



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 11<sup>th</sup> 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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## Tracking Immediate Physiological Changes Pre – Post Volleyball Play

M. Rajkumar 1,\*

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### Abstract

The purpose of the study was to find out the effect of volleyball play on selected physiological variables. To achieve the purpose of the study 12 male inter-collegiate Volleyball players were selected from Department of Physical Education, Bharathiar University Coimbatore. The subjects were dehydrated in 5 Set Volleyball match. The age group of subjects ranged from 18-28 years. The study were delimited to the following variables, Body temperature and Heart rate were tested difference between after completion of 5 set Volleyball play. To execute this investigation, the researcher used dependent, "t" test to find out the significant difference between pre and post Volleyball play. In this case to test the significance 0.01 level of confidence was utilized. It was found that there was a significant increase in heart rate and body temperature after Volleyball play.

**Keywords:** Volleyball, Body temperature, Heart rate

### INTRODUCTION

Dehydration refers to the loss of water from the various body fluid compartments, including the plasma, the water bathing the cells. Water constitutes 50 to 70% of the human body. It serves as a medium for chemical reactions, temperature regulation and lubrication for adults daily water needs is estimated at 1ml/kcal expended. Sources include all beverages and many non beverages foods. The minerals are operating in the body; it helps to understand the nature and general chemical properties of water. Water is the largest component of the human body, making up 50 to 70% of the body's weight. Lean muscle tissue contains about

73% water. Adipose tissue is about 20% water. The fat content increases in the body total body water decreases towards 50%.

The body controls the amount of water in each compartment mainly by controlling the electrolyte concentrations in each compartment. In solution electrolytes dissociate into charged particles called ions. Water is attracted to ions, such as sodium, potassium, chloride, phosphate, magnesium and calcium. By controlling the movements of ions in and out of the cellular compartments the body maintains the appropriate amount of water in each compartment.

## METHODOLOGY

The purpose of the study was to find out the effect of volleyball play on selected variables. To achieve the purpose of the study 12 male inter-collegiate Volleyball players were selected from Department of Physical Education, Bharathiar University Coimbatore. The subjects were dehydrated in 5 Set Volleyball match. The age group of subjects ranged from 18-28 years. The study was delimited to the following variables, Body temperature and Heart rate were tested difference between after completion of 5 set Volleyball play. To execute this investigation, the researcher used dependent, "t" test to find out the significant difference between pre and post Volleyball play. In this case to test the significance 0.01 level of confidence was utilized. The investigator reviewed the available scientific literature from books,

Journals, periodicals, research, papers and magazines and also taking into consideration the feasibility criteria of availability of instrument, the following variable is relevant to the present study.

## SELECTION OF VARIABLES AND TESTS

The investigator reviewed the available scientific literature from books, Journals, periodicals, research, papers, and magazines also taking into consideration the feasibility criteria of availability of instrument, the following variables are relevant to the present study.

The selected variables are

- i) Body temperature
- ii) Heart rate

**TABLE – I**  
**Selection of Tests**

S.No	VARIABLES	TEST ITEMS/ INSTRUMENT	UNIT OF MEASUREMENT
1.	Body Temperature	Thermometer	Fahrenheit
2.	Heart Rate	Radial Pulse	Beat/Min

<b>Table – II</b> <b>The Mean, Standard Deviation, difference Between the means, Correlation, Standard error of the Difference between The means and 'T' Ratio on Body Temperature of Pre –Post Volleyball Play</b>						
Test	M	S D	D M	R	SEDM	t' Ratio
Pre Test	97.60	.70	1.74	.31	.259	6.712*
Post Test	99.35	.81				

\*Significance at 0.01 levels, (df= N-1) 12-1= is 3.11.

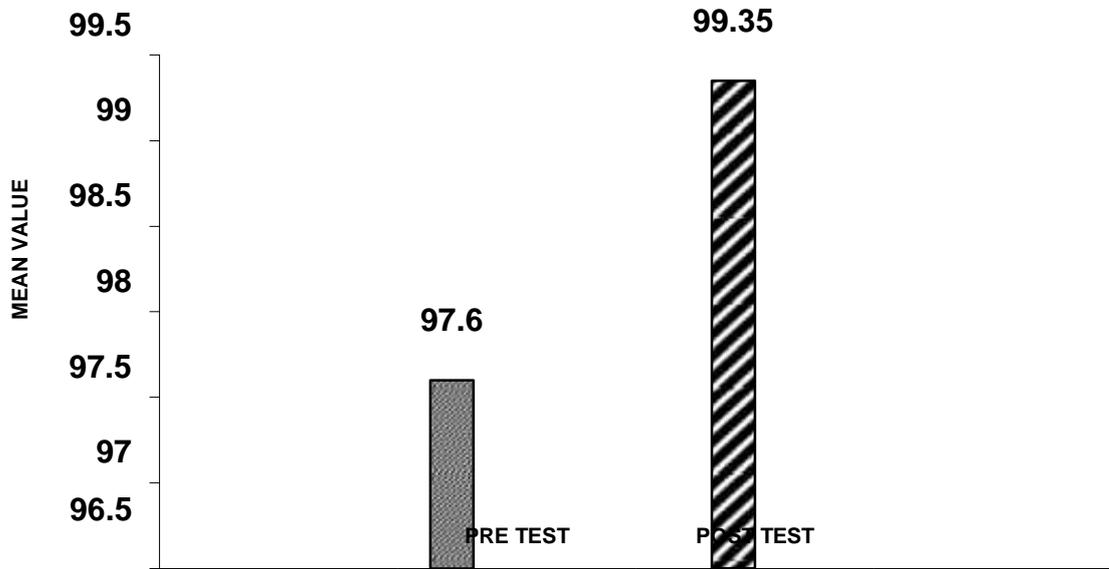


Figure – I The Mean Values of Pre Test and Post Test on Body Temperature

TABLE – III The Mean, Standard Deviation, difference between the means, Correlation, Standard Error of the difference between The Means And ‘T’ Ratio on Heart Rate of Pre –Post Volleyball Play

Test	M	S D	D M	R	SEDM	t' Ratio
Pre Test	73.66	4.65	16.83	.35	4.47	3.76*
Post Test	90.50	16.51				

\*Significance at 0.01 levels, (df= N-1) 12-1= is 3.11.

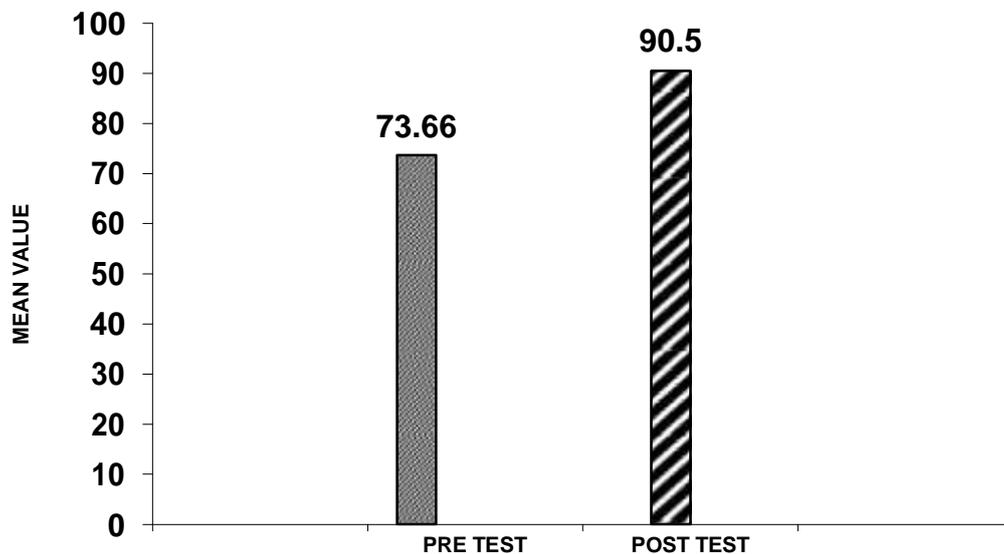


Figure – II The Mean values of Pre Test and Post Test Heart Rate

## RESULTS OF BODY TEMPERATURE

Table II shows that the body weight means of pre test and post test are 97.60 and 99.35 respectively. The obtained „t“ value 6.712 and the table value is 3.11 at 0.01 level of confidence. Since the obtained „t“ value is greater than the table value. It is concluded that there was a significant difference in body temperature between the pre and post Volleyball play.

## RESULTS OF HEART RATE

Table III shows that the body weight means of pre test and post test are 73.66 and 90.50 respectively. The obtained „t“ value 5.613 and the table value is 3.11 at 0.01 level of confidence. Since the obtained „t“ value is greater than the table value. It is concluded that there was a significant difference in heart rate between the pre test and post volleyball play.

## DISCUSSION ON FINDINGS

From the analysis of the data the following findings may be drawn regarding the study. The result of the study reveals that there was a significant variance on body temperature and heart rate after the volleyball play. Due to the effect of volleyball play the body temperature and heart rate had significantly increased. The hypothesis states that there would be a significant increase in body temperature and heart rate due to the effect of volleyball play. The findings of this study reveal that there was a significant increase in body

temperature and heart rate at 0.01 level of confidence, hence the hypothesis was accepted.

## CONCLUSIONS

The result of the study reveals that there was a significant variance on body temperature and heart rate after the volleyball play. Due to the effect of volleyball play the body temperature and heart rate had significantly increased.

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## Effect of strength training program on selected physical Fitness components of adolescent Judo players

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### Abstract

The study was to find out the effect of strength training program on selected physical fitness components of adolescent judo players. To achieve the purpose of the study 30 adolescent boys judo players will be selected from Government higher secondary school, kalveerampalayam, Coimbatore and their age will be ranged between 14 and 17 years. The subjects was randomly assigned to two equal groups (n=15). All the subjects were divided in to two groups with 15 subjects each as experimental and control group. Group-I underwent resistance training for a period of twelve weeks and group-II acted as control who did not participate in any special training other than the regular routine. The physical fitness components such as agility, leg explosive power, and muscular strength. Were selected as dependent variables. Agility was tested by 4 x 10 m Shuttle run, Leg explosive power was tested by Standing broad jump, and Muscular strength was tested by Pull ups. Pre and post-test random group design was used for this study. The dependent 't' test was applied to determine the difference between the means of two group. To find out whether there was any significant difference between the experimental and control groups. To test the level of significant of difference between the means 0.05 level of confidence was fixed. The result of the study shows that, there was a significant improvement takes place on agility, leg explosive power, and muscular strength of adolescent judo players.. Due to the effect of eight weeks of strength training and also concluded that, there was a significant difference exists between experimental and control groups on breathe holding time, resting heart rate and vital capacity. The control group did not improve the selected criterion variables.

**Keywords:** Strength training program, agility, leg explosive power, and muscular strength,

### INTRODUCTION

Judo is a modern martial art, combat and Olympic sport created in Japan in 1882 by Jigoro Kano. The word judo consists of two Japanese characters, ju, which means "gentle", and do, which means "the way". Judo, therefore, literally means the way of gentleness. Judo is a rigorous and

demanding physical activity. aims: physical education, contest proficiency and mental training. Proceeding with the organization of the Kodokan and enacting the regulations of Judo, Prof. Kano became the first Asian member of the International Olympic Committee in 1909 and worked for the spread of Judo world-wide. Judo became an official event in the Olympic Games of Tokyo in 1964, backed by Judo fans

and sport promoters all over the world. The practice of judo techniques helps people develop basic and fundamental physical fitness in a number of ways, such as the development of strength, flexibility, agility, speed, dynamic and static balance, explosive power, and endurance. The practice of active attack and defences helps develop reaction time, coordination, and overall physical self-confidence. Judo students become physically bigger, stronger, and faster through their practice of judo.

## STRENGTH TRAINING

If fat loss and muscle definition are your goals, performing strength training exercises regularly is often an effective strategy. However, lifting weights on a regular basis isn't a guarantee you'll burn body fat or lose weight. Combine resistance training with an appropriate diet to help meet your weight management and body composition goals. **(Mark Hatfield, 2005)**

## SIGNIFICANCE OF THE STUDY

1. The study will helpful to know the effect of strength training program on selected physical fitness components like explosive power, agility, and strength.
2. The investigator will help the physical educationist and coaches to know the level of physical fitness components of adolescent boys judo players.
3. The study will help to changes the explosive power, agility, strength of adolescent judo players.
4. The study may help in selecting good players for the team.
5. The investigator would add to the quantum of knowledge in the area of sports.

## Selection of Subject And Variables

The present study was designed to examine the effects of strength training on physical fitness components of adolescent boys judo players. Thirty Government Higher

Secondary School, kalveerampalayam, Coimbatore acted as subjects. The age of the subjects ranges between 14-17 years. The selected variables were agility, leg explosive power, muscular strength Tests were conducted to all the selected subjects before and after the training. The experimental group underwent a twelve week perceptual training program.

## Experimental Design

In these study 30 adolescent boys judo players will be selected from Government Higher Secondary School madathukulam, tirupur and their age will be ranged between 14 and 17 years. The subjects was randomly assigned to two equal groups (n=15). All the subjects were divided in to two groups with 15 subjects each as experimental and control group. Group-I underwent strength training for a period of eight weeks and group-II acted as control who did not participate in any special training other than the regular routine.

## Test Procedure

The following tests were chosen for testing variables. Agility was tested by 4 x 10 m Shuttle run, Leg explosive power was tested by standing broad jump, and Muscular strength was tested by Pull ups.

**Agility Purpose:** This is a test of speed and agility, which is important in many sports. **Equipment:** Wooden blocks, marker cones, measuring tape, stopwatch, non-slip surface. **Procedure:** This test requires the person to run back and forth between two parallel lines as fast as possible. Set up two lines of cones 10m apart or use line markings, and place two blocks of wood or a similar object behind one of the lines. Starting at the line opposite the blocks, on the signal "Ready, Go!" the participant runs to the other line, picks up a block and returns to place it behind the starting line, then returns to pick up the second block, then runs with it back across the line. **Scoring:** Two or more trails may be per formed, and the

quickest time is recorded. Results are recorded to the nearest tenth of a second.

**Leg explosive power** *Purpose:* To measure the explosive power of the legs. *Equipment:* Tape measure to measure distance jumped, non-slip floor for take-off, and soft landing area preferred. Commercial Long Jump Landing Mats are also available. The take-off line should be clearly marked. *Procedure:* The athlete stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed. *Scoring:* The measurement is taken from take-off line to the nearest point contact on the landing (back of the heels). Record the longest distance jumped, the best of three attempts.

**Muscular strength** *Purpose:* To measure the muscular strength. *Equipment:* Horizontal Bar, score sheet, Whistle, subject, and pen. *Procedure:* The pull-ups are performed starting from a dead hang (arms fully

extended and locked), body motionless, feet off the floor. The grip can be either with both palms facing forward or to the rear, though with both facing in the same direction. From this starting position, a pull-up is performed without excessive body motion, and the body is lifted until the chin has cleared the top of the bar. The body is then lowered until his arms are fully extended or locked out. One complete pull-up is counted when the Marine's arms are locked out. This procedure is repeated until the Marine has reached the maximum 20 complete pull-ups, or can no longer complete a pull-up. *Scoring:* The maximum number of correctly performed pull ups is recorded. Five points for every pull-up is awarded, and at least three are required to pass the test.

### 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, plyometric training for 25 minutes and 10 minutes warm down. Training Schedule

### Strength Training Schedule For Eight Weeks

Exercise	Set x Repetition	Recovery In-between repetition	Recovery In-between Sets
<b>1-2 WEEKS</b> Half squats Push- ups Bent – knee sit – ups Pull- ups Burpees Back extensions	2x10	15sec	2min
<b>3-4 WEEKS</b> Half squats Push- ups Bent – knee sit – ups Pull- ups Burpees Back extensions	3x10	15sec	1min 30 sec

<b>5-6 WEEKS</b> Half squats Push- ups Bent – knee sit – ups Pull- ups Burpees Back extensions	3x15	15sec	1 min
<b>7-8 WEEKS</b> Half squats Push- ups Bent – knee sit – ups Pull- ups Burpees Back extensions	3x12	15sec	30 sec

**Table I Computation of 'T' Ratio on Selected physical fitness components of adolescent boys judo players. on Experimental Group and Control Group**

Group	Variables		Mean	N	Std. Deviation	Std. Error Mean	t ratio
Experimental Group	Agility	Pre	8.96	15	0.99	0.071	4.54*
		Post	8.63	15	1.06		
	Leg explosive power	Pre	1.44	15	0.25	0.014	9.93*
		Post	1.58	15	0.24		
	Muscular strength	Pre	10.80	15	2.14	0.248	8.32*
		Post	12.86	15	1.72		
Control group	Agility	Pre	8.90	15	0.96	0.003	1.33
		Post	8.90	15	0.97		
	Leg explosive power	Pre	1.44	15	0.192	0.003	0.71
		Post	1.43	15	0.193		
	Muscular strength	Pre	10.60	15	1.54	0.235	1.70
		Post	10.20	15	1.65		

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

### Statistical Analysis

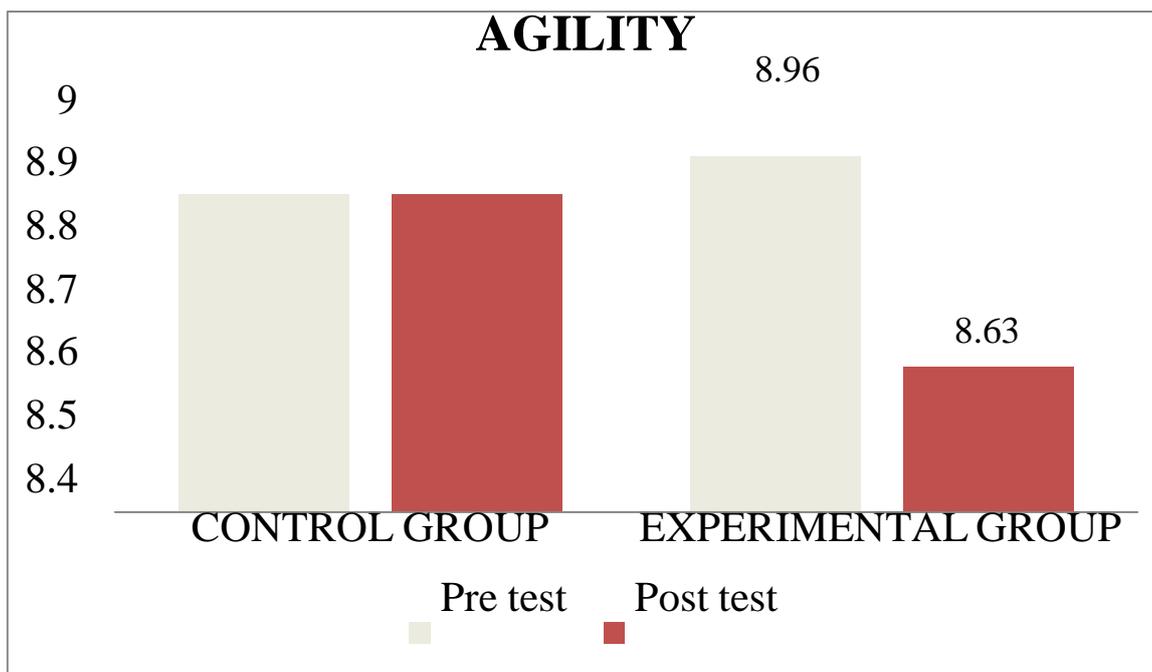
The collected data before and after training period of 8 weeks on the above said variables due to the effect of strength training programme was statistically analysed with 't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence.

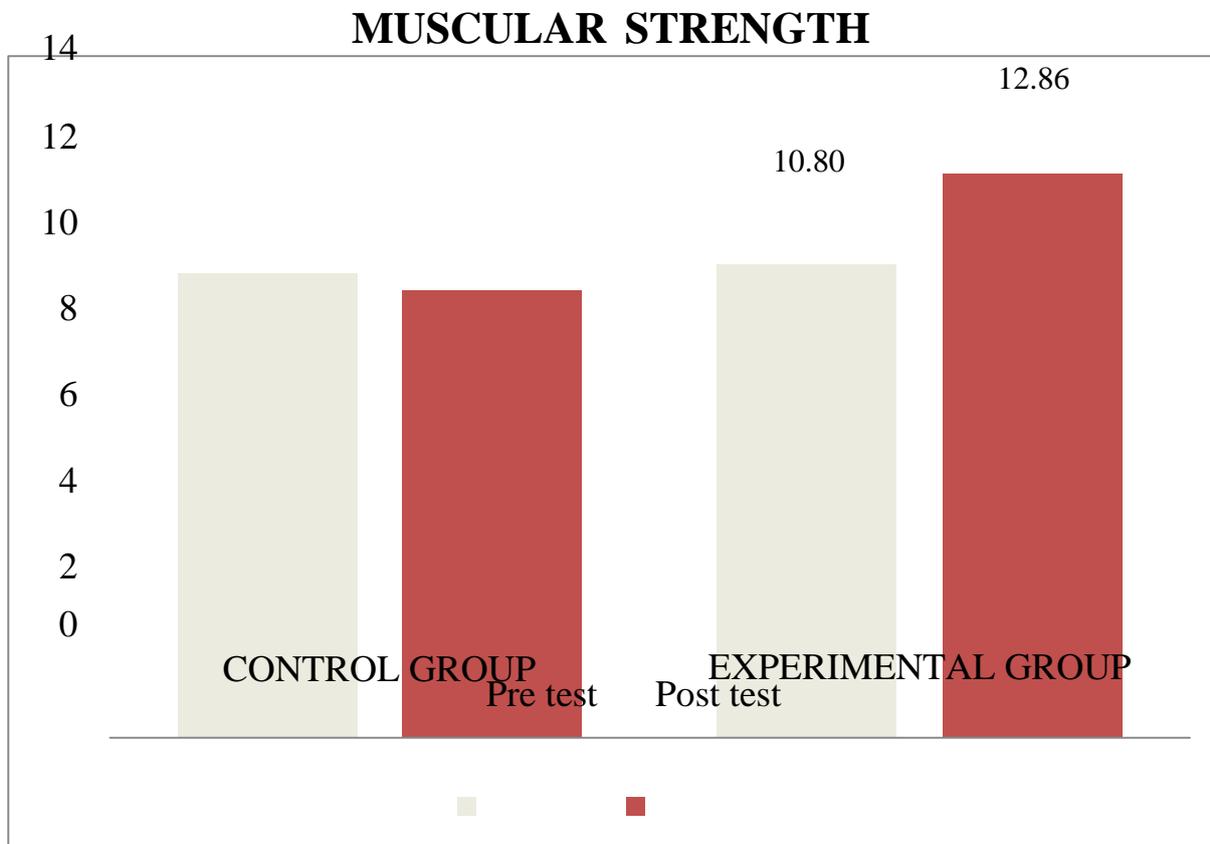
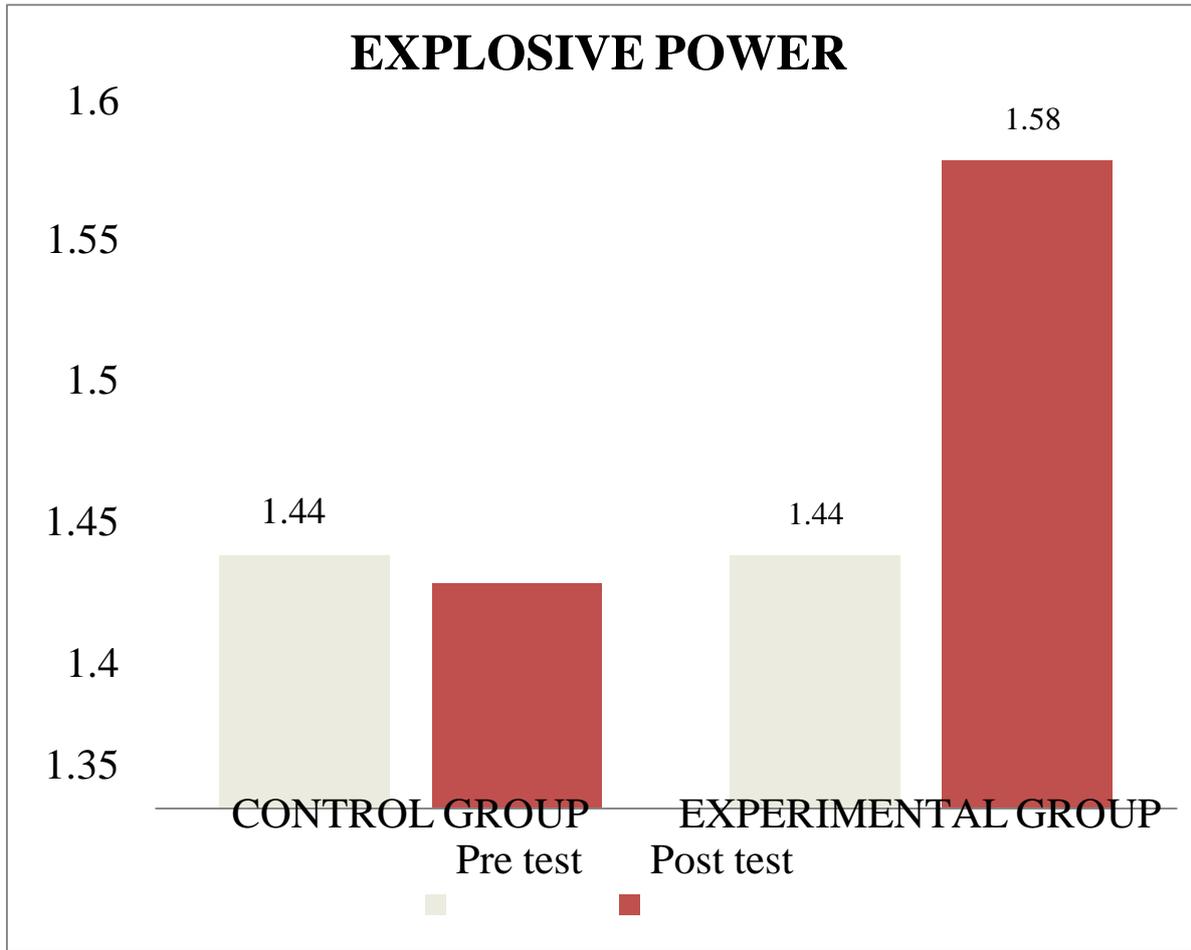
### Result of the Study

Analysed with 't' test was applied to determine whether the training program produced any significant difference by improvements in agility, leg explosive power and muscular strength among adolescent boys judo players. The analysis is presented in the following tables.

Table I reveals the computation of mean, standard deviation and 't' ratio on selected

physical fitness variables namely agility, leg explosive power, muscular strength experimental group. The obtained 't' ratio on agility, leg explosive power, muscular strength were 4.54, 9.93 and 8.32 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant. Further the computation of mean, standard deviation and 't' ratio on selected physical fitness variables namely agility, leg explosive power, muscular strength control group. The obtained 't' ratio on agility, leg explosive power, muscular strength were 1.33, 0.71 and 1.70 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.





## Discussions of Findings

The results of the study indicated that the selected physical fitness variables, agility, leg explosive power and muscular strength were improved significantly after undergoing strength training. The changes in the selected parameters were attributed the proper planning, preparation and execution of the training package given to the players.

The findings of the present study had similarity with the findings of the investigations referred in this study.

However the subjects participated in the control group did not improve their agility, leg explosive power and muscular strength.

The results of the present study indicates that the strength training methods is appropriate protocol to improve agility, leg explosive power and muscular strength of school level boys Judo players.

Johnson (2014) reported that the effect of explosive strength training programme in wheelchair basketball athletes results in significant improvements in sprint and agility performance. Prabhash chad puri The discrepancy between the result and the result of previous studies might be attributed to several reasons, such as the training experience level of the subjects, the training programme, in intensity used and the duration of the training programme.

## Conclusion

Based on the findings and within the limitation of the study it is noticed that practice of strength training helped to improve physical fitness variables of adolescent judo players. It was also seen that there is progressive improvement in the selected criterion variables of experimental group of adolescent judo players after eight weeks of training program. Further practice of drills also helps to improve other physical fitness factors i.e. agility, explosive power, muscular strength. Strength training produced significant improvement over all the selected variables (agility, power, muscular strength).

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speed and agility in wheelchair  
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## COMPARISON OF SKELETAL BREADTH AND SKIN FOLD MEASUREMENTS BETWEEN SPORTS PERSON AND NON SPORTS PERSONS

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### Abstract

*The purpose of the study was to compare skeletal breadth and skin fold tests between sports persons and non sports persons. To achieve the purpose of the study 15 sports persons and 15 non sports persons men students were selected from Ayya Nadar Janaki Ammal college, Sivakasi. The player's age ranged from 18- 23 years. The skeletal breadth and skin fold tests were selected as criterion variables for thos study. Skeletal breadth were taken from bi-acromial, bi-cristal, bi-epicondylar femur were selected were selected, the skin fold tests were taken from triceps, sub scaular, medial calf. The experimental design for the study was static group comparison design. The data collected from the two groups on selected variables were statistically examined by independent 't' test. In all cases 0.05 level was fixed as significant level to test the hypothesis. There was no significant difference between sports persons and non sports persons on skeletal breadth such as bi-acromial, bi-cristal, and bi-epicondylar femur. There was no significant difference between sports persons and non sport persons on skin fold test such as triceps, sub scapular, and medial calf.*

**Keywords:** skeletal breadth, skin fold measurements, sports persons and non sports persons

### INTRODUCTION

The physique and body composition, including the size, shape and form are playing significant role to enhance sports performance. The performance of sportsman in any game or event is also dependent on his suppleness. Skill training, motivation and various physiological and biomechanical natures. Age, sex and physical growth have also been noticed to influence a persons capacity for physical activity.

Anthropometry (anthropo= "human: metry= measuere) is a branch of anthropology, concerned with taking of measurements on the human body. It provides a set of standarized techniques for systematically taking measurements of the body and its parts. It is a means of qualifying the size, proportions and shape of the body. The number of measurements that can be taken on an individual is almost imiltates. Each

measurements however should provide a specific bit of information that aids in understanding growth". (Malina, 1991)

During the early 29<sup>th</sup> century, anthropometry was used extensively by anthropologist in the united states and Europe. One of this primary was using attempted differentiation between in the races of man, and it was often employed to show ways in which races were "inferior" to others. The wide application of intelligence testing also became incorporated into a general anthropometric approach, and many forms of anthropometry were used for the advocacy of eugenics politics.

The modern physical educator is often assigned the task of measuring height and weight of students. Height, weight and certain anthropometric measures used in conjunction with other pertinent data to represent potentially valuable information (Parameswaran, 1984).

## STATEMENT OF PROBLEM

The purpose of the study was to compare the skeletal breadth and skin fold tests between sports persons and non sports persons.

## OBJECTIVES OF THE STUDY

The pupose of the study was to compare the skeletal breadth and skin fold tests between sports persons and non sports persons by achieving the following objectives.

To determine the skeletal breadth such as bi- acromial, bi- cristal, bi- epicondyar femur of sports persons and non sports persons.

2. To determine the skin fold tests such as triceps, sibscapular, medial calf, and abdominal of sorts persons and non sports ersons.

## METHODOLOGY

### SELECTON OF SUBJECTS

The study was based on the comparison of skeletal breadth and skin fold measurements between sports persons and non sports persons. Fifteen sports persons and fifteen non sports persons was selected as subjects, and their age ranged between 18 and 23 years.

### SELECTION OF VARIABLES

As per the availability of literature and the personal knowledge of the investigator, the following variables were selected for the present study.

### STATISTICAL ANALYSIS

To compare the skeletal breadth and skin fold measurements between sports persons and non sports persons independent,t" test was used. The level of significance was set at 0.05 level of confidence.

**SELECTION OF TEST ITEMS**

S. No	Variables	Instruments
1.	Bi- acromial	Measuring tape
2.	Bi-cristal	Measuring tape
3.	Bi- epicondylar	Measuring tape
4.	Triceps	Skin fold caliper
5.	Sub-scapular	Skin fold caliper
6.	Medial calf	Skin fold caliper

**Table 4.1 Summary of Means And Independent't' Test For Comparison of Skeletal Breadth on Sports Persons And Non Sports Persons**

S.NO	VARIABLES	PLAYERS	NUMBERS	MEAN	STANDARD DEVIATION	"T" RATIO
1.	Bi acromial	Sports persons	15	43.67	3.02	0.76
		Non Sports persons	15	42.73	3.69	
2.	Bi- cristal	Sports persons	15	30.27	2.74	0.16
		Non Sports persons	15	30.47	3.85	
3.	Bi- epicondylar humars	Sports persons	15	10.13	1.73	0.42
		Non Sports persons	15	10.40	1.72	

(Table value required for significance at 0.05level for „t“ test with df 28 is 2.05)

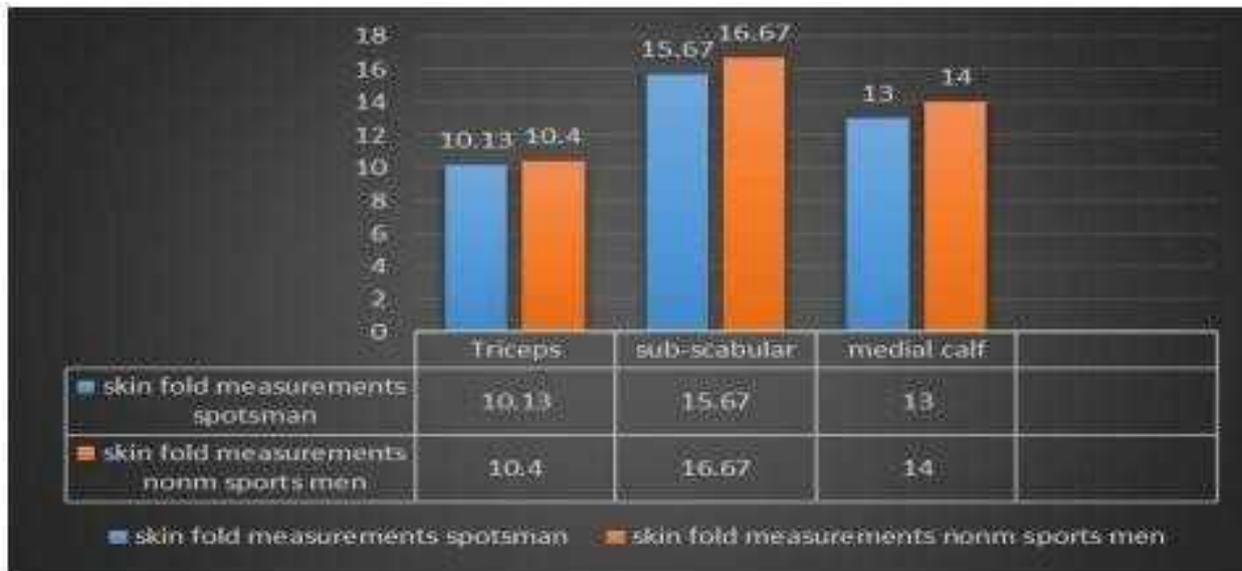


**Figure 4.1 MEAN VALUES OF BI-ACROMIAL, BICRITAL, BI-EPICONDYLAR BETWEEN SPORTS PERSONS AND NON SPORTS PERSONS**

**Table 4.2 Summary Of Means And Independent't' Test For Comparison Of skin fold test On Sports Persons And Non Sports Persons**

S. No	VARIABLES	PLAYERS	NUMBERS	MEAN	STANDARD DEVIATION	"T" RATIO
1.	Triceps	Sports persons	15	16	5.07	1.10
		Non Sports persons	15	18.33	6.45	
2.	Sub-scapular	Sports persons	15	15.67	5.30	0.49
		Non Sports persons	15	16.67	5.88	
3.	Medial- calf	Sports persons	15	13	3.68	0.56
		Non Sports persons	15	14	4.71	

(Table value required for significance at 0.05level for „t“ test with df 28 is 2.05)



**FIGURE 4.2 BAR- DIAGRAM OF MEANS AND INDEPENDENT 'T' TEST FOR COMPARISON OF SKIN FOLD TEST ON SPORTS PERSONS AND NON SPORTS PERSONS**

The table value 4.1 showed that the mean values of sports persons and non sports persons are 43.67,42.73,30.27,30.47,10.13, and 10.40 respectively. The obtained „t“ value is 0.76, 0.16, 0.42 which is lesser than the required table value of 2.05 with df 28 at 0.05level of significance. Therefore, it was concluded that there was no significance difference between sports persons and non sports persons.

The mean values of bi-acromial, bicrital, bi-epicondylar between sports persons and non sports persons are graphically represented in figures, 4.1.

The table value 4.2 showed that the mean values of sports persons and non sports persons are 16,18.37,15.67,16,67,13and 14respectively. The obtained „t“ value is 1.10,0.41,0.56 which is lesser than the required table value of 2.05 with df 28 at 0.05level of significance. Therefore, it was concluded that there was no significance difference between sports persons and non sports persons.

The mean values of triceps, subscapular, and medial calf between sports persons and non sports persons are graphically represented in figures, 4.2.

## DISCUSSION ON FINDINGS

The result of the study indicated that, there was no significant difference between sports persons and non sports persons on skeletal breadth such as bi-acromial, bi-

cristal, bi-epicondylar femur and skin fold tests such as triceps, sub scapular, medial calf.

It is inreferred from the literature presented in the second chapter and from the result of the present study, it is concluded that skeletal breadth and skin fold measurements implemented properly in all discipline in order to achieve maximum performance.

## CONCLUSION

1. There was no significant difference between sports persons and non sports persons on skeletal breadth such as bi-acromial, bi-cristal and bi-epicondylar femur.
2. There was no significant difference between sports persons and non sports persons on skin fold tests such as triceps, sub scapular, and medial calf.

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## Effect of high tempo music on body mass index and stress

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### Abstract

The purpose of this study was to find out the effect of music on body mass index and stress. They were participated in intercollegiate level. To achieve the purpose of the study 15 men physical education students were selected from MEPCO Engineering college, Sivakasi. The player's age ranged from 20-25 years. The variables selected for this study were such as heart rate and breathe rate. There would be significant difference between on selected independent variables such as body mass index and stress. The three group experimental design was used for this study namely without music group, music group and control group. Immediately before and after training test was taken. The collected data were statistically analyzed by Analysis of Co-Variance ANCOVA. In all the cases 0.05 level significances was fixed to test the hypothesis.

**Keywords:** High tempo Music, body mass index, stress and Analysis of Co-Variance ANCOVA.

### Introduction

**Music** is an art form whose medium is sound organized in time. Common elements of music are pitch (which governs melody and harmony), rhythm (and its associated concepts tempo, meter, and articulation), dynamics, and the sonic qualities of timbre and texture. The word derives from Greek word *mousike*, "art of the Muses".

Music can improve the psychological state of athletes and create positive ideas. It contributes to athletes' motivation and their resistance against psychological fatigue, thus improving their performance and skill learning. Music acts as an effective intervention for improving psychological and performance-related factors.

### Beneficial Effect of Using Music in Sport and Exercise

The beneficial effect of using music in sport and exercise contexts has a long history and a strong intuitive appeal. Music has the capacity to capture attention, lift spirits, generate emotion, change or regulate mood, evoke memories,

increase work output, reduce inhibitions, and encourage rhythmic movement – all of which have potential applications in sport and exercise. Considerable effort by researchers has been directed at understanding these effects, although many early studies used poor methods and had no underlying theoretical framework; issues we have addressed in a previous review (Karageorghis & Terry, 1997). Since that review, much new research has been published. The purpose of the present paper is to update theoretical developments, to critically review recent research into the psychophysical and ergogenic effects of music, and to provide examples of evidence-based music interventions for practitioners.

### Selection of Variables

By doing any physical activity, weight, Height and Stress. Body Mass Index (BMI) is a person's weight in kilograms divided by the square of height in meters. A high BMI can be an indicator of high body fatness. BMI can be used to screen for weight categories that may lead to

health problems but it is not diagnostic of the body fatness or health of an individual.

Medications have proven to be effective in lowering blood pressure and protecting against the risk of cardiovascular and kidney(renal) diseases. However, because of the side effects and cost of medications, many individuals would prefer to undertake lifestyle modifications to help improve blood pressure as a first-line treatment. In numerous clinical studies, it has been well documented that aerobic exercise is a suitable treatment and can even play a roll in the prevention of hypertension. (Aerobic exercise is vigorous and sustained exercise, such as jogging, swimming, and cycling.)

Even without changes in body weight, those individuals who participate in aerobic exercise regularly tend to have reductions in resting blood pressure. The blood-pressure reduction does not seem to depend on the frequency or intensity of aerobic exercise or on the type of exercise. That is, the studies have indicated that all forms of exercise seem to be effective in reducing blood pressure. Aerobic exercise appears to have a slightly greater effect on blood pressure in hypertensive individuals than in individuals without hypertension.

Exercise can provide stress relief for your body while imitating effects of stress, such as the flight or fight response, and helping your body and its systems practice working together through those effects. This can also lead to positive effects in your body—including your cardiovascular, digestive and immune systems—by helping protect your body from harmful effects of stress. **It reduces negative effects of stress.**

### Criterion variables

1. Body Mass Index
2. Stress

### Selection of Tests

The present study was undertaken primarily to find out the effect of music on heart rate, and breathe rate. As per the available literature the following tests were used to collect relevant data on the selected dependent variables and they were presented in the table I. Test and retest method was followed in order to establish the reliability of data by using twenty two subjects selected at random. The same persons under similar condition tested all the dependent variables selected in the present study twice for the subjects. The intra class co-efficient of correlation was used to find out the reliability of the data and the results are presented in Table II.

### Experimental Design and statistical procedure

All the subjects were the tested on selected criterion variables. Gender and age group were statistically analyses by using **Analysis of Co-Variance ANCOVA**. Hence, when ever the obtained F-ratio interaction effect test was used as a follow up test. Since, one group and five different stages of test were compared, when ever the obtained F-ratio value in the simple effect test was significant for rows. The scheffes test was applied as post hoc test to determine the paired mean difference, if any. In all cases .05 levels of significant was fixed and considered to be appropriate in view of the fact that very highly sophisticated equipment were not used for more stringent level of significance.

### Results of body mass index

The statistical analysis of dependent't' test comparing the initial and final means of Body Mass Index due to specific training packages of experimental and control groups have been analyzed and presented in Table XV.

**Table I Test selection**

S.No	Criterion Variables	Test Items	Unit of Measurement
1	Body Mass Index	BMI scale	In number
2	Stress	Everly and Girandos scale	In number

Table II Intra class co-efficient of correlation on selected dependent variables		
S. No	Criterion Variables	'R' value
1	Heart rate	0.88*
2	Breathe rate	0.86*

Table I The summary of mean and dependent 't'-test for the pre and post tests on body mass index			
	WOMG	MG	CG
Pre test Mean	24.93	24.80	24.86
Post test Mean	22.87	21.27	24.73
't' test	5.77	12.16	0.52
Table value required	2.14	2.14	2.14

WOMG-Without Music Group, MG- Music Group, and CG-Control Group  
\*significant at 0.05 level (Body Mass Index in counts)  
(The table value required for 0.05 level of significance with df 14 is 2.14)

Table II Computation of analysis of covariance on body mass index							
Adjusted post test means			Sources Of Variance	Sum of square	df	Mean squares	F ratio
WOMG	MG	CG					
22.84	21.29	24.73	Between	89.15	2	44.58	42.11*
			Within	43.4	41	1.06	

WOMG-Without Music Group, MG- Music Group, and CG-Control Group  
\*significant at 0.05 level of confidence  
(The table value required for significance at 0.05 level with df 2 and 41 is 3.23)

Table III Scheffe's post hoc test on body mass index				
Adjusted post test mean				
WOMG	MG	CG	Mean difference	Confidence interval
22.84		24.73	1.89*	0.96
22.84	21.29		1.55*	
	21.29	24.73	3.44*	

WOMG-Without Music Group, MG- Music Group, and CG-Control Group  
\*significant at .05 level

Table I shows that the pre test mean value of Without Music Group, Music Group and control groups are 24.93, 24.80 and 24.86 respectively and the post test means are 22.87, 21.27 and 24.73 respectively. The obtained dependent t-test between the pre and post test means on Body Mass Index of Without Music Group, Music Group and control groups are 5.77, 12.16 and 0.52 respectively. The table value required for significant difference with df 14 at 0.05 level is **2.14. The obtained ‘t’ test of experimental groups are greater than the table value.**

Hence, it is proved that experimental group had significantly improved the Body Mass Index whereas the control group did not improve significantly as they were not subjected to any specific training. Taking into consideration of the pre and post test means on breathe holding time, the adjusted post test means were determined and analysis of covariance was computed for experimental and control groups and presented in Table XVI

Table II shows the adjusted post test means of Without Music Group, Music Group and control groups are 22.84, 21.29 and 24.73 respectively. The obtained f-ratio of 42.11, which is higher than the table value 3.23 with df 2 and 41 required for significance. The result of the study indicates that there are significant mean differences on Body Mass Index among the adjusted post test means of Without Music Group, Music Group and control groups at 0.05 level. Hence it is clear that the training package significantly improved the Body Mass Index of the subjects.

Since significant improvements were recorded among the adjusted post test means, the results were further subjected to post hoc analysis using Scheffe’s confidence interval test to find out which of the three paired means had a significant difference. The results were presented in Table III

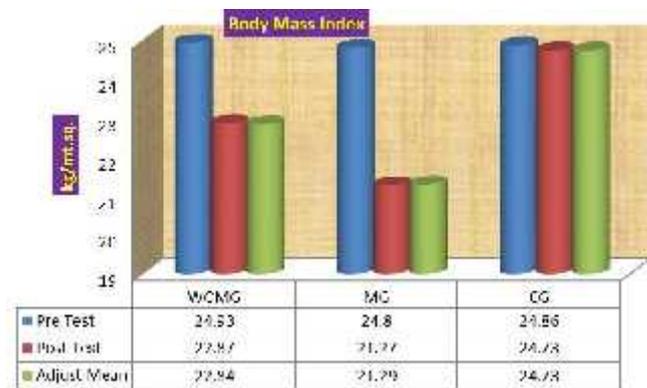
Table III shows that the adjusted post test mean differences in Body Mass Index between Without Music Group and Control is 1.89 which are greater than the confidence interval value of 0.96 which is statistically significant at 0.05 level of confidence. Therefore it is proved that there is

significant difference found in Body Mass Index between Without Music Group and control group.

Table III shows that the adjusted post test mean differences in Body Mass Index between Without Music Group and Music Group is 1.55 which are greater than the confidence interval value of 0.96 which is statistically significant at 0.05 level of confidence. Therefore it is proved that there is significant difference found in Body Mass Index between Without Music Group and Music Group.

Table III shows that the adjusted post test mean differences in Body Mass Index between Music Group and Control group is 3.44 which are greater than the confidence interval value of 0.96 which is statistically significant at 0.05 level of confidence. Therefore it is proved that there is significant difference found in Body Mass Index between Music Group and Control group

The ordered pre-test, post-test and adjusted post test mean values of experimental and control groups on Body Mass Index are graphically illustrated through bar diagram for better understanding in Figure I.



**Figure: I** Mean values and adjusted post mean values of body mass index without music group, music group and control group

**Results of Stress**

The statistical analysis of dependent ‘t’ test comparing the initial and final means of Stress due to specific training packages of experimental and control groups have been analyzed and presented in Table XXIV

Table IV shows that the pre test mean value of Without Music Group, Music Group and control groups are 32.40, 32.60 and 32.53

respectively and the post test means are 28.93, 27.33 and 32.27 respectively.

<b>Table IV</b> The summary of mean and dependent 't'-test for the pre and post tests on stress			
	<b>WOMG</b>	<b>MG</b>	<b>CG</b>
<b>Pre test Mean</b>	32.40	32.60	32.53
<b>Post test Mean</b>	28.93	27.33	32.27
<b>'t' test</b>	7.27*	15.88*	0.84
<b>Table value required</b>	2.14	2.14	2.14

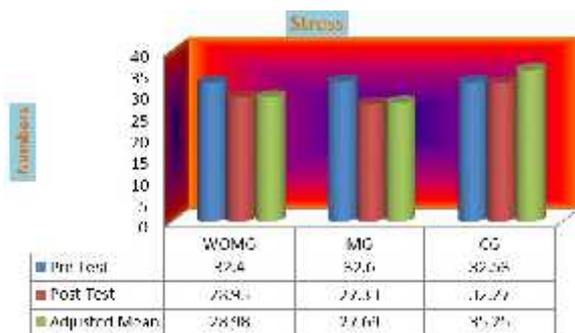
**WOMG**-Without Music Group, **MG**- Music Group, and **CG**-Control Group  
 \*significant at 0.05 level (Stress in counts)  
 (The table value required for 0.05 level of significance with df 14 is 2.14)

<b>Table V</b> Computation of analysis of covariance on stress							
Adjusted post test means			Sources of Variance	Sum of square	df	Mean squares	F ratio
<b>WOMG</b>	<b>MG</b>	<b>CG</b>					
28.98	27.69	32.25	Between	166	2	83	55.69*
			Within	61.11	41	1.49	

**WOMG**-Without Music Group, **MG**- Music Group, and **CG**-Control Group  
 \*significant at 0.05 level of confidence  
 (The table value required for significance at 0.05 level with df 2 and 41 is 3.23)

<b>Table VI</b> Scheffe's post hoc test on stress				
ADJUSTED POST TEST MEAN			Mean difference	Confidence interval
<b>WOMG</b>	<b>MG</b>	<b>CG</b>		
28.98		32.25	3.27*	1.14
28.98	27.69		1.29*	
	27.69	32.25	4.56*	

**WOMG**-Without Music Group, **MG**- Music Group, and **CG**-Control Group  
 \*significant at .05 level



**Figure: VII** Mean values and adjusted post mean values of stress without music group, music group and control group

The obtained dependent t-test between the pre and post test means on Stress of Without Music Group, Music Group and control groups are 7.27, 15.88 and 0.84 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.14. The obtained 't' test of experimental groups are greater than the table value.

Hence, it is proved that experimental group had significantly improved the Stress whereas the control group did not improve significantly as they were not subjected to any specific training. Taking into consideration of the pre and post test means on breathe holding time, the adjusted post test means were determined and analysis of covariance was computed for experimental and control groups and presented in Table V.

Table V shows the adjusted post test means of Without Music Group, Music Group and control groups are 28.98, 27.69 and 32.25 respectively. The obtained f-ratio of 55.69, which is higher than the table value 3.23 with df 2 and 41 required for significance. The result of the study indicates that there are significant mean differences on Stress among the adjusted post test means of Without Music Group, Music Group and control groups at 0.05 level. Hence it is proved that the training of package subjects can improve the Stress of package subjects. Since significant improvements were recorded among the adjusted post test means, the results were further subjected to post hoc analysis using Scheffe's confidence interval test to find out which

of the three paired means had a significant difference. The results were presented in Table VI

Without Music Group and Control is 3.27 which are greater than the confidence interval value of 1.14 which is statistically significant at 0.05 level of confidence. Therefore it is proved that there is significant difference found in Stress between Without Music Group and control group.

Table VI shows that the adjusted post test mean differences in Stress between Without Music Group and Music Group is 1.29 which are greater than the confidence interval value of 1.14 which is statistically significant at 0.05 level of confidence. Therefore it is proved that there is significant difference found in Stress between Without Music Group and Music Group.

Table VI shows that the adjusted post test mean differences in Stress between Music Group and Control group is 4.56 which are greater than the confidence interval value of 1.14 which is statistically significant at 0.05 level of confidence. Therefore it is proved that there is significant difference found in Stress between Music Group and Control group

The ordered pre-test, post-test and adjusted post test mean values of experimental and control groups on Stress are graphically illustrated through bar diagram for better understanding in Figure II.

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### Conflict of interest

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

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## Effect of aerobic dance training on body composition of overweight adults

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### Abstract

Lack of physical activity and an uncontrolled diet cause excessive weight gain, which leads to obesity and other metabolic disorders. A sedentary lifestyle poses a threat to individuals' health because it can lead to an increase or progression in the risk of hypertension, obesity, muscle weakness, postural defects, and lean body mass. Measurement, assessment and monitoring of BC in humans have been three of the main challenges for health sciences professionals. Effective weight management strategies consider not only weight loss toward but also the maintenance of a healthy body weight over time. The researcher was interested in assessing the effects of twelve weeks' aerobic dance training program on body composition of overweight adults. The body composition was assessed using waist to hip ratio and skinfold. The study was a one group pre-test post-test design with thirty subjects. The subjects selected for the study were graduate male students studying during 2020-21 at selvamm arts and science college namakkal, TamilNadu. Their age ranged between 18 to 23 years. All the subjects were residents of men hostel. The criterion measures of body composition were waist to hip ratio and skinfold measurement at four sites. Descriptive statistics like mean and standard deviation were employed on the raw scores during pre and post-test situations. The differences between mean scores were calculated using 't' test for paired samples. Findings of the study are discussed in detail. Within the limitations of the present study, it is concluded that the exercise intervention in the form of aerobic dance performed for twelve weeks is effective in reducing body fat in overweight adults.

**Keywords:** Aerobics, Dance, Body composition, Waist circumference, Waist to hip ratio.

### Introduction

Everyday life, daily life or routine life involves the ways in which people typically act, think, and feel on a daily basis. Everyday life may be described as unexciting, routine, natural, habitual, or normal. Human behavior means most people sleep at last part of the night and are active during daytime. Working time mostly involves a daily schedule, beginning in the morning. Busy in work and everyone avoids their health and unknowingly welcome sedentary life style. Any extended sitting can be considered harmful (Tremblay, et al., 2010). Lack of physical activity and an uncontrolled diet cause excessive weight gain, which leads to obesity and other metabolic disorders (Melam, et al., 2016). A sedentary lifestyle poses a threat to individuals' health because it can lead to an increase or

progression in the risk of hypertension, obesity, muscle weakness, postural defects, and lean body mass (Pantelic, et al., 2007). Nowadays, fitness training is often discussed from different points of view, more and more people believe that systematic fitness training is essential in preserving health. In prosperous states it can be observed that systematic fitness training is not only the private property of the younger generation, but also belongs to children and the older generation, who have opportunities to participate in such fitness training, be fitting for their special needs as well as are well organized under expert guidance. As a matter of record, the results of much scientific research studies have already proved that systematic fitness training can serve as an excellent tool to slow down the

process of aging and improve the quality of life because it has a positive effect on the weight management, the cardiorespiratory, the neuromuscular, the metabolic and the immune systems as well as on mental health (Jordan, 1993; Shimamoto, Adachi, Takahashi, & Tanaka, 1998). Exercise is an important component in physical therapy programs and in maintaining a healthy lifestyle. The conditioning effects gained from an exercise program enable an individual to perform daily activities at a higher functioning level. Physical therapists use a wide range of exercise modes to improve cardiorespiratory endurance (Cassady and Nielsen, 1992; Vickery, Cureton, and Langstaff, 1983).

### **Body Composition**

Measurement, assessment and monitoring of BC in humans have been three of the main challenges for health sciences professionals. Obesity is defined as an excess of body fat, traditionally classified based on the body mass index (W.H.O., 2000). Its prevalence nearly doubled from 1980 to 2008, reaching epidemic levels and affecting countries independently of income or developmental levels (W.H.O., 2011). Central fat accumulation, and in particular intra-abdominal or visceral fat depots, has been identified as an independent risk factor for insulin resistance, Cardio Vascular Diseases and hypertension (Reaven, 1988). Weight management techniques encompass long-term lifestyle strategies that promote healthy eating and daily physical activity (American Dietetic Association, 2009). Effective weight management strategies consider not only weight loss toward but also the maintenance of a healthy body weight over time. Moreover, weight management involves an understanding of meaningful ways to track weight over time and set ideal body weights for different individuals (Ryan and Kahan 2018). Weight management does not include fad diets that promote quick, temporary weight loss.

### **Aerobic Exercises**

Aerobic means "with oxygen," refers to physical exercise to improve cardio respiratory endurance. Aerobic movement is rhythmic and repetitive, engaging the large muscle groups in

the arms and legs for at least 20 minutes at each session. The ensuing demand for a continuous supply of oxygen creates the aerobic training effect, physiological changes that enhance the ability of the lungs, heart, and blood vessels to transport oxygen throughout the body. The most beneficial aerobic exercises include cross-country, swimming, running, cycling, walking, and aerobic dance (Cooper, 2009). Aerobic activities include walking, jogging, bicycling, dancing and swimming etc. anything that involves the large muscle groups, which sustains for thirty minutes or longer, is considered aerobic. It should be done a minimum of five days a week for at least thirty minutes each session (Sunder, 2009).

### **Aerobic Dance exercises**

Aerobic exercise to music or dance aerobics was especially popular during the last few years of the 20th century, primarily among women. A characteristic of this kind of exercise is that all of the people who are participating in the exercise to music program realize certain movements in the same rhythm and tempo, activating different muscle groups at the same time. Aerobic dance exercises have typically been developed as an aerobic exercise to reduce body compositions as well as improve physical fitness and performance (Kimura & Hozumi, 2012).

### **The statement of the problem**

The researcher was interested in assessing the effects of twelve weeks' aerobic dance training program on body composition of overweight adults.

### **Materials and methods**

The study was a one group pre-test post-test design with thirty subjects. The subjects selected for the study were graduate male students studying during 2020-21 at selvamm arts and science college namakkal. Their age ranged between 18 to 23 years. All the subjects were residents of men hostel. The criterion measures of body composition were waist to hip ratio and skinfold measurements at four sites. The free time of the subjects were made known and necessary data was collected. The experimental protocol

designed by the researcher on the basis of reviews gone through and insight of the researcher was implemented for twelve weeks. Selected aerobic dance steps were carefully and systematically performed by the subjects up to twelve weeks. The exercises were performed in simple to complex method thrice a week for one hour a day. Systematic warmup preceded exercise intervention in each class followed by a warm down session. Descriptive statistics like mean and standard deviation were employed on the raw scores during pre and post-test situations. The differences between mean scores were calculated using 't' test for paired samples.

**Findings**

The raw data on body composition measured in terms of waist to hip ratio and percent body fat by skinfold measurements was subjected to intended statistical techniques and the results

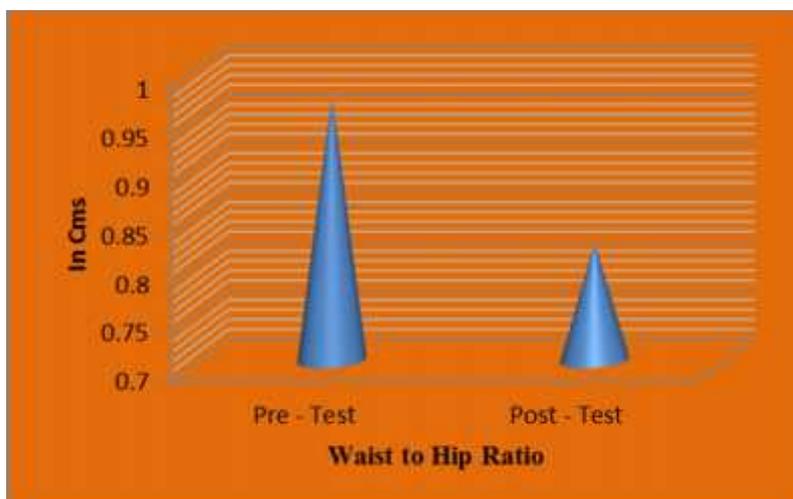
From table 1, it is clear that there is significant difference in waist to hip ratio and percent body fat between pre and post test scores of overweight adults. The results clearly point out that the practice of aerobic dance has significant effect on body composition of young women. Following figures provide graphical representation of results derived from the present analysis.

**Discussion**

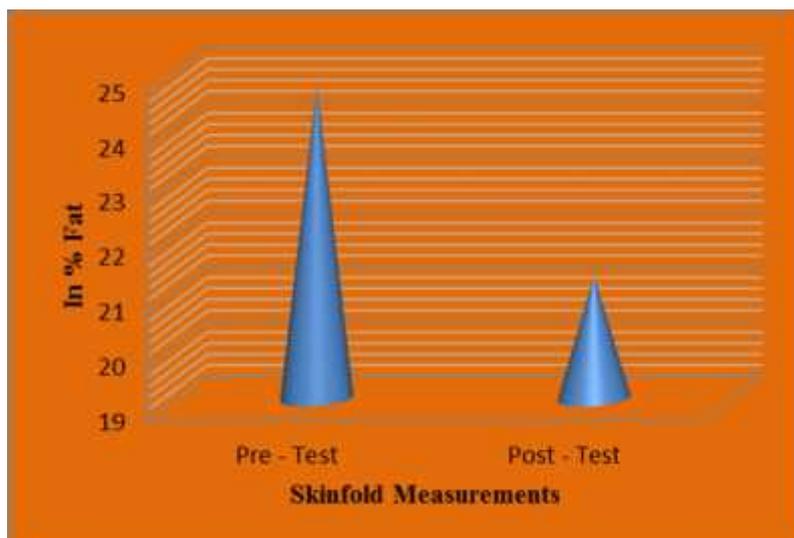
The best way to mobilize body fat is to follow the approach in which aerobic activities are systematically planned (Toy, 2008). Although there are various other factors influencing the reduction of fat including genetics, food and gender, physical activities including aerobic dance is considered useful in dealing excess body fat (Abe, 1997). Shaw, et al., (2012) support the use of exercise as a weight loss intervention.

**Table 1: Summary of 't' test on body composition variables of overweight adults during pre-test and post-test**

	Mean ± SD	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Mean ± SD
<b>Waist to Hip Ratio (in cms)</b>	Pre test	.97±.22	3.165	.002	0.144	.04571
	Post test	.82±.12				
<b>Skinfold Measurements (in % fat)</b>	Pre test	24.70±6.40	2.342	.023	3.466	1.48001
	Post test	21.23±4.98				



**Figure 1** Differences in waist to hip ratio of young female during pre and post test



**Figure 1** Differences in percent body fat of overweight adults during pre and post test

In a similar study, the results of the research of the effects of dance aerobics on body composition in young people show that the application of the appropriate dance aerobics models can affect body composition in terms of reducing the body weight, body fat percentage and visceral fat (Stosic, 2015). The results are supported by Jaywant (2013) in which he indicates aerobics as highly effective in weight loss.

## 5. Conclusions

Within the limitations of the present study, it is concluded that the exercise intervention in the form of aerobic dance performed for twelve weeks is effective in reducing body fat in overweight adults.

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### Conflict of interest

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

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