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BNJPEES**

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**DEPARTMENT OF PHYSICAL EDUCATION  
BHARATHIAR UNIVERSITY  
COIMBATORE-641046**

## **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 12th 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. Volume 12 has brought out 40 articles in total out of the 73 articles submitted. 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 a quarterly journal in this volume we have four issues of 10 articles each. 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 real time research results which would benefit the society.



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## **Investigation on Stress Reduction through Yogic Package for Women During Pandemic**

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### **Abstract**

The purpose of the study was to effect of asanas and meditation on stress level of working women in pandemic situation of Coimbatore District were constituted the population of the study. For this study 30 working women were selected constituted the population of the study were randomly selected as a subject and their age ranged between 30 to 35 years. They were divided group into two equal groups namely Experimental group (n=15) and Control group (n=15 Perceived Stress scale Questionnaire for the analysis of results the level of significance to test t-ratio was set at 0.05 level of confidence for this study. The collected data on Stress was analysed by computing mean and standard deviation. The collected data were analysed statistically by 't' test from the analysis of data proved that there is significant difference between Control group and Experimental group . The study has painted the requirements of the working women to need exact and suitable evidence approximately mental health to survive in pandemic situation.

**Keywords:** Stress, Yogic Package, Asanas and Meditation.

### **1. Introduction**

The COVID-19 pandemic has had a major effect on our lives. Many of us are facing challenges that can be stressful, overwhelming, and cause strong emotions in adults and children. Public health actions, such as social distancing, are necessary to reduce the spread of COVID-19, but they can make us feel isolated and lonely and can increase stress and anxiety. Learning to cope with stress in a healthy way will make the people care about, and those around become more resilient. COVID-19 is hard on women as compared to men. The pandemic has drastically affected all sectors but most importantly the working women. These are

the sectors that comprise women workers more than men. With the lockdown taking unemployment rates above the sky, working women are struggling to balance their families and jobs at the same time. This has resulted in a large number of women especially mothers to cut down on their working hours or in some cases, eventually, quit jobs. The women have routine-dependent career choices that focus more on the needs of the family which creates a problem affecting them differently.

### **2. Literature Review**

**Bus Horiz. 2021**, Mindfulness and the challenges of working from home in

times of crisis, Many employees unexpectedly were required to work from home during the COVID-19 pandemic of 2020. With this abrupt change came the challenge of blurred lines between career and personal life. Lacking designated home office spaces, countless individuals had to create improvised work setups in living rooms, kitchens, bedrooms—wherever there was space. Moreover, the closure of schools forced many working parents to attempt productivity while concurrently supervising their children. As a result of these changes, numerous employees have experienced lower work productivity, lessened motivation, increased stress, and poorer mental health. One approach that may help employees going through the challenges associated with working from home is mindfulness. Mindfulness may be particularly beneficial as it can help employees mentally disconnect from work when they need to; improve individuals' attention to work tasks and thereby improve their performance; and allow workers to better manage screen fatigue. In this installment of Work/Life Balance, we elaborate on how mindfulness may help employees deal with these work issues, explain how mindfulness can be cultivated, and provide a list of mindfulness techniques. We also provide a set of recommendations for managers and team leaders responsible for their employees' well-being and productivity. Crisis, COVID- 19, Mindfulness, Pandemic, Productivity, Telework, Well-being, Telecommuting, Working from home.

**Masoumeh Shohani et al., (2018),** The Effect of Yoga on Stress, Anxiety, and Depression in Women, In recent decades, several medical and scientific studies on yoga proved it to be very useful in the treatment of some diseases. This study was conducted to investigate the effects of yoga on stress, anxiety, and depression in women living in Ilam, Iran. This study is a quasi-experimental study with pre-post test. To collect data, the questionnaire of DASS-21

(Depression Anxiety Stress Scale-21) was used. For eligible samples, hatha yoga exercises and training sessions were held for 4 weeks (3 time/weeks; 60-70 min each) by a specialist. Data were analyzed using SPSS version 20. 52 women with a mean age of  $33.5 \pm 6.5$  were included for analysis. Depression, anxiety, and stress decreased significantly in women after 12 sessions of regular hatha yoga practice ( $P < 0.001$ ). Yoga has an effective role in reducing stress, anxiety, and depression. Thus, it can be used as complementary medicine. Anxiety, depression, stress, women, yoga.

### 3. Materials and Methods

#### 3.1 Subjects

Totally 30 working women's were randomly selected those are working from home from Coimbatore District for the present study. Their aged ranged between 30 to 35 years. They were divided into two equal group experimental group (N=15), and Control Group (N=15). The experimental and control group were tested for stress level before and after asanas and Meditation program for 6 months.

#### 3.2 Inclusion and exclusion criteria

Inclusion criteria were cultured, non-pregnant women with the ability to perform asanas and meditation exercises without inability to exercise. Exclusion criteria encompassed rejection or aversion to make yoga incessantly, immediate exercise, and receiving medication for psychological sicknesses.

#### 3.3 Valuation implements and organization

To collect data, the questionnaire of PSS-21 (Perceived Stress Scale-21) was used. The validity and reliability of this standard questionnaire was examined by **Sahebi et al.** and Cronbach's alpha was estimated 0.76 for stress, respectively. in a study entitled "validation of stress scale for

an Iranian population”. Each of the above mentioned states are assessed with seven questions. Asanas and meditation exercises and training sessions were held 3 time/weeks; 60-70 min each (postures, breathing techniques, meditation) by a specialist. Before the intervention, questionnaires were completed by women. The intervention lasted 12 sessions. At the end of the 12th session, the questionnaire of PSS-21 was again completed by working

women through online Zoom Meeting where they stay.

**3.4 Statistical Procedures**

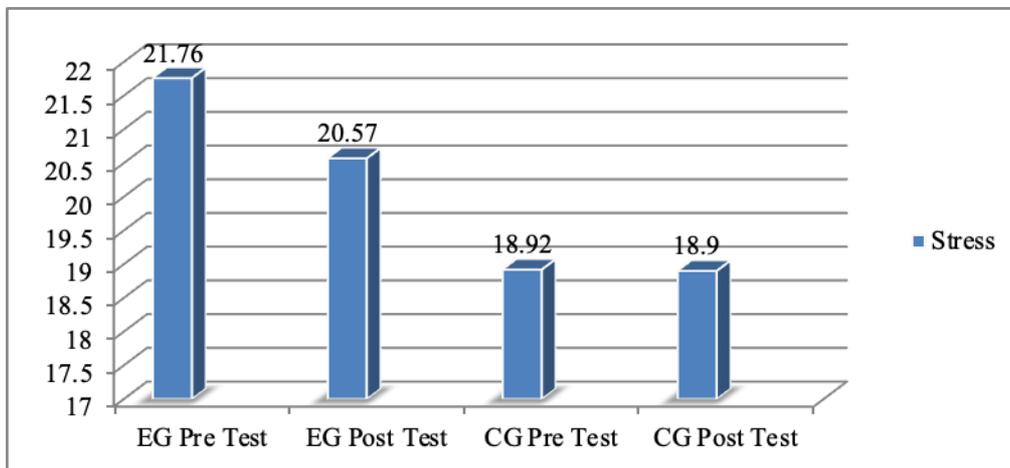
The obtained data were analyzed using SPSS version 20. According to the established normality, paired sample t-test was used for comparing the results before and after the intervention. The threshold of significance was set at  $P < 0.05$ .

**Table 1**  
Computation of “t” ratio on Stress Level of Working Women on Experimental Group and Control Group (SCORES IN POINTS)

Group	Variables	Mean	N	Std. Deviation	Std. Error Mean	T ratio
Experimental Group	Stress	21.76	15	5.12	.628	5.8*
		20.57	15	5.08		
Control Group	Stress	18.92	15	2.652	.548	11.63
		18.90	15	2.864		

Table I reveals the computation of mean, standard deviation and ‘t’ ratio on Stress of experimental group. The obtained ‘t’ ratio on Stress were 5.8 respectively. The required table value was 2.09, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. Since the obtained ‘t’ values

were greater than the table value it was found to be statistically significant. Further the table reveals the computation of mean, standard deviation and ‘t’ ratio on selected psychological parameters namely stress of control group. Since the obtained ‘t’ values were greater than the table value it was found to be statistically not significant.



**Figure 1** showing the mean value of Stress pre and post-test of Experimental and Control group

#### 4. Results

The result of the study proved the different beneficial asanas and meditation practices on stress. The post readings of parameters such as Stress extended notably ( $<0.005$ ) following asanas and Meditation practices. This suggests that some asanas help them to come out of stress. The meditation practice readings of stress level would possibly reduce their stress level and are also statistically significant results shown in Table.

#### 5. Discussion

The Psychology Variables exhibit statistically enormous improvement with regular practice of Asanas and Meditation Practices. These effects can be explained on the following basis: Effects of a single session of large-group meditation and progressive muscle relaxation training on stress reduction, reactivity, and recovery (Rausch, Sarah M et al 2012).

#### 6. Conclusion

COVID-19 has changed the way the economy will function for the foreseeable future. The people are facing problem both financially and mentally. For this purpose the study is created and after six weeks of Asanas and Meditation practices the readings of Stress showed improvement in mental health. From the present study we may additionally conclude that asanas and meditation can be recommended to enhance the IT professionals and humans working mechanically and subsequently maintain their family situation to prevent their mental health in future. These really useful effects of different asanas and Meditation practices can be used as a stress level. The daily practice should also be components of mentally health and life style changing applications in conserving better intellectual health. Asanas and Meditation practices improves the stress level.

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#### Conflict of interest

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

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## Effect of Ball Control Drills on Playing Ability of Middle School Volleyball Players

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### Abstract

In this paper, I have tried to present a highly important and current topic with clear goals and tasks. The development of muscle strength and specific technical skills are particularly important for young players and especially to teenage athletes, as priority factors to achieve success. To achieve the purpose of the study 40 middle school volleyball players were selected using purposive random sampling technique from Coimbatore district. The age of the subjects ranged between 11 - 13 years. The pre test was conducted on the selected skills (passing and serving – Russell - Lange Volleyball Test). After completion of the pretest the subjects were randomly assigned into two groups equally so that each group has 20 subjects. The first group was named as the Ball Control Drill Group (BCG). The second group was Control Group (CG). The training period was scheduled for 12 weeks (5 days (1 session) a week). Experimental group (BCG) underwent Circuit Training and the Control Group (CG) did not undergo any specific training other than the regular work. After 12 weeks of the training period post test was conducted for both the groups. To find out if any significant difference exists between pre and post training, t-ratio was applied. The Ball Control Drill Group (BCG) had significantly improved ( $P < 0.05$ ) the selected skills (passing and serving). The experimental group (BCG) was better than the control group. The control group did not show any significant improvement on the selected variables. Based on the results it was concluded that the implication of Ball Control Drill Group (BCG) might have been the source of its dominance on the improvement of selected skills (passing and serving) of middle school volleyball players.

**Key words:** Ball control drill, Middle school volleyball players, serving, passing.

### 1. Introduction

With the goal of planning optimal training, the selection of training methods is carried out by choosing those which can more efficiently affect the development of training in a young child who is subjected to systematic training (Morrow, 2001). Volleyball is one of the world's most popular sports and because of its enormous popularity many studies have been conducted in an attempt to understand the better program training required to develop total body performance by a volleyball player. The development of muscle strength and

specific technical skills are particularly important for young players and especially to teenage athletes, as priority factors to achieve success (Smith, 2003). One of the many possibilities where ball-handling skills may be well applied is the process of identification of sport-talented children (Malousaris, 2008). If a player wants to achieve reasonable success in competitions at a higher level, improvements in physical fitness needs to be emphasized in addition to skill training (Saravanan, 2016).

There are different types of training methods for the development of

performance abilities of volleyball players. Understanding these training methods and the effectiveness of the training methods to suit a particular game and game situations is a challenging task for any coach or player. This helps coaches and athletes to prevent injury and overtraining while trying to maximize their performance variables, and analyze the strengths and weaknesses related to their specific training programs. Skill based conditioning is a widely used approach for structuring a training program to improve competitive performance in a specific sport by training in a variety of sports. The principles of specificity of training tend to have greater significance, especially for basic level volleyball. For the volleyball players, skill based training may be highly beneficial in terms of overall fitness. Similarly, skill based training may be an appropriate training to prevent physical injury and it should be very specific, also avoiding the mental fatigue compare to traditional training which is common to the fitness. The Scientific method of training and coaching is one of the key areas, which all the successful teams have concentrated and maintained for great results. Even though there are numerous methods of training available, the role of skill based training in developing skill performance and physical fitness components is undisputed. Recent studies have supported the theory that specific training, when executed for the appropriate duration at the appropriate intensity, meets the criteria for developing the performance of football, rugby etc. But less information is available on this area of research in volleyball (**Fortes, 2020**).

To the best of our knowledge, no study investigated simultaneously passing and serving improves through ball control drills for volleyball players attending the middle school. Therefore, the aim of this study was to examine the effect of 12-week ball control drill program on passing

and serving ability among middle school volleyball players. It was hypothesized that the training group would enhance passing and serving ability since they would train this.

## 2. Methods

To achieve the purpose of the study 40 middle school volleyball players were selected using purposive random sampling technique from Meerut. Before starting the training protocol, the subjects were tested for their performance. The data will be stored in MS excel format with restricted access. The age of the subjects ranged between 11 - 13 years. The pre test was conducted on the selected skills (passing and serving - Russel-Lange Volleyball Test). After completion of the pretest the subjects were randomly assigned into two groups equally so that each group has 20 subjects [5]. The first group was named as the Ball Control Drill Group (BCG). The second group was Control Group (CG). Experimental Group (BCG) underwent Ball Control Drills and the Control Group (CG) did not undergo any specific training other than the regular work. The duration of the training program was 12 weeks and subjects trained five days a week i.e. on Mondays, Wednesdays and Fridays. An adaptation period of two weeks was followed. In the first two weeks the number of repetitions was six and thereafter every two weeks one repetition was added and during the 10th week the number of repetitions was 10. After 12 weeks of the training period post test was conducted for both the groups. All data were analyzed using Statistical Package for SPSS. The significance threshold was set to be at  $p < 0.05$  level of confidence for degrees of freedom 1 and 19.

## 3. Results

To find out if any significant difference exists between pre and post

training, t-ratio was applied. The Ball Control Drill Group (BCG) had significantly improved ( $P < 0.05$ ) the selected skills (passing and serving) of middle school volleyball players. The experimental group

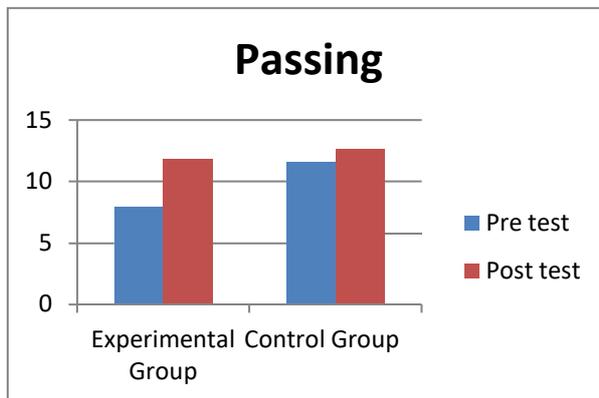
(BCG) Ball Control Drill Group was better than the Control Group (CG). The Control Group did not show any significant improvement on the selected skills.

**Table 1** showing obtained mean values for the selected variables

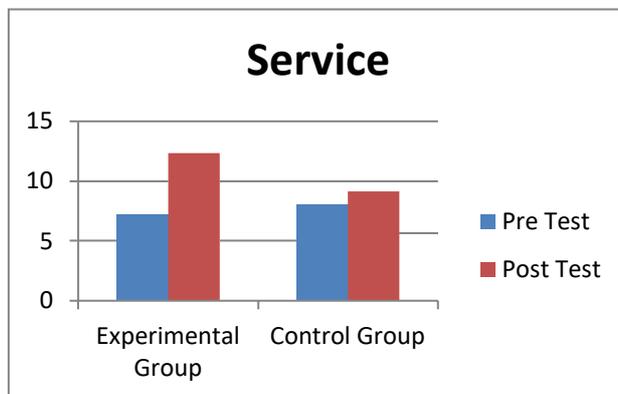
S. No	Variable	Group	Pre test	Post test	Std deviation		Std. Error Mean		“t” Ratio
1.	Passing	Ball control group	11.40	7.59	4.95	0.75	1.27	0.19	9.92
		Control group	10.59	11.02	5.02	5.12	1.29	1.32	-2.87
2.	Service	Ball control group	7.9	11.8	1.06	1.06	0.27	0.27	17.9
		Control group	11.5	12.6	1.25	1.09	0.32	0.28	0.56

Table value 2.14 Significant at 0.05 level of confidence 1 and 19.

**Figure 1** Graphical Representation Showing the Pre and Post Test Mean Values of Experimental Group and Control Group on Passing



**Figure 2** Graphical Representation Showing the Pre and Post Test Mean Values of Experimental Group and Control Group on Service



#### 4. Discussion

To find out if any significant difference exists between pre and post training, t-ratio was applied. The Ball Control Drill Group (BCG) had significantly improved ( $P < 0.05$ ) the selected skills (passing (number of counts increased) and serving (points improved) - Russel-Lange Volleyball Test). The experimental group (BCG) Ball Control Drill Group was better than the control group. The control group did not show any significant improvement on the selected skills. Based on the results it was concluded that the implication of Ball control drill might have been the source of its dominance on the improvement of skills (passing and serving) of middle school volleyball players.

#### 5. Conclusion

Based on the results of the study, the following conclusions were drawn. Through this study we find out that the ball control drill improves the passing and serving skills of middle school volleyball players. The investigator suggests the ball control drill to all the volleyball players for improve their passing and serving skills among them. This type of training is comfortable to all volleyball players. It helps to improve their overall playing ability also.

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## Effect of Crossfit Training and Plyometric Training on Breath Holding Time and Resting Pulse Rate among Women Basketball Players

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### Abstract

The purpose of the study was to find out the effect of crossfit training and plyometric training on selected breath holding time and resting pulse rate among women Basketball Players. For this purpose sixty (n=60) collegiate women basketball players who were participated in inter collegiate basketball tournament were randomly selected as subjects. Their age ranged from 18 to 22 years. The subjects were assigned at random into four groups of fifteen each (n=15). Group-I underwent crossfit training, Group-II underwent plyometric training, Group-III underwent combined crossfit and plyometric training and Group-IV was acted as control group. The experimental groups underwent respective training period for three days per week for twelve weeks. The dependent variables selected for this study were breath holding time, resting pulse rate, and it was measured by stopwatch and stethoscope respectively. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variable and the collected data were analyzed by using ANCOVA was used to determine the differences, whenever the 'F' ratio for adjusted post test means was found to be significant, the scheffe's post hoc test was followed to determine paired mean differences. In all the cases significant at 0.05 level of confidence was fixed. The results of the study showed that all the experimental had significantly improved in selected physiological variables. The study showed that all the experimental groups namely, crossfit training, plyometric training and combined crossfit training and plyometric training had significantly improved in selected parameters such as breath holding time and resting pulse rate. Further the study showed combined crossfit training and plyometric training group is better than crossfit training, plyometric training and control group.

**Keywords: Breath Holding Time, Resting Pulse Rate.**

### 1. Introduction

Sports science is the application of scientific principles to explain sporting phenomena and provide a basis for improving the performance of teams and individuals (Simon et al., 2015). Training is a programme of exercise designed to improve the skills and to increase the energy capacity of an athlete for a particular

event, therefore training is essential for the development of physical fitness components (Williams et al., 2002). Sports training is a special process of preparation of sports persons based on scientific principles aimed at improving and maintaining higher performance capacity in different sports activities. It is a particular type of training designed to improve fitness and abilities to perform in a given sport

(Smith et al., 2013). Crossfit based high-intensity power training improves the body composition, maximal aerobic capacity, VO<sub>2</sub>max was improving in women, and body fat significantly increased (decreased) in men. The high-intensity power training program framed by selected CrossFit exercises was helping to significantly improves on VO<sub>2</sub>max, body composition, maximal aerobic capacity, and body fat (Donald et al., 2013).

Plyometric exercise is a popular form of training used to improve athletic performance. It involves a stretch of the muscle-tendon unit immediately followed by a shortening of the muscle unit. This process of muscle lengthening followed by rapid shortening during the stretch-shortening cycle (SSC) is integral to plyometric exercise. The SSC process significantly enhances the ability of the muscle-tendon unit to produce maximal force in the shortest amount of time. These benefits have prompted the use of plyometric exercise as a bridge between pure strength and sport-related power and speed (Carole et al., 2013).

Exercise physiology is the study of how the body responds and adapts to physical stress. Sport physiology is the application of exercise physiology principles to guide training and enhance sport performance. Exercise and sport physiology overlap significantly, and therefore are generally considered together. For the remainder of this chapter, the term exercise physiology will be used to encompass the areas of both exercise and sport physiology. Exercise is an intentional physical stress placed upon the body, producing both acute and chronic effects that can be studied. Acute exercise effects are sudden and immediate, whereas chronic exercise effects are gradual and long term. When you start jogging, the systems in your body (cardiovascular, respiratory, nervous, endocrine, etc.) immediately respond with acute changes

(e.g., increased heart rate and breathing rate) that permit your body to meet the demands of the stress and perform the processes necessary for you to jog. If you jog regularly, the stress is placed upon the body chronically, and the body's systems respond over time with long-term physiological adaptations. Physiological adaptations result in less stress on the body's systems, greater efficiency of the systems, and improved physical performance during exercise and other types of physical activity (Fox et al., 1993).

The body's physiologic responses to episodes of aerobic and resistance exercise occur in the musculoskeletal, cardiovascular, respiratory, endocrine, and immune systems. These responses have been studied in controlled laboratory settings, where exercise stress can be precisely regulated and physiologic responses carefully observed (Dexhemieret al., 2019).

The present study has attempted to find out the isolated and combined effect of crossfit training and plyometric training on breath holding and resting pulse rate among women basketball players.

## 2. Materials and Methods

The study was conducted on sixty (N=60) collegiate women basketball players who were participated in inter collegiate basketball tournament were randomly selected as subjects, their age ranged from 18 to 22 years. The subjects were assigned at random into four groups of fifteen each (n=15). Group-I underwent crossfit training, Group-II underwent plyometric training, Group-III underwent combined crossfit and plyometric training and Group-IV was acted as control group. The Experimental groups underwent respective training period for three days per week for twelve weeks. The dependent variables selected for this study were breath holding time, resting pulse rate, and it was measured by stopwatch and stethoscope. All the subjects were tested

prior to and immediately after the experimental period on the selected dependent variables.

### 3. Results

The data collected from the experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance ANCOVA, Whenever the 'F' ratio for adjusted post test means was found to be significant, scheffe's test was

followed, as a post hoc test to determine which of the paired mean differences was significant. In all the cases the significant at 0.05 level of confidence was fixed. Analysis of covariance on the data obtained on breath holding time and resting pulse rate from the subjects in the pre-test, post-test and adjusted post test mean of crossfit training group, plyometric training group, combined crossfit and plyometric training group and control group have been presented in **table- I**.

**Table I**

Analysis of covariance on breath holding time and resting pulse rate of experimental groups and control group

Physiological parameters		Crossfit training group	Plyometric training group	Combined crossfit and plyometric training group	Control group	F ratio
Breath holding time	Pre test mean	30.17	29.77	29.50	28.10	1.25
	Post test mean	33.37	31.10	33.87	31.20	12.56*
	Adjusted post test mean	34.58	33.28	35.48	28.50	69.89*
Resting pulse rate	Pre test mean	74.57	72.80	70.59	70.20	1.25
	Post test mean	73.52	71.54	69.28	70.18	29.28*
	Adjusted post test mean	73.43	72.56	71.26	71.19	48.64*

\* Significant at 0.05 level of confidence Table value for df (3, 56) at 0.05 level = 2.76 Table value for df (3, 55) at 0.05 level = 2.78

Table 1 shows that the pre-test and post-test mean values of breath holding for crossfit training group, plyometric training group, combined crossfit and plyometric training group and control group are (pre-test) 30.17, 29.77, 29.50 and 28.10 respectively and (post-test) are 33.37, 31.10, 33.87 and 31.20 respectively. The 'adjusted post test mean' values of breath holding are 34.58, 33.28, 35.48 and 28.50 respectively.

The pre-test and post-test mean values of resting pulse rate for crossfit training group, plyometric training group, combined crossfit and plyometric training group and control group are (pre-test) 74.57, 72.80, 70.59 and 70.20 respectively

and (post-test) are 73.52, 71.54, 69.28 and 70.18 respectively. The 'adjusted post test mean' of resting pulse rate were 73.43, 72.56, 71.26 and 71.19 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. It was concluded that the experimental groups such as crossfit training group, plyometric training group and combined crossfit & plyometric training group had registered significant improvement in breath holding time and resting pulse rate. The above data also reveal that the combined crossfit and plyometric training group had shown better performance than crossfit training group, plyometric training group and control group in breath holding time and resting pulse rate.

Scheffe's test was followed on the data obtained in selected physiological variables such as breath holding time, resting pulse rate from the subjects in the pre-test and post-test of crossfit training

group, plyometric training group, combined crossfit and plyometric training group and control group have been presented in Table- II.

**Table II,**

**The scheffe's test for the differences between the adjusted post test paired means on breath holding time and resting pulse rate**

Physiological variable	Adjusted post-test means				Mean difference	Confidence interval
	Crossfit training group	Plyometric training group	Combined crossfit and plyometric training group	Control group		
Breath holding time	34.58	33.28			1.30*	0.99
	34.58		35.48		0.90	0.99
	34.58			28.50	6.08*	0.99
		33.28	35.48		2.20*	0.99
		33.28		28.50	4.78*	0.99
			35.48	28.50	6.98*	0.99
Resting pulse rate	73.43	72.56			0.87	1.36
	73.43		71.26		2.17*	1.36
	73.43			71.19	2.24*	1.36
		72.56	71.26		1.30	1.36
		72.56		71.19	1.37*	1.36
			71.26	71.19	0.07	1.36

\* Significant at 0.05 level of confidence

Table 2 shows that the adjusted post test mean differences on breath holding time and resting pulse rate between crossfit training group and plyometric training group, crossfit training group and combined crossfit and plyometric training group, crossfit training group and control group, plyometric training group and combined crossfit and plyometric training group, plyometric training group and control group & combined crossfit and plyometric training group and control group. The adjusted post test mean differences on breath holding time are 1.30, 0.90, 6.08, 2.20, 4.78 and 6.98 respectively. The adjusted post test mean differences on resting pulse rate are 0.87, 2.17, 2.24, 1.30, 1.37 and 0.07 respectively. Which are greater than the confidence interval value of 1.36 at 0.05 level of confidence.

The results of the study showed that there was a significant difference between crossfit training group and plyometric training group, crossfit training group and combined crossfit and plyometric training group, crossfit training group and control group, plyometric training group and combined crossfit and plyometric training group, plyometric training group and control group & combined crossfit and plyometric training group and control group on breath holding time and resting pulse rate.

The above data also reveal that combined crossfit and plyometric training group had shown better performance than crossfit training group, plyometric training group and control group in breath holding time and resting pulse rate.

#### 4. Discussion

The results of the study reveal that there was a significant change found after crossfit training group, plyometric training group & combined crossfit training and plyometric training group on breath holding time and resting pulse rate (Mangune et al., 2020).

#### 5. Conclusions

The experimental groups namely, crossfit training group, plyometric training group & combined crossfit training and plyometric training group had significantly improved in breath holding time and resting pulse rate. The combined crossfit training and plyometric training group was found to be better than the crossfit training group, plyometric training group in the performance of breath holding time and resting pulse rate.

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## Six Weeks of Kinetic Band Training on Flexibility Among Volleyball Players

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### Abstract

The purpose of the present study was to investigate the effect of kinetic band training on flexibility among college men volleyball players. To achieve the purpose of the study thirty men volleyball players were selected from Madurai district, Tamilnadu, India during the year 2021. The subject's age ranges from 18 to 25 years. The selected subjects were divided into two equal groups consists of 15 men volleyball players each namely experimental group and control group. The experimental group underwent a kinetic band training programme for six weeks. The control group was not taking part in any training during the course of the study. Flexibility was taken as criterion variable in this study. The selected subjects were tested on flexibility was measured through sit and reach test method. Pre-test was taken before the training period and post- test was measured immediately after the six week training period. Statistical technique 't' ratio was used to analyse the means of the pre test and post test data of experimental group and control group. The results revealed that there was a significant difference found on the criterion variable. The difference is found due to kinetic band training given to the experimental group on flexibility when compared to control group.

**Keywords:** Kinetic band training, Flexibility.

### 1. Introduction

Today, sports have become a part and parcel of our culture. It is being influenced and does influence all our social institutions including education, economics, arts, politics, law, mass communication and even international diplomacy. Kinetic-bands are a great innovative training tool used to help you improve your speed, muscular strength, reaction time, acceleration, and coordination, jumping and sport specific quickness by optimally activating your muscles. With Kinetic-bands your feet and legs will become faster than ever. Athletes who are using Kinetic-bands Leg Resistance Bands

will see that their lateral agility and explosive sprint speed have increased majorly. During sport specific training you will enhance your hip flexor strength and activate your glutes, and with that all athletes no matter how old they are will benefit from the power of Kinetic-bands. You will find a drill for your specific sport on our website Kinetic-bands.eu where we have hundreds of hosted drills. Build explosive hip flexors (**Shilva et, 2015**).

Volleyball is an explosive sport in which the objective is to pass a ball over a net in such a way that the opponent is unable to successfully return the ball back over the net. Rallies, which

commonly include powerful actions such as spiking, blocking, diving, and serving, are followed by relatively long recovery periods (Ronnestad et al., 2015). "Volleyball is a game which calls for demanding, consistent exciting activity and attracts the adolescent the world over. There is a distinction, which gives a specialty to volleyball compared to that of other games. It is the natural behavior of human beings to use their hands and arms for doing almost all activities. In all other games, hands are dominantly used. But in volleyball, the use of hand has been restricted which is only used for throw in and all other parts of the body are allowed to play, especially to use the hand. The important motor fitness components are speed, strength, endurance, power, agility, flexibility and etc. Executing the Throw-In limits the use of hands in game play (M.RajKumar et al., 2019). The throw-in can be a valuable weapon in a team's plan of attack. A powerful throw can propel the ball from the touchline to the center of the field, up the sideline, or in front of the goal. Resistance training is a form of exercise for the development of strength and size of skeletal muscles. Resistance training produces increased strength, superior movement performance and general fitness, including enhanced function of the respiratory, cardiac and metabolic systems. Other improvements include an increase in muscle mass, strengthening of connective tissue and supportive tissue as well as improvements in posture and physique (Jayasivarajan et al., 2020). Strength is defined as the maximal amount of force a muscle or muscle group can produce in a specified movement pattern and velocity. Alternatively, power is the ability to exert as much force as possible in a limited amount of time (Holmberg et al., 2013).

## 2. Selection of subjects

The purpose of the study was to find out the effect of kinetic band training on flexibility among college men volleyball players. To achieve this purpose of the study, thirty men

volleyball players were selected as subjects at random. The age of the subjects were ranged from 18 to 25 years.

The selected subjects were divided into two equal groups of fifteen subjects each, such as a kinetic band training group (Experimental Group) and control group. The experimental group underwent kinetic band training for five days per week for six weeks. Control group, which they did not undergo any special training program apart from their regular physical activities as per their curriculum. The following physical variable namely flexibility was selected as criterion variable. All the subjects of two groups were tested on selected criterion variable flexibility was measured through sit and reach test method at prior to and immediately after the training program.

### 2.1 Statistical technique

The 't' test was used to analysis the significant differences, if any, difference between the groups respectively.

The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate.

The Table-I and II shows that the mean values of pre-test and post-test of the control group on flexibility were 13.39 and 13.36 respectively. The obtained 't' ratio was 1.00, since the obtained 't' ratio was less than the required table value of 2.14 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of the experimental group on flexibility were 13.43 and 13.90 respectively. The obtained 't' ratio was 3.46\* since the obtained 't' ratio was greater than the required table value of 2.14 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and experimental group in flexibility. It may be concluded from the result of

the study that experimental group improved in training. flexibility due to six weeks of kinetic band

**Table I**  
**Analysis of t-ratio for the pre and post tests of experimental and control group on Flexibility (Scores in centimeters)**

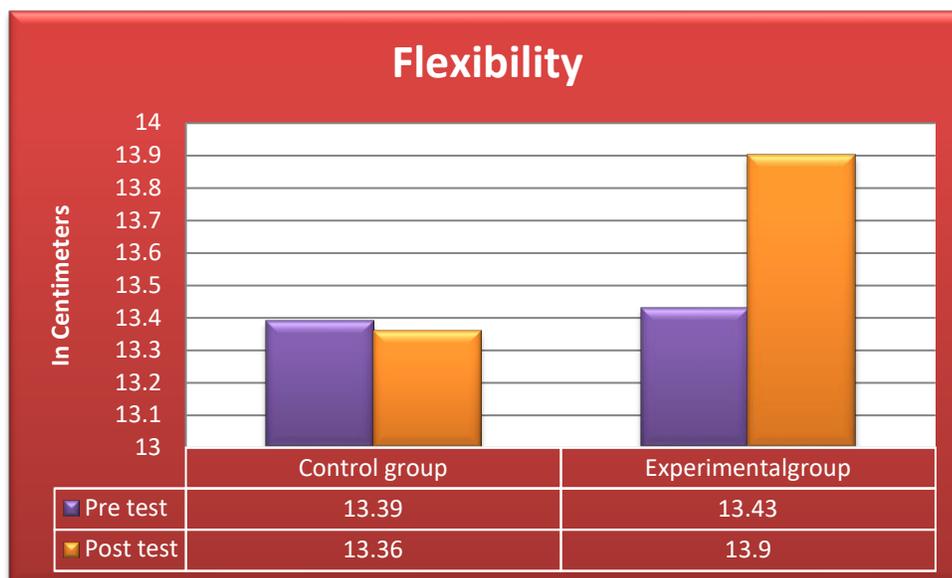
Variables	Group	Standard Deviation		Sd Error	
		Pre	Post	Pre	Post
Flexibility	Control Group	1.31	1.37	0.33	0.35
	Experimental Group	1.29	1.31	0.33	0.34

TABLE II					
Variables	Group	Mean		Degree of freedom	't' ratio
		Pre	Post		
Flexibility	Control Group	13.39	13.36	14	1.00
	Experimental Group	13.43	13.90	14	<b>3.46*</b>

\*Significance at 0.05 level of confidence.

**Figure-1**

Bar Diagram Showing the Pre and Post Mean Values of Experimental and Control Group on Flexibility



### 3. Discussions on Findings

The result of the study indicates that the experimental group, namely kinetic band training group had significantly improved the selected dependent variable, namely flexibility, when compared to the control group. It is also found that the improvement caused by kinetic band training when compared to the control group.

### 4. Conclusion

On the basis of the results obtained the following conclusions are drawn, There was a significant difference between experimental and control group on flexibility after the training period. There was a significant improvement in flexibility. However the improvement was in favor of experimental group due to six weeks of kinetic band training.

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## **Impact of Medium Intensity Sports Specific Resistance Training with Yoga on Selected Arthrokinematics Variables of Badminton Players**

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### **Abstract**

This study was designed to find out the impact of Medium intensity sports specific resistance training with yoga on selected arthrokinematics variables of badminton players. To achieve the purpose of the study 40 badminton players were selected from coimbatore .The subject was randomly assigned to two equal group (n=20).group I underwent Medium intensity sports specific resistance training with yoga (LISSRTWY) and group II acted as control group (CG) .the respective training was given to the experiment group for 3 day 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 arthrokinematics variables shoulder- Elevation through Flexion, Extension, Horizontal Adduction, Horizontal Abduction, Extension rotation and Internal Rotation was assessed by 360° Universal Goniometer. The data collected from the subject was statistically analyzed with 't' ratio to find out significant improvement if any at 0.05 level of confidence. The results of the selected variables improved significantly due to impact of Medium intensity sports specific resistance training with yoga with the limitation 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 Influence of Medium intensity sports specific resistance training with yoga significantly improved Elevation through Flexion, Extension, Horizontal Adduction, Horizontal Abduction, Extension rotation and Internal Rotation of handball players.

**Keyword: Sports Specific Resistance Training, Yoga, Arthrokinematics and Badminton**

### **1. Introduction**

Knowledge of musculoskeletal anatomy and bio- Mechanics is important for understanding human Movements, including those involved in sport and Resistance exercise. Anatomy encompasses the Study of components that make up the musculo-Skeletal "machine," and biomechanics focuses on the mechanisms through which these components Interact to create movement. By providing insight into how body movements are carried out and the Stresses that the movements place on the musculoskeletal system, both areas of study

facilitate the design of safe and effective resistance training programs **(Thomas R Baechle& Roger W Earle 2008)**.

It is the general term for the specific movements of joint surfaces. Normal joint surface movement is necessary to ensure long-term joint integrity. (Joint surface movements are sometimes called joint play motions or component motions).Joint surfaces move with respect to one another by simultaneously rolling, gliding, and spinning. This discussion focuses on how joint surfaces roll and glide with respect to one another, and largely ignores the spin

component. The figure, a sagittal plane depiction of the knee (tibio-femoral) joint, illustrates roll, like the rolling of a tire on a surface, and glide, like a tire slipping without rolling. If the moving joint surface rolls on its partner without simultaneously gliding, the surfaces would separate (gap or subluxate) in some places and impinge in others. Roll and glide must occur simultaneously to preserve joint integrity. We can predict and understand the relationship between bony shapes at a joint surface and the surfaces' movements by applying the rules of concavity and convexity (Kaltenborn 1989,).

## 2. Methods

In order to address the hypothesis presented herein, we selected 40 badminton players from coimbatore district. The subjects were divided into two equal groups, consist of 20 each, namely, Experimental group I underwent Medium intensity sports specific resistance training with yoga (n=20), and Group III will act as Control group. The respective training will be

given 3 days per week for a training period of eight weeks. The Control group was not given any sort of training except their routine.

### 2.1 Design

Experimental design is a blue print of the procedure that enables the researcher to test the hypothesis by reaching valid conclusions in testing the relationship between independent variables and dependent variables. The investigator use pre and posttest random group design in this study. This procedure involves dividing a sample into two or more groups based on random selection. No attempt will be made to equate the groups in this study. The selected sixty subjects will be divided into two equal groups consisting of 20 each such as experimental group I (n = 20), and control group (n = 20). The treatment will be administered to all the experimental groups for a period of 8 weeks. After the end of 8<sup>th</sup> week the post test will be administered to all the groups.

**Table I - Criterion Measure**

Variables		Test/Equipment	Unit of Measure
Shoulder	Elevation through Flexion	360° Universal Goniometer	In Degree
	Extension		
	Horizontal Adduction		
	Horizontal Abduction		
	External rotation		
	Internal Rotation		

### 2.2 Training Program

The training program will be lasted for 60 minutes for session in a day, 3 days in a week for a period of eight weeks duration. This 60 minutes included 10 minutes warm up, 40 minutes respective training and 10 minutes warm down procedure. Every three weeks of training 5% of intensity of load will be increased from 65% to 80% of work load. Volume of training is

prescribed based on the number of sets and repetition.

### 2.3 Statistical Technique

The collected data before and after training period of 12 weeks on the above said variables due to the influence of isometric strength training was statistically analyzed with 't' test to find out the significant improvement between pre and posttest. In all cases the

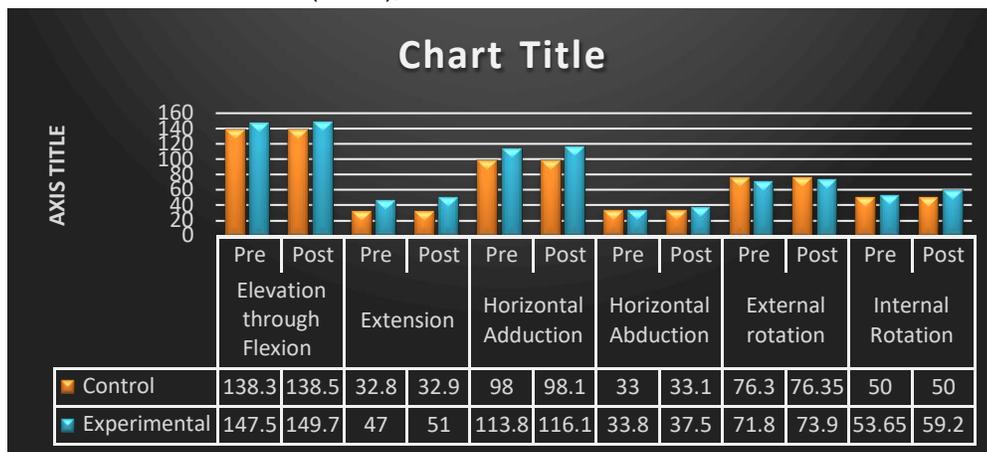
criterion for statistical significance was set at 0.05 level of confidence. (P < 0.05)

**Table - II**

Computation of 'T' Ratio on Arthrokinematics Variables of badminton Players On Experimental Group And Control Group (Scores in degree)

Group	Variables	Group	Mean	S.D	T ratio
Control	Elevation through Flexion	Pre test	138.30	7.40	1.83
		Post test	138.45	7.45	
	Extension	Pre test	32.80	4.50	0.62
		Post test	32.90	4.43	
	Horizontal Adduction	Pre test	98	9.14	1.45
		Post test	98.10	9.14	
	Horizontal Abduction	Pre test	33	3.34	1.45
		Post test	33.10	3.38	
	External rotation	Pre test	76.30	5.11	1.00
		Post test	76.35	5.18	
	Internal Rotation	Pre test	50	5.10	1.45
		Post test	50	5.09	
Experimental	Elevation through Flexion	Pre test	147.50	9.28	5.99*
		Post test	149.70	8.66	
	Extension	Pre test	47	3.14	5.79*
		Post test	51	3.21	
	Horizontal Adduction	Pre test	113.75	5.04	7.66*
		Post test	116.05	4.94	
	Horizontal Abduction	Pre test	33.80	3.88	7.54*
		Post test	37.50	2.92	
	External rotation	Pre test	71.80	4.70	8.31*
		Post test	73.90	4.33	
	Internal Rotation	Pre test	53.65	5.50	6.85*
		Post test	59.20	6.66	

\*Significant level 0.05 level of confidence (2.093),1 and 19



**Figure 1** Graph Represented in Arthrokinematics Variables.

### 3. Discussion and Findings

The present study experiment the effect of Medium intensity sports specific resistance training with yoga on selected ARTHROKINEMATICS variables of badminton players. The result of this study indicated that the Medium intensity sports specific resistance training with yoga improves the ARTHROKINEMATICS variables such as Elevation through Flexion, Extension, Horizontal Adduction, Horizontal Abduction External rotation and Internal Rotation. The findings of the present study had similarity with the findings of the investigations referred in this study **Sethu (2016)** reported that the Suryanamaskar on joint flexibility improvement takes place on ankle and wrist flexibility **Pinto (2012)** determinate that result was improved with both full and part resistance training, but full may lead to greater strength gains. **Jung-Hyun choi (2016)** examined that the result was increase in flexibility and joint range of motion.

**Fatouros (2018)** observed that the results was improves flexibility in the aged. However, intensities greater than 60% of 1RM are more effective in producing flexibility gains, and strength improvement with resistance training is also intensity-dependent. Detraining seems to reverse training strength and flexibility gains in the elderly in an intensity-dependent manner. **Saravanan Elumalai (2019)** observed the results of the study delivered that the influence of the upper body kettlebell and Swiss ball exercise is recommended to incorporate into their regular badminton conditioning. **Bruno (2016)** evaluated that the results was elbow flexion exercise with full ROM seems to induce greater muscle damage than partial ROM exercises, even though higher absolute load was achieved with partial ROM. **clark (2011)** reported that the results was improves terminal and midrange performance gains, resulting in the athlete possessing an improved ability to control external loading and produce dynamic force.

The results of the present study indicates that the Medium intensity sports specific resistance training with yoga is effective method to improve elevation through flexion, extension, horizontal Adduction, horizontal Abduction external rotation and internal rotation of badminton players. 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.

### 4. Conclusions

Eight weeks of Medium intensity sports specific resistance training with yoga produced significant improvements in the elevation through flexion, extension, horizontal Adduction, horizontal Abduction external rotation and internal rotation of badminton players. Medium intensity sports specific resistance training with yoga is an appropriate training protocol to bring out desirable changes over ARTHROKINEMATICS variables for badminton players.

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## **EFFECT OF ACCELERATION TRAINING AN EFFECTIVE METHOD TO MAINTAIN THE SPEED AND VELOCITY OF SPRINTERS**

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### **Abstract**

The objective of the present investigation was to examine the effect of acceleration training on speed and velocity of sprinters. To achieve the purpose of the study 30 Inter collegiate sprinters were selected as subjects. The age of the subjects ranged between 18-25 years. They were randomly assigned into two groups equally consisting of 15 subjects. The experimental group was named as acceleration training group (ATG). The second group was control group (CG). After assigning the subjects into various groups the pre-test was conducted on speed and velocity. After completion of the pre-test the subjects of the experimental group was treated with acceleration training programs for two days a week along with their regular training schedule. The training period was scheduled for 6 weeks. After 6 weeks of the training period post test was conducted on the dependent variables for all the groups. To analyse the treatment effect of pre and post-test training 'F' ratio was used. The experimental group (ATG) acceleration training group has shown significant improvement than the control group in the selected variables. The control group did not show any significant improvement on any of the selected variables. Based on the results it was concluded that the implication of acceleration training might have been the source of its dominance on the improvement of speed and velocity.

**KEYWORDS:** Acceleration training (AT), Speed and Velocity

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### **1.INTRODUCTION**

Sprinting is one of the oldest recorded forms of athletic competition. The ancient Olympic Games consisted almost entirely of sprint races. The chief event was the staid which at 192m was roughly the length of the stadium. Two more running races were held, the dialos, which was an out and back race double the length of the staid, and a distance race of approximately 5,000m called the

dolichos. Starting in the ancient games was from starting blocks, which were quite literally blocks of marble with grooves for the feet cut in them. These blocks ran the width of the stadium and thus all athletes had to use the same start irrespective of their size. Athletes also ran naked on bare, hard-barked earth.

## 2.METHODOLOGY

To achieve the purpose of the study 30 Inter collegiate sprinters were selected as subjects. The age of the subjects ranged between 18-25 years. They were randomly assigned into two groups equally consisting of 15 subjects. The experimental group was named as acceleration training group (ATG).The second group was control group (CG). After assigning the subjects into various groups the pre-test was conducted on speed and velocity. After completion of the pre test the subjects of the experimental group was treated with acceleration training programs for two days a week along with their regular training schedule. The training period was scheduled for 6 weeks. After 6 weeks of the training period post test was conducted on the dependent variables for all the groups.

## 3.TRAINING PROGRAMME

Acceleration training was given for six weeks for 30 minutes as 2 days a week along with one hour of regular training for six days a week. Load was managed by increasing the repetition of the exercises once and reducing the rest for the second six weeks. The training schedule included exercises such as 3 sets 3x30m sprint, 45seconds rest, 4min rest between sets, 6 x30m alternate leg bounds 60 seconds rest between bounds, 2x30m, 2x40m, 2x50m: 2.30min rest between sprints. 5min rest between sets. 4x40m weighted straight leg bounds, 60sec rest between bounds.

## 4.STATISTICAL TECHNIQUE

The collected data were analyzed statistically through analyze of covariance (ANCOVA) to find the significance difference.

### RESULTS OF THE STUDY:

Table – I showing Significance improvement of the mean difference of pre and post test of acceleration training group and control group on the selected variables.

Test	EX- G	CG	Source of variance	Sum of Squares	df	Mean Square	F
<b>SPEED</b>							
Pre-test	11.73	11.62	Between	0.085	1	.085	0.18*
			Within	13.203	28	.472	
Post-test	11.20	11.72	Between	1.987	1	1.987	6.87*
			Within	8.089	28	.289	
Adjusted	11.17	11.74	Between	2.500	1	2.500	20.73*
			Within	3.256	27	0.121	
<b>VELOCITY</b>							
Pre-test	8.56	8.62	Between	.027	1	.027	0.11
			Within	7.080	28	.253	
Post-test	8.92	8.47	Between	1.541	1	1.541	12.26*
			Within	3.519	28	0.126	
Adjusted	8.92	8.47	Between	1.570	1	1.570	12.21*
			Within	3.469	27	0.128	

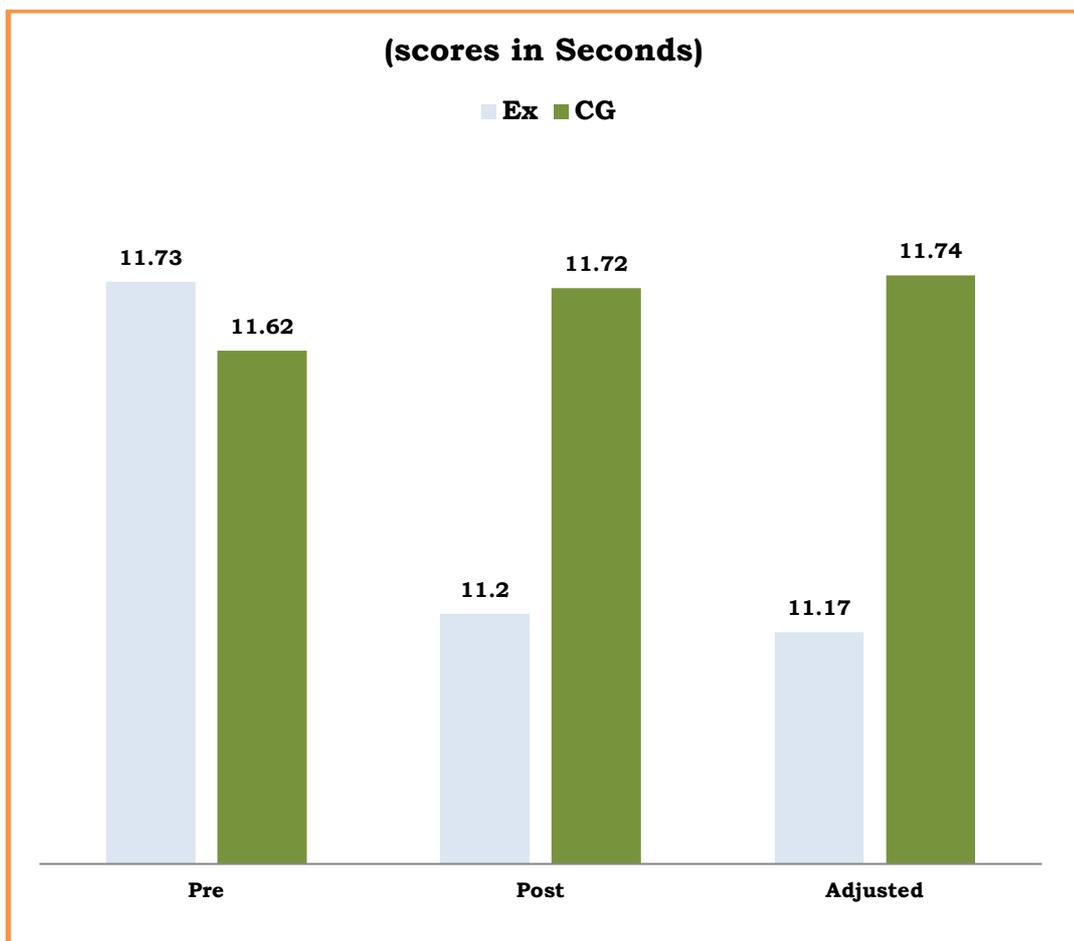
\*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level of confidence with df 1 and 28 and 1 and 27 were 4.19 and 4.21 respectively).

The obtained F value on pre test scores on speed and velocity 0.18 and 0.11 was lesser than the required F value of 4.19 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage.

The post test scores analysis proved that there was significant difference between the groups as the obtained F value of speed and velocity at 6.87 and 12.26 was greater than the required F value at 4.19. This proved

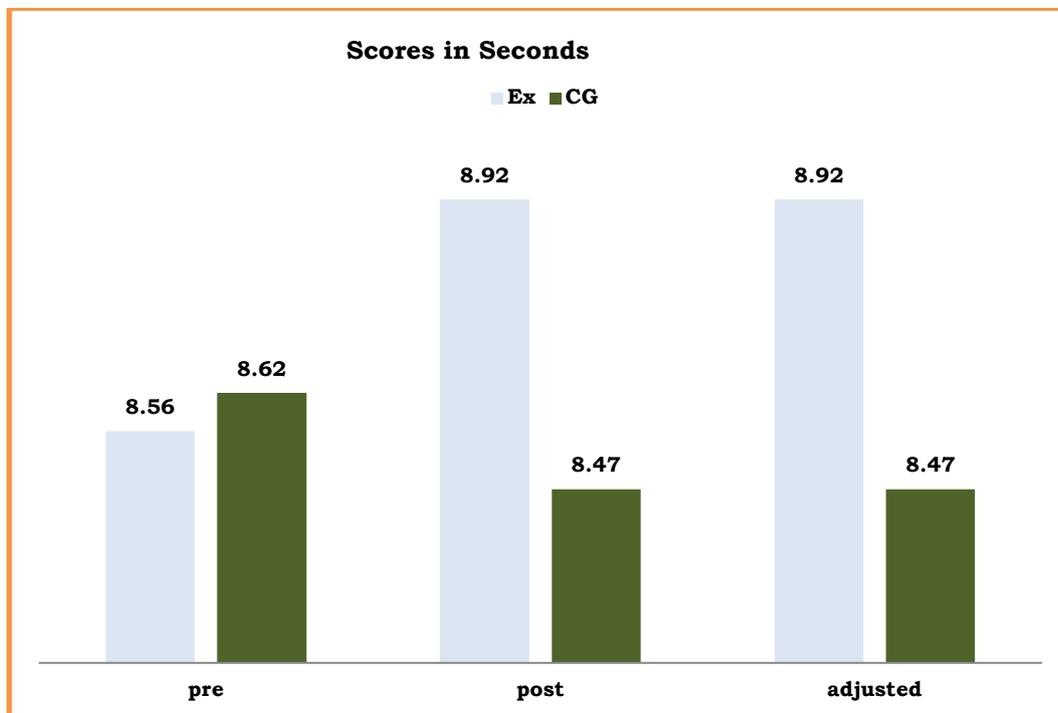
that the differences between the post test mean at the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of speed and velocity at 20.73 and 12.21 was greater than the required F value at 4.21 to be significant at 0.05 levels and hence it was accepted that there was significant difference among the adjusted post test means on speed and velocity due acceleration training



**Figure -1:** DIAGRAM SHOWING PRE-TEST AND POST-TEST MEANS OF ACCELERATION TRAINING GROUP AND CONTROL GROUP ON SPEED

**Figure -2**  
**DIAGRAM SHOWING PRE-TEST AND POST-TEST MEANS OF ACCELERATION TRAINING GROUP AND CONTROL GROUP ON VELOCITY**



## 5.CONCLUSIONS AND DISCUSSION ON FINDINGS

This study confirms that acceleration training had significant improvements in speed and velocity while comparing control group. Thus it is concluded that acceleration training is an essential vital part of training programme designed for sprinters. Bahman (2014) found that specific training programme improved reaction time among artistic gymnasts. Martin (2015) established that interval training significantly improved fitness level of school boys. Further Sofie Debaere (2013) revealed that specific of sprit techniques training significantly improve the maximal horizontal velocity of trained sprinters. These findings suggested that acceleration training were able to promote speed and velocity among sprinters. Carmo (2022) found Warming-up and time-of-day effects in enhancing muscular power are

independent. further beneficial effects on performance than the time-of-day variation, a faster post-exercise recovery was observed in the late afternoon. Alikhajeh (2012) static stretching as part of a warm-up may decrease short sprint performance, while active dynamic stretching seems to increase 20-m sprint performance. Archiza (2020) revealed performance decrement during repeated-sprint ability was found to be related to time-to-exhaustion, oxygen uptake recovery time and oxygen uptake mean response time of recovery. Moreover, the best sprint time and the mean sprint time were found to be related to maximal oxygen uptake. Gawad, & Mohamed, (2021) suggested plyometric training is an effective method to improve sprint kinematics and lower limb stiffness considering that neural adaptation may take long time to occur. study suggest that both strength and plyometric training can improve sprinting kinetics, jumping performance and overall strength in young females. Talukdar,

(2021) recommended the strength and plyometric training can improve sprinting kinetics, jumping performance and overall strength in young females. Sanpasitt (2021) indicated that there was a dose-dependent increase in muscle activation during a propulsive phase of speed bounding on a sloped surface, with a greater magnitude observed in the extensor muscles group compared to other muscles. Le Scouarnec (2022) sprint capacity of elite young soccer players can be further improved by adding incremental resistance against runner displacement to raise the ability to produce AP force, rather at high velocity in the final phase of the acceleration. Derakhti (2021) Four weeks of heavy RST led to superior improvements in short-sprint performance compared with UST among adolescent soccer players. Heavy RST, using a load individually selected to maximize horizontal power, is therefore highly recommended as a method to improve sprint acceleration in youth athletes. Ben Brahim (2021) combined strength and both horizontal (weighted sled) and vertical (weighted vest) resisted sprint training are more effective than regular soccer training for enhancing sprinting and jumping abilities as well as ball-shooting speed in soccer. Olmez, & Akcan, (2021) Repetitive sprint and calisthenics training methods are both effective in regulating the body composition of athletes and accelerating aerobic endurance, power, and strength progress, but when designed at similar training intensity, both methods have similar effects. Loturco (2022) Traditional strength-power oriented training resulted in improved maximum strength performance. Vescovi, & Jovanovic, (2021). Concurrent Strength Endurance training is beneficial for running performance, but changes in running biomechanics and muscle activity may not be contributing factors to the performance improvement.

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## Effect of Different Plyometric Training Volume on Selected Motor Fitness Components and Performance Enhancement of Soccer Players

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### Abstract

The main purpose of the study was to find out the effect of Plyometric training on selected motor fitness components and playing ability of soccer players. 20 university male soccer players were selected as subject. The subjects for the study were chosen only those players who represented inter-collegiate tournament of Anna University, Chennai. The age of the subjects was ranging from 18 to 25 years. The analysis of data collected on selected motor fitness components and playing ability of soccer players cardio-vascular endurance, agility, speed, flexibility, explosive leg strength, and kicking for distance, kicking for accuracy, juggling. One-way analysis of variance (F-test) and LSD post hoc statistical techniques were employed to determine the significant difference among the performance on after administering Plyometrics training for each selected variable. The result showed 15 minutes of Moderate volume of training was highly favorable for cardio-vascular endurance, 20min intermediate volume of training for Agility, 25 min high volume of training for explosive leg strength, kicking for distance and accuracy. Insignificant difference was found in speed, dribbling and ball juggling ability.

**Key Words: Plyometric, Motor Components, volume of training.**

### 1.Introduction

Plyometric training as a quick, powerful movement involving a system of reactive exercises and an eccentric contraction, followed immediately by an explosive concentric contraction. (1, 2) You accomplish this through any movement utilizing the Stretch-Shortening Cycle (SSC). (6, 7) Plyometric training is often interchangeable with power training. However, as some traditionally use plyometric training to define a specific movement pattern in which three distinct

phases of movement occur rapidly, not all power training is plyometric training (though all plyometric training is considered power training). Further, the movement patterns categorized in the NASM OPT Model's Phase 1 would better be classified as power patterns and not plyometric since they all involve a long pause (isometric) between the eccentric and concentric phases.

In a study concluded that 25 min. of high volume of training leads highest performance and followed by 20 min. intermediate and least performance after 15 min. of moderate training in the skill of dribbling, kicking accuracy and kicking for

distance. The result also showed no significant difference due to different volume of training in the variable of juggling. (Mondal, 2012) Khan concluded that 20 minutes of intermediate training is most effective for the optimum performance in trunk flexibility, agility and explosive leg strength of volleyball players. (Khan, 2008)

### **Purpose of the Study**

The main purpose of the study was effect of different plyometric training volume on selected motor fitness components and performance enhancement of soccer players.

### **Significance of the study**

1. The result of this study might be helpful to the coaches and players to know the effect of different volume of training on the performance of selected motor fitness components and playing ability of soccer players.

2. The findings of this study would also help to the physical education teachers, coaches and players to determine the appropriate volume of training for the soccer players to exhibit optimum performance as well as prevent from getting injuries.

### **Hypotheses**

On the basis of literatures and scholar's own understanding, it was hypothesized that there would be significant difference on the performance of selected motor fitness components and playing ability of soccer players due to different volumes of training.

### **Methodology**

Twenty (20) male soccer players were selected as subjects. The subjects for the study were chosen only those soccer

players who represented Anna University, Chennai. The age of the subjects was ranging from 18 to 25 years. Purposive Sampling technique was adopted for the selection of 20 subjects.

### **Selection of Variables**

For the present study following variables were chosen: -

#### **A. Motor Fitness Components**

1. Cardio-vascular Endurance
2. Agility
3. Speed
4. Flexibility
5. Explosive Leg Strength

#### **B. Soccer Playing Ability**

Dribbling

1. Kicking for Distance
2. Kicking for Accuracy
3. Ball Controlling

### **Selection of Tests and Criterion Measures**

1. Cardio-vascular Endurance was measured by administering 600-meter run and walk test and score was recorded in seconds.
2. Semo agility test was applied to assess agility and the score was recorded in seconds.
3. 50mt dash was administered to measure speed and score was noted down in seconds.
4. Sit and reach test was applied to measure flexibility and the score was recorded in centimeter.
5. Explosive leg strength was measured by applying standing broad jump and

the measurement was recorded in centimeter.

6. The Dribbling ability was measured by applying L. Heath and E.G. Rodgers test of dribbling and the score was recorded in seconds.
7. Kicking for distance of the soccer players was measured by using distant kicking test and the distance covered by the subject was recorded in meters.
8. The kicking for accuracy was measured by applying L.Heath and E.G. Rodgers test of kicking on rolling ball for accuracy and score was recorded in points.
9. Covac's juggling test was applied to assess the ball controlling ability and score was recorded in numbers.

### Collection of Data

The data pertaining to this study were collected in three consecutive days at 4pm after different volume of training (after 15 min, after 20 min, after 25 minutes) by administering the aforesaid tests.

### Tabulation of Data

All the collected data were arranged systematically in a table for further statistical treatments.

### Statistical Treatment

One-way Analysis of variance (F-test) statistical technique was employed to determine the significant difference if any among the performance on after administering three different durations of warming-up performance on the selected variables. While the F-ratio was found to be significant then LSD Post Hoc test was applied to determine the paired mean difference.

### Level of Significance

The level of significance to check the differential effect of three different volume of training on selected motor fitness components and playing ability obtained by F-ratio was set at 0.05, which was considered appropriate, because the research process adopted did not involve highly sophisticated equipment's.

### Findings

Findings pertaining to the selected motor fitness components and playing ability of soccer players i.e., cardio-vascular endurance, agility, speed, flexibility, explosive leg strength and dribbling, kicking for distance, kicking for accuracy and juggling are presented in the table given below: -

**Table-1**

Variable	Source of variation	Degree of freedom	Sum of squares	Mean sum of squares	F-ratio
<b>Cardio-vascular Endurance (600m Run &amp; Walk Test)</b>	Between the Group	K-1 3-1=2	2485.833	1242.9165	3.4385 <sup>*</sup>
	Within the Group	N-K 60-3=57	20603.5	361.464	
<b>Agility (Semo Agility Test)</b>	Between the Group	K-1 3-1=2	3.969	1.984	3.166 <sup>*</sup>
	Within the Group	N-K 60-3=57	35.711	0.626	
<b>Speed</b>	Between the Group	K-1	1.24175	0.6208	

<b>(50m Dash Test)</b>		3-1=2			3.07022 <sup>@</sup>
	Within the Group	N-K 60-3=57	11.53095	0.2022	
<b>Flexibility (Sit &amp; Reach Test)</b>	Between the Group	K-1 3-1=2	31.034	15.517	0.387 <sup>@</sup>
	Within the Group	N-K 60-3=57	2281.95	40.034	
<b>Explosive Leg Strength (Vertical Jump Test)</b>	Between the Group	K-1 3-1=2	4.6804	2.3404	4.5756 <sup>*</sup>
	Within the Group	N-K 60-3=57	29.125	0.5115	
<b>Dribbling Test</b>	Between the Group	K-1 3-1=2	15.1695	7.58475	1.11795 <sup>@</sup>
	Within the Group	N-K 60-3=57	386.7161	6.78449	
<b>Kicking for Distance Test</b>	Between the Group	K-1 3-1=2	422.8	211.4	8.667 <sup>*</sup>
	Within the Group	N-K 60-3=57	1390.2	24.38	
<b>Kicking for Accuracy Test</b>	Between the Group	K-1 3-1=2	520.534	260.267	42.9058 <sup>*</sup>
	Within the Group	N-K 60-3=57	345.8	6.066	
<b>Juggling Test</b>	Between the Group	K-1 3-1=2	476.1333	238.066	1.8856 <sup>@</sup>
	Within the Group	N-K 60-3=57	7196.45	126.253	

Significant at .05 level Tabulated  $F_{.05(2, 57)} = 3.162$

It is evident from the above table that significant difference was found in the variables of Cardio-Vascular Endurance ( $F = 3.4385 > 3.162$ ), Agility ( $F = 3.166 > 3.162$ ), Explosive Leg Strength ( $F = 4.5756 > 3.162$ ), Kicking for Distance ( $F = 8.667 > 3.162$ ) and kicking for accuracy ( $F =$

$42.9058 > 3.162$ ). It is also observed that insignificant difference was found in the variables of speed ( $F = 3.07022$ ), Flexibility ( $F = 0.387$ ), dribbling (1.11795) and Juggling ( $F = 1.8856$ ) at .05 level.

**Table-2**

**Paired Mean Difference for the Data on Cardio-Vascular Endurance (600m Run & Walk Test) Performance among the Three Different volume of Training**

Mean Performance on 600m Run & Walk			Mean Difference	Critical Difference
15min. Moderate training	20min. Intermediate Training	25min. High volume Training		
246.75	231		15.75*	12.043
246.75		238.25	8.5	12.043
	231	238.25	7.25	12.043

\*Significant at .05 level

The findings of table-2 reveal that there is significant mean difference in the performance of cardio-vascular endurance (600m run & walk) after 15min. moderate training and 20minintermediate training (MD=15.75>12.043). The findings of above table also show that there are no

significant differences in the mean performance after 15min. moderate training and 25 high volumes of training. (MD=8.5<12.043) and, after 20minintermediate training and 25 min high volume of training (MD=7.25<12.043) at .05 level

**Table-3**

**Paired Mean Difference for the Data on Semo Agility Test Performance among the Three Different Durations of Warm-up**

Mean Performance on Semo Agility Test			Mean Difference	Critical Difference
15min. Moderate training	20min. Intermediate Training	25min. High volume Training		
27.7	28.4		0.7*	0.5011
27.7		29.45	1.75*	0.5011
	28.4	29.45	1.05*	0.5011

\*Significant at .05 level

The findings of table-3 reveal that there are significant mean differences in the performance on Semo agility test I between

15min. moderate and 20min. intermediate (MD=0.7>.5011), 15min.

moderate and 25min. high volume and 25min. high volume (MD=1.05>.5011) at (MD=1.05>.5011) and, 20min. intermediate .05 level

**Table-4**

**Paired Mean Difference for the Data on Explosive Leg Strength (Vertical Jump) Performance among the Three Different volume of Training**

Mean Performance on Vertical Jump			Mean Difference	Critical Difference
15min. Moderate training	20min. Intermediate Training	25min. High volume Training		
10.065	10.47		0.405	0.4530
10.065		10.745	0.68*	0.4530
	10.47	10.745	0.275	0.4530

\*Significant at .05 level

It is evident from the above table that there is significant mean difference in between the performance of vertical jump after 15min. moderate and 25min. high volume (MD=0.68>0.4530) and no significant

difference were found between in the mean performance after 15min. moderate and 20min. intermediate (MD=0.405) and, after 20min. intermediate and 25min. high volume (MD=0.275<0.4530) at .05 level.

**Table-5**

**Paired Mean Difference for the Data on Kicking for Distance among the Three Different Three Different volume of Training**

Mean Performance on Vertical Jump			Mean Difference	Critical Difference
15min. Moderate training	20min. Intermediate Training	25min. High volume Training		
43.6	46.6		3.40*	3.13
43.6		49.7	6.50*	3.13
	46.6	49.7	3.10	3.13

\*Significant at .05 level

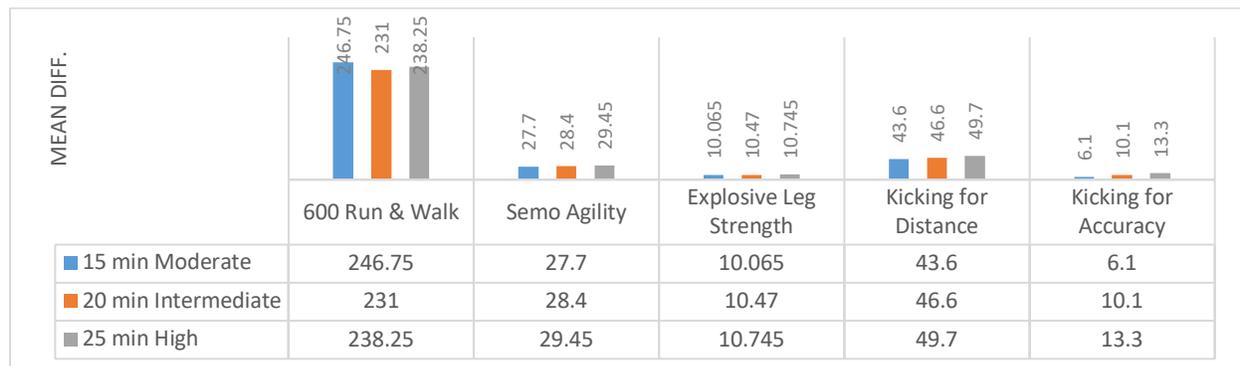
**Table-6**  
**Paired Mean Difference for the Data on Kicking for Accuracy among the Three Different volume of Training**

Mean Performance on Kicking for Accuracy			Mean Difference	Critical Difference
15min. Moderate training	20min. Intermediate Training	25min. High volume Training		
6.1	10.1		4.0*	1.5601
6.1		13.3	7.2*	1.5601
	10.1	13.3	3.2*	1.5601

\*Significant at .05 level

The findings of table reveal that there is significant mean difference in between the performance of kicking for accuracy after 15min. moderate and 20min. intermediate (MD=4.0) and, 15min. warm-up and 25min.

high volume (MD=7.2), and 20min. intermediate and 25min. high volume (MD=3.2) the mean difference value is greater than the critical difference value of 1.5601 at .05 level.



## Discussion of Findings

Findings of the study revealed that the performance in cardio-vascular endurance, agility, speed, explosive leg strength, kicking for distance and kicking for accuracy had shown significant improvement in the performance after 25 min of high volume followed by 20 min of intermediate and least performance after 15 min of moderate training. It may be because as a result of 25 min high volume training the local

temperature in the muscle which lead to develop muscle excitability joint mobility, rhythmic blood circulation and stable respiratory functions might have assisted for the optimum performance in the above-mentioned fitness variables and skill performance of soccer. Hence such result might have occurred in this study. The findings of this study is in consonance with the results of Aslam and Mondal.

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## Conclusion

Recognizing the limitations of this study and on the basis of statistical findings the following conclusion may be drawn-

1. Twenty (20) minutes of warming-up highly favorable for the cardio-vascular endurance (600m Run/Walk) performance, it was followed by 25 min, of high volume of training and least performance after 15 min. moderate training.
2. Significant difference was found in semo agility test due to three different durations of warm-up 15 minutes moderate training showed best for agility performance compared to 20 minutes & 25 minutes volume of training, 20 minutes of intermediate training also showed significantly better than 25 minutes high volume of training.
3. In significant difference was observed in 50m dash performance due to three different volumes of training.
4. No significant difference was found in sit & reach performance due to three different volumes of training.
5. After 25 minutes of high-volume training significantly superior of performance was showing vertical jump test performance than after 20 minutes and 15 minutes volume of training.
6. There was no significant difference in dibbling test performance due to three different volumes of training.
7. After 25 minutes of high-volume training significantly superior of performance was shown in kicking for distance than after 20 minutes and 15 minutes volume of training.

8. Significantly better performance was shown in kicking for accuracy after 25 min. high volume training and least after 15 min. moderate.

9. There was no significant difference in juggling performance due to three different volumes of training.

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#### **Conflict of interest**

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## **COMBINED EFFECTS OF AEROBIC DANCE AND YOGIC PRACTICES ON PSYCHOMOTOR VARIABLES OF COLLEGE MEN**

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### **Abstract**

The purpose of this study was to find out the combined effect of aerobic dance and yogic practice on selected psychomotor variables of college men. The investigator selected 60 NIFT-Tea College of Knitwear Fashion, Tirupur. The subject's age was ranged from 18 to 25 years. The subjects were divided into two equal groups. Group 1 consist 30 subjects called as experimental group and group 2 consist of 30 students called as control group. The group I was assigned aerobic dance and yogic practices for a period of 12 weeks training programme. The control group was not allowed to participate in any kind of treatment. The dependent variables namely reaction time and hand eye coordination were selected and measured by the reaction timer test and mirror tracing board test respectively for this study. The data was analysed by the use of paired 't' test. The obtained 't' ratio was tested for significance at 0.05 level of confidence. The analysis of the data revealed that there was a significant improvement on the selected variables namely reaction time and hand eye coordination by the application of aerobic dance and yogic practice training programme.

**KEYWORDS:** Reaction time, Hand eye coordination, Psychomotor Variables

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### **1.INTRODUCTION**

#### **AEROBIC DANCE**

Aerobic dance exercise is currently one of the most commonly practiced adult fitness activities. The majority of the research pertaining to this form of exercise supports its application as a valid cardiovascular training alternative, especially for adult females if performed according to the American College of Sports Medicine (ACSM) guidelines. If however, the participant is interested in modifying body composition, training

frequency, duration, or efforts toward caloric restriction may need to be increased or altered beyond those employed in the aerobic dance training investigations. The amount of energy expended during a bout of aerobic dance can vary dramatically according to the intensity of the exercise. 'Low intensity' dance exercise is usually characterized by less large muscle activity and/or less low extremity impact, and music of slower

tempo. Dance exercise representative of this variety requires a cost of approximately 4 to 5 kcal/minute. Several trials, however, have shown that vigorous 'high intensity' aerobic dance which entails using the large muscle groups can require 10 to 11 kcal/minute. The associated training outcomes could be affected by such differences in dance exercise intensity and style. Group aerobic has grown in popularity and most of the facilities provide classes in high-impact and low-impact aerobics.

## YOGA

Yoga means union of the individual soul or consciousness with the Universal Consciousness or spirit. It is a 5000 years plus old Indian technique of body culture. Indian seers and saints have been practicing Yoga since ancient times to bring flexibility to the spine and joints, to keep the muscles of the body pliable and youthful, increase circulation in arteries and strengthen internal organs. And yet, yoga is so much more than this. Yoga has been said to help strengthen the power of concentration, to banish constipation, to relieve stomach disorders, improve muscle coordination and reduce excess body fat. It was practised by Indian Sages to strengthen the mind-body connection, bring calmness and relaxation to mind, enhance self-confidence, strengthen self-discipline and self resolve, reduce stress / anxiety and increase vitality and energy throughout the body. The modern era is the era of competition. Competition in job, competition in education, competition in

sports - competition lies in everywhere. To face this competition every individual has to be fit from body, mind and spirit. Yoga can be applied to enhance the sports performance of the professional athletes. Sound body, mind and spirit is very essential for ideal and peak performance in games and sports, practicing yoga is the best way for that.

## METHODOLOGY

The purpose of this study was to find out the combined effect of aerobic dance and yogic practice on selected psychomotor variables of college men. The investigator selected 60 NIFT-Tea College of Knitwear Fashion, Tiruppur. The subject's age was ranged from 18 to 25 years. The subjects were divided into two equal groups. Group 1 consist 30 subjects called as experimental group and group 2 consist of 30 students called as control group. The group I was assigned aerobic dance and yogic practices for a period of 12 weeks training programme. The control group was not allowed to participate in any kind of treatment. The dependent variables namely reaction time and hand eye coordination were selected and measured by the reaction timer test and mirror tracing board test respectively for this study. The data was analysed by the use of paired 't' test. The obtained 't' ratio was tested for significance at 0.05 level of confidence

## RESULTS OF THE STUDY

**TABLE- I**

**COMPUTATION OF 'T'-RATIO BETWEEN THE PRE AND POST TESTS ON REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS**

GROUP	TEST	M	SD	$\sigma$ DM	DM	t-ratio	'P' Value
EXPERIMENTAL GROUP	Pre test	1.99	0.38	0.03	0.85	12.49	0.01
	Post test	1.14	0.17				
CONTROL GROUP	Pre test	2.01	0.33	0.01	0.01	1.85	0.07
	Post test	1.99	0.33				

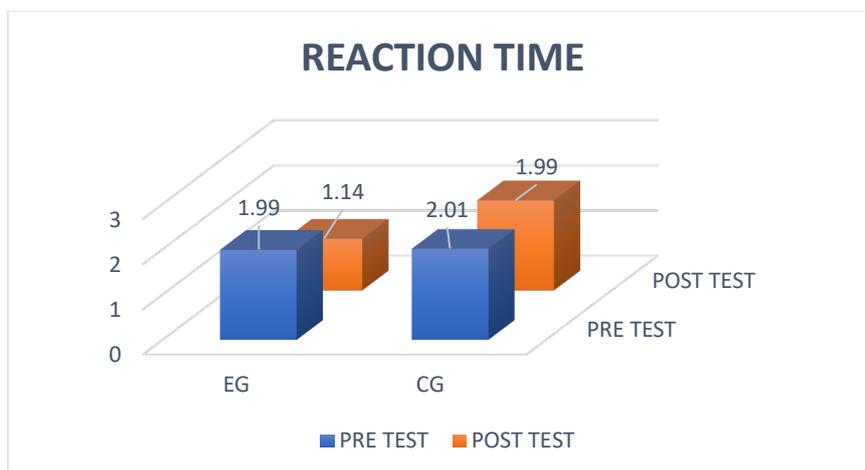
\*Significance at 0.05 level.

The table I indicates that there was a significant improvement on the reaction time through the combined training of aerobic dance and yogic practices. It reveals that the obtained t-ratio 12.49 is significant because the 'p' value is lesser than the 0.05, level of confidence. So, there was a significant improvement on

the reaction time between the pre and post-tests of experimental group, whereas control group showed no significant improvement. Hence the result indicates that the significant improvement on the reaction time was due to the combined training of aerobic dance and yogic practice.

**FIGURE – I**

**THE FIGURE SHOWING THE MEAN DIFFERENCE OF PRE AND POST-TESTS SCORES ON REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS**



**TABLE-II**

**COMPUTATION OF 'T'-RATIO BETWEEN THE PRE AND POST TESTS ON HAND EYE COORDINATION OF EXPERIMENTAL AND CONTROL GROUPS**

GROUP	TEST	M	SD	$\sigma$ DM	DM	t-ratio	'P' VALUE
EXPERIMENTAL GROUP	Pre test	21.63	5.80	0.60	7.27	12.10	0.01
	Post test	14.37	5.01				
CONTROL GROUP	Pre test	21.83	5.34	0.60	0.10	1.79	0.08
	Post test	21.73	5.25				

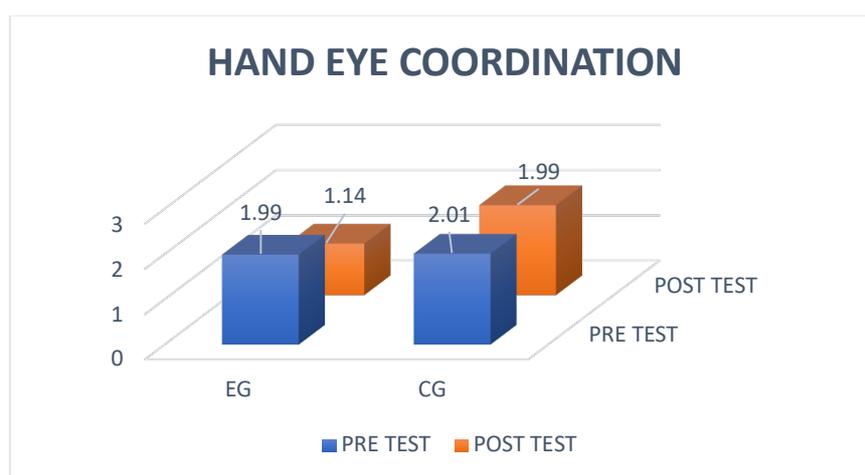
\*Significance at 0.05 level.

The table II indicates that there was a significant improvement on the hand eye coordination through the combined training of aerobic dance and yogic practice. It reveals that the obtained t-ratio 12.10 is significant because the 'p' value is lesser than the 0.05, level of confidence. So there was a significant improvement on the hand eye

coordination between the pre and post tests of experimental group, whereas control group showed no significant improvement. Hence the result indicates that the significant improvement on the hand eye coordination was due to the combined training of aerobic dance and yogic practice.

**FIGURE – II**

**THE FIGURE SHOWING THE MEAN DIFFERENCE OF PRE AND POST-TESTS SCORES OF HAND EYE COORDINATION OF EXPERIMENTAL AND CONTROL GROUPS**



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## DISCUSSION ON FINDINGS

The result of the study reveals that the twelve weeks of combined training programme of aerobic dance and yogic practice on the selected dependent variable there was a significant improvement on the reaction time. It reveals that the obtained t-ratio 12.49 is significant because the 'p' value is lesser than the 0.05, level of confidence. So, there was a significant improvement on the reaction time between pre and post-tests of the experimental group, whereas the control group showed no significant improvement. Hence the results indicate that the significant improvement on the reaction time was due to the combined training.

The result of the study reveals that the twelve weeks of combined training programme of aerobic dance and yogic practice on the selected dependent variable there was a significant improvement on the hand eye coordination. It reveals that the obtained t-ratio 12.10 is significant because the 'p' value is lesser than the 0.05, level of confidence. So, there was a significant improvement on the hand eye coordination between pre and post-tests of the experimental group, whereas the control group showed no significant improvement. Hence the result indicates that the significant improvement on the hand eye coordination was due to the combined training.

## CONCLUSIONS

Based on the findings and within the limitation of the study it is noticed that

practice of combined training of aerobic dance and yogic practice helped to improve psychomotor variables among college men. It was also seen that there is progressive improvement in the selected criterion variables of aerobic dance and yogic practice group of college men after twelve weeks. Further, it also helps to improve reaction time and hand eye coordination. It was concluded that combined effects of aerobic dance and yogic practice showed a statistically significant over the course of the treatment period on psychomotor variables of among college men.

1.It was concluded that individualized effect of control group showed a statistically insignificant over the course of the period on selected psychomotor variables of among college men.

2.The results of comparative effects lead to conclude that the combine aerobic dance and yogic practice group had better significant enhancement on psychomotor variables of among college men as compared to their performance with control group.

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## Effect of Adapted Aerobic Dance on Body Composition of Obese Children with Down syndrome

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### Abstract

This study is to investigate the effect of adapted aerobic dance on body composition of obese children with Down syndrome. Thirty obese Down syndrome children age ranging from 10-15 years were chosen with purposive random sampling technique from Coimbatore district. The subjects were randomly conferred into two groups equitably with 15 subjects. The first group was named as the Adapted Aerobic Dance group (ADG) and the second group as controlled group (CG). The training period was scheduled for 6 weeks (3 days a week). Experimental group (ADG) underwent Adapted Aerobic Dance practice and the control group (CG) did not undergo any specific training other than the regular work. After 6 weeks of the training period post test was conducted for both the groups. To find out significant difference exist between pre and post training, t ratio was applied. The Adapted Aerobic Dance group (ADG) had significantly improved ( $P < 0.05$ ). The Experimental group was better than the control group. The Control group did not show any significant improvement. Based on the results, it is break through that Adapted Aerobic Dance have enhancement in variables of obese children with Down syndrome.

**Keyword: Down Syndrome, Adapted Aerobic Dance, Body Composition**

### 1. Introduction

Down syndrome (DS) is a chromosomal blemish of trisomy 21 in all cells of the body. The effects of an extra chromosome have direct concerns for their health and wellbeing (e.g. heart defects, muscle hypo tonicity, joint hypermobility). Likewise, DS has been ordinarily related to obesity and low levels of physical fitness. Overall growth of children with Down syndrome is moderately slow when they are compared to their peers as those children are floppy and poorly coordinated because of diminished muscle tone during childbirth (i.e., hypotonic) however it improves with

age. Children with Down syndrome (DS) are at risk for major pulmonary morbidities, including obstructive sleep apnea, pulmonary hypertension, dysphagia and recurrent respiratory infections. Down syndrome (DS) is the most common chromosomal abnormality with an occurrence of 11.8 per 10,000 live births. Approximately 50% of new-born with DS have congenital heart disease (CHD). For the past twenty years in Western Australia the prevalence has remained relatively stable at approximately 1/1000 live births. Down syndrome includes a combination of birth defects, mental retardation, characteristic facial features, heart imperfections, expanded infection and pulmonary problems, in

addition to visual and auditory problems. Thus, the cruelty of these problems varies greatly among those children. Individuals with DS are commonly physically inactive. As with non-DS individuals, this sedentary lifestyle is associated with multiple health consequences and ultimately increased healthcare costs. A mean cost of \$4,287 is spent every year on healthcare in the United States for every individual with DS, with diabetes and heart disease being two of the top costs. With an estimated 250,000 individuals having DS, costs in the US could surpass \$1,071,750,000. Being an avertible risk factor, sedentary lifestyle contributes to disease development and decreases quality of life. The main value of sporting activity is in its prevention of heart and circulation disease. In innumerable studies it has already been proved that people who regularly do some kind of endurance sport suffer less often from coronary heart disease than non-sportsmen. Aerobic training include both cardiovascular and pulmonary benefits as lowering resting, submaximal heart rates (HR) and respiratory rates, while higher VO<sub>2</sub> at maximal workloads. Over and above all this, Aerobic plays an important role in overcoming day to day. This study is to analyses the effect of adapted aerobic dance on body composition of obese children with Down syndrome. This review is based on the PRISMA guidelines (Preferred Reporting Items for Systematic reviews and Meta-Analyses). The main conclusion is that prescribing structured physical exercise intervention may be related to a greater variation in body composition. Some guidelines are proposed to contribute to the improvement of knowledge in this field.

This study proposes the assessment of body composition in individuals with DS using the dual X-ray absorptiometry (DXA)

technique, the current gold standard for comparison of its values with those found in general population. The WHO BMI Z-score in patients with DS has a correspondence with the body composition only in individuals classified as overweight or Obese by BMI z-score. To investigate the effects of a 12-week aerobic and resistance exercise on body composition of adolescents with Down syndrome. The aerobic and resisted training programs-maintained body fat levels. ATG significantly reduced BMI and WC measures. Individuals who did not attend the training intervention increased their percentage of fat. In this context, we conducted a literature search of original articles, published between May 2010 and May 2020, on the effects of physical activity on body shape, Body composition improves after conditioning and plyometric jumps training program. Finally, bone quality shows positive results after conditioning and plyometric jumps training program, whole body vibration and weight bearing exercise. This study is to check Whether BMI captures adiposity and cardio metabolic risk in Down syndrome (DS) a condition associated with obesity, short stature and altered body proportions is not known. We compared cardio metabolic risk measures in youth with DS and typically developing matched controls. The purpose of this article was to review the measurement, determinants and promotion of physical fitness and PA for youth (i.e., children and adolescents) with DS. The existing body of research indicates that youth with DS have low cardiovascular and muscular fitness/exercise capacity, demonstrate a greater prevalence of overweight and obesity. This paper is to investigate and compare the effect of proprioceptive neuromuscular facilitation of respiratory muscles with that of inspiratory muscle training as a preventive measure on respiratory muscle strength, chest expansion, spirometry and functional capacity in children with Down syndrome.

## 2.Methods

To achieve the purpose of the study 30 obese Down syndrome children were selected using

purposive random sampling technique from Coimbatore district. The demographic data of the Down's syndrome children, both sexes will be collected from the clinic from their medical history. The data will be stored in MS excel format with restricted access. The age of the subjects ranged between 10-15 years. The pre-test was conducted on the variables (body composition). The first group was named as the Adapted Aerobic Dance Group (ADG). The second group was named as Control Group (CG). The training period was scheduled for 6 weeks (3 days a week). Experimental group (ADG) underwent Adapted Aerobic Dance practice and the Control Group (CG) did not undergo any specific training period post test was conducted for both the groups. All data were analyzed using Statistical Package for SPSS. The significance threshold was set to be at  $p < 0.05$  level of confidence for degrees of freedom 1. After completion of the pretest the subjects were randomly assigned into two groups equally so that each group has 15 subjects. The first group was named as the Adapted Aerobic Dance Group (ADG). The Second group was named as Control Group (CG). The training period was scheduled for 6 weeks (3 days a week). Experimental group (ADG) underwent Adapted Aerobic Dance Practice and the control group (CG) did not undergo any specific training other than the regular work. After 6 weeks of the training period post test

### TRAINING PROGRAM

The training program was impaired for a period of 45 minutes which included warm down after the training programme for three days per week for period of six weeks. The length of training intervention for this study was based on the fact that six weeks has shown to be sufficient to prove significant changes of obese children with Down syndrome. The experimental group

### 2.1 STATISTICAL TECHNIQUE

The statistics of mean and standard deviation was calculated to measure the status of selected body composition of

was conducted for both the groups. All data were analyzed using Statistical Package for SPSS. The significance threshold was set to be at



supervision of the investigator.

**Figure: 1**

Measuring Weight

**Figure: 2**

Measuring Height



**Figure: 4**

Teaching Aerobic Dance Steps

obese children with Down syndrome. In order to find out the significant changes if any between pre and post test of control and experimental group dependent "t" test was applied at 0.05 level of confident.

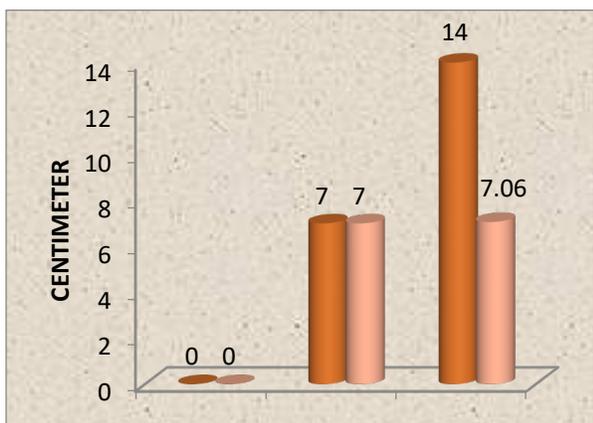
Table - I

Table Showing Obtained Mean Values for the Selected Variables

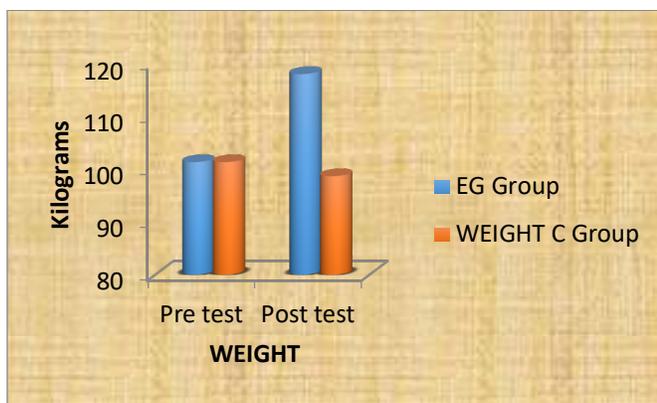
S. No	Domain	Variable	Test	Pre test	Post test	Std deviation		Std.Error Mean		"t" Ratio
1.	Anthropometric	Height	Adapted aerobics group	145.76	145.66	12.99	13.07	3.35	3.37	1.87
			Control group	142.23	142.24	17.80	17.77	4.59	4.59	-1.00
Weight		Adapted aerobics group	47.32	39	14.41	8.68	3.72	2.24	4.53	
		Control group	47.11	48.86	10.69	10.74	2.76	2.77	-9.40	
3.		Waist girth	Adapted aerobics group	31.33	18	4.95	0.75	1.27	0.19	9.92
			Control group	31.53	32.2	5.02	5.12	1.29	1.32	-2.87
4.	Body composition	Fat %	Adapted aerobics group	22.64	16	5.91	2.32	1.52	0.60	6.10
			Control group	22.99	23.78	0.99	1.04	0.25	0.27	-3.58
5.		BMI	Adapted aerobics group	25	17.08	2.58	2.02	0.66	0.52	9.55
			Control group	25.1	24.28	2.32	2.16	0.60	0.55	1.09

Significant at 0.05 level of confidence 1 and 14.

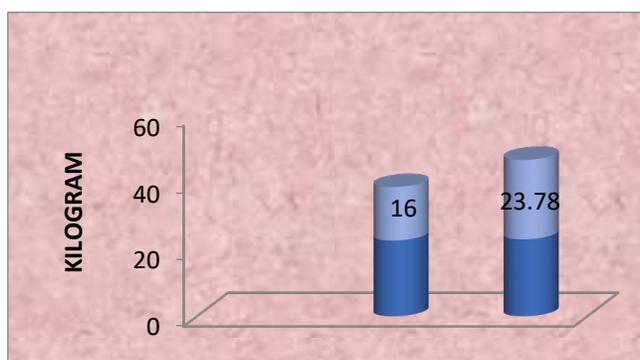
**Graphical Representation showing the Pre and Post test mean values of experimental group and control group on Height**



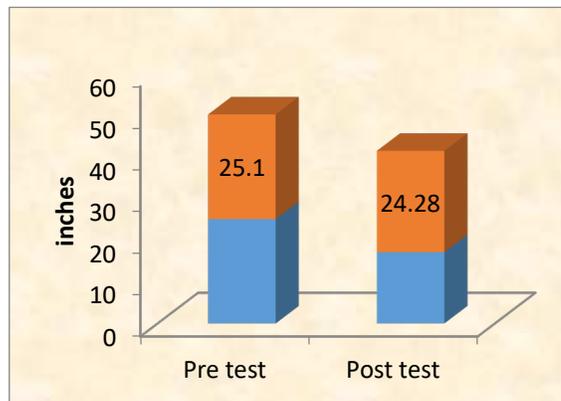
**Graphical Representation showing the Pre and Post test mean values of experimental group and control group on Weight**



**Graphical Representation showing the Pre and Post test mean values of experimental group and control group on Body Mass Index group**



**Graphical Representation showing the Pre and Post test mean values of experimental group and control group on Waist Circumference**



### 3.DISCUSSION AND FINDINGS

Aerobic Exercise is a beneficial for Down syndrome children. It shows that Physical activity / Exercise improvements in aerobic capacity. Parents of a child with Down syndrome will more likely provide their child with the opportunity of participating in physical activity because the benefits of aerobic exercise are proven. To find out if any significant difference exists between pre and post training, t-ratio was applied. The Adapted Aerobic Dance Group (ADG) had significantly improved ( $P < 0.05$ ) the selected variables (Body Composition and The experimental group (ADG) Adapted Aerobic Dance Group was better than the control group. The control group did not show any significant improvement on the selected variables. Based on the results it was concluded that the implication of Adapted Aerobic Dance might have been the source of its dominance on the improvement of variables (Body Composition) of obese Children with Down syndrome. To find out if any significant difference exists between pre and post training, t-ratio was applied. The Adapted Aerobic Dance Group (ADG) had significantly improved ( $P < 0.05$ ) the selected variables (body composition) The experimental group (ADG) Adapted Aerobic Dance Group was better than the control group. The control group did not show any significant improvement on the selected variables.

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### **Conflict of interest**

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

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