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BHARATHIAR UNIVERSITY
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From the Editors' Desk

Whilst we are striving hard to manage the new normal post Covid pandemic, there is a great realization on health fitness and wellness. The department of Physical Education, Bharathiar University with societal responsibility publishes this 13th 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 Sciences (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. The submitted articles are subjected to a double blind referee system for review. Based on the reviewers report the articles are accepted. 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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Publisher's Desk

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Influence of Ladder Training on Agility Balance Speed Among Volleyball Players

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Abstract

The purpose of the study was to find out the Influence of Ladder Training on Agility Balance Speed among Volleyball Players. To achieve the purpose of the study, the investigator selected thirty men Volleyball players from Selvam college of Physical Education, Namakkal district, Tamilnadu as subjects and their age ranged from 18 to 24. Research design that was used in the study was Random Experimental Research design. The subjects (n = 30) were randomly assigned to two equal groups of volleyball players each. The groups were assigned as Ladder Training group and control group and in an equivalent manner. Ladder Training was measured by agility balance and speed. The training group had undergone the training for a period of eight weeks and the post-tests were conducted after the training period. Analysis of covariance (ANCOVA) was applied because the subjects were selected random, but the groups were not equated in relation to the factors to be examined. Hence the difference between means of the two groups in the pre-test had to be taken into account during the analysis of the post-test differences between the means. This was achieved by the application of the analysis of covariance, where the final means were adjusted for differences in the initial means, and the adjusted means were tested for significance. To test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study. The Ladder Training group had shown significant difference in all the selected agility balance and speed variables.

Keywords: Ladder Training, Agility, Balance and Speed

1. Introduction

Ladder Training

The ladder training has a time to tested and proven effective tool for improving our footwork. The training effect is similar to jump rope, but with several advantages on sports players. First- agility ladder training is multi – directional. In most sports, we are not staying in one sport. Graydon L. Gains was examined the effect of ladder drill weight training and iron yoga on agility, speed, flexibility and vital capacity among college badminton players. We are moving forward, sideways and sometimes backwards, second- our feet are also allowed to move independently I more complex patterns than jump rope allows. And third, the cycle time can be result is that you can train your feet to move quickly through complex footwork patterns. The benefits to any ground based sport are huge. Ladder training increases dynamic balance because the athlete must make numerous neuromuscular adjustments to the imbalance created by each of the hundreds of jumps per training session. These adjustments also force the athlete to balance the body weight on the balls of the feet, reinforcing the universal athletic position. Alexis Padrón-Cabo the findings of this study suggest coordination training with an agility ladder does not seem to be effective to improve physical fitness and dribbling. Therefore, this information could be beneficial to players and coaches for programming tasks during soccer training session. The universal athletic position is a standing position of readiness that allows the athlete to react quickly in any direction and then move back to the starting position. In sports play

this position also requires slightly crouching with the weight balanced on the balls of the feet and one foot placed slightly in front of the other. As in a basketball player's defensive position, the arms may be slightly extended to the side, preparing the athlete for Omni directional multi joint movements. My ladder training system targets the anaerobic energy system and helps the athlete to develop agility, balance and speed key factors in gaining and sustaining that competitive edge. Specific programs are included to target each of these factors. Ladder training becomes aerobic and elicits a training response in athletes when performed for 10 minutes or longer in the aerobic training zone, which is 70 to 85 percent of the athlete's maximum heart rate (MHR). But the greatest benefits of ladder training can be achieved when it is used to enhance the anaerobic energy system. Once athletes have developed proper jumping technique and endurance, their jumping sessions can be performed in the anaerobic training zone, 85 to 95 percent of the MHR, for 30 to 120 seconds at a time and at the Vo2 max for 10 to 30 seconds. Athletes can receive maximum benefits in minimal time from a ladder training program tailored to the specific performance needs of their sport. My programs target the anaerobic energy system to develop competitive advantages in the skills discussed in the following sections.

Speed

Speed can be defined as quickness over a sustained period of time. It's speed that allows an athlete to maintain and build on slight advantages in distance and time or to close disadvantage in distance and time. Speed can be increased and extended by forcing the anaerobic energy system to operate at progressively greater levels of intensity for longer periods of time. My sprint program will increase speed by challenging the athlete's anaerobic energy system sustain maximum anaerobic intensity for up to two minutes. This will prepare the athlete for the anaerobic demands of most sports. (Susilaturochman Hendrawan) It could be concluded that there was an increase in the speed and agility of each group after being given a training.

Agility

Agility is an athlete's ability to accelerate, decelerate and quickly change direction while maintaining balance, body control and speed. It's very similar to balance in that it forces the athlete to regulate shifts in the body's centre of gravity while constantly changing posture. Most sports require athletes to move in multiple planes while simultaneously changing direction. Fantiro (2018) menerapkan latihan ladder drill speed run Dan ladder drill crossover terhadap peningkatan kelincahan (agility). My circuit-training program, in addition to developing quickness of the hands and feet, enhances agility by improving body control and full control of the feet. Greater agility also boosts speed and quickness of the hands and feet and it enables the athlete to instantly assess situations and make accurate changes in direction while moving at high speed.

Balance

Balance is the body's ability to keep its equilibrium when stationary or moving, keeping our equilibrium means keeping our centre of gravity over our area of support. If we do not keep our equilibrium we will fall over. Stationary or static, balance is shown in activities such as gymnastics. Moving, or dynamic, balance is important in most sports. Snowboarders and surfers must have very good dynamic balance. They move very fast over uneven surfaces and must constantly readjust their positions. We maintain our balance through the coordinated actions of our eyes, our ears and the proprioceptive organs in our joints. We can improve the balance needed in particular sports by developing the appropriate skills thoroughly. We can then put these skills to the test under the stress of competitive or team situations.

2. Methodology

To achieve the purpose of the study, thirty men volleyball players studying Selvam College of institutions, Namakkal were randomly selected as participants. The age of the subjects were ranged from 18 to 24 years respectively. The subjects selected for this study

were randomly divided into two groups of twelve subjects each.

Criterion Variables and Test Item			
S.No	**Criterion Variables**	**Test Items**	**Unit of Measurement**
1	Agility	Shuttle Run	In Seconds
2	Balance	Stroke Stand	In Seconds
3	Speed	50 mt Run	In seconds

Table I

Intra Class Co-Efficient of Correlation on Selected Dependent Variables

S.No	Criterion Variables	Correlation Coefficient 'r'
1	Agility	0.88*
2	Balance	0.91*
3	Speed	0.92*

Table II

The Summary of Mean and Dependent 't' Test For the Pre and Post Tests on Agility of Experimental and Control Groups

Mean	Experimental group	Control Group
Pre-test mean	10.27	10.28
Post-test Mean	10.22	10.29
't' test	**3.25***	**1.48**

***Significant at .05 level.**
(Agility performance in Seconds)
(The table value required for .05 level of significance with df 11 was 2.21)

Table III

Analysis of Covariance on Agility of Experimental and Control Groups

Adjusted post-test mean values		Sources Of Variance	Sum of Square	Df	Mean Squares	F-ratio
Experimental Group	Control Group					
10.22	10.29	Between	0.01	1	0.014	11.26*
		Within	0.03	21	0.01	

*Significant at .05 level of confidence.
(The table value required for significance at .05 level with df 1 and 21 was 4.32)

The experimental group I was named as ladder training group and group II acted as control. All the subjects in the experimental group (ladder training) was given their respective training programme three alternative days in a week for eight weeks duration in addition to the regular physical education activities of the department as per the curriculum. The subjects were free to withdraw their consent in case of feeling any discomfort or injuries during the period of their participation, however there were no drop out in the study The pre and post-test random group design was used as experimental design in which thirty men subjects were divided into two groups of twelve each at random. No attempt was made to equate the group in any manner. Group I underwent ladder training and Group II acted as control. The subjects were tested on the selected criterion variables such as agility, balance and speed prior to and immediately after the instruction period.

The table II shows that the obtained dependent t-ratio values between the pre and post-test means of experimental and control groups are 3.25 and 1.48 respectively. The table value required for significant difference with df 11 at .05 level is 2.21. Since, the obtained 't' ratio value of experimental group was greater than the table value, it was understood that experimental group had significantly improved the performance of agility when compared control group.

The analysis of covariance on agility of experimental and control groups have been analyzed and presented in Table III.

Table III shows that the adjusted post-test means of experimental and control groups were 10.22 and 10.29 respectively. The obtained F-ratio value is 11.26, which was higher than the table value 4.32 with df 1 and 21 required for significance at .05 level. Since the value of F-ratio was higher than the table value, it indicates that there was significant difference exist between the adjusted post-test means of experimental and control groups in improving the performance of agility.

The mean values of experimental and control groups on agility were graphically represented in the figure I.

The adjusted post-test mean values of experimental and control groups on agility were graphically represented in the figure II.

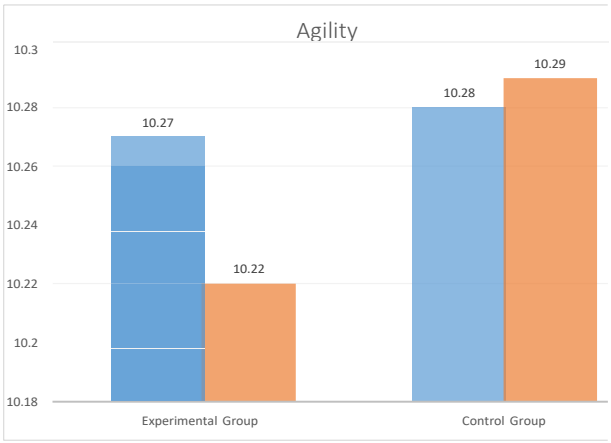

Figure – I: Mean Values of Experimental and Control Groups on Agility.

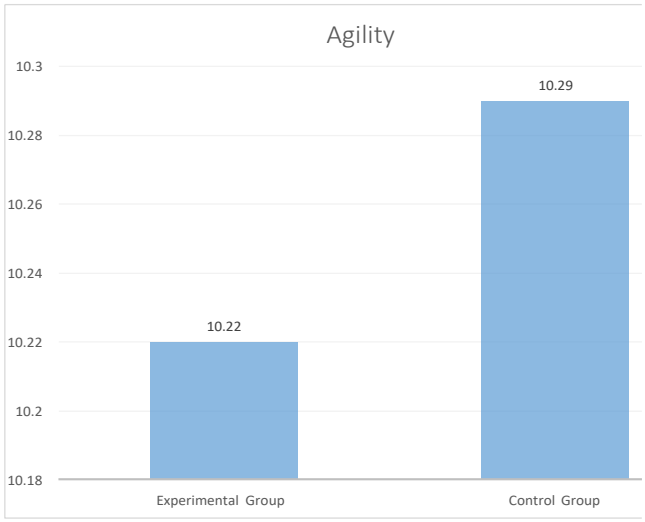

Figure – II: Adjusted Mean Values of Experimental and Control Groups on Agility.

The table IV shows that the obtained dependent t-ratio values between the pre and post-test means of experimental and control groups were 9.38 and 1.39 respectively. The table value required for significant difference with df 11 at .05 level was 2.21. Since, the obtained 't' ratio value of experimental group was greater than the table value, it was understood that experimental group had significantly improved the performance of balance when compared control group.

The analysis of covariance on balance of experimental and control groups have been analyzed and presented in Table V.

Table - IV

The Summary of Mean and Dependent 't' Test For the Pre and Post Tests on Balance of Experimental and Control Groups

Mean	Experimental group	Control Group
Pre-test mean	35.57	35.67
Post-test Mean	38.89	35.54
't' test	**9.38***	**1.39**

***Significant at .05 level.
(Balance performance in Seconds)
(The table value required for .05 level of significance with df 11 was 2.21

Table V

Analysis of Covariance on Balance of Experimental and Control Groups

Adjusted post-test mean values		Sources Of Variance	Sum of Square	df	Mean Squares	F-ratio
Experimental Group	Control Group					
38.94	35.54	Between	66.12	1	66.12	77.84*
		Within	17.84	21	0.85	

*Significant at .05 level of confidence.
(The table value required for significance at .05 level with df 1 and 21 was 4.32)

Table VI

The Summary of Mean and Dependent 'T'-Test for the Pre and Post Tests on Speed of Experimental and Control Groups

Mean	Experimental Group	Control group
Pre-test mean	7.29	7.35
Post-test Mean	7.27	7.36
't' test	**9.38***	**1.11**

***Significant at 0 .05 level. (Speed performance in Seconds)
(The table value required for 0.05 level of significance with df 11 was 2.201)

Table VII

Analysis of Covariance on Speed of Experimental and Control Groups

Adjusted post-test mean values		Sources of Variance	Sum of Square	df	Mean Squares	F-ratio
Experimental Group	Control Group					
7.31	7.33	Between	0.01	1	0.005	10.91*
		Within	0.10	21	0.000	

*Significant at .05 level of confidence.
(The table value required for significance at .05 level with df 1 and 21 was 4.32)

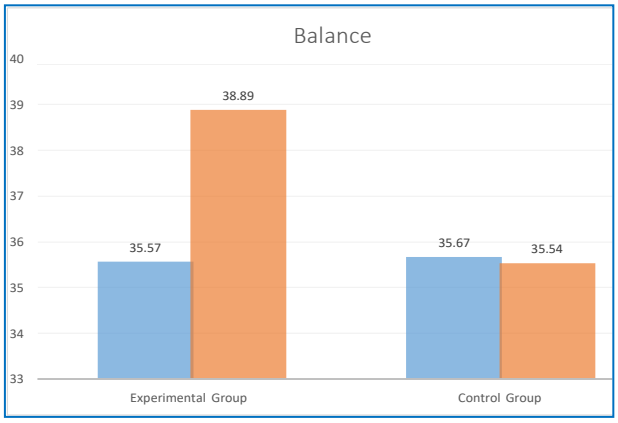

Figure - III: Mean Values of Experimental and Control Groups on Balance

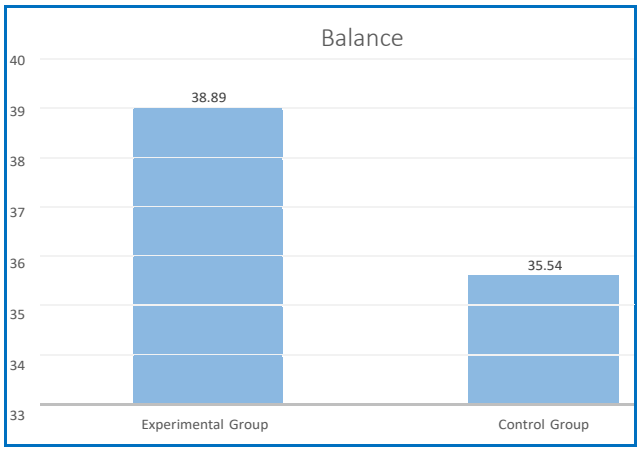

Figure – IV: Adjusted Mean Values of Experimental and Control Groups on Balance.

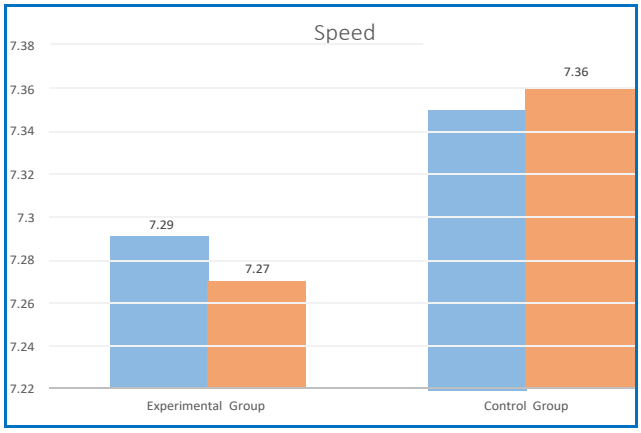

Figure - V: Mean Values of Experimental and Control Groups on Speed.

Table V shows that the adjusted post-test means of experimental and control groups were 38.94 and 35.54 respectively. The obtained F-ratio value is 77.84, which was higher than the table value 4.32 with df 1 and 21 required for significance at .05 level. Since the value of F-ratio was higher than the table value, it indicates that there was significant difference exist between the adjusted post-test means of experimental and control groups in improving the performance of balance.

The mean values of experimental and control groups on balance were graphically represented in the figure III.

The adjusted post-test mean values of experimental and control groups on balance were graphically represented in the figure IV.

Table VI shows that the obtained dependent t-ratio values between the pre and post-test means of experimental and control groups are 9.38 and 1.11 respectively. The table value required for significant difference with df 11 at .05 level is 2.201. Since, the obtained 't' ratio value of experimental group was greater than the table value, it is understood that experimental group had significantly improved the performance of speed when compared to control group.

The analysis of covariance on speed of experimental and control groups have been analyzed and presented in Table VII.

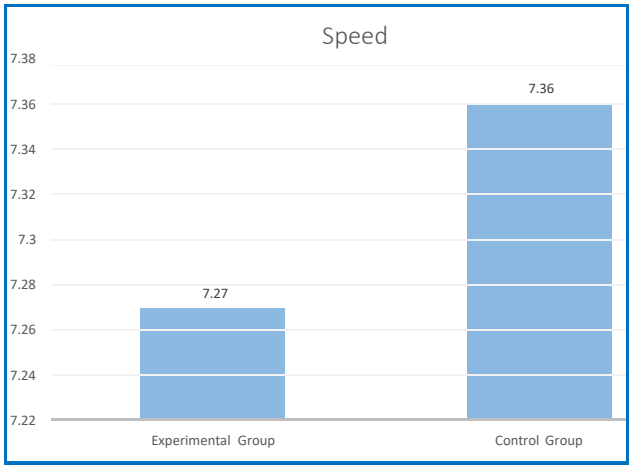

Figure - VI: Adjusted Mean Values of Experimental and Control Groups on Speed.

Table VII shows that the adjusted post-test means of experimental and control groups were 7.31 and 7.33 respectively. The obtained F-ratio value is 10.91, which was higher than the table value 4.32 with df 1 and 21 required for significance at .05 level. Since the value of F-ratio was higher than the table value, it indicates that there was significant difference exist between the

adjusted post-test means of experimental and control groups in improving the performance on speed.

The mean values of experimental and control groups on speed were graphically represented in the figure V.

The adjusted post-test mean values of experimental and control groups on speed were graphically represented in the figure VI.

3. Discussion on Findings

The result of the study indicates that the experimental group namely ladder training had significantly improved the selected dependent variables namely agility, balance and speed. It was also found that the improvement caused by ladder training was better when compared to control group.

4. Conclusion

From the analysis of the data, the following conclusions were drawn. The experimental groups namely ladder training had achieved significant improvement on agility, balance and speed when compared to control group. Significant differences were found among the experimental group toward improving the selected criterion variables such as agility, balance and speed when compared control group. Ladder training was found to be better in improving the selected dependent variables such as agility, balance and speed when compared to the control group.

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Conflict of interest

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

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Impacts of Circuit Training with Yogic Practice on Physical Fitness Variables Among Athletes

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Abstract

This study was planned to examined the impacts of circuit training with yogic practice on selected physical fitness variables among athletes. Thirty men athletes were randomly selected from SIVET College, Chennai, Tamilnadu. The subjects age ranged from 21 to 25 years. They were divided into two equal groups. The group 1 is considered as experimental group (circuit training with yogic practice) and group 2 was considered as control group. Pre-test was conducted on Speed, Agility and leg explosive power for both the groups and the reading were carefully recorded in their respective unit as pre-test score. After pretest, experimental group was treated with specific circuit training and yogic practice, for duration of 45 minutes, three days per week for a period of twelve weeks. The control group was not treated with any special training. After twelve weeks of training posttest was conducted and the reading were carefully recorded in their respective units as post test score. The pre and posttest were taken for analysis. The collected data on physical fitness variables due to twelve weeks circuit training with yogic practice was analysed by dependent 't' test with 0.05 level of confidences. From the results of the study, it was found that there was a significant improvement on physical fitness variables among athletes.

Keywords: Yogic Practice, Circuit training, Physical Fitness Variables, Athletes.

1. Introduction

Circuit training is an efficient and challenging form of conditioning. It works well for developing strength, endurance (both aerobic and anaerobic), flexibility and coordination. Its versatility has made it popular with the general Public right through to elite athletes. For sports men and women, it can be used during the closed season and early pre-season to help develop a solid base of fitness and prepare the body for more stressful subsequent training. Circuit training in an effective organizational form of doing physical exercises for improving all physical fitness components. Before and after training, the initial and final tests were conducted for the variables such as speed agility, power, co-ordination, static balance and dynamic balance for the experimental and control groups. Circuit training is an exercise program that develops overall fitness. Circuit training is an effective and quick way to fit your workout into your busy day. Circuit training provides a high intensity cardio workout, along with resistance training. This is designed to target fat loss and lean muscle building. A Circuit is designed with a series of exercises performed in succession of each other. When one Circuit is complete you start these quinces over again with little to no break. To start you want to perform each exercise for 10reps and 3 times through each Circuit. Remember to perform reps quickly and keep breaks assort as possible. The purpose of Circuit training is to keep moving, which pushes your body aerobically, while still challenging your strength.

2. Experimental Design

The selected thirty subjects were randomly divided into two equal groups consist of 15 each such an experimental group and control group. Pre-test was conducted on Speed, Agility and leg explosive power for the two groups and the reading were carefully recorded in their respective

unit as pre-test score. After pre test, experimental group was treated with specific circuit training, for duration of 45 minutes, three days per week for a period of twelve weeks. The control group was not treated with any special training. After twelve weeks of training post test was conducted and the reading were carefully recorded in their respective units as post test score. The pre and post test were taken for analysis.

3. Training Program

The training program is design for 60 minutes per session in a day, three days in weeks for a period of twelve weeks duration these 60 minutes included 10 minutes warm up and 10 minutes warm down remaining 40 minutes allotted for circuit training program. Every two weeks 10% intensity is increase from 50% to 60% of work load. The training load is increased from the maximum working capacity of the subjects.

4. Statistical Technique

The collected data on physical fitness variables due to twelve weeks circuit training analyzed by using means and standard deviation. In order to find out the significant changes if any dependent 't' test will be applied 0.05 level of confidences fixed to level of significant..

5. Results

Table 1 reveals that the Computation of 't' ratio between pre and post-test means of experimental group on Physical fitness variables. The 't' ratio on Speed, Agility and Leg Explosive power are 13.88, 5.17 and 22.06 respectively. The required table value was 2.14 for the degrees of freedom 14 at 0.05 level of significance. Since the obtained 't' ratio values were greater than the table value, it was found statistically significant.

. Table 2 reveals that the Computation of 't' ratio between pre and post-test means of control group on Physical fitness variables. The 't' ratio on Speed, Agility and Leg Explosive power are 1.12, 1.17 and 1.04 respectively. The required table value was 2.14 for the degrees of freedom 14 at 0.05 level of significance. Since the obtained 't' ratio values were lower than the table value, it was found statistically insignificant.

6. Discussion on Findings

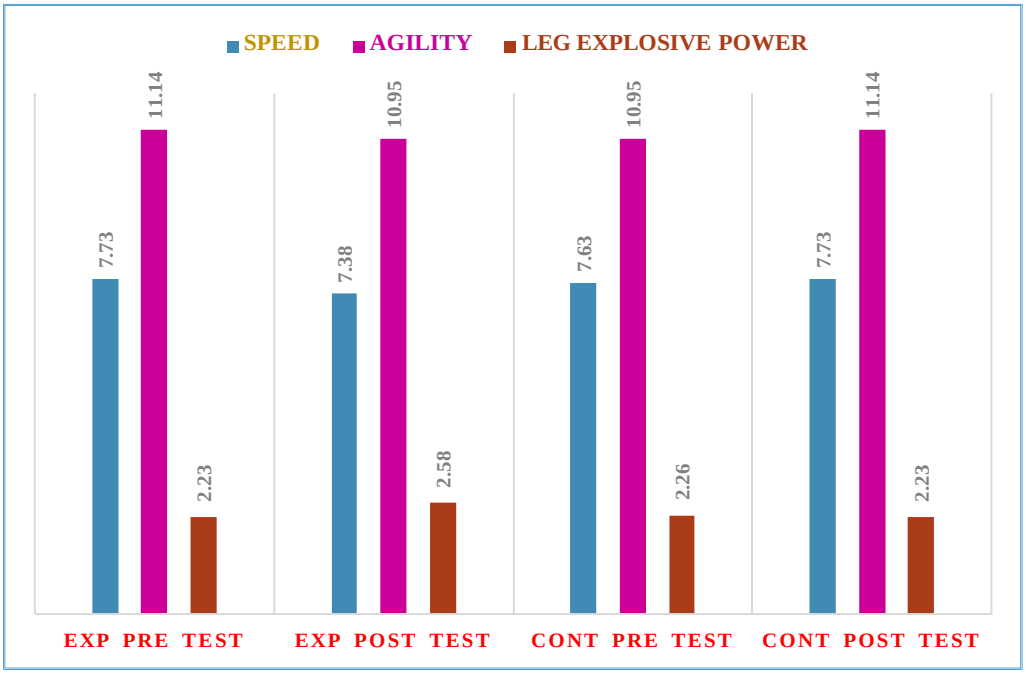
The effect of circuit training with yogic practice is a fantastic training which has been found to be beneficial for the athletes. To study the circuit training on physical fitness variable of college level men athletes, it was tested under, to differentiate between circuit training with yogic practice group and control group. The circuit training includes on pull ups, medicine ball throw, burpee, speed squats, skipping, depth jump, abdominal crunch. It also improves the dribbling ability, game tactics, anaerobic capacity, quickness, eye hand coordination and other than some physical fitness components are namely speed, agility, and power. The following studies was revealed that Dr. Jatinder Kumar (2017)5 Impact of circuit training on selected physiological variables of hand ball players.

Table 1: Computation of 't' ratio between pre and post-test means of experimental group on physical fitness variables

Experimental Group					
Physical Fitness Variables	**Pre/Post test**	**Mean**	**Std. Deviation**	**Std Error Mean**	**'t' Ratio**
Speed	Pre-Test	7.73	0.57	0.02	13.88*
	Post-Test	7.38	0.63		
Agility	Pre-Test	11.14	0.61	0.03	5.17*
	Post-Test	10.95	0.60		
Leg Explosive power	Pre-Test	2.23	0.11	0.35	22.06*
	Post-Test	2.58	0.12		

*Significant at 0.05 level of confidence (2.145), 1 & 14.

Table 2: Computation of 't' ratio between pre and post-test means of Control group on Physical Fitness variables					
Control Group					
Physical Fitness Variables	**Pre/Post test**	**Mean**	**Std. Deviation**	**Std Error Mean**	**'t' Ratio**
Speed	Pre-Test	7.63	0.58	0.55	1.12
	Post-Test	7.73	0.57		
Agility	Pre-Test	10.95	0.60	0.03	1.17
	Post-Test	11.14	0.61		
Leg Explosive power	Pre-Test	2.26	0.12	0.89	1.04
	Post-Test	2.23	0.11		
*Significant at 0.05 level of confidence (2.145), 1 & 14.					



The result of the study supports the result of the present study. Dr. Praveen Kumar (2021)8 Impact of circuit training on selected physical fitness among college level athletes. The result of the study supports the result of the present study. These finding had not been previously replicated for a sample of college students. The result of the study showed that the control group was not significantly improved.

4. Conclusion

Based on the findings and within the limitation of the study it is noticed that practice of circuit training with yogic practice helped to improve physical fitness variable among athletes. It was also seen that there is progressive improvement in the selected criterion variables of circuit training group of college level men athletes after twelve weeks. Further, it also helps to improve speed, agility and leg explosive power. It was concluded that individualized circuit training with yogic practice group showed a statistically significant over the course of the treatment period on physical fitness variables of among men athletes.

1. It was concluded that individualized effect of control group showed a statistically insignificant over the course of the period on

selected physical fitness variables of men athletes.

2. The results of comparative effects lead to conclude that the circuit training with yogic group had better significant improvement on selected physical fitness variables (speed, agility and leg explosive power) of athletes as compared to their performance with control group.

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Effects of SAQ Training on Selected Physical Fitness Parameters of Grassroots Cricketers

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Abstract

This study was designed to investigate effects of SAQ training on selected physical fitness parameters of grassroots cricketers and. To achieve the purpose of the study 30 grassroots cricket male cricket players were selected from National sports school, Coimbatore. The subjects will be randomly assigned to two equal groups (n=15). Group- I SAQ training (SAQTG) and Group - II was act as a control group (CG). The respective training was given to the experimental groups for 3 days per week (Monday, Wednesday and Friday) days the period of twelve weeks. The control group was not be given any sort of training except their routine. The selected physical fitness parameters were speed (50 m) and agility (10 X4). The data collected from the subjects was statistically analyzed with't' ratio to find out significant improvement if any at 0.05 level of confidence. The result of this speed and agility improved significantly due to effects of SAQ training with the limitation of (diet, climate, life style) status and previous training the result of the present study coincide findings of the investigation don by different experts in the field of sports sciences. Due to the influence of effects of SAQ training significantly improved selected physical fitness parameters of grassroots cricketers.

Keywords: SAQ Training, Speed, Agility and grassroots Cricketers.

1. Introduction

Circuit training is an efficient and The SAQ training method more frequently uses the programmed than random type conditioning after the SAQ continuum. One SAQ session is composed of 7 components, where the main part of the session, explosion and expression of potential, are combinations of programmed and random conditioning. Integral planning and programming is required to progress from fundamental movement patterns to highly positional specific movements a logical sequence in the learning process must not be neglected because it develops neural structures that are a pre requisite for elite-level upgrade. On sequent, elite players manipulate with their bodies without the loss of speed, balance, strength, and control. Also, with correct movement patterns (technique) and greater muscle power, they accelerate faster.

Firstly let me point out that of the speed, agility and anticipation components, the X-factor would most certainly be anticipation and to coach this most would agree is extremely difficult. So let us then focus on what we can improve through technique and training, that being speed and agility.

When considering speed more often than not we consider maximal speed and acceleration and ultimately the goal of speed training is to get an individual to achieve maximum speed in as short a time as possible. This is obviously achieved through optimizing acceleration and is usually reached after a sprint acceleration phase of approximately 30 – 50m. Bearing that in mind it is likely that you may only get the opportunity to reach maximum speed a couple of times in an entire cricket match when chasing a ball to the boundary, our training interventions from a speed point of view need to target acceleration because cricket involves many bursts of explosive acceleration and linear distances in cricket are

carried out over mostly 5 – 20m distances. The first and most important step in improving speed is to improve efficiency and we do this by improving running technique. This can be achieved through a basic understanding of technique and then the implementation of various technical drills involving apparatus such as hurdles, speed resistors and speed parachutes.

Most importantly we need to implement interventions focused on improving agility. This is achieved through drills that target foot movement and body position because these 2 factors will decide how quickly we change direction. If we can improve the speed at which our feet move we can improve the time it takes to move towards the ball or between the wickets. As part of my training sessions I will use ladders, hurdles and slalom poles to improve quickness and body position. The final step in the progression will see the introduction of fielding stimuli such as catching or ground fielding to ensure that the movements are relative to those that take place on the field of play and encourage reaction time and eye, foot and hand co-ordination. A part of all of us wants to be the one who takes that brilliant catch, stops that vital run or steals the winning single to win the game. Through an understanding of the basic principles of speed and agility and the implementation of various basic training drills we can all improve how quickly we move and ultimately have a large role to play in both our personal success and the team's success as a whole..

2. Materials and Methodology

This study was designed to determine the impacts of SAQ training on selected physical fitness parameters of grassroots cricketers and. To achieve the purpose of the study 30 grassroots cricket male cricket players were selected from National sports school, Coimbatore. The subjects will be randomly assigned to two equal groups (n=15). Group- I SAQ training (SAQTG) and Group - II was act as a control group (CG). The respective training was given to the experimental groups for 3 days per week (Monday, Wednesday and Friday) days the period of twelve weeks. The control group was not be given any sort of training except their routine. The selected physical fitness parameters were speed (50 m) and agility (10 X4).

Criterion measures

Variables	Test items	Unit of measurements
speed	50m dash	In second
agility	10X4 shuttle run	In second

Training programme

The training programme was lasted for 45 minutes for session in a day, 3 days in a week for a period of 12 weeks duration. These 45 minutes included 10 minutes warm up, 15 minutes 25 minutes SAQ training and 10 minutes warm down. Every three weeks of training 5% of intensity of load was increased from 65% to 80% of work load. The volume of plyometric training is prescribed based on the number of sets and repetition. The equivalent in SAQ training is the length of the time each action is held for and the number action in total 5 day per week.

Table I reveals the computation of mean, standard deviation and 't' ratio on selected physical fitness parameters, namely speed and agility of SAQ training group. The obtained 't' ratio on speed and agility were 3.57 and 3.85 respectively. The required table value was 2.14 for the degrees of freedom 14 at the 0.05 level of significance. Since the obtained t values were greater than the table value it was found statistically significant.

Table I reveals the computation of mean, standard deviation and 't' ratio on selected physical fitness parameters, namely speed and agility of control group. The obtained 't' ratio on speed and agility were 1 and 0.09 respectively. The required table value was 2.14 for the degrees of freedom 14 at the 0.05 level of significance. Since the obtained t values were greater than the table value it was found statistically not insignificant.

TABLE- I

Computation of T Ratio on Selected Physical Fitness Parameters of Grassroots Cricketers on SAQTG And Control Group

Group		Mean	N	Std. Deviation	Mean difference	Std. Error Mean	T ratio
		Experimental Group					
speed	Pre test	7.8600	15	.61737	.25067	.07008	3.57*
	Post test	7.6093	15	.58790			
agility	Pre test	16.0620	15	.19380	0.07	0.02	3.85*
	Post test	15.9827	15	.21107			
		Control Group					
speed	Pre test	7.7533	15	.57553	0.02	0.02	1.00
	Post test	7.7733	15	.57875			
agility	Pre test	16.1020	15	.22059	0.002	0.02	0.09
	Post test	16.1047	15	.21437			
*significant level 0.05 level (degree of freedom 2.14,1 and 14)							

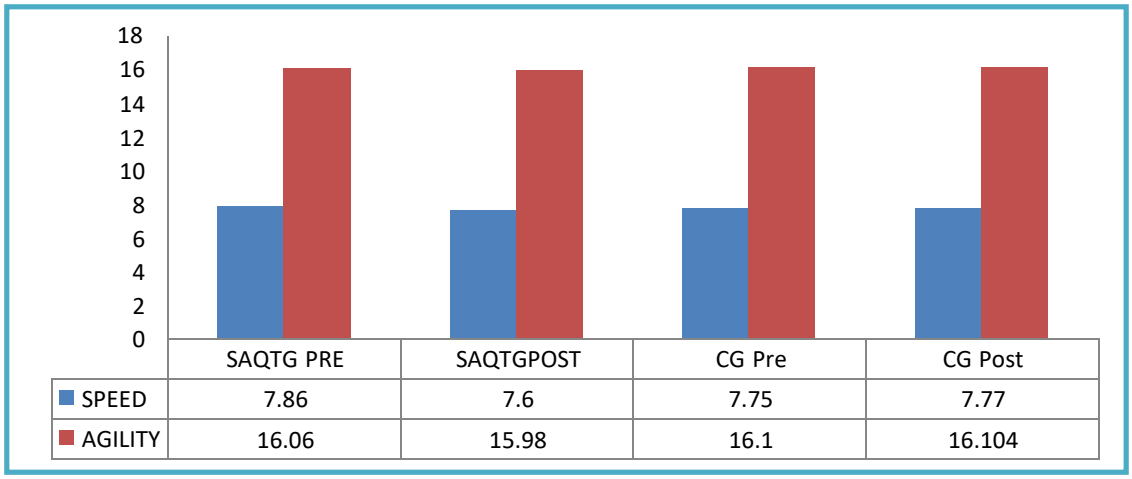

FIGURE- I Bar Diagram Showing The Mean Value On Selected Physical Fitness Parameters Of Grassroots Cricketers On Saqtg And Control Group

3. Discussion and Findings

The present study experimental the impact of 12 weeks SAQ training significantly improved the selected physical fitness parameters grassroots cricketers. The results of this study indicated that SAQ training after is more efficient to bring out desirable changes over the speed, agility of grassroots cricketers. The finding of the present study had similarity with the findings of the investigators referred in this study.

Speed is one of the basic capabilities necessary bio motoric in every sport Sukadiyanto et al (2011).The speed is very dependent on power because without power, speed cannot be developed. Agility or agility related to gestures that involve footwork and quick changes of position of the body (Mylsudayu et al., 2015). To be able to provide quality results and quality, one athlete requires agility is good in itself that will

affect the performance during exercise so as to improve the performance of athletes. According to Kusnanik et al., (2017) speed and agility can be regarded as the most dominant element in a football game. Some way or method of exercise that can be used to improve the speed and agility of athletes among which the speed ladder run and repeated sprints. Overall running technique can be broken down into several phases, the early phase of the block, the acceleration phase, and the velocity step phase. During the acceleration phase, an athlete increase strides length and step frequency. When an athlete reaches the stage of the maximum constant speed, running speed increased through increased stride length and more importantly through the stride frequency. The speed and acceleration are essentials for football athletes because they need to achieve high speed when chasing a ball in a game of football (Gevat et al.,2012).

4. Conclusion

1. It was concluded that 12 weeks SAQ training significantly improved the selected physical fitness parameters of grassroots cricketers.

2. It was concluded that 12 weeks SAQ training significantly improved the speed, agility of grassroots cricketers.

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Impacts of Yogic Practice with Plyometric Training on Selected Motor Fitness Variables Among Hockey Players

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Abstract

The purpose of this study to find out an impact of yogic practice with plyometric training on selected motor fitness variables among hockey player. The selected twenty subjects were taken from the Department of Physical Education, Bharathiar University, Coimbatore. The student are selected within a age group between 21 to 25 years. The selected players were divided into two equal groups consists of ten hockey players each namely experimental group and control group. The experimental group underwent yogic practice with plyometric training for eight weeks. The control group was not taking part in any training during the course of study. The following motor fitness variables are Flexibility, Explosive Power and Muscular Strength was taken as criterion variable in this study. The experimental group was treated with their respective training in the basis of one hour per day for three days a week for a period of eight weeks of training. Statistical analyzed paired 't' ratio was used to analyses 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 variables. The difference was found due to yogic practice with plyometric training given to the experimental group on flexibility, explosive power and muscular strength when compared to control group.

Keywords: Yogic Practice, Plyometric training, Flexibility, Explosive Power, Muscular Strength and hockey players.

1. Introduction

Yoga means the oneness or unity with inner being. This unity comes after dissolving the duality of mind and matter into supreme reality. Yoga has the surest remedies for man's physical as well as psychological alignments. It makes the organs of the body active in their functioning and has good effect on internal functioning of the human body. In other system of physical exercises, the internal organs of the body mostly do not get proper exercises, while yogic practices gives sufficient exercise to the internal organs of the body. Yoga practices have a greater impact on the mind and control the senses. Yogic practices make possible not only physical and mental development but also intellectual and spiritual development. Yoga practice are called a non-violent activity.

Plyometric training is one of the most effective method to improve the explosive power. A wide variety of athletes can benefit from power training, particularly if it is followed by a strength training programme. The purpose of plyometric is to improve the player's capacity to apply more force more rapidly. Plyometric training has received much attention recently, it had been a part of the training of athletes in a variety of sports for years. It is used in conjunction with other power development methods in a complete training programme to bridge the gap between maximum strength and explosive power. Scientific research has given us a fundamental understanding of the elastic properties of muscle and its training ability.

2. Methodology

The purpose of this study to find out an impact of yogic practice with plyometric training on selected motor fitness variables among hockey

player. The selected twenty subjects were taken from the Department of Physical Education, Bharathiar University, Coimbatore. The student are selected within a age group between 21 to 25 years. The selected players were divided into two equal groups consists of ten hockey players each namely experimental group and control group. The experimental group underwent yogic practice with plyometric training for eight weeks. The control group was not taking part in any training during the course of study. The following motor fitness variables are Flexibility, Explosive Power and Muscular Strength was taken as criterion variable in this study. The experimental group was treated with their respective training in the basis of one hour per day for three days a week for a period of eight weeks of training. Statistical analyzed paired 't' ratio was used to analyses the means of the pre-test and post-test data of experimental group and control group.

3. Statistical Technique

The data will be collected before and after the experimental treatment. The data obtained from the experimental period will be statistically analyzed with paired 't' test at 0.05 level of significant improvement on flexibility, explosive power and muscular strength from base line to post treatment.

Table –II shows that the obtained mean values of pre-test and post-test of experimental group for flexibility, explosive power and muscular strength were 22.40 and 26.70, 1.78 and 1.81, 31.50 and 34.60 respectively, the obtained 't' ratio were 26.00*, 7.42*, 10.80* respectively. The tabulated 't' value is 2.26 at 0.05 level for the degree of freedom 9. The calculated 't' ratio was greater than the table value. It is found to be significant change in flexibility, explosive power and muscular strength of the hockey players.

Table – I: Selection of variables and criterion measures

S.No		Test	Unit of measurement
1	Flexibility	Sit and Reach Test	In Meters
2	Explosive Power	Standing Broad Jump	In Meters
3	Muscular Strength	Sit-ups	Counts / Minutes

Table – II: The summary of t-ratio for the pre-test and post-test of experimental group and control group

S.No	Motor Fitness Variables	Groups	Test	Mean	't' value
1	Flexibility	Experimental group	Pre-test	22.40	**26.00***
			Post-test	26.70	
		Control group	Pre-test	21.50	**0.71**
			Post-test	22.10	
2	Explosive Power	Experimental group	Pre-test	1.78	**7.42***
			Post-test	1.81	
		Control group	Pre-test	1.75	**0.83**
			Post-test	1.77	
3	Muscular Strength	Experimental group	Pre-test	31.50	**10.80***
			Post-test	34.60	
		Control group	Pre-test	27.50	**1.08**
			Post-test	30.50	

*Significant at 0.05 level

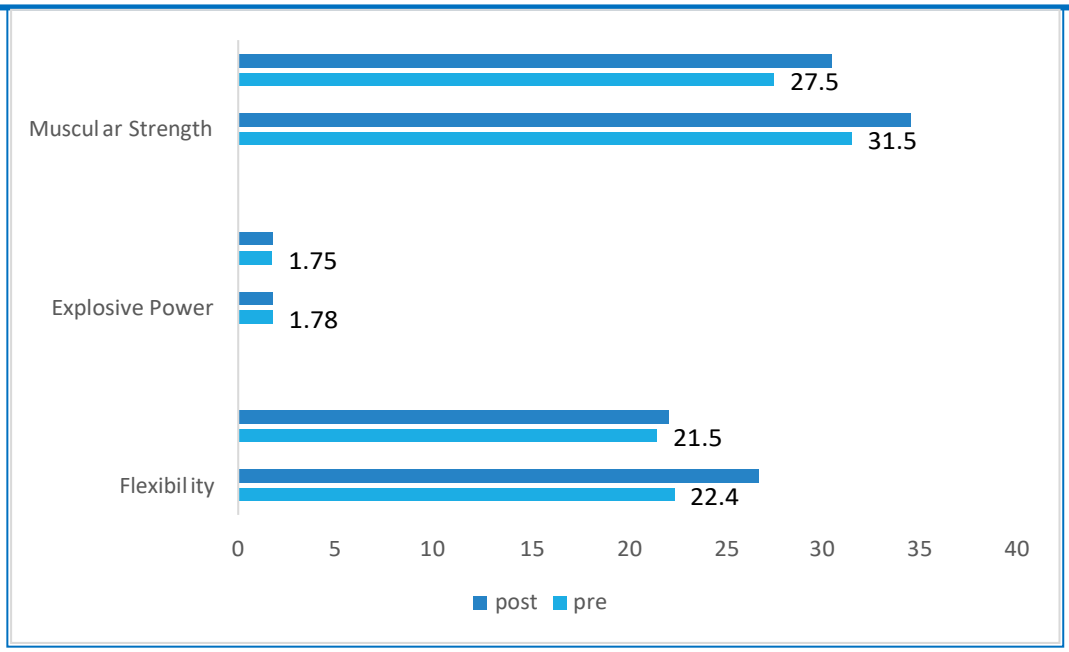

Fig-1: Bar diagram shows the pre-test and post-test on selected motor fitness variables of experimental group and control group.

The obtained mean values of pre-test and post-test of control group for flexibility, explosive power and muscular strength were 21.50 and 22.10, 1.75 and 1.77, 27.50 and 30.50. The required table value is 2.26 at 0.05 level for the degree of freedom 9. The calculated 't' ratio was lesser than the table value. It is found to be insignificant change in flexibility, explosive power and muscular strength of the hockey players. The mean values of selected motor fitness variables among experimental group and control group are graphically represented in fig-1.

4. Discussion on Findings

The result of the study indicated that the selected motor fitness variables such as flexibility, explosive power and muscular strength were improved significantly after undergoing yogic practice with plyometric training. The changes in selected parameters were attributed for the proper planning, preparation and execution of the training package given to the hockey players. The findings of the present study had similarly with the findings of Prasanna, T. A., & Vaithianathan, K. (2019), Arunprasanna, T., Sundar, M., & Jaskar, K. M. M. (2019), Prakash, J., & Nagarajan, S[6]. The results of the present study indicates that the yogic practice with plyometric training methods is appropriate protocol to improve flexibility, explosive power and muscular strength of the hockey players. From the result of the present study it is clear that the selected motor fitness variables such as flexibility, explosive power and muscular strength improved significantly due to yogic practice with plyometric training.

5. Conclusion

Based on the findings and within the limitation of the study it is noticed that practice of with yogic practice with plyometric training helped to improve motor fitness variable among hockey players. It was also seen that there is progressive improvement in the selected criterion variables of plyometric training group of college level men hockey players after eight weeks. Further, it also helps to improve muscular strength, leg explosive power and flexibility. It was concluded that customized yogic practice with plyometric training group showed a statistically significant over the course of the treatment period on motor fitness variables of among men hockey players.

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

2. The results of comparative effects lead to conclude that the yogic practice with plyometric

training group had better significant improvement on selected motor fitness variables of men hockey players as compared to their performance with control group.

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Effect of Varied Specific Training on Physical Fitness Variables Among Central University Level Handball Players

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Abstract

The study was to find out the effect of varied specific training on physical fitness variables among Central University level handball players. To achieve the purpose of the study, 80 handball players were selected from Central University. The age of the subjects was ranged between 20 and 23years. 80 subjects were selected at randomly and the subjects were divided into four equal groups namely experimental group I, experimental group II, experimental group III and control group. Thus each group consisted of 20 subjects. The experimental group I underwent 12 week of plyometric training programme and experimental group II underwent 12 weeks of staircase training programme and experimental group III underwent 12 weeks of jump rope training programme and the control group did not involve in any specific training. The pre test and post test were taken to all the four groups before and after the training programme respectively. To analyse the data investigator used ANCOVA for this study. If 'F' ratio is found to be significant the investigator used Scheffe's post hoc test to find out the etter group. The study was concluded that the plyometric training group, staircase training group and jump rope training group were better than the control group and also there is no significant difference among plyometric, staircase and jump rope training groups.

Keywords: Plyometric training Staircase training, Jump rope training and Physical fitness variables.

1. Introduction

Plyometrics

Plyometric, also known as "jump training" or "plyos", are exercises in which muscles exert maximum force in short intervals of time, with the goal of increasing power (speed-strength). This training focuses on learning to move from a muscle extension to a contraction in a rapid or "explosive" manner, such as in specialized repeated jumping..

Plyometric is type of exercise training designed to produce fast, powerful movement and improve the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to jump higher, run faster, throw farther, or hit harder, depending on the desired training goal. Plyometric training is used to increase the speed or force of muscular contractions, often with the goal of increasing the height of a jump (Will and Freeman, 1994).

Staircase

Walking stairs provides an efficient low-impact cardiovascular workout that also builds strength in your lower body. The vertical nature of stairs presents a unique challenge for the quadriceps, hamstrings and gluteus. Most exercise and athletic activity consist of moving forward or laterally, such as jogging, walking and cycling, whereas the upward motion used to climb stairs requires your body to move in an alternative direction. Working your muscles from different angles can help you to maximize muscle growth. Walking stairs can burn 472 calories per hour for someone weighing 130 pounds and up to 690

calories per hour if you weigh 190 pounds, according to State of Wisconsin's Department of Health and Family Services.

Jump Rope Training

A jump rope exercise is the best aerobic training exercise. It is a simple exercise of jumping the rope and anyone can jump at a rope near his or her feet. This exercise needs no more equipment but a pair of jumping sneakers and a jumping rope. The best thing about this that it is convenient for any age.

The jump rope training is used for improving the cardiovascular system, improving the respiratory system and strengthening the wrists, forearms, shoulders, upper legs, and especially the calves and ball of the feet. It also increases physical stamina and increases coordination and reflexes.

2. Methodology

To achieve the purpose of the study, 80 handball players was selected randomly from Central University. The age of the subjects was ranged between 20-23 years. The subjects were divided equally into four groups namely experimental group-I (plyometric training group), experimental group-II (staircase training group), experimental group-III (jump rope training group) and control group. The experimental groups underwent respective training programme for the period of 12 weeks. The investigator selected abdominal muscular strength, cardiovascular endurance and shoulder muscular strength were selected as dependent variables. They were tested through modified sit up, Harvard step test and pull ups respectively. The investigator conducted pre test and post before and after the training programme.

Required table value at 0.05 level of significance for 3 & 76 and 3 & 75 degree of freedom 2.76.

Table-I Shows that the pre-test mean value of experimental group I (Plyometric training group), experimental group II (staircase training group), experimental group III (jump rope training group) and control group are 27.00, 26.65, 25.40 and 26.50 respectively. The obtained 'F' ratio for pre-test on abdominal muscular strength is 0.97. It is lesser than the value of 2.76 for df 3 and 76 at 0.05 level of confidence on abdominal muscular strength.

The post-trest mean value of experimental group I (Plyometric training group), experimental group II (staircase training group), experimental group III (jump rope training group) and control group are 39.51, 38.75, 34.15 and 26.80 respectively. The obtained 'F' ratio for post-test on abdominal muscular strength is 46.31. It is greater then the required table value of 2.76 for df 3 and 76 at 0.05 level of confidence on obdominal muscular endurance.

The obtained 'f' ratio of pre test, post test and adjusted post test on obdominal

muscular endurance is 38.83, 38.61, 34.65 and 26.74 respectively. It is greater than the required table value of 2.76 for df 3 and 75 at 0.05 level of confidence on obdominal muscular strength.

The result of the study indicated that there is significant difference among the plyometric training group, staircase training group, jump rope training group and control group on obdominal muscular strength.

Whenever the obtained 'F' ratio of adjusted post-test mean was found to be significant, the investigator applied the Scheffe's post hoc test to find out the paired mean differences and it was presented in table – II.

The table II shows that the mean difference values between, experimental group I (Plyometric training group) and control group, experimental group II (staircase training group) and control group, experimental group III (jump rope training group) and control group experimental group II (staircase training group) experimental group III (jump rope training group) experimental group I (Plyometric training group) and experimental group III (jump rope training group) are 12.09, 11.87, 7.91, 3.96 and 4.18 respectively. They are greater than the confidence interval value 3.12 on abdominal muscular strength.

TABLE – I
Computation of Analysis of Co Variance Results on Abdominal Muscular Strength Among Plyometric Staircase Jump Rope And Control Groups

Test	Plyometric training group	Staircase training group	Jump rope training group	Control group	Source of Variances	Sum of Squares	Df	Mean Squares	Obtained 'F' Ratio
Pre Test Mean	27.00	26.65	25.40	26.50	Between	28.63	3	9.54	0.97
SD	1.86	2.32	4.92	2.43	Within	742.35	76	9.76	
Post Test Mean	39.15	38.75	34.15	26.80	Between	1978.33	3	659.44	46.31*
SD	4.24	4.16	3.71	2.78	Within	1082.05	76	14.23	
Adjusted Post Test Mean	38.83	38.61	34.65	26.74	Between	1911.66	3	637.22	53.78*
					Within	888.50	75	11.84	

*Significant at 0.05 level of confidence.

TABLE – II
SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN ADJUSTED POST-TEST MEAN OF ABDOMINAL MUSCULAR STRENGTH

S.No	Plyometric training group	Staircase training group	Jump rope training group	Control group	Mean Difference	Confidence Interval
1	38.83	38.61			0.22	3.12
2	38.83		34.65		4.18*	
3	38.83			26.74	12.09*	
4		38.61	34.65		3.96*	
5		38.61		26.74	11.87*	
6			34.65	26.74	7.91*	

*Significant at 0.05 level of confidence

The mean difference between plyometric training group and staircase training group 0.22. It is lesser than the confidence interval value of 3.12 on abdominal muscular strength.

Required table vaalue 0.05 level of significance for 3 & 76 degree of freedom 2.76.

Table III shows that the pre-test mean value of experimental group I (Plyometric training group), experimental group II (staircase training group), experimental group III (jump rope training group) and control group are 55.75, 56.60, 57.75 and 56.95 respectively. And standard deviation values of experimental group I, experimental group II experimental group III and control group are 6.64, 6.12, 5.34 and 4.32 respectively. The obtained 'F' ratio for on cardiovascular endurance is 0.42. It is lesser than the required table value of 2.76 for df 3 and 76 at

0.05 level of confidence on cardiovascular endurance.

TABLE III
COMPUTATION OF ANALYSIS OF COVARIANCE RESULTS ON CARDIOVASCULAR ENDURANCE AMONG EXPERIMENTAL GROUP AND CONTROL GROUP

Test	Plyometric training group	Staircase training group	Jump rope training group	Control Group	Sources of Variances	Sum of Squares	df	Mean Squares	Obtained 'F' ratio
Pre Test Mean	55.75	56.60	57.75	56.95	Between	41.23	3	13.74	0.42
SD	6.64	6.12	5.34	4.32	Within	2449.25	76	32.22	
Post Test Mean	75.80	81.65	80.40	57.30	Between	7628.63	3	2542.87	72.68*
SD	5.13	8.35	5.04	4.28	Within	2658.75	76	34.98	
Adjusted Post Test Mean	76.10	81.69	80.10	57.24	Between	7630.88	3	2543.62	78.37*
					Within	2434.26	75	32.45	

*Significant at 0.05 level of confidence

TABLE - IV
SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN ADJUSTED POST-TEST MEAN OF CARDIOVASCULAR ENDURANCE

Adjusted Post – test Mean

S.No.	Plyometric training group	Staircase training group	Jump rope training group	Control group	Mean Difference	Confidence Interval
1	76.10	81.69			5.59*	5.37
2	76.10		80.10		4.00	
3	76.10			57.24	18.86*	
4		81.69	80.10		1.59	
5		81.69		57.24	24.45*	
6			80.10	57.24	22.86*	

*Significant at 0.05 level of confidence

TABLE – V
COMPUTATION OF ANALYSIS OF CO VARIANCE RESULTS ON SHOULDER MUSCULAR ENDURANCE AMONG PLYOMETRIC STAIRCASE JUMP ROPE AND CONTROL GROUP

Test	**Plyometric training group**	**Staircase training group**	**Jump rope training group**	**Control Group**	**Source of Variances**	**Sum of Squares**	**Df**	**Mean Squares**	**Obtained 'F' Ratio**
Pre Test Mean	5.70	5.40	5.90	5.85	Between	3.03	3	1.01	0.40
SD	2.47	1.27	0.96	1.13	Within	189.35	76	2.49	
Post Test Mean	7.40	7.45	6.10	6.10	Between	28.25	3	9.49	12.66*
SD	1.18	0.51	0.60	0.96	Within	56.50	76	0.74	
Adjusted Post Test Mean	7.40	7.56	7.47	6.04	Between	31.07	3	10.35	26.13*
					Within	29.72	76	0.39	

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

TABLE – VI
SCHEFFE POST HOC TEST FOR THE DIFFERENCE BETWEEN ADJUSTED POST-TEST MEAN OF SHOULDER MUSCULAR ENDURANCE

S.No	Plyometric training group	Staircase training group	Jump rope training group	Control group	Mean Difference	Confidence Interval
1	7.40	7.56			0.16	0.57
2	7.40		7.47		0.07	
3	7.40			6.04	1.36*	
4		7.56	7.47		0.09	
5		7.56		6.04	1.52*	
6			7.47	6.04	1.43*	

*Significant at 0.05 level of confidence

The post-test mean value on cardiovascular endurance of experimental group I (Plyometric training group), experimental group II (staircase training group), experimental group III (jump rope training group) and control group are 75.80, 81.65, 80.40 and 57.30 respectively. And standard deviation value of experimental group I, experimental group II, experimental group III and control group are 5.13, 8.35, 5.04 and 4.28 respectively. The obtained 'F' ratio for post-test on cardiovascular endurance is 72.68. It is greater than the required table value 2.76 for df 3 and 76 at 0.05 level of confidence on cardiovascular endurance.

The adjusted post-test mean value on cardiovascular endurance of experimental group I (Plyometric training group), experimental group II (staircase training group), experimental group III (jump rope training group) and control group are 76.10, 81.69, 80.10 and 57.24 respectively. The obtained 'F' ratio of 78.37 for adjusted post-test score is greater than the required table value of 2.76 for df 3 and 75 at 0.05 level of confidence on cardiovascular endurance.

The result of the study indicated that there was a significant difference among the adjusted post-test means of plyometric training group, staircase training group, jump rope training group and control group on cardiovascular endurance. Whenever the obtained 'F' ratio of adjusted post-test mean was found to be significant, the investigator applied the Scheffe's post hoc test to find out the paired mean differences and it was presented in table – IV.

The table – V shows that the mean difference value between, experimental group I (Plyometric training group) and experimental group II (staircase training group) experimental group I ((Plyometric training group) and control group, experimental group II (staircase training group) and control group, experimental group III (jump rope training group) and control group are 5.59, 18.86, 24.45 and 22.86 respectively. It is greater than the confidence interval value of 5.37 on cardiovascular endurance.

The mean difference value between plyometric training group and jump rope training group, staircase training group and jump rope training group are 4.00 and 1.59 respectively. They are lesser then the confidence interval value of 5.37 on cardiovascular endurance.

Required table value at 0.05 level of significance for 3 & 76 and 3 & 75 degree of freedom 2.76

Table-V shows that the pe-test mean value of experimental group I (Plyometric training group), experimental group II (staircase training group), experimental group III (jump rope training group) and control group are 5.70, 5.40, 5.90 and 5.85 respectively. The obtained 'F' ratio for pre-test on shpulder muscular endurance is 0.40. It is lesser than the required table value of 2.76 for df 3 and 76 at 0.05 level of confidence on shoulder muscular endurance.

The post-test mean value of experimental group I (Plyometric training group), experimental group II (staircase training group), experimental group III (jump rope training group) and control group are 7.40, 7.45, 6.10 respectively. The obtained 'F' ratio for post-test on shoulder muscular endurance is 12.66. It is greater than the

required table value of 2.76 for df 3 and 76 at 0.05 level of confidence on shoulder muscular endurance.

The obtained 'f' ratio of pre test, post test and adjusted post test on shoulder muscular endurance is 7.40, 7.56, 7.47, 6.40 and 26.13 respectively. It is greater than the required table of 2.76 for df 3 and 75 at 0.05 level of confidence on shoulder muscular strength.

The result of the study indicated that there is significant difference among the Plyometric training group, staircase training group, jump rope training group and control on shoulder muscular endurance.

Whenever the obtained 'F' ratio of adjusted post-test mean was found to be significant, the investigator applied the Scheffe,s post hoc test to find out the paired mean differences and it was presented in table – VI.

The table VI shows that the mean difference value between, experimental group I (Plyometric training group) and control group experimental group II (staircase training group) and control group, experimental group III (jump rope training group) and control group are 1.36, 1.52 and 1.43 respectively. They are greater than the confidence interval value of 0.57 on shoulder muscular endurance.

The mean difference between Plyometric training group and staircase training group, Plyometric training group and jump rope training group are 0.16, 0.07 and respectively. They are lesser than the confidence interval value of 0.57 on shoulder muscular endurance.

3. Discussion on Findings

The study revealed that plyometric training, staircase training and jump rope training were better than control group on abdominal muscular strength. Plyometric training group was better than jump rope training group, staircase training group was better than the jump rope training group on abdominal muscular strength. And also it indicate that there is no significant difference between plyometric training group and staircase training group on abdominal muscular strength.

The study revaluated that plyometric training staircase training and jump rope training was better than the control group on cardiovascular endurance. Plyometric training group was better than the staircase training group. And also indicated that there is no significant difference between plyometric training group and jump rope training group, staircase training group and jump rope training group on cardiovascular endurance. Hwiet al. (2010) conducted a study on effects of aerobic exercise on abdominal fat, thigh muscle mass and muscle strength in type 2 diabetic subject. Daily moderate intensity aerobic exercise is effective at reducing abdominal fat mass, while high intensity exercise improves cardiopulmonary function.

The study revealed that is no significant difference between plyometric training group and staircase training group, plyometric training group and jump rope training group, staircase training group and jump rope training group on shoulder muscular endurance. Irem Duzgun et al. (2010) conducted a study on The Effect on Jump-Rope Training on shoulder Isokinetic Strength in Adolescent Volleyball Player. Staircase training improved the task-specific performance of ascent. Gaita parameters, including base of support, stride length, regularity index (RI), and step sequence, also improved. Over ground locomotion and the grid test, both showed a trend of improved performance. Finally, hind limb muscle mass was maintained with training. Staircase ascent training after incomplete SCI has beneficial effects on task-specific as well as nonspecific motor and sensorimotor activities.

4. Conclusion

1. Ii was concluded that the plyometric training group, staircase training group and jump rope training group were better than the control group on abdominal muscular strength.
2. It was concluded that the plyometric training group and staircase training group were better than the jump rope training group on abdominal muscular strength.
3. It was concluded that there is no significant difference between plyometric trtaining group and staircase training group on shoulder.

4. It was concluded that the plyometric training group, staircase training group and jump rope training group were better than the control group on cardiovascular endurance.
5. It was concluded that the plyometric training group were better than the staircase training group on cardiovascular endurance.
6. It was concluded that there is no significant difference between plyometric training group and jump rope training group, staircase training group and jump rope training group on cardiovascular endurance.
7. It was concluded that the plyometric training group, staircase training group and jump rope training group were better than the control group on shoulder muscular strength.
8. It was concluded that there is no significant difference between plyometric training group, staircase training group and jump rope training group on shoulder muscular endurance.

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Conflict of interest

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

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Effect of Yoganidra Training Programme on Selected Physical Fitness Components Among sports Persons in Maldives

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Abstract

The purpose of this study was to find out the Effect of Yoganidra Training Programme on Selected Physical Fitness Components among sports persons in Maldives. For the purpose of the study 30 subjects were assigned in to two group's namely experimental group (EG) and control group (CG). The subject's age ranged between 18 to 25years. Subjects in the group I experimental group (EG) performed a Yoganidra training program for a period of three days per week for a total of twelve weeks of training. Group II acted as control group (CG), the subjects in control group were not engaged in any training programme other than their regular work. The following variables were determined before and after training: Speed, Flexibility and Muscular strength. All variables were found to significantly improve ($p < 0.05$) in response to the training programs. These data indicate that a Yoganidra training program using instability training devices is as effective in sports persons as a program executed under stable conditions for improving Speed, Flexibility and Muscular strength. The subjects were free to withdraw their consent in case of feeling any discomfort during the period of their participation but there were no drop outs during the study..

Keywords: Yoganidra, Speed, flexibility and Muscular Strength.

1. Introduction

In the modern scenario, human life has become very fast, hectic and demanding. The present lifestyle demands adjustment on the part of the individual. Each of us, as per our coping resources, tries to adjust in this changing world. Some adjust by becoming overactive and others by withdrawing from the situation. When we fail to make a proper adjustment according to the demands of the situation, a state of negative stress or distress develops in our personality, which gives rise to mental or psychological problems. In most people the mind always remains in a state of arousal and tension. Yoganidra, as a technique of pratyahara, not only provides relaxation to the body and mind but also has a number of benefits. Yoga nidra is one of the practices of pratyahara where the awareness is internalized. Literally, yoga nidra means 'psychic sleep' i.e. sleep with full awareness. In the practice of yoganidra the body sleeps but the mind remains awake listening to the instructions. In psychology, the state achieved in yoganidra is termed the hypnogogic state, a state between sleep and wakefulness. Yoga nidra has its origin in the ancient tantric practice called nyasa. It was Swami SatyanandaSaraswati (1998) who adapted and presented the practice of yoga nidra in a systematic and scientific way in the 1960s.

2. Methodology

The purpose of the study was to find out the effect of yoganidra training programme on selected physical fitness components among sports persons in Maldives. To achieve the purpose of the study, (N=30) sports persons were selected from M. Maduvvaree Island, Meemu Atoll, Maldives as subjects. The age of the selected subjects ranged between18 to 25 years. They were divided into two equals groups. The group I was named as Experimental group (EG) and group II was named as Control group (CG). The investigator did not made any attempt to

equate the group. The experimental group was treated with Yoganidra training programme for three days per week for a period of twelve weeks and control group were not engaged in any training programme other than their regular work.

To carry out the study the investigator used two groups, Experimental group (EG) and Control group (CG) each group consists of 15 subjects. Both the groups were tested on selected criterion variables and the readings were recorded in their respective units, as pre-test scores. After pre-test Experimental group (EG) was treated with Yoganidra training programme for a period of twelve weeks. After twelve weeks of training both the groups were tested again on the selected criterion variables and the scores were recorded in their respective units as post test scores. The pre and posttest were taken for analysis.

3. Results And Discussion

The data collected on Sports persons from the Island of Maldives were statistically processed and discussed on the Effects of Yoganidra Training Programme on Selected Physical Fitness Components among sports persons in Maldives were statistically processed and discussed.

The analysis of the table-I clearly reveals that the obtained 't' ratio of Yoganidra Training Programme, the calculated t-value was 6.02* and 1.68 respectively. It had a significant effect in improving Speed at 0.05 levels. The increase in speed from pre to post training for the experimental group were significantly higher than the control group. 't' ratio required to be significant at 0.05 level was 2.14.

The analysis of the table-I clearly reveals that the obtained 't' ratio of Yoganidra Training Programme, the calculated t-value was 4.52* and 1.40 respectively. It had a significant effect in improving Explosive Power at 0.05 levels. It increases in Explosive power from pre to post training for the experimental group was significantly higher than the control group. 't' ratio required to be significant at 0.05 level was 2.14.

The analysis of the table-I clearly reveals that the obtained 't' ratio of Yoganidra Training Programme, the calculated t-value was 4.93* and 1.61 respectively. It had a significant effect in improving Muscular Strength and endurance at 0.05 levels. The increase in Muscular Strength endurance from pre to post training for the experimental group were significantly higher than the control group. 't' ratio required to be significant at 0.05 level was 2.14.

4. Discussions on Findings

The present study experimented that the Effect of Yoganidra Training Programme On Selected Physical Fitness Components among Sports Persons in Maldives. The result of this study indicated that the Yoganidra training programme improves the physical variables such as Speed, Flexibility, and Muscular Strength. The findings of the present study had similarity with the findings of the investigations referred in this study.

TABLE-I
COMPUTATION OF 't' RATIO BETWEEN PRE AND POST TEST MEANS OFEXPERIMENTAL GROUP AND CONTROL GROUP ON SPEED

	Pre Test			Post Test				
Group	Mean	SD	SEM	Mean	SD	SEM	Mean Diff	't' Ratio
Experimental Group	7.07	.596	.154	6.43	.463	.119	.628	6.02*
Control Group	7.50	.636	.164	7.61	.490	.126	.628	1.68
*Significant 0.05 level of confidence (2.14)								

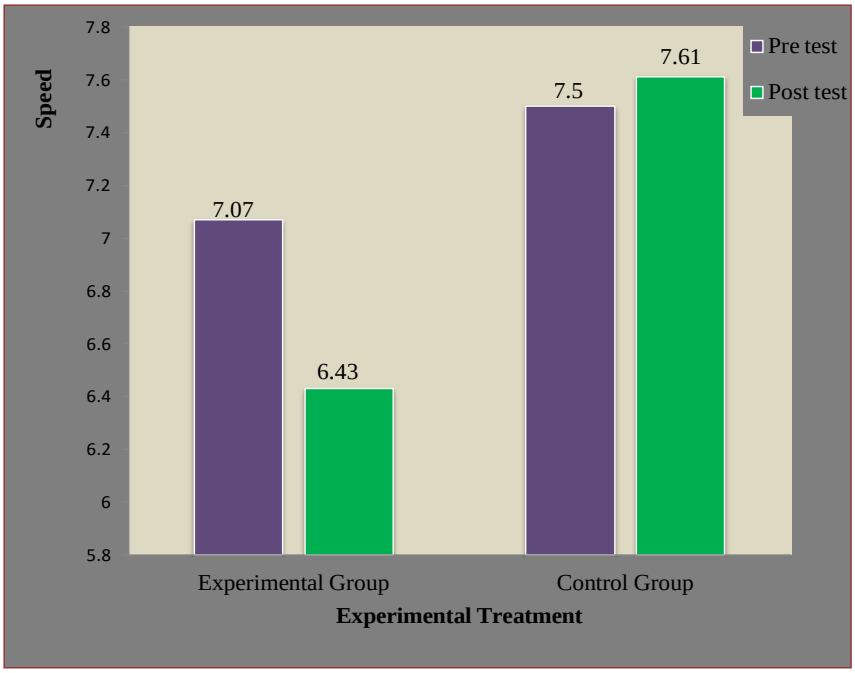

FIGURE 4.1 GRAPHICAL REPRESENTATION SHOWING THE PRE TEST AND POST TEST MEAN VALUES OF EXPERIMENTAL GROUPS AND CONTROL GROUP ON SPEED

TABLE-II
COMPUTATION OF 't' RATIO BETWEEN PRE AND POST TEST MEANS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON FLEXIBILITY

	Pre Test			Post Test				
Group	Mean	SD	SEM	Mean	SD	SEM	Mean Diff	't' Ratio
Experimental Group	1.83	0.13	0.19	1.86	0.24	0.19	0.22	4.52*
Control Group	1.85	0.94	0.15	1.83	0.17	0.15	0.02	1.40
*Significant 0.05 level of confidence (2.14)								

TABLE-III
COMPUTATION OF 't' RATIO BETWEEN PRE AND POST TEST MEANS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON MUSCULAR STRENGTH

	Pre Test			**Post Test**				
Group	**Mean**	**SD**	**SEM**	**Mean**	**SD**	**SEM**	**Mean Diff**	**'t' Ratio**
Experimental Group	**2.68**	**0.117**	**0.002**	**2.71**	**0.115**	**0.002**	**0.03**	**4.93***
Control Group	**2.55**	**0.22**	**0.09**	**2.51**	**0.30**	**0.09**	**0.04**	**1.61**
***Significant 0.05 level of confidence (2.14)**								

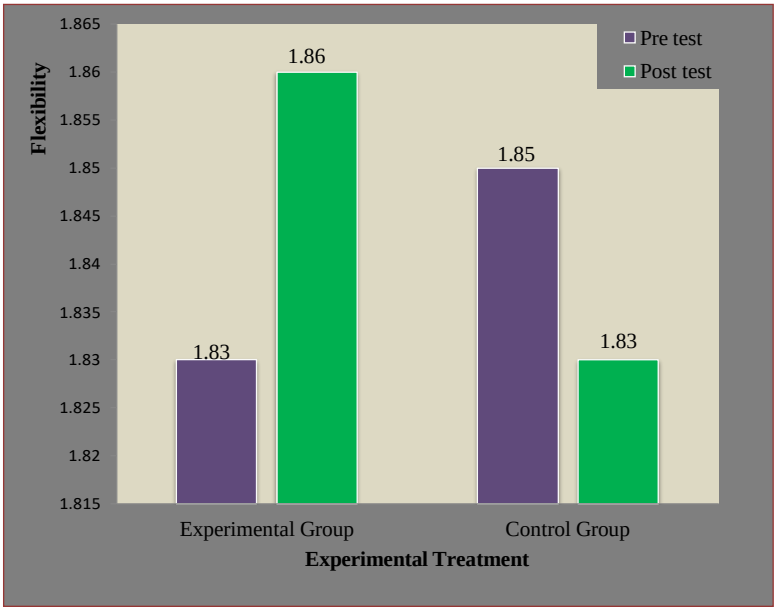

FIGURE 4.2 GRAPHICAL REPRESENTATION SHOWING THE PRE TEST AND POST TEST MEAN VALUES OF EXPERIMENTAL GROUPS AND CONTROL GROUP ON FLEXIBILITY

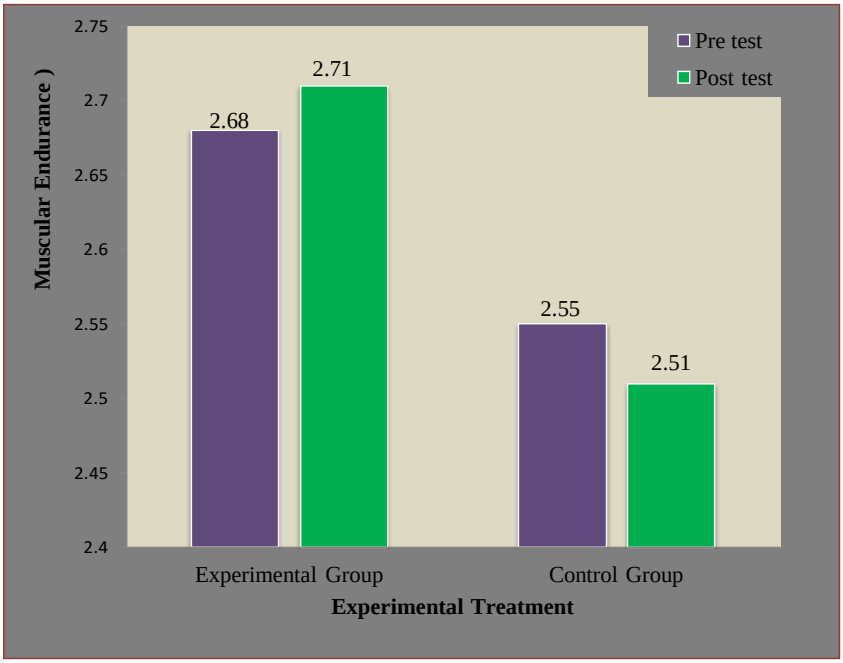

FIGURE 4.3 GRAPHICAL REPRESENTATION SHOWING THE PRE TEST AND POST TEST MEAN VALUES OF EXPERIMENTAL GROUPS AND CONTROL GROUP ON MUSCULAR STRENGTH

4. Conclusion

1. From the results of this study, the following conclusions were drawn
2. It was concluded that there was a significant mean difference on Yoganidra Training

Programme on Speed of Maldivian Sports Persons.

3. It was concluded that there was a significant mean difference on Yoganidra Training Programme on Flexibility of MaldivianSports Persons.
4. It was concluded that there was a significant mean difference on Yoganidra Training Programme on Muscular Strength of MaldivianSports Persons.

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Combined Effect of Plyometrics Training Associated with Specific Skill Training on Horizontal Explosive Power Vertical Explosive Power and Speed Among Veterinary College Volleyball Players

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Abstract

The purpose of the study was to find out the combined effect of Plyometrics training associated with specific skill training on horizontal explosive power, vertical explosive power and speed among veterinary college volleyball players. Twenty four (24) male volleyball players those who are studying Bachelor of Veterinary Sciences (B.V.Sc.,) from Veterinary College and Research Institute, Tirunelveli were selected randomly as subjects. The volleyball players from all the five years were restricted to act as subjects for this study. The age of the subjects ranged from 18 to 23 years. The selected subjects were divided into two groups. Group I underwent Plyometrics training associated with specific skill training (JMTASST) and Group II acted as control (CG). The experimental group (Plyometrics training associated with specific skill training) was subjected to do specific training for five days (Monday, Tuesday, Wednesday, Thursday and Friday) for up to eight weeks. The training was restricted to practice on the evening session after completion of all the classes in all the years. The Plyometrics Training Associated with Specific Skill Training (JMTASST) was selected as Independent Variable and the criterion variables Horizontal Explosive Power, Vertical Explosive Power and Speed were selected as dependent variables and the selected dependent variables were assessed by the standardized test items. Horizontal Explosive Power was assessed by Standing broad Jump and the unit of measurement in centimetres and Vertical Explosive Power was assessed by vertical jump test and the unit of measurement in centimetres and the speed was assessed by 50 Meters Run and the unit of measurement in seconds. The experimental design selected for this study was pre and post test randomized design. The data were collected from each subject before and after the training period and statistically analyzed by using paired sample 't' test and analysis of covariance (ANCOVA). It was found that there was a significant improvement and significant difference exist due to the combined effect of Plyometrics training associated with specific skill training on horizontal explosive power, vertical explosive power and speed among veterinary college volleyball players.

Keywords: Plyometrics training, Volleyball, Veterinary College.

1. Introduction

Plyometric exercise is a popular form of training used to improve athletic performance. It involves a stretch of the muscle – tendon unit immediately flowed by a shortening of the muscle unit. This process of muscle lengthening followed by a shortening during the stretch shortening cycle is integral to Plyometric exercise. The stretch shortening cycle 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 (Chu and Myer, 2013).

As Plyometric training techniques have evolved, the description of this training and the

related terminology have undergone a metamorphosis. The term Plyometrics is a later creation in American training literature, much of the early physiological research on this type training described it by other names. The term used by researchers in Italy, Sweden, and the Soviet Union for the type of muscle action involved was the stretch – shortening cycle. Based on original forms of training described by Yuri Verkhoshansky, the Russian national jump coach for track and field, Plyometrics were originally developed as a shock method of training. Verkhoshansky believe that in order for athletes to develop a higher level of muscle performance, they needed to be presented with a stimulus that was unique and different from their usual training methods (Chu and Myer, 2013).

The term Plyometrics and stretch shortening cycle are used synonymously by some authors, whereas others use the term stretch – shortening cycle instead of Plyometric to differentiate from the literal translation of the Greek word Pliometric (Plio – more, Plythein – increase, metric – measure), meaning “to increase the measurement. The use of terminology often seems to differ by field of study. In the physiology literature, the term stretch-shortening cycle is used to describe activities such as running, jumping, and throwing. How ever, in the rehabilitation and conditioning literature, the term Plyometric is used to describe these activities when they are part of training designed to capitalize on the maximizing force production or enhancing performance (Chu and Myer, 2013).

Plyometric training is an effective mode of training as it enhances motor learning and neuromuscular efficiency by promoting the excitability, sensitivity, and reactivity of the neuromuscular system to increase the rate of force production, motor unit recruitment, frequency and synchronization (http://downloads.lww.com/)

Muscle produces the necessary force to change the direction of an object center of mass. All movement patterns that occur during functional activities involve a series respective stretch shortening cycles. The neuromuscular system must react quickly and efficiently following an eccentric muscle action to produce a concentric contraction and impart the necessary force in the appropriate direction. Therefore, specific functional exercises that emphasize a rapid change in direction must utilized to prepare each athlete for the functional demands of a specific activity (http://downloads.lww.com/)

Plyometric training provides the opportunity to train specific movement patterns in a bio mechanically correct manner at a more functionally appropriate speed. This provides functional strengthening of the muscle, tendon, and ligaments specific to the demands of everyday activities and sport. The ultimate goal of Plyometric training is to improve the reaction time of the muscle action spectrum (http://downloads.lww.com/)

The speed of muscular exertion is limited by neuromuscular coordination. This means that the body will move most effectively and efficiently within a range of speed that the nervous system has been programmed to allow. Plyometric training improves both neuromuscular efficiency and the range of speeds set by the central nervous system (http://downloads.lww.com/)

Sports specific skill training is increasingly being used to improve the skill and physical fitness of team sports players. The use of game in training is based on the premise that the greatest improvements in performance occur when the physiological demands and movements patterns replicate the demands of the sport. However, studies investigating the effectiveness of sports specific skill training are limited. The greatest improvements in fitness and performance occur when training stimulates the physiological and technical demands of the competition. Sports specific skill training is increasingly being used as a means of improving the skill and physical fitness levels of team sports and the players, as it allows the simulation of movement patterns of team sports. While maintaining a competitive environment where players must perform under pressure and while fatigued. Perhaps more importantly sports specific skill training offers an additional challenge to team sports and players that would not normally be present in non skill related conditioning activities (Gabbett, Jenkins and Abemethy, 2009).

Several studies have investigated the physiological demands of sports specific skill training and compared these demands to competition. Although sports specific skill training has been to provide a specific training stimulates that generally replicates the overall demands of team-sports competition, recent evidence suggests that it may not always meet the high-intensity, repeated-sprint demands of competition. The majority of evidence has demonstrated that sports specific skill training can be used to simulate the overall demands of competition. However, sports specific skill training may not simulate the high intensity repeated sprint demands of competition. While studies have demonstrated that sports specific skill training and traditional conditioning programs results in similar improvements in physical fitness, the optimum balance between traditional conditioning and sports specific skill training activities remains unclear.

2. Methodology

To achieve the purpose, twenty four (24) male volleyball players those who are studying Bachelor of Veterinary Sciences (B.V.Sc.,) from Veterinary College and Research Institute, Tirunelveli were selected randomly as subjects. The volleyball players from all the five years were restricted to act as subjects for this study. The age of the subjects ranged from 18 to 23 years. The selected subjects were divided into two groups. The study restricted to select the male volleyball players as a subject of the study. The age of the subjects ranged from 18 to 23 years. They were assigned randomly into two groups (Group I) underwent Plyometric Training Associated with Specific Skill Training (PTASST) and (Group II) acted as control (CG) of twelve each. The experimental group were subjected to the Plyometric Training Associated with Specific Skill Training (PTASST) during the evening hours for five days (Monday, Tuesday, Wednesday, Thursday and Friday). The training was restricted to practice on the evening session after completion of all the classes in all the years and Group II acted as control. The control group was instructed to practice their regular routine work of the evening hours. The Plyometric Training Associated with Specific Skill Training (PTASST) was selected as Independent Variable and the criterion variables horizontal explosive power, vertical explosive power and speed were selected as dependent variables and the selected dependent variables were assessed by the standardized test items. Horizontal explosive power was assessed by standing broad jump and the unit of measurement in centimetres, vertical explosive power was assessed by vertical jump test and the unit of measurement in centimetres, and the speed was measured by 50 meters run and the unit of measurement in seconds. The experimental design selected for this study was pre and post randomized design. The data were collected from each subject before and after the training period and statistically analysed by using paired sample‘t’ test and analysis of co variance (ANCOVA).

3. Results and Discussion

The data pertaining to the variables in this study were examined by using paired sample‘t’ test to find out the significant improvement and analysis of covariance (ANCOVA) for each variables separately in order to determine the difference and tested at 0.05 level of significance. The analysis of paired sample‘t’ test on a data obtained for Horizontal Explosive Power, Vertical Explosive Power and Speed of the pre and post test means of experimental and control groups have been analysed and presented in Table I

The obtained paired sample ‘t’ ratio value on Horizontal Explosive Power, Vertical Explosive Power and Speed of experimental group is higher than the table value, it is understood that the combined effect of Plyometrics training associated with specific skill training has made significant improvement on horizontal explosive power, vertical explosive power and speed. However, the control group has not made significant improvement as the obtained ‘t’ value is less than the table value, because it was not subjected to any specific training. The analysis of covariance on the data obtained on horizontal explosive power, vertical explosive power and speed due to the combined effect of Plyometric training associated with specific skill training and control groups have been analysed and presented in Table II.

TRAINING PROGRAMME

TRAINING SCHEDULE FOR PLYOMETRIC TRAINING					
Week	**Name of the Exercise**	**Intensity**	**Reps**	**Sets**	**Recovery**
I Week	Med ball Box Jump	45%	6-8	2	50 Sec
	Box Skip	45%	6-8	2	50 Sec
	Alternate Leg Bound	45%	6-8	2	50 Sec
	Double Leg Bound	45%	6-8	2	50 Sec
	Lateral Bound	45%	6-8	2	50 Sec
	Double Leg Box Bound	45%	6-8	2	50 Sec
	Ankle Box Hop	45%	6-8	2	50 Sec
	Single Leg Stride Jump	45%	6-8	2	50 Sec
	Med Ball Twister	45%	6-8	2	50 Sec
	Depth Jump	45%	6-8	2	50 Sec
II Week	Med ball Box Jump	50%	8-10	2	60Sec
	Box Skip	50%	8-10	2	60Sec
	Alternate Leg Bound	50%	8-10	2	60Sec
	Double Leg Bound	50%	8-10	2	60Sec
	Lateral Bound	50%	8-10	2	60Sec
	Double Leg Box Bound	50%	8-10	2	60Sec
	Ankle Box Hop	50%	8-10	2	60Sec
	Single Leg Stride Jump	50%	8-10	2	60Sec
	Med Ball Twister	50%	8-10	2	60Sec
	Depth Jump	50%	8-10	2	60Sec
III Week	Med ball Box Jump	60%	8-12	3	70 Sec
	Box Skip	60%	8-12	3	70 Sec
	Alternate Leg Bound	60%	8-12	3	70 Sec
	Double Leg Bound	60%	8-12	3	70 Sec
	Lateral Bound	60%	8-12	3	70 Sec
	Double Leg Box Bound	60%	8-12	3	70 Sec
	Ankle Box Hop	60%	8-12	3	70 Sec
	Single Leg Stride Jump	60%	8-12	3	70 Sec
	Med Ball Twister	60%	8-12	3	70 Sec
	Depth Jump	60%	8-12	3	70 Sec
IV Week	Med ball Box Jump	65%	8-12	4	70 Sec
	Box Skip	65%	8-12	4	70 Sec
	Alternate Leg Bound	65%	8-12	4	70 Sec
	Double Leg Bound	65%	8-12	4	70 Sec
	Lateral Bound	65%	8-12	4	70 Sec
	Double Leg Box Bound	65%	8-12	4	70 Sec
	Ankle Box Hop	65%	8-12	4	70 Sec
	Single Leg Stride Jump	65%	8-12	4	70 Sec
	Med Ball Twister	65%	8-12	4	70 Sec
	Depth Jump	65%	8-12	4	70 Sec

Week	Name of the Exercise	Intensity	Reps	Sets	Recovery
V Week	Med ball Box Jump	70%	12-15	4	80 Sec
	Box Skip	70%	12-15	4	80 Sec
	Alternate Leg Bound	70%	12-15	4	80 Sec
	Double Leg Bound	70%	12-15	4	80 Sec
	Lateral Bound	70%	12-15	4	80 Sec
	Double Leg Box Bound	70%	12-15	4	80 Sec
	Ankle Box Hop	70%	12-15	4	80 Sec
	Single Leg Stride Jump	70%	12-15	4	80 Sec
	Med Ball Twister	70%	12-15	4	80 Sec
	Depth Jump	70%	12-15	4	80 Sec

TRAINING SCHEDULE FOR SPECIFIC SKILL TRAINING

Week	Exercise/Skill Training	Repetition	Duration	Sets	Recovery
I Week	Fore Arm Pass Drills with Pair	15-18	-	3-4	45 Sec
	Over Head Pass with Partner	15-18	-	3-4	45 Sec
	Jump Service (Continuous)	15-18	-	3-4	45 Sec
	Blocking the Target	15-18	-	3-4	45 Sec
	Forward Roll with Ball	12-15	-	2-3	45 Sec
	Spiking with Sprint	12-15	-	3-4	45 Sec
II Week	Fore Arm Pass with Half Squad	12-15	-	3-5	45 Sec
	Over Head Pass with 180^0 (Degree) Turning	12-15	-	3-5	45 Sec
	Jump Service with Target	12-15	-	3-5	45 Sec
	Blocking with Partner	12-15	-	3-5	45 Sec
	Forward Roll and Fore Arm Pass	12-15	-	3-5	45 Sec
	Dropping Drills	12-15	-	3-5	45 Sec
III Week	Fore Arm Pass with Assisting the Chair	15-18	-	4-6	50 Sec
	Over Head Pass with Assisting the Chair	15-18	-	4-6	50 Sec
	Jump Service with hitting the Target	15-18	-	4-6	50 Sec
	Forward Roll with Sprint and Fore Arm Pass	15-18	-	4-6	50 Sec
	Forward Roll with Sprint and Over Head Pass	15-18	-	4-6	50 Sec
	Blocking with Continuous Jump (Vertical)	15-18	-	4-6	50 Sec

Week	Exercise/Skill Training	Repetition	Duration	Sets	Recovery
IV Week	Fore Arm Pass with Floor touch	15-18	-	4-6	50 Sec
	Over Head Pass with Forward Roll	12-15	-	3-5	60 Sec
	Spiking Drills on the Target Zone	15-18	-	4-6	60 Sec
	Jump Service on the Target Zone	15-18	-	4-6	60 Sec
	Blocking Action with Pairs	15-18	-	4-6	60 Sec
V Week	Fore Arm Pass drill with Medicine Ball	15-18	-	4-6	60 Sec
	Over Head Pass drills with Medicine Ball	15-18	-	4-6	60 Sec
	Resisted Spikes Drills	15-18	-	4-6	60 Sec
	Resisted Jump Service Drills	15-18	-	4-6	60 Sec
	Assisted Resistance Blocking Brills	15-18	-	4-6	60 Sec

TABLE- I

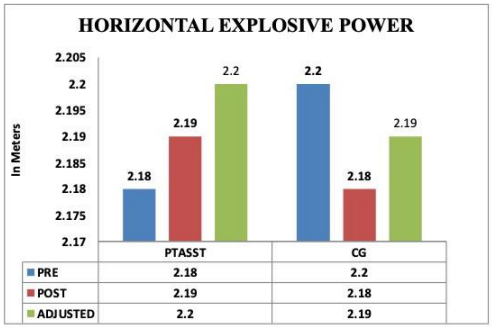
MEAN AND PAIRED SAMPLE 't' TEST OF EXPERIMENTAL AND CONTROL GROUPS ON SELECTED VARIABLES

Variables	Mean	Game Specific Fitness Training Associated with Jump Rope Training	Control Group
Horizontal Explosive Power	Pre test Mean	2.18	2.19
	Post test Mean	2.20	2.18
	't' test	**7.00***	**1.00**
Vertical Explosive Power	Pre test Mean	34.83	34.50
	Post test Mean	35.74	34.40
	't' test	**34.95***	**1.00**
Speed	Pre Test Mean	7.16	7.17
	Post Test Mean	7.14	7.17
	't' test	**10.46***	**1.00**
Significant at 0.05 level of confidence (11) = 2.201			

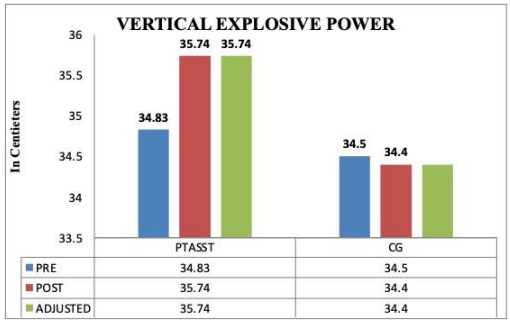
TABLE- II
ANALYSIS OF COVARIANCE OF EXPERIMENTAL AND CONTROL GROUPS ON SELECTED VARIABLES

Variables	Adjusted Post Test Means		Source of Variance	SS	df	Mean Squares	'F'-Ratio
	Game Specific Fitness Training Associated with Jump Rope Training	Control Group					
Horizontal Explosive Power	2.20	2.19	Between	.001	1	0.0009316	**42.79***
			Within	0.000457	21	2.177132	
Vertical Explosive Poser	35.74	34.40	Between	6.24	1	6.239	**233.47***
			Within	0.561	21	0.027	
Speed	7.14	7.17	Between	0.003	1	0.003	**109.76***
			Within	0.001	21	0.00002809	

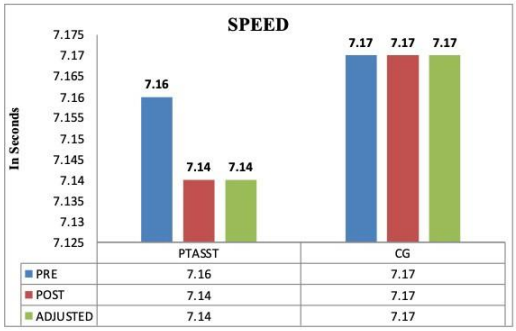
*Significant at .05 level of confidence, df (1, 21) = 4.32



THE BAR DIAGRAM SHOWS THE MEAN VALUES OF PRE POST AND ADJUSTED POST TEST MEANS OF HORIZONTAL EXPLOSIVE POWER OF COLLEGE LEVEL VOLLEYBALL PLAYERS



THE BAR DIAGRAM SHOWS THE MEAN VALUES OF PRE POST AND ADJUSTED POST TEST MEANS OF VERTICAL EXPLOSIVE POWER OF COLLEGE LEVEL VOLLEYBALL PLAYERS



THE BAR DIAGRAM SHOWS THE MEAN VALUES OF PRE POST AND ADJUSTED POST TEST MEANS OF SPEED OF COLLEGE LEVEL VOLLEYBALL PLAYERS

Table II showed that the obtained 'F' ratio values are 42.79, 233.47 and 109.76 which are higher than the table value 4.32 with df 1 and 21 required to be significant at 0.05 level. Since the obtained value of 'F' ratio is higher than the table value, it indicates that there is significant difference has made among the adjusted post means for the combined effect of Plyometric training associated with specific skill training and control group on horizontal explosive power, vertical explosive power and speed.

The combined effect of Plyometric training associated with specific skill training may influence the significant difference on horizontal explosive power, vertical explosive power and speed.

4. Conclusion

1. The Combined Effect of Plyometric Training Associated with Specific Skill Training (PTASST) practices had significantly improves the horizontal explosive power, vertical explosive power and speed.
2. There was significant difference among the adjusted post – test means for the Combined Effect of Plyometrics Training Associated with Specific Skill Training
3. (PTASST) and Control group (CG) on horizontal explosive power, vertical explosive power and speed..

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Effect of Aerobic Training on Motor Fitness Components Among School Level Boys

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Abstract

The reason of this study was to explore the effect of aerobic training on motor fitness components among school level boys. To achieve this purpose of the study thirty school level boys were selected from GHSS PN Pudhur, Erode Tamilnadu, India were randomly selected as subjects. Their age ranged in between 12 and 14 years. The subjects were divided into two group's namely aerobic training group and control group. The aerobic group was subjected to aerobic training (for weekly three days monday, wednesday, friday) at evening session for eight weeks. Speed, agility & endurance were selected as dependent variable. After the collection of appropriate data, it was statistically analyzed by using paired 't' test. The level of significance was set at 0.05. The result of the present study showed that the aerobic training has significant improvement on Speed, agility & endurance of school level boys.

Keywords: Aerobic Training, Speed, Agility & Endurance, School Boys.

1. Introduction

Specific aerobic energy systems and cardiovascular systems are the focus of aerobic exercise, which also enhances oxygen delivery and use. Aerobic exercise should be performed for at least 30 minutes, three times a week, at an intensity of 70% to 80% of one's maximal heart rate. All sports can benefit from aerobic exercise since it builds a foundational level of fitness for athletes. This is because exercise will help to improve the cardiovascular system especially, and because each energy system needs oxygen to recover. There are certain sports, such marathons, triathlons, long-distance cycling like the Tour de France, and Iron Man, for which aerobic training is most suited. Cross-country skiing, sporting activities, and Australian rules football. This kind of training improves the clearance of waste products from all energy systems, increases oxygen delivery to the muscles, and strengthens the muscles' capacity to utilise the aerobic energy system, all of which have an impact on performance. Due to the fact that they become of lower effort for the trained athlete, these advances enable the athlete to operate at higher workloads for longer. The lactic acid energy system's recovery period will be expedited by this exercise. This form of exercise can be carried out using a variety of training techniques, such as Fartlek, aerobic interval training, and circuit training.

Reasons for Selection of the Topic

The investigator reviewed the number of scientific articles, journals, books, self analyzed and found that selected motor fitness component would influence of aerobic training. The investigator, being a school level boys, coach, selector, and official was motivated to find out the effect of aerobic training on motor fitness components among school level boys. Moreover, very little research had been done on aerobic training among school level boys. This also motivated the investigator to take-up the study.

2. Methodology

The reason of this study was to explore the effect of aerobic training on motor fitness components among school level boys. To achieve

this purpose of the study thirty school level boys were selected from GHSS PN Pudhur, Erode Tamilnadu, India were randomly selected as subjects. Their age ranged in between 12 and 14 years. The subjects were divided into two group's namely aerobic training group and control group. The aerobic group was subjected to aerobic training (for weekly three days monday, wednesday, friday) at evening session for eight weeks. Speed, agility & endurance were selected as dependent variable. After the collection of appropriate data, it was statistically analyzed by using paired 't' test. The level of significance was set at 0.05.

Training Procedure

For aerobic group underwent their training programme as three days per week for eight weeks. Training was given in the evening session. The training session includes warming up and cool down. Every day the workout lasted for 45 to 60 minutes approximately. The subjects underwent their training programmes as per the schedules such as slow movements, medium movements & fast movements under the strict supervision of the investigator. During experimental period control group did not participate in any of the special training.

3. Results

Table-II reveals that the obtained mean values of per test and post test of aerobic group for Speed, agility & endurance were 9.20 and 8.47, 11.89 and 11.02, 1937 and 2110 respectively; the obtained 't' ratio were 8.41*, 11.63* and 47.13* respectively. The tabulated 't' value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated 't' ratio was greater than the table value. It is found to be significant change in Speed, agility & endurance of the school level boys. The obtained mean values of pre test and post test scores of control group were 9.38 and 9.35, 11.99 and 11.96, 1885 and 1885 respectively, the obtained 't' ratio was 1.10, 1.16 and 1.23. The required table value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated 't' ratio was lesser than the table value. It is found to be insignificant changes in Speed, agility & endurance of the school level boys. The mean values of motor fitness components among aerobic group and control group are graphically represented infigure-1.

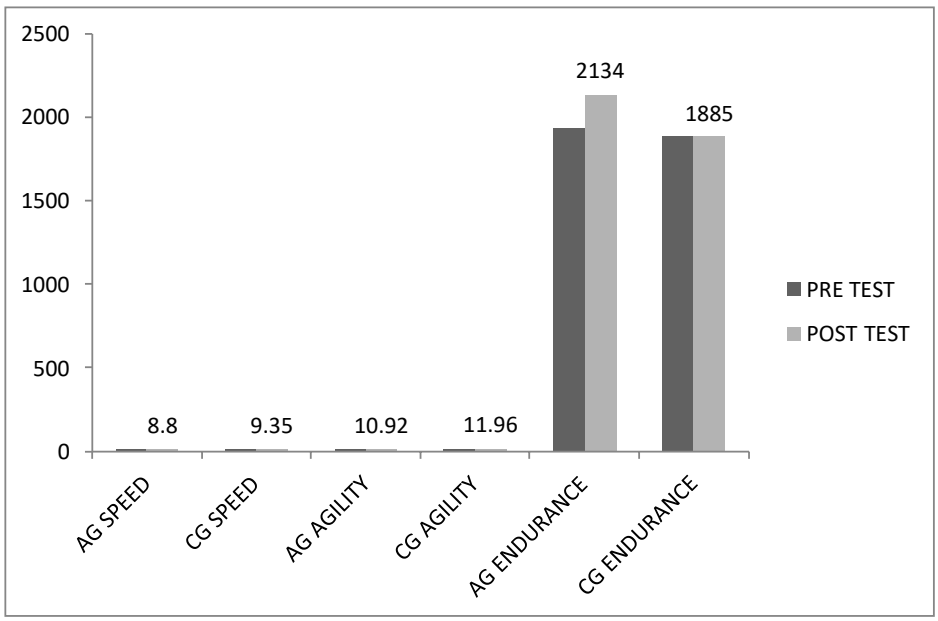

Table-I

CRITERION MEASURES

The test used to assess the motor fitness components are given in.

Variables	Test items	Unit of measurement
Speed	50 metres dash	Second (1/100 sec)
Agility	Zig Zag run	Second (1/100 sec)
Endurance	12 minutes run & walk	In Metres

Table-II
Comparison of Mean, and 't'-Values of Motors Fitness Components between Pre & Post Test among Aerobic and Control Groups

S. No	Motors Fitness Components	Groups	Test	Mean	't' Values
1.	Speed	Aerobic group	Pre Test	9.20	8.41*
			Post Test	8.48	
		Control group	Pre Test	9.38	1.10
			Post Test	9.35	
2.	Agility	Aerobic group	Pre Test	11.89	11.63*
			Post Test	10.92	
		Control group	Pre Test	11.99	1.16
			Post Test	11.96	
3.	Endurance	Aerobic group	Pre Test	1937	47.13*
			Post Test	2134	
		Control group	Pre Test	1885	1.23
			Post Test	1885	

*Significant at 0.05 level of confidence

4. Discussion on Findings

The result of the study indicates that the experimental group namely aerobic training groups had shown significant improvement in all selected motor fitness components among the school level boys. The control group boys had not shown significant changes in any of the selected variables. The analysis of the study indicates that the aerobic training group had shown significant level difference in speed, agility, and endurance among school level boys.

It is inferred from the literature and from the result of the present study. That systematically designed training develops dependent variables are very importance quilts for better performance in almost all sports and games. Hence it is concluded that systematically designed training may be programmes of all the discipline in order to achieve maximum given due recognition and implemented properly in the training performance.

These findings are in accordance with the findings of Rashiti (2016) and Kumar (2013).

5. Conclusion

1. From the analysis of the data, the following conclusions were drawn.
2. The school level boys of control group had not shown significant changes in any of the selected variables.
3. The aerobic training group shown significant improvement in all selected motor fitness components among school level boys.
4. The school level boys who had undergone eight weeks of aerobic training showed significant improvement in speed, agility and endurance when compared with control group.

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Effects of Kettlebell Training on Leg Strength and Muscular Strength Among College Level Throwers

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Abstract

The rationale of this study was to discover the Effects of kettlebell training on Leg strength and muscular strength among college level throwers. To achieve this purpose of the study thirty college level men throwers from Velalar College of Engineering and Technology, Thindal, Erode, Tamilnadu, India were randomly selected as subjects. Their age ranged in between 21 and 23 years. The subjects were separated into two groups namely kettlebell group and control group. The kettlebell group was subjected to kettlebell training (for weekly three days monday, wednesday, friday) at evening session for eight weeks. Leg strength and muscular strength was selected as dependent variable. After the compilation of proper data, it was statistically analyzed by using paired‘t’ test. The level of significance was set at 0.05. The result of the present study showed that the kettlebell training has significant enhancement on leg strength and muscular strength of college level throwers.

Keywords: Kettlebell Training, Leg Strength, Muscular Strength, College Level Throwers.

1. Introduction

kettlebell is a cast-iron or cast steel weight (resembling a cannonball with a handle) used to perform all types of exercises, including but not limited to ballistic exercises that combine cardiovascular, strength and flexibility training. They are also the primary equipment used in the weight lifting sport of kettlebell lifting. It's well-known that compound, whole body movements typical of kettlebell exercises are superior to machines that isolate muscles for improving muscle tone, body composition, and strength. Further, kettlebells strengthen the tendons and ligaments, making the joints tougher and less-susceptible to injury. Strengthens every muscle from head-to-toe. Kettlebell training consists of whole-body movement exercises. It's well-known that compound, whole body movements typical of kettlebell exercises are superior to machines that isolate muscles for improving muscle tone, body composition, and strength. kettlebell training should be implemented in the condition program of all sports, not just strength sports. The increase in leg strength, muscular strength and muscular endurance will advantages of every sport. As athletes involves more of muscular contraction. Which build the components for the game, as a researcher special planned kettlebell training programme for the college level men throwers.

2. Methodology

The rationale of this study was to discover the Effects of kettlebell training on Leg strength and muscular strength among college level throwers. To achieve this purpose of the study thirty college level men throwers from Velalar College of Engineering and Technology, Thindal, Erode, Tamilnadu, India were randomly selected as subjects. Their age ranged in between 21 and 23 years. The subjects were separated into two groups namely kettlebell group and control group. The kettlebell group was subjected to kettlebell training (for weekly three days monday, wednesday, friday) at evening session for eight weeks. Leg strength and muscular strength was selected as dependent variable. After the compilation of proper data, it was statistically analyzed by using paired‘t’ test.

Training Protocol

For kettle group underwent their training programme as three days per week for eight weeks. Training was given in the evening session. The training session includes warming up and cool down. All day the workout lasted for 50 to 60 minutes approximately. The subjects underwent their training programmes as per the schedules such as pistol squat, biceps curl, row and front raise under the strict regulation of the researcher. During experimental period control group did not contribute in any of the exceptional training.

3. Results

Table-I reveals that the mean values of per test and post test of control group for leg strength were 68.80 and 68.86 respectively; the obtained t ratio was 0.26 respectively. The tabulated t value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated t ratio was lesser than the table value. It is found to be insignificant change in leg strength of the college level throwers. The obtained mean and standard deviation values of pre test and post test scores of kettlebell group were 81.73 and 86.46 respectively; the obtained t ratio was 12.33. The required table value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The obtained t ratio was greater than the table value. It is found to be significant changes in leg strength of the college level throwers. The mean values of leg strength among kettlebell group and control group are graphically represented in figure-1.

Table-II reveals that the mean values of per test and post test of control group for muscular strength were 25.46 and 25.33 respectively; the obtained t ratio was 0.48 respectively. The tabulated t value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated t ratio was lesser than the table value. It is found to be insignificant change in muscular strength of the college level throwers. The obtained mean and standard deviation values of pre test and post test scores of kettlebell group were 27.66 and 31.80 respectively; the obtained t ratio was 3.19. The required table value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The obtained t ratio was greater than the table value. It is found to be significant changes in muscular strength of the college level throwers. The mean values of muscular strength among kettlebell group and control group are graphically represented in figure-2.

4. Discussion on Finding

The kettlebell training is a incredible training which has been found to be beneficial of the college level throwers. To study the kettlebell training on leg strength and muscular strength of college level men throwers, it was tested under to difference between kettlebell group and control group. The kettlebell training includes on selected leg strength and muscular strength. The kettlebell exercises are namely pistol squat, biceps curl, row and front raise.

Table-I

RELATIONSHIP OF MEAN, SD AND ‘t’-VALUES OF THE LEG STRENGTH BETWEEN PRE & POST TEST OF THE KETTLEBELL AND CONTROL GROUPS OF COLLEGE LEVEL THROWERS

	Groups	Test	Mean	S.D	‘t’ Values
Leg Strength	Control Group	Pre Test	68.80	17.12	0.26
		Post Test	68.86	17.27	
	Kettlebell Group	Pre Test	81.73	11.84	12.33*
		Post Test	86.46	12.18	

*Significant at 0.05 level of confidence

Table-II
RELATIONSHIP OF MEAN, SD AND 't'-VALUES OF THE MUSCULAR STRENGTH BETWEEN PRE & POST TEST OF THE KETTLEBELL AND CONTROL GROUPS OF COLLEGE LEVEL THROWERS

	Groups	Test	Mean	S.D	't' Values
Muscular Strength	Control Group	Pre Test	25.46	6.42	0.48
		Post Test	25.33	6.52	
	Kettlebell Group	Pre Test	27.66	5.16	3.19*
		Post Test	31.80	5.73	

*Significant at 0.05 level of confidence

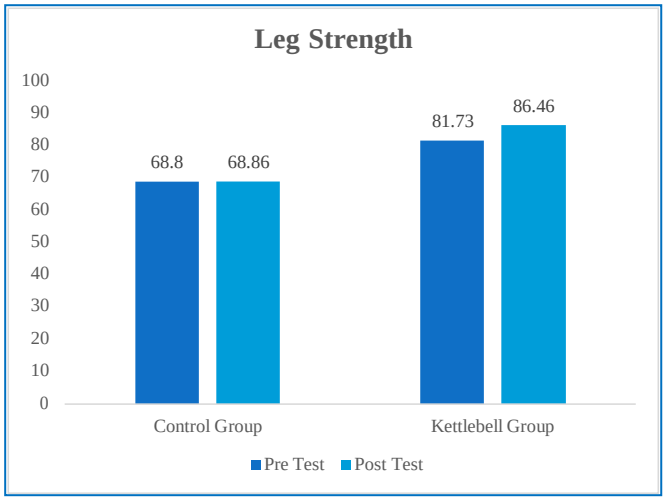

Figure-1: Bar Diagram Showing the Pre Test and Post Test on Leg Strength Variables of Kettlebell and Control Groups

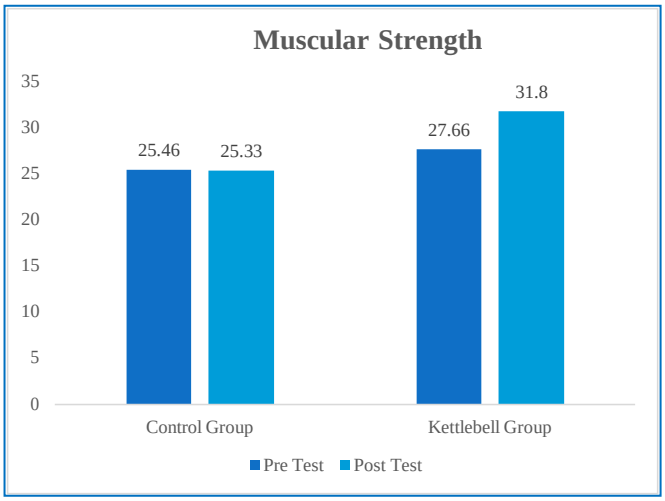

Figure-2: Bar Diagram Showing the Pre Test and Post Test on Muscular Strength Variables of Kettlebell and Control Groups

It also improves the leg strength, muscular strength, muscle size and other than some physical fitness components are namely speed, agility, and power. The obtained result proved positively the kettlebell group significantly improved.

The result of the present study showed that the kettlebell training has significant improvement on leg strength and muscular strength of throwers. The results of the study are in line with the studies of Ooraniyan and Senthil Kumaran (2018), Manocchia, P et al., (2015) &

Joe girard et al., (2014) The result of the study showed that the control group was not significantly improved kettlebell training on leg strength and muscular strength of college level men throwers.

5. Conclusion

Based on the findings and within the limitation of the study it is noticed that practice of kettlebell training helped to improve leg strength and muscular strength of throwers players at college level. It was also seen that there is progressive improvement in the selected criterion variables of kettlebell group of throwers after eight weeks of kettlebell training programme. Further, it also helps to improve leg strength and muscular strength.

1. It was concluded that individualized impacts of kettlebell group showed a statistically significant positive sign over the course of the treatment period on leg strength and muscular strength of college level men throwers.
2. It was concluded that individualized impacts of control group showed a statistically insignificant positive sign over the course of the period on leg strength and muscular strength of college level men throwers.
3. The results of comparative effects lead to conclude that kettlebell group had better significant improvement on leg strength and muscular strength of college level men throwers as compared to their performance with control group.

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Conflict of interest

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Yoga's Outcome on Physiological Characteristics of Men

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Abstract

This study investigated effect of yoga on physiological parameters of men. To achieve the purpose of the study thirty men were selected from Agricultural College and Research institute, Eachangkottai, Thanjavur, Tamilnadu. Their age ranged from 21 to 23 years. The subjects were randomly assigned to two equal groups (n=15). Group- I underwent Yoga training group (YTG) and Group - II was acted as control group (CG). The yoga training was given to the experimental group for 3 days per week (Monday, Wednesday and Friday) for the period of twelve weeks. The control group was not given any sort of training except their routine work. The physiological parameters of resting pulse rate and vital capacity were assessed before and after training period of 12 weeks the data collected from the subjects was statistically analysed with 't' test to find out significant improvement if any at 0.05 level of confidence. The result of the resting pulse rate and vital capacity speculated significant improvement due to influence of yoga training with the limitations of (diet, climate, life style) status and previous training. The result of the present study coincide findings of the investigation done by different experts in the field of sports sciences. Influence of yoga training significantly improved resting pulse rate and vital capacity of men.

Keywords: Yoga Training, Resting Pulse Rate and Vital Capacity.

1. Introduction

Yoga is a very ancient discipline. It is recognized as one of the most important and valuable gifts of our heritage. Today the world is looking to yoga for solving the various problems men are facing. At no time in the past yoga had attracted so much attention from people in so many places in the world as is so today. The term yoga is used in literature both as end and as well as means. As an end yoga signifies the integration of personality at the highest level. Health, physical fitness and emotional stability are the objectives which bring yoga and physical education on a common platform for the benefit of human individual. Health is a more general and comprehensive term conveying the 'feeling of well-being', while physical fitness is a more specific term. Through constant practice of yoga, one can overcome all difficulties and eradicate all weakness pain can be transmitted in to bliss, sorrow in to joys, and failure into success and sickness in to perfect health. Determination, patience and persistence lead one to goal.

Yoga practice has been transmitted from teachers (gurus) to students. Over the millennia, yoga has been influenced by different traditions and philosophies evolving into a variety of practices. Different schools often emphasize different components of the 8 limbs described above. Health benefits were recognized as a by-product to physical and mental discipline of yoga practice. In the twentieth century, the introduction of yoga to the West has emphasized the potential for yoga as means of health maintenance, prevention, and treatment for chronic disease. The majority of yoga practices in the West contain aspects of postures, breath control and meditation. Styles of vary in the emphasis of each component by technique, sequence, and intention. By systematically contracting and relaxing muscles in coordinate sequences, changing breathing patterns, and cultivating mental attentiveness and awareness during practice, yoga attempts to synchronize the body and mind. The practice of yoga requires active participation of the subjects. Hence, the effects of

factors such as the motivation to receive yoga training as well as the subject's age and gender may be expected to influence the outcome. This is interesting to study as yoga training is increasingly being included as part of routine programmes.

2.Methods

Experimental Approach to the Problem

In study 30 men were selected from Agricultural College and Research institute, Eachangkottai, Thanjavur, Tamilnadu. Their age ranged from 21 to 23 years. The subjects were randomly assigned to two equal groups (n=15). Group- I underwent yoga training group (YTG) and group - II was acted as control group (CG). Yoga training was given to the experimental group for 3 days per week (Monday, Wednesday and Friday) for the period of twelve weeks. The control group was not given any sort of training except their routine work.

Design

Pre and post random group design were employed. The evaluated physiological parameters were resting pulse rate was assessed by Radial Pulse and the unit of measurement was in In Counts and vital capacity was assessed by Wet Spirometer the unit of measurement was in Ml/lt. The parameters were measured at baseline and after 12 weeks of yoga training were examined.

Taining programme

The training programme was lasted for 45 minutes for session in a day, 3 days in a week for a period of 12 weeks duration. The equivalent in yoga training is the length of the time each action in total 3 day per weeks (Monday, Wednesday and Friday).

Statistical Analysis

The collected data before and after training period of 12 weeks on the selected variables due to the outcome of yoga training was statistically analyzed with't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. ($P< 0.05$).

3. Results

RPR – Resting pulse rate, VC – Vital capacity

Table I reveals the computation of mean, standard deviation and 't' ratio on selected physiological parameters namely resting pulse rate and vital capacity of experimental group. The obtained 't' ratio on resting pulse rate and vital capacity were 8.48 and 6.56 respectively. The required table value was 2.14 for the degrees of freedom 1and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant. Further the table the computation of mean, standard deviation and't' ratio on selected physiological parameters namely resting pulse rate and vital capacity of control group. The obtained 't' ratio on resting pulse rate and vital capacity were 0.71 and 0.82 respectively. The required table value was 2.14 for the degrees of freedom 1and 14 at the 0.05 level of significance. Since the obtainer's' values were lesser than the table value it was found to be statistically not significant.

4.Discussion on Findings

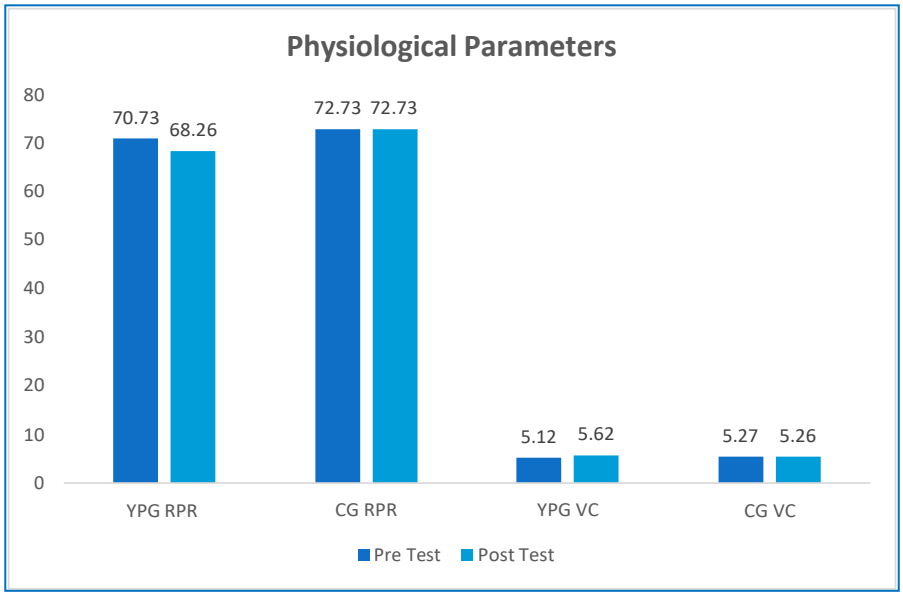
The result of the study indicates that the experimental group namely yoga training groups had shown significant improvement in selected physiological variables of men. The control group men had not shown significant changes in any of the selected variables. The analysis of the study indicates that the yogic practice group had shown significant level difference in physiological variables of men.

It is inferred from the literature and from the result of the present study. That systematically designed training develops dependent variables are very importance quilts for better performance in almost all sports and games. Hence it is concluded that systematically designed training may be programmes of all the discipline in order to achieve maximum given due recognition and implemented properly in the training performance. These findings are in accordance with the findings

of Keerthi et al (2013) and Pradnya Waghmare and Baji (2013).

Table 1: Computation of 't' ratio on selected physiological parameters of men on experimental group and control group (Scores innumbers)

Group	Variables		Mean	N	Std. Deviation	Std. Error Mean	't' ratio
Experimental Group	RPR	Pre test	70.73	15	2.12	0.91	8.48*
		Post test	68.26	15	1.43		
	VC	Pre test	5.12	15	0.31	0.15	6.56*
		Post test	5.62	15	0.29		
Control group	RPR	Pre test	72.73	15	2.12	0.97	0.71
		Post test	72.73	15	2.44		
	VC	Pre test	5.27	15	0.29	0.17	0.82
		Post test	5.26	15	0.42		
*significant level 0.05 level degree of freedom (2.14,1 and 14)							



5. Conclusion

1. Based on the findings and within the limitation of the study it is noticed that practice of with yogic practice helped to improve physiological characteristics of men. It was also seen that there is progressive improvement in the selected physiological characteristics of men was through yoga practice after twelve weeks. It was concluded that customized yogic practice group showed a statistically significant over the course of the treatment period on physiological characteristics of men.
2. It was concluded that individualized effect of control group showed a statistically insignificant over the course of the period on physiological characteristics of men.
3. The results of comparative effects lead to conclude that the yogic practice group had better significant improvement on physiological characteristics of men as compared to their performance with control group.

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Conflict of interest

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