to other exercises, aerobic dance will raise the circulation of the blood, decrease the levels of blood sugar and cholesterol. Since aerobic dancing would incorporate correct breathing exercises, far more oxygen is circulated in the heart, lungs and blood vessels which makes the body perform better and increase overall energy and stamina. The physical benefits also include a healthier immune system preparing the body against colds, flu and many other illnesses.

Aerobic dancing can also be a terrific way to deal with stress. If you are unable to leave the house in order to go to a fitness center, you could conduct the aerobic exercises at home, master the steps and pick your own tune.

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Methods

Experimental Approach to the Problem

In order to address the hypothesis presented herein, we selected 30 college men SMS College sivakasi. Their age ranged from 18 to 25 years. The subjects were randomly assigned in to two equal groups namely, Aerobics training (ADTG) (n=15) and Control group (CG) (n=15). The

respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of eight weeks. The control group was not given any sort of training except their routine.

Design

The evaluated Cardiorespiratory Endurance were assessed by Coopers 12 minutes run or walk the unit of measurement was in meters. The parameter were measured at baseline and after 8 weeks of aerobics dance training were examined. The intensity was increased once in two weeks based on the variation of the exercises.

Training Programme

The training programme was lasted for 45 minutes for session in a day, 3 days in a week for a period of 8 weeks duration. These 45 minutes included warm up for 5 minutes, 35 minutes aerobics dance training and 5 minutes warm down. The equivalent in aerobics dance training is the length of the time each action in total 3 day per weeks (Monday, Wednesday and Friday).

Table V reveals that the computation of 't' ratio between mean of pre and post test of experimental group & control group on Cardio Respiratory Endurance of college men. The mean values of pre and post test on experimental group & control group were 26.90, 34.00, 26.72 and 26.73 respectively. Since the obtained 't' ratio 17.33 was higher than the required table value 2.145 it was found to statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. Since the obtained 't' ratio .650 was less than the required table value 2.145 it was found to statistically not significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the cardio respiratory endurance of the control group had not been improved. The results clearly indicated that the Cardio Respiratory Endurance of the experimental group improved due to the influence of aerobic dance.

The bar diagram shows the mean values of pretest and posttest on Cardio Respiratory

Endurance of control group and experimental group

Discussion of Findings

The present study experimented the effect of aerobic dance training on cardio respiratory endurance of college men. The result of this study indicated that the aerobic dance training improved cardio respiratory endurance. The findings of the present study had similarity with the findings of the investigations referred in this study.

Kostic, et.al, (2005) compared the changes in cardiovascular fitness from two models of women's aerobic training. **Pechar, et.al,(1991)** evaluated the physical fitness effects of a high school aerobic dance curriculum, 34 subjects (13-18 years) participated in this study to evaluate the physical fitness effects experienced by engaging in the North East High School aerobic dance curriculum in North East, PA. **Cluphf (1999)** examined the physiological effects of a 12-week program of progressive low-impact aerobic dance on adults with mental retardation. **Arslan, (2011)** investigated that the effects of an eight-week step-aerobic dance exercise programme on body composition parameters in middle-aged sedentary obese women Regular physical activity leads to significant changes in terms of the reduction of health-related risks. **Williams, et.al, (1986)** experimented the changes in selected cardio respiratory responses to exercise and in body composition following a 12-week aerobic dance programme. **Milburn, et.al, (1983)** compared the training responses to aerobic dance and jogging in college females. **Williford, et.al, (1989)** experimented aerobic dance. **Pepper, et.al, (1984)** conducted a study on the dance a suitable form of exercise A physiological appraisal. **Stalec, et.al, (2007)** conducted a study on the impact of dance-aerobics training on the morpho-motor status in female high- schoolers. **Rousanoglou, et.al, (2005)** investigated the study of ground reaction forces and heart rate profile of aerobic dance instructors during a low and high impact exercise programme. **Mosher, et.al,(2005)** conducted a study on lipid and lipoprotein changes in premenstrual women following step aerobic dance training.

TABLE-I Computation of 't'-ratio between pre and post test means of experimental group and control group on cardio respiratory endurance					
Group	Test		Mean	Std. Deviation	T ratio
Cardio Respiratory Endurance	Experimental Group	Pre test	26.90	3.80	17.33*
		Post test	34.00	4.39	
	Control Group	Pre test	26.72	2.82	0.65
		Post test	26.73	2.82	

*Insignificant of 0.05 level of confidence (2.145)

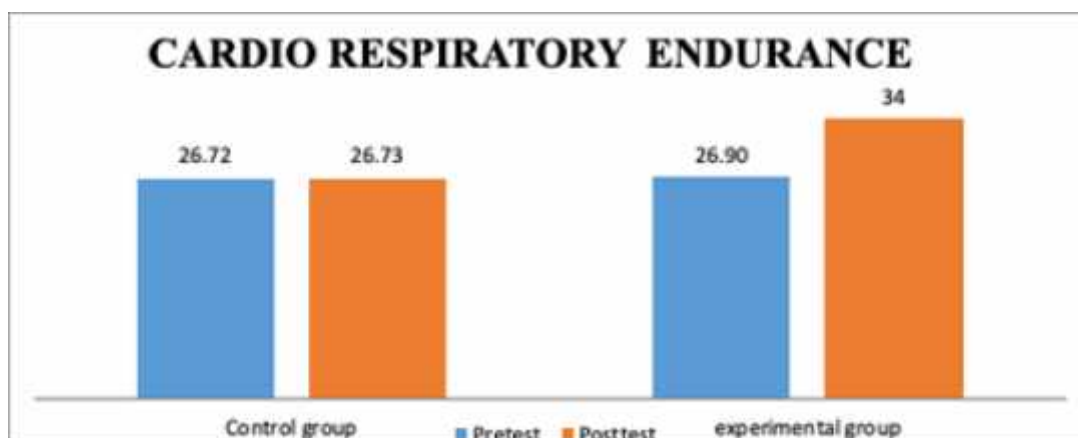


Figure I Bar diagram shows the mean values of pre and post test on cardio respiratory endurance of control group and experimental group

Wyon, et.al,(2005) conducted a study on the physiological monitoring of cardio respiratory adaptations during rehearsal and performance of contemporary dance. **Grier,et.al,(2005)** investigated a study on the metabolic cost of aerobic dance bench stepping at varying cadences and bench heights. **Isler, et.al,(2001)** conducted a study on the effects of step aerobics and aerobic dancing on serum lipids and lipoproteins. **Angelis, et.al,(1998)** conducted a study on the oxygen uptake, heart rate and blood lactate concentration during a normal training session of an aerobic dance class. **Hopkins, et.al, (1990)** experimented the low-impact aerobic dance on the functional fitness of elderly women. **McCord, et.al,(1989)** experimented the low impact dance training on aerobic capacity, sub maximal heart rates and body composition of college-aged females. **Parker, et.al, (1989)** investigated a study on the failure of target heart rate to accurately monitor intensity during aerobic dance.

Blessing, et.al, (1987) investigated the eight weeks of aerobic dance with and without hand-held weights. **Darby,et.al,(1995)** examined the cadence, impact, and step on physiological responses to aerobic dance exercise. Darby, et.al, (2000) examined the differentiated ratings of perceived exertion and physiological responses during aerobic dance steps by impact/type of arm movement. **Leelarungrayub,et.al,(2011)** experimented the six weeks of aerobic dance exercise improves blood oxidative stress status and increases interleukin-2 in previously sedentary women. **Burgess, et.al, (2006)** conducted a 6-week aerobic dance intervention on body image and physical self-perceptions in adolescent girls. **Shimamoto, et.al, (1998)** examined the low impact aerobic dance as a useful exercise mode for reducing body mass in mildly obese middle-aged women. **Schaeffer, et.al, (1995)** examined a study on the perceived exertion and metabolic responses of women during aerobic dance exercise. **Koutedakis, et.al,**

(2007) conducted a study on the effects of three months of aerobic and strength training on selected performance- and fitness-related parameters in modern dance students. **Hickey**, *et.al*, (1994) conducted a study on the aerobic dance injuries. Aerobic dance has taken the spotlight as one of the most popular forms of exercise in America. **Kemble (2003 –2006)** examined low to moderate intensity aerobic exercise on fatigue in breast cancer patients. **Wigaeus, et.al, (1980)** investigated a study on the physical demands during folk dancing to evaluate the aerobic demands during one of the most popular and demanding Swedish folk dances the "hambo". The discrepancy between the results and the results of previous studies might be attributed to several reasons, such as the training experience level of the subjects, the training programme, the intensity used and the duration of the training programme.

5. Conclusions

Based on the results, the following conclusions have been arrived.

1. It was concluded that eight weeks aerobic dance training significantly improved the cardio respiratory endurance of the college men.
2. Aerobic dance training is one among the most appropriate means to bring about the desirable changes over cardio respiratory endurance of college men. Hence, suggested that doctors and the fitness trainers deal with aged people to incorporate aerobic dance training as a component in their regular fitness activity.

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Performance Analysis of Grappling Techniques of Judo Used By Men judokas In 35th National Games 2015

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Abstract

The Technical efficacy of grappling techniques in 35th National Games 2015 were subject to analysis. 56 male competitors in seven weight categories of different states, competing in 77 bouts under the 2012-2016 IJF Rules were analysed using Open judo software and recorded video footage of National games 2015 judo competitions. The ultimate aim was to develop a technical profile for ground techniques in India judo, looking into technique type and grappling efficiency. After the data analysis the male participants most effectively use "Hell Strangle" technique (Jigoku Jime) to obtain scoring, with Yoko Shiho Gatame, Tata Shiho Gatame and Kami shiho Gatame are being the other most scoring and efficient techniques among Indian judokas.

Keywords: Technical efficacy, data analysis, judokas, Grappling techniques, Judokas.

Introduction

Olympic Judo is a sport with high relevance in understanding the reflexes, attacks and counterattacking capabilities of the players. A detailed analysis of techniques related to high performance Judo was conducted during 35th National Games held in Kerala in 2015. Judo competitions during the games lasted for 4 days and 56 male judokas from all over India participated. The major area of analysis was throwing of Judo. The entire competition was recorded using 4 video cameras. A single bout was recorded using four cameras; placing one each in every corner of the mat area. This was done in order to capture every movement by the judokas from every angle possible to make the analysis more reliable. A total of 77 bouts were conducted for male categories as well as all the 7 weight categories combined.

The seven weight categories for men are Extra Light Weight (-60kg), Half Light Weight (-66kg), Light Weight (-73kg), Half Middle Weight (-81kg), Middle Weight (-90kg), Half Heavy Weight (-100kg), Heavy Weight (above 100kg). Various tactics related to each weight category was analyzed according to classification of judo techniques. Different types of throwing were

analyzed. Throwing techniques were 67 in number and difference in techniques used by male judokas were closely watched and were noted down.

Out of 67 techniques approved by International Judo federations (IJF), 6 grappling techniques for male category were used by the referees for awarding points during the competitions. And the same parameters used by them were taken for our critical analysis. The procedure of analysis included close viewing of videos of each bout. The video was played in slow motion for better understanding of the techniques used by the judokas. The analyzing process was carried out by one international referee (IJF) and two national referees (JFI). The videos of a bout from cameras kept at four different angles were played simultaneously and these referees awarded points for the judokas according to their analysis. The scores awarded in real time for the bout during the competition were then compared with the scores awarded by the referees during the video analysis. And thereby it was analyzed whether the judgment during the competition was fair.

In the men's Extra Light Weight (-60kg) category successful grappling techniques were used once. In the men's Half Light Weight (-66kg) category successful grappling techniques were used once. In the men's Light Weight (-73kg) category successful grappling techniques were used thrice. In the men's Half Middle Weight (-81kg) category successful grappling techniques were used thrice. In the men's Middle Weight (-90kg) category successful 0 grappling techniques were used. In the men's Half Heavy Weight (-100kg) category successful grappling techniques were used 3 times. In the men's Heavy Weight (above 100kg) category successful throwing techniques were used once..

Population of the study

The participants for the study were the competitors qualified for the Judo competition of 35th National Games 2015 held at Thrissur, Kerala. The top 8 states qualified in men section were taken part in event was considered. The teams participated are Punjab, Haryana, Uttar Pradesh, Services Sports control Board, Rajasthan, Madhya Pradesh and host state Kerala in Men's section The total numbers of participants were 56 in 7 weight categories in Male section.

The above presented table.1 shows that, 112 Judo players participated in National Games 2015. Based on the gender, the population consists of 56 (50%) men and 56 (50%) women. Considering the participants' gender, in men section 7 weight category is included, 6 Ground techniques were used by men competitors for the competition. Among this Jigoku Jime was used 3 times. The success of Ground technique depends on the number of points scored in the competition. After considering the analysis of Successful Attacks (SA) 0.35 scored with Jigoku Jime. Yoko - Shiho - Gatame was scored 2 times with SA score of 0.22. Tate - Shiho - Gatame was scored 2 times with SA score of 0.22. Kami - Shiho - Gatame was also scored 2 times with SA score of 0.19. The ground techniques like Ude - Hishigi - Juji - Gatame, and Kata - Juji - Jime was used only once and have Successful Attacks (SA) value is 0.13.

In this figure.1 shows that the percentage of Successful Attacks (SA) in ground technique performed by men competitors. Jigoku Jime was mostly used by men judokas with 28% followed by Yoko shiho gatame and Tate shiho gatame scored 18% each, kami shiho gatame scored 16%. The scoring percentage of techniques like Ude - Hishigi - Juji - Gatame and Kata - juji jime scored 10% each.

Table .1 Descriptive Analysis On Successful Attacks (Sa) Of Ground Techniques Used By Men Competitors

SI No	Ne waza – Men (Ground Techniques)	Weight Categories							Total Score	Points Scored			Successful Attacks (SA)
		-60 Kg	-66 Kg	-73 Kg	-81 Kg	-90 Kg	-100 Kg	Above 100 kg		Yuko	Waza-Ari	Ippon	
1	Jigoku Jime	0	1	1	0	0	1	1	3	0	1	2	0.35
2	Yoko - Shiho -Gatame	0	0	0	1	0	1	0	2	0	1	1	0.22
3	Tate – Shiho - Gatame	0	0	1	1	0	0	0	2	0	1	1	0.22
4	Kami - Shiho - Gatame	1	0	0	1	0	0	0	2	1	0	1	0.19
5	Kata - Juji - Jime	0	0	0	0	0	1	0	1	0	0	1	0.13
6	Ude - Hishigi - Juji - Gatame	0	0	1	0	0	0	0	1	0	0	1	0.13

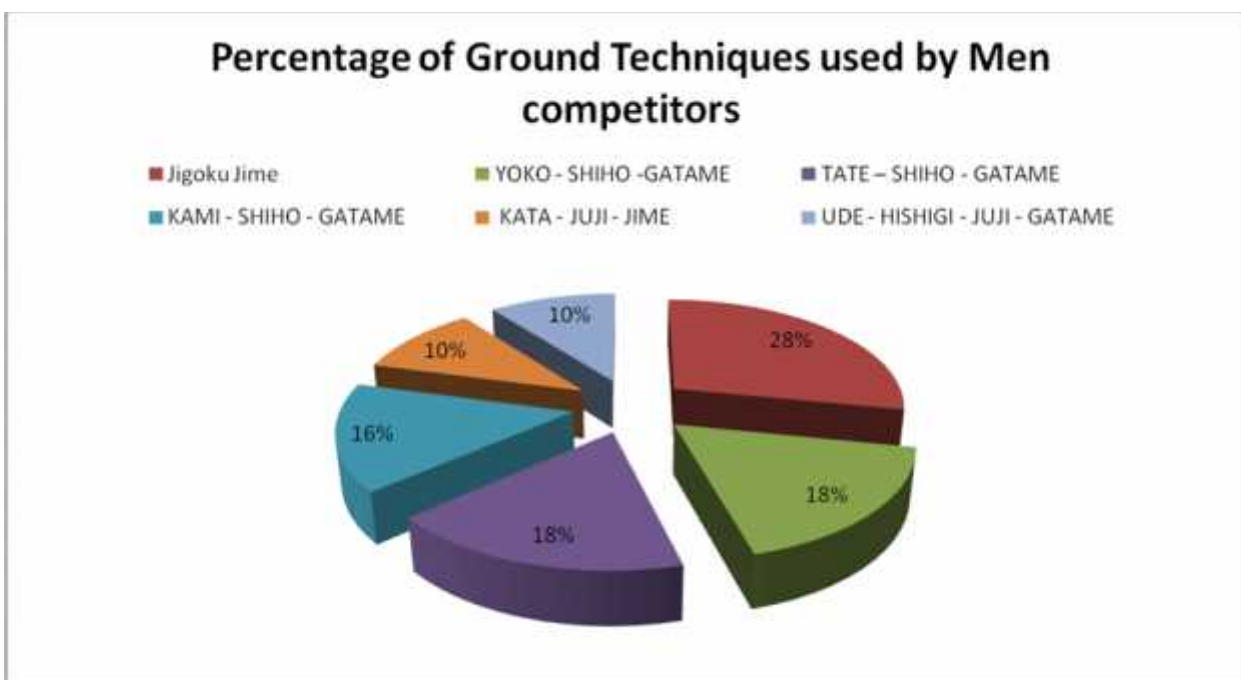


Figure .1 Percentage Of Ground Techniques Used By Men Competitors

Research instrument

The data for the purpose of study was collected from the analysis of video recordings of the 77 bouts and technical data of the Judo competitions (Indian participants) held in 35th National Games 2015. The video recordings were appropriately tabulated and further statistically analyzed in detail to determine the possibility of optimizing the relationship between technical and tactical training (Stekowicz and Koziol,1996) requirements of the Judoka. The present research initiative has been carried out in line with the international Algorithmic system (Hantau 2000) concept. As the international algorithmic system has been based on the complexity and specific motor actions the methodology for this study has been based on the international algorithmic systems.

Statistical tools applied

The present research initiative has been carried out in line with the international Algorithmic system (Hantau 2000) concept. Judo as a sport has high relevance in understanding the reflexes, attacks and counterattacking capabilities of the players. As the international algorithmic system has been based on the complexity and specific

motor actions the methodology for this study has been based on the international algorithmic systems.

Analysis

A method used by Adam (2007) and Glenn et.al, (2015) to order the efficiency has been used to identify the highest scoring techniques performed in British Judo.% of successful attacks = (No. of successful attacks/total number of attacks) x 100 (1)

The value of indices of efficient attacks (Sa) is equal to points scored by efficiently executed techniques during one contest,

$$Sa = (5 \times Y) + (7 \times W) + (10 \times I) / n \quad (2)$$

Where:

Y,W,I – number of attacks scoring for Yuko (Y),Wazari (W)and Ippon(I)

N – number of contests

The analysis of the techniques used by men Judo players of National Games 2015 were noted.

5. Conclusions

This study underlines the trend set in National level judo players of India regards to technique that are most effectively used in competition, with *Jigoku Jime* contributing the highest percentage of scores overall and in the majority of the analysed categories. Yoko shiho gatame and Tate shiho Gatame is the second most effective grappling technique used in the tournament. Kami shiho Gatame technique, is the next most frequently scoring attack within National games 2015..

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Impact of yogic practices on physical and physiological, performance related variables of men volleyball players

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Abstract

Volleyball is a game of constant action and requires continuous adaptations to changing situations by the team as a whole as well by the individual players. Forty women intercollegiate volleyball players of Bharathidasan University, Tiruchirappalli (Tamilnadu state) were selected as subjects for the study. They play Volleyball at College level competitions. Their age ranges from 18 to 23 years. Importance of variables at the high level performance, availability of equipment, feasibility aspect of measurement, the following variables are selected for this study: physical variables flexibility and cardio respiratory systems physiology variables namely heart rate, systolic blood pressure and diastolic blood pressure. Within the limitations, the results of present study seem to permit the following conclusion on college level women volleyballers. The training effects of yogic practices evidenced significant influence over the physical, physiological, and performance related variables of men volleyballers. Particularly by positively increasing flexibility, cardio respiratory endurance, volley pass and serving scores. In addition to this, heart rate, systolic blood pressure, diastolic blood pressure, levels were decreased.

Keywords: Flexibility, Heart rate, Systolic blood pressure, Diastolic blood pressure.

Introduction

Participation in modern sports is influenced by various physical, Physiological, factors. During training, besides good physique and physical fitness of the athlete, more emphasis is laid on the development of various types of motor skills involved in the game as well as on teaching the strategies, techniques and tactics of the game. Today's athletes face some unique challenges. The standards are higher, the competition is tougher, and the stakes are greater. Among the best, Physical preparation is to be more complete, and the psychological component is more vital than ever before.

Volleyball is a game of constant action and requires continuous adaptations to changing situations by the team as a whole as well by the individual players. Although it is a team game, there is ample room for players to display their brilliance through individual performance with the ball as well as through the team play involving improvisation and tactical knowledge. One of the greatest strengths of the game is its simplicity. At

its crudest level all that are needed is a ball with something to act as net. No other sport is so easily available and so immediately inspiring. The most exciting quality of volleyball is that it is a quick moving and a fast flowing game. The simplicity of the rules and familiarity of the tactical moves make every movement of the play immediately unpredictable.

Strength is important for volleyballers because the spiker must spike the ball heavily, which can be done only with the help of the strength of his arms and legs. Since the game takes a considerable amount of time to finish, a team has to play about an hour or more to complete the whole five sets. So volleyball must have a good cardio respiratory endurance to play efficiently even during the fifth set. Being flexible enables greater range of movement in the execution of spiking, and movements around the court may be easier. Good flexibility may also reduce the incidence of injury in the long term. Co-ordination is a very important component for

any player to excel in any game. In volleyball it is very vital because often the ball will be in the air and the player must coordinate with his hand, eye and leg before spiking, blocking, volley pass and serving. Co-ordination is an effective and useful quality for any volleyball whether he is a spike, blocker, setter or a libero. Agility plays a crucial role in this game. During the play a player has to move quickly in all the direction to retrieve the ball. If one is agile enough he will be a good spike, setter and libero. Speed in which a player moves to retrieve or spike the ball is contributing more to win the game. It is also an important component for volleyball to develop before competition. The ability to jump also plays an important role while spiking.

Yoga

The word 'Yoga' itself comes from a Sanskrit word meaning 'Yoke' or 'union'. It conveys the idea of harnessing oneself to a discipline and at the same time of unifying the part of the self, body, mind and spirit and the individual self with something greater and transcendent, a concept which may be expressed as God, the Absolute, the Greater self, the universal flow of life and so on, according to one's religious and philosophical stance. Yoga is an art, a science and a philosophy.

Physical aspects of Yoga

Yoga is an excellent method of enhancing the performance of sports participants. Salient feature of yoga is the combination of both physical conditioning and focused concentration. Physical fitness can be attained excellently by indulging in yogic routine. Yogic exercises deal with the vital organs of the body on which health depends. The precursor for physical fitness lies in the efficient working of the vital organs of the body and yoga aims at it. The various selected 'asanas' giving different movements to the spine, controlled respiration, relaxation technique and concentration practice as a whole form an excellent routine to take care of the health of vital organs of the body. Although not many scientific researchers have been done, the works of **Oken, et.al., 2000, Govindaraju, et.al., (2003),**

Johnson Prem kumar and Marriayyah (2006) have shown enough evidence about how yoga could be gainfully employed in the promotion of physical factors.

Physiological aspects of Yoga

Yogic exercises improve circulation vital to proper functioning of the body. Yoga nourishes, stimulates and maintain the balance of the endocrine glands which govern growth and development. Regular practice of yoga improves functions such as digestion and respiration so that there is more energy available for the growing child. It increases the supply of fresh blood to the brain thus enhances mental capacity. Yogic exercises practiced properly strengthen the muscle fibers and nerves and there by improves physiological functioning of all the systems. It also promotes proper structural developments by working on the joints, regulates respiration and blood pressure.

Methods of materials:

Forty women intercollegiate volleyball players of Bharathidasan University, Tiruchirappalli (Tamilnadu state) were selected as subjects for the study. They play Volleyball at College level competitions. Their age ranges from 18 to 23 years. Based on the relevant literature that are viewed and in accordance with the views of professional physical education personalities, the importance of variables at the high level performance, availability of equipment, feasibility aspect of measurement, the following variables are selected for this study. The dependent physical and physiological variables are flexibility, cardio respiratory endurance, heart rate, systolic blood pressure and diastolic blood pressure

In table - 4, the results of one-way ANOVA for both initial and final test scores of physical variables flexibility and cardio respiratory endurance are presented. From the table it can be seen that the calculated F value of .012 for initial test for flexibility between the groups are insignificant ($P > 0.05$) indicating that the random sampling is successful. The calculated F value of 4.875 for final test of flexibility between the yogic practices group and control group were greater

than the table value of 4.098 indicating that it was significant at 0.05 level ($P < 0.05$).

Table: - 4.2 Results of Anova between yogic practices and control groups with respect to physical variables flexibility and cardio respiratory endurance

Variable	Test	Source of Variance	Sum of squares	df	Mean Square	F-Ratio
Flexibility	Initial	Between Groups	0.23	1	0.23	0.012
		Within Groups	672.55	38	17.70	
	Final	Between Groups	81.23	1	81.23	4.875*
		Within Groups	635.75	38	16.73	
Cardio respiratory endurance	Initial	Between Groups	774.40	1	774.40	0.008
		Within Groups	3486465.20	38	91749.084	
	Final	Between Groups	326705.63	1	326705.63	4.430*
		Within Groups	2796113.75	38	73581.94	

* $P < 0.05$ Table F, df (1, 38) (0.05) = 4.098

Table: 4.4 Results of Anova between yogic practices and control groups with respect to physiological variables heart rate, systolic blood pressure and diastolic blood pressure

Variable	Test	Source of Variance	Sum of squares	df	Mean Square	F-Ratio
Heart rate	Initial	Between Groups	0.23	1	0.25	0.003
		Within Groups	3245.55	38	85.41	
	Final	Between Groups	302.50	1	302.50	4.604*
		Within Groups	2553.50	38	67.20	
Systolic	Initial	Between Groups	28.90	1	28.93	2.717
		Within Groups	404.20	38	10.64	
	Final	Between Groups	62.50	1	62.50	4.276*
		Within Groups	555.40	38	14.62	
Diastolic blood pressure	Initial	Between Groups	3.03	1	3.06	0.158
		Within Groups	727.75	38	19.15	
	Final	Between Groups	75.63	1	75.625	4.230*
		Within Groups	679.35	38	17.88	

* $P < 0.05$ Table F, df (1, 38) (0.05) = 4.098

The calculated F value of .008 for initial test for Cardio respiratory endurance between the groups are insignificant ($P>0.05$) indicating that the random sampling was successful. The calculated F value of 4.430 for final test of Cardio respiratory endurance between the yogic practice group and control group were greater than the table value of 4.098 indicating that it is significant at 0.05 level ($P<0.05$). The final F value indicated that there were significant differences in flexibility and Cardio respiratory endurance between the groups in the final test because of the treatment effect.

In table 6, the results of one-way ANOVA for both initial and final test scores of physiological variables Heart rate, Systolic blood pressure and Diastolic blood pressure are presented. From the table it can be seen that the calculated F value of 0.003 for initial test for heart rate between the groups are insignificant ($P>0.05$) indicating that the random sampling is successful. The calculated F value of 4.604 for final test of heart rate between the yogic practice group and control group are greater than the table value of 4.098 indicating that it is significant at 0.05 level ($P<0.05$). The calculated F value of 2.717 for initial test for Systolic blood pressure between the groups are insignificant ($P>0.05$) indicating that the random sampling is successful. The calculated F value of 4.276 the final test of Systolic blood pressure between the yogic practice group and control group are greater than the table value of 4.098 indicating that it was significant at 0.05 level ($P<0.05$). The calculated F value of 0.158 for initial test for Diastolic blood pressure between the groups are insignificant ($P>0.05$) indicating that the random sampling is successful. The calculated F value of 4.230 for final test of Diastolic blood pressure between the yogic practices group and control group are greater than the table value of 4.098 indicating that it is significant at 0.05 level ($P<0.05$). The final F value for Heart rate, Systolic blood pressure and Diastolic blood pressure indicated that there are significant differences between the groups in the final test because of the treatment effect.

Discussion on findings Physical Variables

The results of physical variables-flexibility and cardio respiratory endurance have shown that there is an increase in the level of flexibility and cardio respiratory endurance due to the training effects of yogic practices. The physical variable flexibility and cardio respiratory endurance are essential not only for a volleyballer but for all the players. Lack of flexibility has many ill effects, ranging from imperfect skill acquisition to its execution. Lack of cardio respiratory endurance also affects a player while the competition prolongs. A player who is lacking in cardio respiratory endurance cannot perform well.

The asanas such as Pachimottanasana, Halasana, Dhanurasana, Matsyasana, and Bhujangasana are responsible for improving flexibility. Pranayamas like Nadisuddhi, Nadishodhana, Ujjai and meditation like breath counting meditation increases the circulation to the brain which stimulates the brain nerve cells. These results in increased vitality improve brain functions and calm the body and the mind, there by increasing cardio respiratory endurance. The physical movements involved in some of these asanas could be the viable source to develop the flexibility. In yogic practices, the movement to reach the maximum range of motion is very slow and the hold on period also lasts for long. Thus the yogic practices improve flexibility and cardio respiratory endurance. The results of this investigation are supported by the following findings **Oken, et.al., (2006), Baldwin,(1999), Govindarajulu et.al., (2003), Johnson PremKumar and Mariayyah,(2006), Mishra, et.al., (2003) and Bera and Rajapurkar (1993).**

Physiological variables

The results indicate that there is a decrease in the heart rate of the women volleyballers due to the training effects of yogic practices. The heart rate is regulated or controlled by neural, hormonal and parasympathetic nerves - a sub division of autonomic nerves system. When the sympathetic nerves are regulated, they secrete epinephrine and nor epinephrine on the nerve endings of the heart. These chemical substances increase heart rate. As a hormonal

response, adrenal medulla secretes adrenaline and secretes nor adrenaline when in excited states which in turn increases heart rate. As an effect of yogic practice, heart rate is reduced enabling the ventricles to accommodate greater volume of blood. When the heart rate decreases there is more time for filling the ventricles with blood and more time for delivery of oxygen as well as nutrients to while activating the para sympathetic nerves system the body.

Practice of asana such as Padmasana, Halasana, Vajrasana and Shavasana has been shown to relax the body and the mind. Pranayama like Nadisuddhi and Nadishodhana calm the sympathetic nerves system while activating the Para sympathetic nerves system. The yogic practices control the adrenal hormone level which also influences the heart rate. Hence the yogic practices reduce the heart rate of women volleyballers.

The results of systolic blood pressure and diastolic blood pressure show that there is a reduction of blood pressure due to the training effects of yogic practices for the women volleyballers. There are five important factors responsible for maintaining blood pressures. They are cardiac out put, peripheral resistance, elasticity of the arterial wall, blood volume and the volume of the vascular space. The peripheral resistance is directly proportional to blood pressures. The function of blood stream depends upon lumen of the blood vessels. If the lumen is narrowed (vasoconstriction) the pressure increases. If it widens (vasodilation) the blood pressure decreases (**Sarada Subramanian, 2001**)

The asanas such as Matsyasana, Halasana, Sarvangasana and Yogamudra, pranayama such as Nadisuddhi, Nadishodhana and Sitali influence the blood pressure to become normal involving the effects of epinephrine and nor epinephrine. The training effects of yogic practices have shown to control the hormones epinephrine and nor epinephrine so as to enhance the lumen of blood vessels. Hence the systolic blood pressure and diastolic blood pressure are decreased considerably. (vishnudevananda.1998; Disclaimer, 2001). The results of this investigation are also

supported by the following findings of **Schell, et.al. (1994), Telles, et.al., (2004), Pete Arambula, et.al., (2004), Gore,et.al., (2003), Shenbagavalli and Rajkumar, (2007) and Gore, (2005).**

Performance related variables

The results of volley pass and serving scores have shown that there was an increased level of scores due to the training effects of yogic practices among men volleyballers. The training effects of yogic practices have shown that there was an improvement in all the physical, physiological, men volleyballers. Pranayamas such as Nadisuddhi, Nadishodhana and meditation produce a calming effect and increases concentration. This is responsible for improvement of volley pass and serving scores of women volleyballers. The results of this investigation are supported by the following findings of **Raja Gopal and Jim Reeves (2007), Samsudeen and Kalidasan (2007), Viveganandan and Aravinda (2007), Kalidasan (1998) and Duncan et.al. (2006).**

5. Conclusions

Within the limitations, the results of present study seem to permit the following conclusion on college level women volleyballers:

The training effects of yogic practices evidenced significant influence over the physical, physiological, and performance related variables of men volleyballers. Particularly by positively increasing flexibility, cardio respiratory endurance, volley pass and serving scores. In addition to this, heart rate, systolic blood pressure, diastolic blood pressure, levels were decreased.

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Conflict of interest

None of the authors have any conflicts of interest to declare.

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