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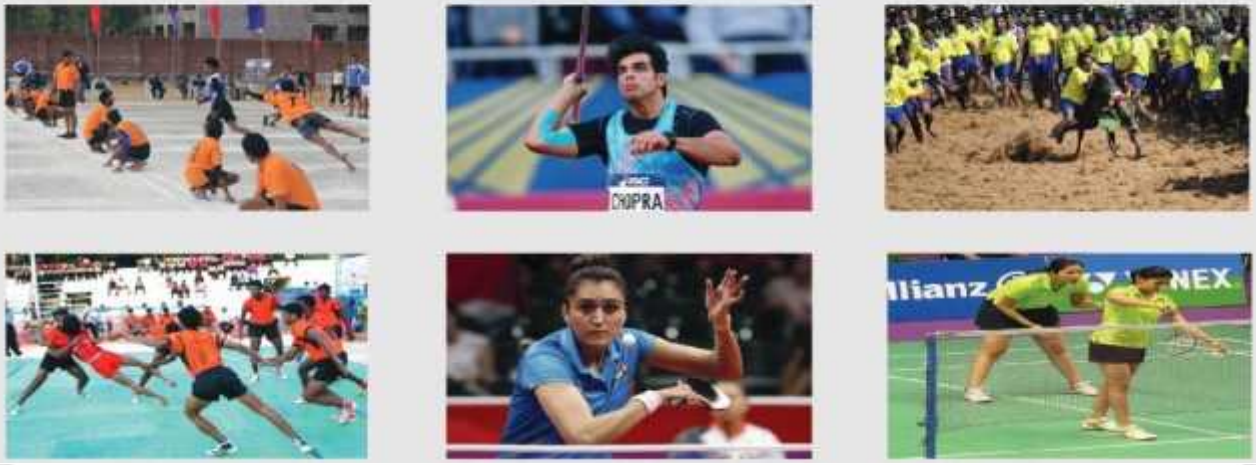

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DEPARTMENT OF PHYSICAL EDUCATION
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From the Editors' Desk

Whilst we are striving hard to manage the new normal post Covid pandemic, there is a great realisation on health fitness and wellness. The department of Physical Education, Bharathiar university with societal responsibility publishes this 12th volume of 'The Bharathiar National Journal of Physical Education and Sports Sciences'. Inspite of the pademic break the editorial team had put in tremendous efforts to bringout this volume of research works and articles.

The Bharathiar National Journal of Physical Education and Exercise Science (BNJPEES) is an open access quarterly journal, double blind refreed 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 oppurtunity scling up research heights. The journal has been indexed with google scholar, world cat, core and road.

We appreciate the research scholars for stepping forward to get their works published in our university journal. Volume 12 has brought out 40 articles in total out of the 73 articles submitted. After though plagarism check using Ithenticate and Turnitin, the articles are subjected to a double blind refree system for review. Based on the reviewers report the articles are accpeted. Being a quarterly journal in this volume we have four issues of 10 articles each. We are also working hard towards quality control of the articles in par with the international standards.

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



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Anaerobic Power Analysis and Various Training Methods in College Men Players

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Abstract

Purpose: The anaerobic power is a trainable variable that is extremely important for men players and can be trained in different ways. The aim of this research is to investigate the influence of high intensity plyometric training, maximal power training with and without plyometrics on anaerobic power of college men players.

Material: One Hundred twenty college level men players were randomly selected from Coimbatore district as subjects. Their age ranged between 18 and 25 years. The selected subjects were divided into three equal groups consisting of twenty each. No attempt was made to equate the groups. Experimental group I (n = 30) underwent high intensity plyometric Training (HIPT) Experimental group II (n = 30) underwent maximal power training with plyometrics (MPTWP), Experimental group III (n = 30) underwent maximal power training without plyometrics (MPTWOP) for a period of 12 weeks and group IV (n = 30) acted as control group (CG), the subjects in control group were not engaged in any training programme other than their regular work. Data obtained were evaluated in SPSS package.

Results: The F value revealed that the anaerobic power max was significantly improved due to the influence of maximal power training with plyometrics.

Conclusion: As a result, 12 weeks of maximal power training with plyometrics can be said to increase the anaerobic power of college men players.

Keywords: Anaerobic power, High Intensity Plyometric Training, Maximal Power Training.

Introduction

Every human being has a fundamental right of access to physical education and sport, which are essential for the full development of his or her personality. The freedom to develop physical, intellectual and moral powers through physical education and sport must be guaranteed both within the educational system and in other aspects of social life. Everyone must have opportunities, in accordance with his or her national tradition of sport, for practicing in physical education and sport, developing physical fitness and attaining a level of achievement in sport which corresponds to his or her gifts. Physical education performances are essential elements of lifelong education in the overall education system. Physical education and sport, as an essential dimension of education and culture, must develop the abilities, will-power and self-discipline of every human being as a fully integrated member of society. The continuity of physical activity and the practice of sports must be ensured throughout life by means of a global lifelong and democratized education.

Sports have been viewed as a way to stay healthy and in shape, but their importance goes much further. As a matter of fact, playing sports teaches life lessons like discipline, responsibility, self-confidence, accountability, and teamwork. While academics play a significant role, sports and training related activities are also important in molding the personality and character of college students. Sports and exercises are the positive outlets for of present adults from their academic stress like home works, projects, presentations and group discussions. It helps them to relax and reduce their anxiety.

Human muscle is composed of two broad categories of muscle cells (fibers). The slow twitch muscle fiber is characterized by high endurance, but slow rate of force production and low power output. In contrast, the fast twitch fibers possess

low endurance, but a fast rate of force production and high-power output. Slow twitch fibers are innervated regularly by normal daily activity: however, the fast twitch fibers are used only during muscle contractions requiring high force or rapid movement. In the aged there is a selective disuse atrophy of fast twitch fibers which is most likely a result of physical activity levels which have declined to a chronically low intensity [1].

Maximal power is the decisive factor of performance in activities requiring one movement series with a objective of producing high speed at release or impact [2]. Neuromuscular actions which increase power production are needed in putting, jumping and striking movements. In addition, sudden bursts of power are required when rapidly changing direction or accelerating during various sports or athletic events. The ability to get highest power throughout sports-specific movements obsessed with the sort of movement concerned however additionally the load applied thereto movement. Power output varies dramatically because the load associate contestant is needed to accelerate throughout a movement changes [3].

According to Wilson [4] Maximal explosive power training involves performance of dynamic weight training at the load which maximizes mechanical power output. This involves lifting loads in the range of 30 to 45 percent of maximum at high speed. It ought to be clear that the exercises should not be general weight-training exercises where the bar reaches zero velocity at the end of the movement. This would be disadvantageous to the stated goal of raising explosive power. One explanation is to believe of MPT as a marriage between strength training and plyometrics. Maximal power training could be considered a form of plyometrics training that is specifically performed at a load which maximizes the power output of the exercise. The loading is greater than plyometrics because more load than body weight is used, but lighter than conventional weight training.

Plyometrics are exercises characterized by rapid stretch-shorten cycle (SSC) muscle actions [5]. The ability to aim both short and long SSCs as well as the ballistic nature of these actions, plyometric workouts are very particular to a mixture of movements usually encountered in sport. Hence, it is not amazing that the employ of plyometrics in power training schedule has been exposed to significantly improve maximal power output during sports-specific movements [6]. Similar to ballistic workouts, plyometrics are theorized to bring out precise adaptations in neural drive, the rate of neural activation and inter muscular control, which result in improved RFD capacity. Adaptations to the aforesaid mechanisms driving improved performance during SSC movements are also theorized to contribute to enhanced maximal power production following plyometric training [7].

This training method seems to be a good option for athletes, but some precautions must be taken. The athlete's adaptation and improvement at the beginning of the training are factors that need to be considered. Variations in the methods also deserve attention and this fact depends on the athlete's current situation. It is thought that this type of exercise is extremely important for soccer as it aims for the explosive force of the lower limbs.

Anaerobic power (ANP) is understood as the performance of a work with maximal speed [8]. The explosive movement needs a fast energy production that occurs with the alactic anaerobic metabolism (ATP-CP). This energy comes almost exclusively from high-energy phosphocreatine in the muscles, each kg of muscle containing from 3 to 8 mmol of ATP [9].This is characterized as a production system of immediate energy production for short-term actions (10 to 15 seconds) with high intensity that have phosphocreatine as a prominent substrate that is also characterized as a limited source [8].

There is evidence that an athlete's performance decreases after a period of intense effort and the full recovery may take more than 5 minutes [9]. After a maximum effort, the body attempts to restore the ATP that was depleted during the action.

Fat and carbohydrates influence the reconstruction of phosphocreatine (phosphagen) and ATP resynthesis [10,11]. There is a quick demand for phosphagen restoration but for phosphocreatine, the pathway is slower (Table 1).

Table 1 Phosphocreatine recovery percentage after maximum effort [10]

Phosphocreatine	Recovery
20 to 30 seconds	50 to 70%
2 minutes	85%
4 minutes	90%
8 minutes	97%

Young adults participate in many recreational and competitive sport activities, which rely, to a great degree, on anaerobic energy production. Thus, success in many sports is achieved by those with the greatest ability to produce energy anaerobically. A well-designed training programme improves students' fitness level. Physical and motor fitness is plinth of health and academic achievement of students. The fitness levels of the students nowadays are getting deteriorated due to lack of physical activities. Physical fitness has a significant role in changing the students to fit worthy citizens. Physical activity increases the life span and gives a better appearance to a person. However, there was no attempt made to find out the impact of high intensity plyometric training, maximal power training with and without plyometrics on anaerobic power of college men players, especially in India. Hence, the researchers are an experienced physical educator and very much interested in student's fitness, selected this study.

Hypothesis

The hypothesis argued in this paper is that college students can significantly increase the anaerobic power with high intensity plyometric training, maximal power training with and without plyometrics over a consecutive 12 weeks period. Therefore, the objective of this research was to investigate the changes in the parameters produced during 12 weeks of high intensity plyometric training, maximal power training with plyometrics and maximal power training without plyometrics in one hundred and twenty college men players.

Materials and Methods

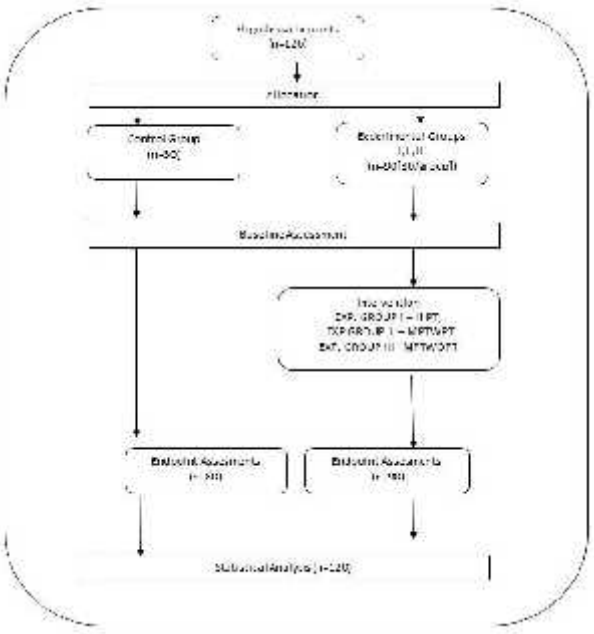
Participants

In order to address the hypothesis presented herein, we selected one hundred and twenty college men players irrespective of their games. Their age ranged between 18 and 25 years (M = 20.75, SD = 1.55). Both the subjects and their parents were informed about this research and written consent was obtained from them. In accordance with the experimental research in the field of physical education and sports, we chose a small size target group. The selected subjects were divided into four equal groups consisting of thirty each. No attempt was made to equate the groups. Experimental group I (n = 30) underwent high intensity plyometric training, experimental group II (n = 30) underwent maximal power training with plyometrics training (MPTWP), experimental group III (n = 30) underwent maximal power training without plyometrics training (MPTWOP) for a period of 12 weeks and group IV (n = 30) acted as control group (CG), the subjects in control group were not engaged in any training programme other than their regular work.

Research Design

The evaluated parameter was anaerobic power (Margaria Kalamen test). The parameter was measured at baseline after 12 weeks of HIPT, MPTWPT and 12 weeks of MPTWOPT and the effects of the training were examined. Before the test, the subjects underwent 5 minutes of low intensity aerobic run and 10 minutes of dynamic and static stretching of upper and lower extremity muscles for general warm-up [12].

Figure 1 – Flow Diagram



Training Protocol

In each training session the training was imparted for a period 60 minutes.

The high intensity plyometric training, maximal power training with plyometrics and maximal power training without plyometrics which included 5 minutes warming up and 5 minutes relaxation procedure after training programme for three days per week for a period of 12 weeks.

Table – 2 Schedule of High Intensity Plyometric Training

Statistical Analysis

The collected data were analyzed with application of SPSS package. The 't' test was finding out the individual effect from base line to post-test if any.

Further Analysis of Covariance (ANCOVA) was used to determine the significant difference between the treatment means.

Whenever the 'F' ratios were found to be significant, Scheffe's post hoc test was applied to test the significant difference between the paired

Training week	Volume (Foot contacts)	Drills	Sets × Reps	Intensity & Rest
I & II	90	Single leg bounding Lateral jump single leg Split pike jump	5×6 2×15 2×15	High & Two minutes between the sets
III & IV	120	Single leg bounding Lateral jump single leg Split pike jump Double leg vertical power jump	2×15 5×6 2×15 5×6	High & Two minutes between the sets
V & VI	120	Single leg bounding Lateral jump single leg Single leg vertical barrier hop Split pike jump Lateral jump over barrier	2×12 4×6 2×12 3×8 2×12	High & Two minutes between the sets
VII & VIII	140	Lateral jump single leg Single leg bounding Straight pike jump Single leg tuck jump Single leg speed jump	4×8 4×8 2×12 4×7 4×6	High & Two minutes between the sets
IX & X	140	Lateral jump single leg Single leg bounding Single leg tuck jump Single leg speed jump Box jump 18" Depth jump landing	2×7 4×7 4×7 4×7 4×7 2×7	High & Two minutes between the sets
XI & XII	120	Single leg bounding Double leg vertical power jump Box jump 18" Lateral bound single leg Depth jump landing	2×12 2×12 4×6 3×8 4×6	High & Two minutes between the sets

adjusted means. 0.05 level of confidence was fixed to test the level of significance.

Table – 3 Schedule of Maximal Power Training with Plyometrics

Training week	Drills	Reps × Sets	Rest	Intensity
I - III	Bent-over row Biceps curl Bench press Jump squat Line hops Line jumps Split squat jump Lateral Box Touches	8×3 8×3 8×3 8×3 8×3 8×3 8×3 8×2	45 sec/90 sec	Low
IV- VI	Biceps curl Bench press Jump squat Push press Lunge jump Power step ups Butt kicks Repeat squat jumps	10×3 10×3 10×3 10×2 10×3 10×3 10×3 10×3	45 sec/90 sec	Moderate
VII - IX	Bench press Bent-over row Biceps curl Jump squat Depth jump to squat jump Depth jump to long jump Depth jump to bounding Depth jump to sprinting	12×3 12×3 12×3 12×2 12×3 12×3 12×3 12×3	45 sec/90 sec	High
X -XII	Biceps curl Bench press Jump squat Push press Lunge jump Power step ups Butt kicks Repeat squat jumps	10×3 10×3 10×3 10×2 10×3 10×3 10×3 10×3	45 sec/90 sec	Moderate

Table 5 shows that the‘t’ ratios on anaerobic power of HIPTG, MPTWPTG, MPTWOPTG were 17.95, 25.26, and 5.04 respectively. Since, these values were higher than the required table value of 2.045, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom1 and 29. Further, the obtained‘t’ ratio between pre and post-test of control group 1.35 was lesser than the required table value of 2.045, found to be not statistically significant. From the results it was inferred that, all the three training groups (HIPT, MPTWPT, and MPTWOPT) produced a significant improvement in anaerobic power of college men players.

Table 6 reveals the computation of ‘F’ ratios on pre-test, post-test and adjusted post-test means of HIPTG, MPTWPTG, MPTWOPTG and CG on anaerobic power.

Table – 4 Schedule of Maximal Power Training without Plyometrics

Training week	Drills	Reps × Sets	Rest	Intensity
I - III	Bent-over row Biceps curl Bench press Back squat Dead lift Step-up Power clean Push press	8×3 8×3 8×3 8×3 8×3 8×3 8×3 8×2	45 sec/90 sec	Low
IV- VI	Biceps curl Bench press Back squat Push press Power clean Hang clean Jump squat Step ups	10×3 10×3 10×3 10×2 10×3 10×3 10×3 10×3	45 sec/90 sec	Moderate
VII - IX	Bench press Bent-over row Biceps curl Back squat Dead lift Jump squat Power clean Push press	12×3 12×3 12×3 12×2 12×3 12×3 12×3 12×3	45 sec/90 sec	High
X -XII	Biceps curl Bench press Back squat Push press Power clean Hang clean Jump squat Step ups	10×3 10×3 10×3 10×2 10×3 10×3 10×3 10×3	45 sec/90 sec	Moderate

Results and Discussions

The obtained 'F' ratio for the pre-test means of HIPTG, MPTWPTG, MPTWOPTG and CG on anaerobic power was 0.67. Since, the 'F' value was less than the required table value of 2.70 for the degrees of freedom 3 and 116, it was found to be not significant at 0.05 level of confidence.

Further, the 'F' ratio for post-test means of HIPTG, MPTWPTG, MPTWOPTG and CG on anaerobic power was 35.96. Since, the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 116, hence it was found to be statistically significant at 0.05 level of confidence.

The obtained 'F' ratio for the adjusted post-test means of HIPTG, MPTWPTG, MPTWOPTG and CG on anaerobic power was 83.42. Since, the 'F' value was higher than the required table value of 2.70 for the degrees of freedom 3 and 115, it was found to be statistically significant at 0.05 level of confidence. The results revealed that there was a significant difference in post-test means among HIPTG, MPTWPTG, MPTWOPTG and CG in anaerobic power of college level men players

Table 5. Computation of 't' ratio on anaerobic power of college men players (Scores in Kg/min/sec)

Groups	Pre – test mean	Pre – test S. D (±)	Post – test mean	Post – test S. D (±)	't' ratio
HIPT	97.68	13.26	116.75	11.47	17.95*
MPTWPT	99.25	8.48	123.94	8.42	25.26*
MPTWOPT	95.76	13.73	104.65	13.71	5.04*
CG	95.60	9.93	97.01	9.71	1.35

* Significant at 0.05 level for the degrees of freedom 1 and 29, 2.045

Table 6. Analysis of covariance on Pre, Post and Adjusted Posttest means on anaerobic power of HIPT, MPTWPT, MPTWOPT and Control Group (Scores in Kg/min/sec)

Test	HIPTG	MPTWPTG	MPTWOPTG	CG	Source of variance	df	Sum of squares	Mean squares	F-ratio
Pre-test mean	97.68	99.25	95.76	95.60	B .G	3	270.61	90.20	0.67
					W .G	116	15515.80	133.76	
Post-test mean	116.75	123.94	104.65	97.01	B .G	3	13070.65	4356.88	35.96*
					W .G	116	14055.98	121.17	
Adjusted post-test mean	116.27	122.25	105.67	98.16	B .G	3	10244.39	3414.80	83.42*
					W .G	115	4707.67	40.94	

* Significant at 0.05 level for the degrees of freedom (3, 116) and (3, 115), 2.70

Table 7 revealed that the mean differences between the paired adjusted post-test means of all groups. The values of mean difference of adjusted post-test means were higher than that of the required confidence interval value of 6.60 and it was found to be significant. From these results it was inferred that MPTWPT produced significant improvement in anaerobic power of college men players than the other training groups of HIPT, MPTWOPT and CG. Further, twelve weeks of HIPT significantly improved anaerobic power when compared with MPTWOPT and control group. Mean values of pre, post and adjusted post-test of HIPTG, MPTWPTG, MPTWOPTG and CG on anaerobic power was presented in figure 2.

Discussion

This study aimed to analyze the anaerobic power of college level men players by various training methods. The Physical characters of the students in the equated groups were comparable with respect to the parameters like age, height and weight. The difference between anaerobic power values of experimental groups and control was statistically significant. Priest and Hagan also found that maximum steady state training results in increase in maximum anaerobic power by 3.7% [13]. Tomasz Boraczynski and Jersy Urniaz showed significant increase in VO2 max and anaerobic power in handball players after the 4-week training programme [14].

Table – 7 Scheffe's post hoc test for the differences between the paired adjusted post-test means of anaerobic power

HIPT	MPTWPT	MPTWOPT	Control group (CG)	Mean difference	Confidence Interval
116.27		105.67		10.60*	6.60
116.27	122.25			5.97	
116.27			98.16	18.12*	
	122.25	105.67		16.58*	
		105.67	98.16	7.51*	
	122.25		98.16	24.09*	

*Significant at 0.05 level

J M Crielaard and F. Primi compared anaerobic and aerobic power of top-level sprinters, long distance runners and untrained students. They observed higher anaerobic power in top level athletes as compared to untrained students [15]. Anaerobic power plays an important role in sport and is a good indicator of the physical performance in many sports' disciplines. A significant part of its development is genetically conditioned but the type and intensity of the applied sports training has a great share in its stimulation [16]. A high level of anaerobic power was recorded in volleyball and basketball groups [17], weightlifters [18], power-lifters and wrestlers [19] but low among long distance runners [20] and handball players [17]. The above-mentioned types of anaerobic power among various sports' groups are supported by laboratory tests, which indicate that strength training and plyometric training have a significant influence on the increase of anaerobic power [21]. Dea Karaba et all shown more anaerobic power in athletes as compared to non-athletes and more anaerobic power in swimmer [22].

The results from the present study are very encouraging and demonstrate the benefits of high intensity plyometric training, maximal power training with and without plyometric exercises over anaerobic power in college men players.

In addition, the results report improvements in fitness can occur in a little as 12 weeks of maximal power training with plyometrics which can be useful during the preparative phase before the competition session for college level men players. So, the maximal power training with plyometrics training holds good to desired effect on selected parameter.

Conclusions

Within the limitations and on the basis of the findings, it was very clear that twelve weeks of maximal power training with plyometrics training produced significant changes in the anaerobic power of college level men players.

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Conflict of interest

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

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Influence of Specific Training with and Without Yogic Practices on Anxiety Among Women Kabaddi Players

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Abstract

The purpose of the study was to find out the influence of specific training with and without yogic practices on anxiety among women kabaddi players. To achieve the purpose of the present study, sixty women kabaddi players from various Arts and Science Colleges affiliated to Madurai Kamaraj University, from Madurai district, Tamilnadu, India were chosen as the subjects was selected as subjects at random and their age ranged from 18 to 24 years. The subjects (N=60) were randomly assigned to three equal groups of twenty women kabaddi players each. The groups were assigned as specific training with yogic practices, specific training without yogic practices and control group in an equivalent manner. The group I underwent specific training with yogic practices, group II underwent specific training without yogic practices and group III acted as a control group. 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. Whenever the adjusted post-test means were found significant, the scheffe's post-hoc test was administer to find out the paired means difference. In comparing the effect of specific exercises with yogic practices and specific exercises without yogic practices on speed, from the obtained f-ratios, it was observed that SEWOYPG showed better performance than the SEWYPG and control group.

Keywords: Specific Training, Yogic Practices, Anxiety.

Introduction

In the modern competitive sports, seriousness towards work and workouts plays important role in achieving high performance in competitions. Outstanding players have been found to be more sober, disciplined, practical, and tough minded. Competitions now a day are so tough that only those achieve high performance who trains for long hours. Games, on the other hand, are structured activities that have rules, can be competitive or co-operative, and usually require the exertion of one's mental powers as opposed to bodily strength. To excel in sports and games one should have excellent technique, tactics, training, skill and etcetera. In performance and high performance sport, a great importance is given to the physical condition. It is in fact the preoccupation for the adaptation of the sports man's body to growing physical and mental efforts, to which all the parts of the human body participate. Kabaddi is our indigenous game, which requires skill and power. It is one of the major games in India. Bio motor, physiological and psychological variables are very essential for kabaddi players and form a condition for higher performance. Every sport differs from other in their level of fitness required for success. The components of bio motor, physiological and psychological parameters and the various coordinative abilities are essential for a high technique and tactical efficiency. Depending upon the demand of the event, each factor should be optimally developed. Kabbadi game requires a combination of bio motor, physiological and mental skills.

Methodology

The purpose of the study was to find out the influence of specific training with and without yogic practices on anxiety among women kabaddi

players. To achieve the purpose of the present study, sixty women kabaddi players from various Arts and Science Colleges affiliated to Madurai Kamaraj University, from Madurai district, Tamilnadu, India were chosen as the subjects was selected as subjects at random and their age ranged from 18 to 24 years. The subjects (N=60) were randomly assigned to three equal groups of twenty women kabaddi players each. The groups were assigned as specific training with yogic practices, specific training without yogic practices and control group in an equivalent manner. The group I underwent specific training with yogic practices, group II underwent specific training without yogic practices and group III acted as a control group. 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. Whenever the adjusted post-test means were found significant, the scheffe's post-hoc test was administer to find out the paired means difference. To test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study

Results

The results of the dependent 't'-test on the data obtained for anxiety of the subjects in the pre-test and post-test of the experimental and control groups have been analysed and presented in Table I.

Table:1

The summary of mean and dependent 't' -test for the pre and post tests on speed of specific training with yogic practices, specific training without yogic practices and control groups

	STWY PG	STWOY PG	CG
Pre-test mean	16.50	16.85	16.55
Post-test mean	12.00	13.50	16.40
't'-test	14.82*	13.75*	0.49
Magnitude of Improvement	27.27%	19.88%	0.90 %

* Significant at .05 level

(Anxiety scores in seconds)

(Table value required for significance at .05 level for't'-test with df 19 is 2.09)

From table 1 the dependent 't' test values, on anxiety performance between the pre and post-test means of specific training with yogic practices group and specific training without yogic practices group are 14.82 and 13.75 respectively.

Since the obtained 't'-test values of the experimental groups are greater than the table value 2.09 with df 19 at 0.05 level of confidence it is concluded that specific training with yogic practices group, specific training without yogic practices group had registered significant improvement on the performance of anxiety and in case of control group the obtained 't' value 0.49 is failed to reach the significant level.

From the table it is also observed that the magnitude of improvement (MI) of speed due to the influence of specific training with yogic practices group, specific training without yogic practices group and control group are 27.27%, 19.86% and 0.90% respectively. It indicates that the specific training with yogic practices had registered better percentage of improvement in speed. The analysis of covariance (ANCOVA) on speed of specific training with yogic practices group, specific training without yogic practices group and control group have been analysed and presented in table -II.

Table 2 shows that the adjusted post-test mean value of anxiety for specific training with yogic practices group, specific training without yogic practices group and control group are 12.03, 13.44 and 16.42 respectively. The obtained F-ratio of 84.28 for the adjusted post-test mean is more than the table value of 3.16 for df 2 and 56 required for significance at 0.05 level of confidence. The results of the study indicate that there are significant differences among the adjusted post-test means of specific training with yogic practices group, specific training without yogic practices group and control group on the development of anxiety.

To determine which of the paired means had a significant difference, Scheffe's test was applied as post hoc test

Table: 2 Analysis of covariance on anxiety of specific training with yogic practices, specific training without yogic practices and control groups

Adjusted Post-test Means			Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
STWYPG	STWOYPG	CG					
12.03	13.44	16.42	BG	200.634	2	100.317	84.28*
			WG	66.651	56	1.190	

* Significant at.05 level of confidence

Table: 3 The scheffe's test for the differences between the adjusted post-test paired means on anxiety

Adjusted Post-test Means				Mean Difference	Confidence Interval
STWYPG	STWOYPG		CG		
12.03	13.44			1.41*	0.86
12.03			16.42	4.39*	0.86
	13.44	16.42	2.98*		0.86

Table 3 shows that the mean difference values between specific training with yogic practices and specific training without yogic practices; specific training with yogic practices and control groups; specific training without yogic practices and control group are 1.41, 4.39 and 2.98 respectively on anxiety which are greater than the confidence interval value 0.86 at 0.05 level of confidence.

The results of the study showed that there was significant difference between specific training with yogic practices, specific training without yogic practices and control group on anxiety.

Figure 01 Mean values of specific training with yogic practices, specific training without yogic practices and control groups on anxiety

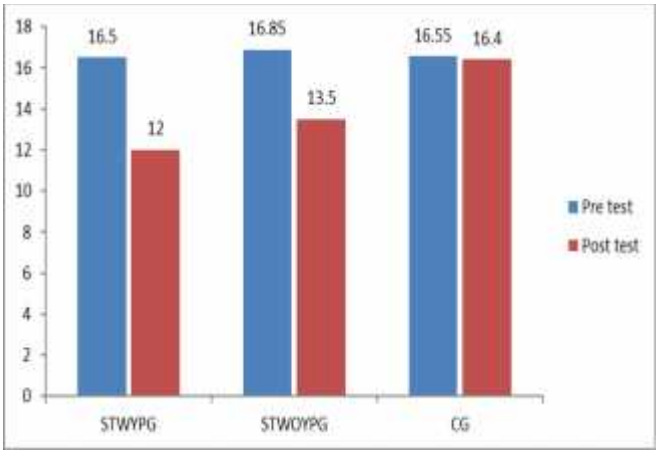
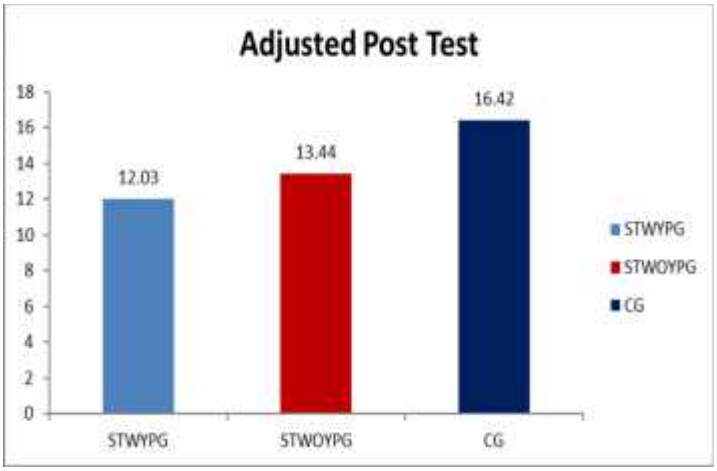


Figure 02 The adjusted post-tests mean values of specific training with yogic practices, specific training without yogic practices and control groups on anxiety



Conclusion

1. In comparing the effect of specific exercises without yogic practices on anxiety, from the obtained f-ratios, it was observed that STWOYPG showed better performance than the control group.

2. In comparing the effect of specific exercises with yogic practices and specific exercises without yogic practices on anxiety, from the obtained f-ratios, it was observed that STWOYPG showed better performance than the STWYPG and control group

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Conflict of interest

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

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Assessment of Muscular Endurance of School Volleyball Players in Madurai District of Tamilnadu Through Selected Yogic Practices Combined With Plyometics

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Abstract

Aim of this study was to assess the Muscular Endurance of school volleyball players in Madurai District of Tamilnadu through selected yogic practices combined with plyometrics. To achieve this purpose, sixty (N=60) boys school Volleyball players in Madurai District, Tamilnadu, India were selected as subjects. The athletes' age ranged between 14 and 16 years. The subjects were divided at random into four groups of fifteen each (n=15). Group-I underwent Yogic practices, Group-II underwent Plyometric training, Group-III underwent combined yogic practices and plyometric training and Group-IV acted as Control. All the Experimental groups undergo their respective training for 12 weeks in addition to the regular training as per School curriculum. Among various general fitness variables, Muscular Endurance only was selected as dependent variable and it was assessed by Bent Knee Sit-up test. The data was collected from the four groups prior to and post experimentation on Muscular Endurance was statistically analyzed by using Analysis of Covariance (ANCOVA). Hence, whenever they obtained f-ratio value was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed. The results of the study showed there was a significant difference among the selected groups, further the results showed, combined yogic practices and plyometric training group was better than other groups on the development of Muscular Endurance.

Keywords: Yogic practices, Plyometric training, combined yogic practices and plyometric training Muscular Endurance.

Introduction

"Sports training is a scientifically based and pedagogically organized process which through planned and systematic, effect on performance ability and performance readiness aims at sports perfection and performance improvement as well as at the contest in sports competition". Power output and reactive neuromuscular control represents a component of function. Power and reactive neuromuscular control are perhaps the best measures of success in activities that require rapid force production. Plyometric training, also called reactive training, makes use of the stretch shortening cycle to produce maximum force in the shortest amount of time and to enhance neuromuscular control efficient, rate of force production, and reduce neuromuscular inhibition (Chimera et al, 2004).Plyometrics refers to human movement that involves an eccentric (lengthening) muscle contraction immediately and rapidly followed by a concentric (shortening) contraction. This is often referred to as the stretch-shortening cycle. The phase between these two contractions is referred to as the amortization phase. Energy stored during the eccentric phase is partially recovered during the concentric phase. In order to best use this stored energy, the eccentric phase must be rapidly followed by the concentric. Yoga has a hoary past. The importance for the spiritual attainment has been recognized throughout the ages by all the systems of Indian philosophy. There is no doubt that the essence of yoga has been considered in the spiritual upliftment of man. One may question as to how then yoga is related to the physical education and whether yoga will not be pulled down from its highest pedestal in doing this. It is necessary, therefore, to clear the concepts of

yoga and physical education first (Gharote, 1976). Yoga has been practiced in India for over two millennia. Stories and legends from ancient times testify to the existence of yoga, and to the practitioners and divinities associated with it. Indian literature is a storehouse of knowledge about yoga covering every conceivable level. Roughly in chronological order are the vocals (books of Scriptural knowledge), the Upanishada (philosophical cosmologies), and their commentaries; then the Puranas (ancient cosmologies), and the two epics, the Ramayana and the Mahabharatha.

The Mahabharatha contains within itself that masterpiece of Indian scripture the Bhagavad Gita. Towards the end of Vedic period comes the aphoristic literature, with the "Yoga Aphorisms" of Patanjali of special interest to yoga students. These are, besides, whole bodies of works both ancient (Pre-Christian) and more modern dealing with various aspects of yoga and yoga philosophy, testifying to the continued relevance of yoga as a discipline (Mira- Mehta, 1994).

METHODOLOGY

The purpose of this study was to assess the selected general fitness variables of school volleyball players in Madurai District of Tamilnadu through selected yogic practices combined with plyometrics.

To achieve this purpose, sixty (N=60) boys school Volleyball players in Madurai District, Tamilnadu, India were selected as subjects. The athletes' age ranged between 14 and 16 years. The subjects were divided at random into four groups of fifteen each (n=15). Group-I underwent Yogic practices, Group-II underwent Plyometric training, Group-III underwent combined yogic practices and plyometric training and Group-IV acted as Control. All the Experimental groups undergo their respective training for 12 weeks in addition to the regular training as per School curriculum. Among various general fitness variables, Muscular Endurance only was selected as dependent variable and it was assessed by Bent Knee Sit-up test.

The data collected from the experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post-test means on selected criterion variables separately.

Whenever they obtained f-ratio value in the simple effect was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

RESULTS AND DISCUSSION

Table 1–I

Analysis of covariance on muscular endurance of yogic practices group, plyometric training group and combined yogic practices and plyometric training and control group.

Adjusted Post-test Means				Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
Yogic Practices Group	Plyometric Training Group	Combined Yogic Practices and Plyometric Training Group	Control Group					
17.38	17.96	18.90	14.56	Between With in	156.70 41.37	3 55	52.23 0.75	69.44*

* Significant at.05 level of confidence (Muscular Endurance Scores in Numbers) (The table value required for Significance at .05 level with df 3 and 55 is 2.77)

Table-I shows that the adjusted post-test means value of Muscular Endurance for Yogic

practices group, Plyometric training group and combined yogic practices and plyometric training and Control group are 17.38, 17.96, 18.90 and 14.56 respectively. The obtained F-ratio 69.44 for adjusted post-test mean is more than the table value of 2.77 for df 3 and 55 required for significant at 0.05 level of confidence. The results of the study indicate that there are significant differences among the adjusted post-test means of Yogic practices group, Plyometric training group and combined yogic practices and plyometric training and Control group on the development of Muscular Endurance. To determine which of the paired means had a significant difference, the Scheffe's test was applied as Post hoc test and the results are presented in Table-II.

TABLE – II

The Scheffe's Test for The Differences Between the Adjusted Post Test Paired Means on Muscular Endurance

Adjusted Post-test Means				Mean Difference	Confidence Interval
Yogic Practices Group	Plyometric Training Group	Combined Yogic Practices and Plyometric Training Group	Control Group		
17.38	17.96	--	--	0.58*	0.54
17.38	--	18.40	--	1.02*	0.54
17.38	--	--	14.56	2.82*	0.54
--	17.96	18.40	--	0.44*	0.54
--	17.96	--	14.56	3.40*	0.54
--	--	18.40	14.56	3.84*	0.54

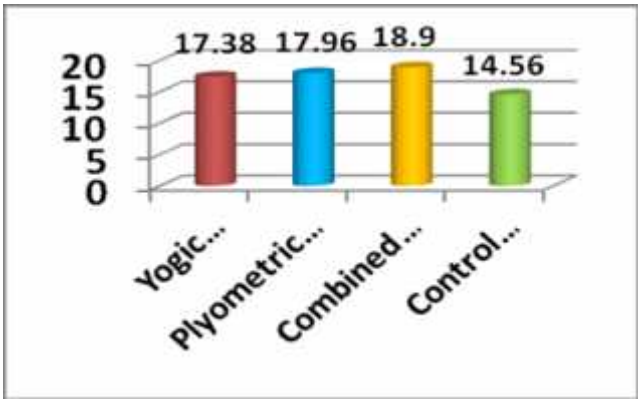
* Significant at 0.05 level of confidence

Table-II shows that the adjusted post-test mean difference on yogic practice group and plyometric training group, yogic practice group and combined yogic practices and plyometric training group, plyometric training group and combined yogic practices and plyometric training group, plyometric training group and control group and combined yogic practices and plyometric training group and Control group are 0.58, 1.02, 2.82, 0.44, 3.40 and 3.84 respectively.

The values are greater than the confidence interval 0.54, which shows significant differences at 0.05 level of confidence. It may be concluded from the results of the study that there is a significant difference in Muscular Endurance between the adjusted post-test means of yogic practice group and plyometric training group, yogic practice group and combined yogic practices and plyometric training group, plyometric training group and combined yogic practices and plyometric training group, plyometric training group and control group and combined yogic practices and plyometric training group and control group.

However, the improvements of Muscular Endurance were significantly higher for combined yogic practices and plyometric training group than yogic practices group, plyometric training group and control group. It may be concluded that combined yogic practices and plyometric training group is better than yogic practices group, plyometric training group and control group in improving Muscular Endurance.

The adjusted post-test means values of Yogic practices group, Plyometric training group and combined yogic practices and plyometric training and Control group on Muscular Endurance are graphically represented in the Figure -I.



The adjusted post-test means values of Yogic practices group, Plyometric training group and combined yogic practices and plyometric training and Control group on Muscular Endurance

Conclusions

From the analysis of the data, the following conclusions were drawn. The Experimental groups namely, Yogic practices group, Plyometric training group and combined yogic practices and plyometric training had significantly improved in Muscular Endurance. Significant differences in achievements were found between Yogic practices group, Plyometric training group and combined yogic practices and plyometric training in the entire selected criterion variable such as Muscular Endurance. The Combined Yogic Practices and Plyometric Training was found to have greater impact on the Group concerned than the Yogic Practices group, Plyometric Training group and Control group in enhancing the performance of Muscular Endurance.

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Conflict of interest

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

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Impacts of Loop Band Training on Speed and Leg Strength among Badminton Players

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Abstract

The good reason of this study was to discover the impacts of loop band training on speed and leg strength among badminton players. To achieve this purpose to the study twenty college level male badminton players from Karpagam University, Coimbatore, Tamilnadu. India were randomly selected as subjects. Their age ranged in between 18 and 23 years. The subjects were separated into two groups namely loop band group and control group. The loop band group was subjected to loop band training (for weekly three days Monday, Wednesday, Friday) at evening session for eight weeks. Speed and Leg 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 loop band training has significant enhancement on speed and leg strength of badminton players.

Keywords: Loop Band Training, Speed, Leg Strength, Badminton Players.

Introduction

Loop band is an elastic band used for strength training. They are also commonly used in physical therapy, predominantly by convalescents of muscular injuries, as well as cardiac rehabilitations to allow slow rebuilding of strength. flexible band training is a type of physical exercise specializing in the use of resistance to make muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles. When well performed, band strength training can give significant functional benefits and advance in overall health and well-being, including increased bone, muscle, tendon, ligament strength and toughness. Sports where band training is central are highland games, shot put, discus throw, and javelin throw. Many other sports use band resistance training as part of their training, athletes, rowing, lacrosse, basketball, hockey and soccer. Band resistance training should be implemented in the condition program of all sports, not just strength sports. The increase in speed, strength, agility and muscular endurance will advantage athletes of every sport. As athletic performance is involving more of muscular contraction. Which build the components for the game, as a coach special planned loop band training programme for the college level male badminton players.

Methodology

The good reason of this study was to discover the impacts of loop band training on speed and leg strength among badminton players. To achieve this purpose to the study twenty college level male badminton players from Karpagam University, Coimbatore, Tamilnadu. India were randomly selected as subjects. Their age ranged in between 18 and 23 years. The subjects were separated into two groups namely loop band group and control group. The loop band group was subjected to loop band training (for weekly three days monday, wednesday, friday) at evening session for eight weeks. Speed and Leg 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.

Training Procedure

For loop band 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 lateral walk, leg raise, squat, split walk and wall sit under the strict regulation of the researcher. During experimental period control group did not contribute in any of the exceptional training.

Results

Table-I -Relationship of mean, sd and't'-values of the speed between Pre & post-test of the loop band and Control groups of badminton players.

	Groups	Test	Mean	S.D	't' Values
Leg Speed	Loop Band Group	Pre Test	7.32	0.28	32.84*
		Post Test	7.27	0.24	
	Control Group	Pre Test	7.36	0.27	1.51
		Post Test	7.35	0.26	

*Significant at 0.05 level of confidence

Table-I reveals that the mean values of per test and post-test of control group for speed were 7.36 and 7.35 respectively; the obtained t ratio was 1.51respectively. The tabulated t value is 1.83 at 0.05 level of confidence for the degree of freedom 9. The calculated t ratio was lesser than the table value. It is found to be insignificant change in speed of the badminton players. The obtained mean and standard deviation values of pre-test and post test scores of loop band training group were 7.32 and 7.27 respectively; the obtained t ratio was 32.84. The required table value is 1.83 at 0.05 level of confidence for the degree of freedom 9. The obtained t ratio was greater than the table value. It is found to be significant changes in speed of the badminton players. The mean values on loop band 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 leg strength were 71.10 and 71.40 respectively; the obtained t ratio was 0.51respectively. The tabulated t value is 1.83 at 0.05 level of confidence for the degree of freedom 9. The calculated t ratio was lesser than the table value. It is found to be insignificant change in leg strength of the badminton players.

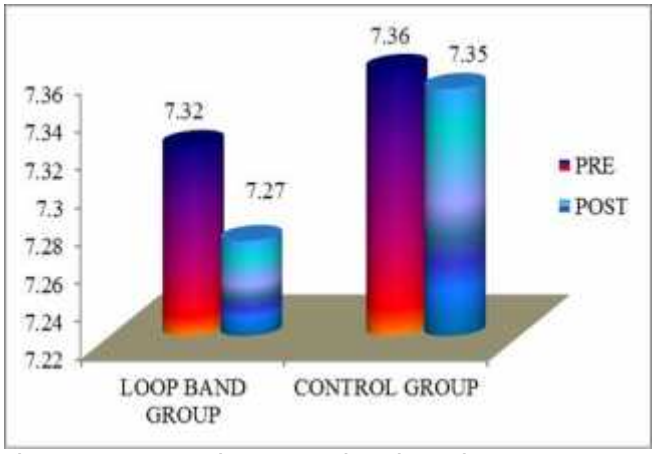

Figure-1: Bar Diagram Showing the Pre-Test & Post Test on Speed of Loop Band and Control Groups

Table-II- Relationship of Mean, Sd and 'T'-Values of The Leg Strength Between Pre & Post Test of The Loop Band and Control Groups of Badminton Players

	Groups	Test	Mean	S.D	't' Values
Leg Strength	Loop Band Group	Pre-Test	71.70	13.08	22.84*
		Post Test	75.80	13.04	
	Control Group	Pre-Test	71.10	9.55	0.51
		Post Test	71.40	8.79	

*Significant at 0.05 level of confidence

The obtained mean and standard deviation values of pre-test and post test scores of loop band training group were 71.70 and 75.80 respectively; the obtained t ratio was 22.84. The required table value is 1.83 at 0.05 level of confidence for the degree of freedom 9. The obtained t ratio was greater than the table value. It is found to be significant changes in leg strength of the badminton players. The mean values on loop band group and control group are graphically represented in figure-2.

Discussion on Findings

The loop band training is a extraordinary training which has been found to be valuable of the badminton players. To study the loop band training on speed and leg strength of badminton players at college level, it was tested under to difference between loop band group and control group. The loop band training includes on speed and leg strength. The loop band exercises are namely lateral walk, leg raise, squat, split walk and wall sit.

It also improves the muscle size and leg strength and other than some physical fitness components are namely speed, agility, and power. The obtained result proved positively the loop band group significantly improved. The result of the present study showed that the loop band training has significant improvement on speed and leg strength of badminton players. The results of the study are in line with the studies of Senthil kumaran and vinoth kumar (2018), Ooraniyan and Senthil Kumaran (2018), Velmurugan and Rajamohan (2016). The result of the study showed that the control group was not significantly improved loop band training on speed and leg strength of badminton players at college level.

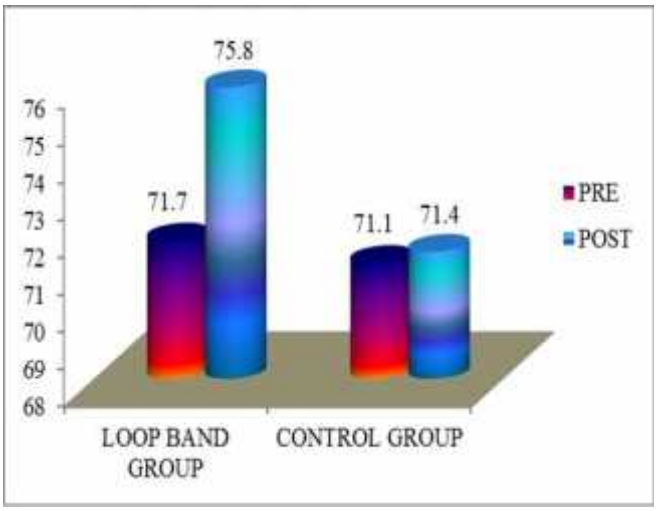

Figure-2: Bar Diagram Showing the Pre-Test & Post Test on Leg Strength of Loop Band and Control Groups.

Conclusions

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

1. It was concluded that individualized effect of loop band training group showed a statistically significant positive sign over the course of the treatment period on speed and leg strength of college level badminton players.
2. It was concluded that individualized effect of control group showed a statistically insignificant positive sign over the course of the period on speed and leg strength of college level badminton players.
3. The results of comparative effects lead to conclude that loop band group had better significant improvement on speed and leg strength of college level badminton players as compared to their performance with control group.

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Effect of Yogasana on Muscular Strength and Flexibility of School Students

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Abstract

This study was investigated the impact of yoga practice on selected physical fitness of school students. To achieve the purpose of the study 40 school students were selected from Sri Sowedeshwari vidhayalaya higher secondary school Coimbatore. The subjects were randomly assigned to two equal groups (n=20). Group- I underwent yogasana (YG) and group - II was acted as control group (CG). The yogasana 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 physical parameters of flexibility (sit and reach test) and muscular strength (modified setups) before and after training period. 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 present study yoga practices significantly improved selected physical fitness of school students.

Keywords: Yogasana, Muscular Strength and Flexibility.

Introduction

yoga

The meaning of the Sanskrit word asana is 'a study and comfortable posture'. The postures performed in all yoga practices (Hatha Yoga and Astanaga Yoga) are called asana. Although many people believe that they are physical exercises, it does not convey their full significance. 'Asana aim at influencing the body, mind and consciousness, molding and yoking them into one harmonious whole'. The practice of asanas requires active involvement of one's entire being as fully as possible. In other words, try not to think about work or friends or food while performing them. The prime aim of asana is to help us tread the path to higher consciousness so we can begin to understand and know our relationship with existence. We cannot even consider attaining higher awareness if we are ill with disease, aches and pains or mental depression. Therefore, the initial purpose of practicing asana is to eliminate these disturbances and afflictions. A regular practice of asana makes us acquainted with the way our body is, and we then begin to understand the importance of breathing and staying still. The opening up of the body that results after a regular practice gives us a sense of freedom not only in the body, but more importantly in the mind driving us to come to terms with whatever is happening in our mind. Yoga aims at bringing the different bodily function in to perfect co-ordination so that they work for the good of the whole body. Swami Satyananda Saraswathi (2002) Suriya namaskar integrate and harmonize all aspects of the physical, intellectual, and spiritual body. Positions are related to energize pituitary, pineal and thyroid gland, liver solar pineal, blood flow to organ and glands efficacious for the neck, chest, abdomen and sexual gland. The regular performance of Suriya namaskar is intended to raise one's state of conscious to higher level of realization. Suriya namaskar are mostly more popular in older men than young wrestlers. They strengthen body without strain in bones and organs of the body. Suriya namaskar are not vigorous, but they are practiced to maintain physique.

Methodology

In this study the selected 40 school students selected from sri Sowedeshwari vidhayalaya higher secondary school coimbatore.

The subjects were randomly assigned in to two equal groups namely, yoga Practices group (YP) (n=20) and Control group (CG) (n=20).

The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of twelve weeks. The control group was not given any sort of training except their routine. The evaluated physical parameters were flexibility was assessed by sit and reach test and the unit of measurement was in centimetres, muscular strength was assessed by modified sit-ups and the unit of measurement was in counts. The training programme was lasted for 60 minutes for session in a day, 3 days in a week for a period of 12 weeks' duration. These 60minutes included 10 minutes warm up, Yoga practice for 45 minutes and 5miniutes warm down.

The equivalent in yoga is the length of the time each action in total 3 days per weeks (Monday, Wednesday and Friday).

to the effect of yogasana was statistically analyzed with 't' test to find out the significant improvement between pre and post test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. ($P < 0.05$).

Table I reveals the computation of mean, standard deviation and 't' ratio on selected Flexibility and Muscular strength experimental group. The obtained 't' ratio on Flexibility and Muscular strength were 4.63 and 18 respectively. The required table value was 2.09 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 computation of mean, standard deviation and 't' ratio on Flexibility and Muscular strength control group. The obtained 't' ratio on Flexibility and Muscular strength were 1.71 and 1.37 respectively.

Table- I Computation Of 'T' Ratio on Selected Parameters on Experimental Group and Control Group (Scores in numbers)

Group	Variables		Mean	N	Std. Deviation Pre	Std. Deviation Post	T ratio
Experimental Group	Flexibility	Pre test	15.93	20	1.11803	1.05210	4.63*
		Post test	19.66	20			
	Muscular strength	Pre test	23.73	20	0.85070	0.89443	18.00*
		Post test	26.53	20			
Control group	Flexibility	Pre test	15.8	20	1.03110	1.05131	1.71
		Post test	15.33	20			
	Muscular strength	Pre test	23.73	20	16.31112	17.34139	1.37
		Post test	23.66	20			

Statistical Analysis

The collected data before and after training period of 12 weeks on the above said variables due

The required table value was 2.09 for the degrees of freedom 1and 14 at the 0.05 level of

significance. Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.

Discussion and Findings

The present study experimented the effect of yogasana on physical parameters of school students. The result of the study shows that the yoga Practice improved the Flexibility and Muscular strength. The findings of the present study had similarity with the findings of the investigations referred in this study. Rayat, S. (2015). Effect of yoga on selected physical and physiological variables of physical education students. Arivazhagan, R. (2020). Effect of selected yogic practices and aerobics exercises on physical, physiological and psychological variables among agriculture men students. Giridharaprasath, R. G (2019).

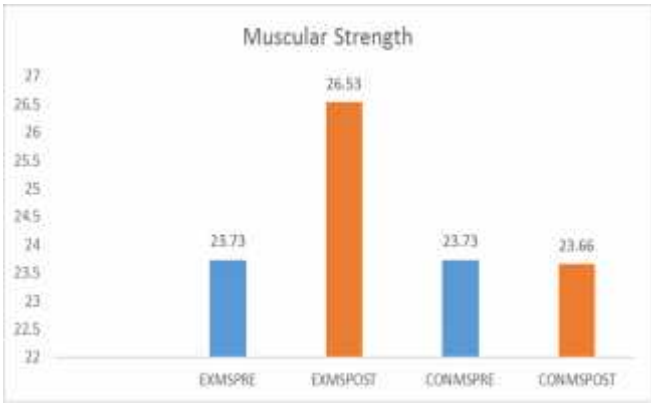

Figure – I Bar Diagram Showing the Mean Value on Muscular Strength and Of School Students on Experimental and Control Group

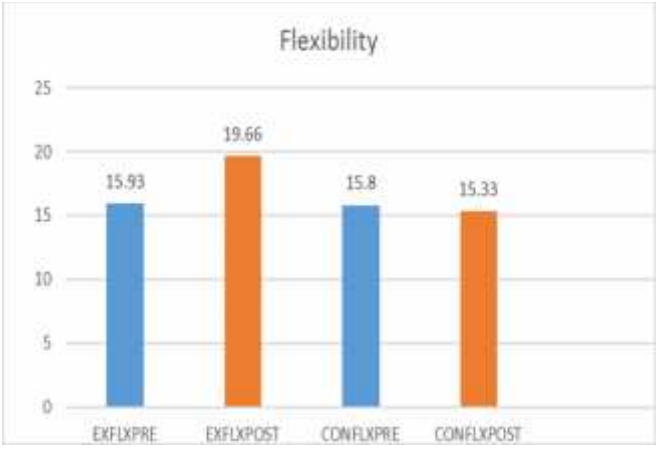

Figure – II Bar diagram showing the mean value on flexibility of school students on experimental and Control group (Sore in Numbers)

Effect of Yoga Practices on Selected Health Related Physical Fitness Components among Assistant Conservator of Forests Trainees Players. Bharathiar National Journal of Physical Education and Exercise Science (ISSN: 0976-3678) e-ISSN Applied (International Peer-Reviewed Journal), 10(1), 28-33.However, there was a significantly changes of subjects in the present study the Flexibility and Muscular strength was significantly improved of subject in the group may be due to the in yogasana.

Conclusions

It was concluded that 12 weeks twelve weeks yogasanas significantly improved the Flexibility and Muscular strength of school students.

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Conflict of interest

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Impact of Yoga Practice on Physiological Variables of Cricket Players

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Abstract

This study was investigated the impact of yoga practice on physiological variables of cricket players. To achieve the purpose of the study 40 cricket players were selected from department of physical education, Bharathiar University Coimbatore. The subjects were randomly assigned to two equal groups (n=20). Group- I underwent yoga Practice (YG) and group - II was acted as control group (CG). The yogasana 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 Vo2 max and resting pulse rate before and after training period. 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 present study yoga practices significantly improved selected physiological variables of cricket players.

Keywords: Yoga Practice, Vo2 Max, Resting Pulse rate and Cricket Players.

Introduction

yoga

The origin of yoga is shrouded in the mists of time-for yoga is regarded as a divine science of life, revealed to enlightened sages in meditation. The oldest archaeological evidence of its existence is provided by a number of stone seals showing figures in yogic postures, excavated from the Indus Valley and though to date from around 3000BC. Yoga is first mentioned in the vast collection of scriptures called the vedas, portions of which date back to 2500 BC, but it is the upanishads, which form the later part of the vedas, that provide the main foundation of yoga teaching. Around the sixth century BC appeared two massive epics. The Ramayana, written by Valmiki and the Mahabharata, written by Vyasa and containing the Bhagavad Gita, perhaps the best known of all yogic scriptures. The backbone of Raja yoga is furnished by patanjalis yoga sutras though to have been written in the third century BC. The classical text on Hatha yoga is the Hatha yoga pradipika, which describes the various asanas and breathing exercises which form the basis of the modern practice of yoga. Yoga is not a religion. It is a philosophy of life based on certain psychological facts, and its aim is the development of a perfect balance between the body and the mind that permits union with the divine. A perfect harmony between the individual and the cosmos. All the sacred writings of India (the Vedas, the Upanishads, the Puranas and the Tantras) are full of exploits by men and women of all castes, creeds and religions; people from all walks of life that arrived at the highest degree of knowledge through the discipline of yoga-while carrying on their various occupations. (Sri Ananda, 2006).

Methodology

In this study the selected 40 cricket players were selected from department of physical education, Bharathiar University Coimbatore. The subjects were randomly assigned in to two equal groups namely, yoga Practices group (YP) (n=20) and Control group (CG) (n=20). The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of twelve weeks. The control group was not given any sort of training except their routine. The evaluated physiological parameters were Vo2 max was assessed by Bench step test and the unit of measurement was in seconds, resting pulse rate was assessed by the bio monitor unit of measurement was in beats/min. The training

programme was lasted for 60 minutes for session in a day, 3 days in a week for a period of 12 weeks' duration. These 60minutes included 10 minutes warm up, Yoga practice for 45 minutes and 5miniutes warm down. The equivalent in yoga is the length of the time each action in total 3 days per weeks (Monday, Wednesday and Friday). The collected data before and after training period of 12 weeks on the above said variables due to the effect of yogasana was statistically analyzed with't' test to find out the significant improvement between pre and posttest. In all cases the criterion for statistical significance was set at 0.05 level of confidence. ($P < 0.05$)

Table I reveals the computation of mean, standard deviation and 't' ratio on selected Vo2 max and resting pulse rate experimental group.

The obtained 't' ratio on Vo2 max and resting pulse rate were 10.135 and 3.66 respectively. The required table value was 2.09 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 computation of mean, standard deviation and 't' ratio on Vo2 max and resting pulse rate control group. The obtained 't' ratio on Vo2 max and resting pulse rate were 1.93 and 0.25 respectively. The required table value was 2.09 for the degrees of freedom 1and 14 at the 0.05 level of significance.

Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.

Discussion and Findings

The present study experimented the effect of yoga practice on physiological parameters of cricket players. The result of the study shows that the yoga Practice improved the Vo2 and resting pulse rate.

The findings of the present study had similarity with the findings of the investigations referred in this study. Biswas, S., Biswas, A., & Bandyopadhyay, N. (2021). Effects of four weeks intervention of yogic practices on cricket specific motor fitness. Mullerpatan, R. (2021). Effect of Yoga on Performance and Physical Fitness in Cricket Bowlers. International Journal of Yoga Therapy. Rayat, S. (2015). Effect of yoga on selected physical and physiological variables of physical education students.

Vijayalakshmi, A., (2021). Effect of Zumba dance with yoga on body composition and vo2 max of school girls.

However, there was a significantly changes of subjects in the present study the Vo2 and resting pulse rate was significantly improved of subject in the group may be due to the in-yoga practice of cricket players

Table- I - Computation of 't' ratio on selected parameterson experimental groupand control group (scores in numbers)

Group	Variables		Mean	N	Std. Deviation	T ratio
Experimental Group	Vo2 max	Pre test	131.86	20	15.27 16.02	10.135*
		Post test	127.36	20	16.02	
	Resting Pulse rate	Pre test	71.80	20	1.47	3.66*
		Post test	69.73	20	1.22	
Control group	Vo2 max	Pre test	133.933	20	9.29	1.93
		Post test	134.667	20	9.87	
	Resting Pulse rate	Pre test	72.26	20	1.48	0.25
		Post test	72.40	20	1.29	

*significant level 0.05 level degree of freedom (2.09,1 and 19)

Figure – I Bar Diagram Showing the Mean Value on Vo2 Max Of Cricket Players On Experimental And Control Group (Scores in numbers)

Figure – II Bar diagram showing the mean value on resting pulse rate of cricket players on experimental and Control group (Sore in Numbers).

Conclusions

It was concluded that 12 weeks twelve weeks yoga practice significantly improved the Vo2 and resting pulse rate of cricket players

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Effect of Game-Specific Training on Selected Skill Performance Variables among Hockey Players

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Abstract

The goal of the study was to see how game-specific training affected certain skill performance characteristics in hockey players. Thirty men hockey players from Tamilnadu, India, were chosen at random as subjects for the current study, and their ages ranged from 18 to 25 years. The participants were split into two groups of fifteen each. Group I was designated as the Experimental Group I (Game-specific training), while Group II was designated as the Control Group. The experiment lasted for a total of 12 weeks. Subjective assessment was used to evaluate dribbling and hitting. All of the subjects were examined on their skill performance factors after the experimental treatment. The subjects' post-test scores were derived from the final test scores. The results of the pre- and post-tests were analysed statistically using the dependent 't' test. To test hypotheses, a 0.05 threshold of significance was used in all cases. Dribbling and hitting had improved significantly in the game-specific training group.

Keywords: Game-specific training, Dribbling, Hit, Hockey.

Introduction

Sports-specific training can increase players' quality, adaptability, and stamina, allowing them to improve their performance in specific sports. For this particular training, the focus is on physical moulding in order to increase execution and abilities in a specific game. Similarly, learning the game's requirements at the appropriate pace in order to meet sports requirements. In terms of quality and competition shaping programmes, sports-specific is the emerging trend. At the higher levels, training that is customised to the demands of a single game has significance, assuming the competitor is formatively sound. A good competitor combines raw physicality with sport-specific ability. Mentors for game abilities are experts at developing the unique ranges of abilities required for that game. Mentors in athletic execution or: Mentors are masters at making a competitor faster, more grounded, increasingly adaptable, and increasingly responsive. They can't develop a programme that improves both unless each of these mentors have extensive, competent experience creating the two parts of physicality. Aside from sports-specific training, neuromuscular adaptations, physicality, injury aversion, and recovery time are also improved. To improve how an individual delivers oxygen to their working muscles, they must plan or participate in exercises that will help them generate the necessary vitality stores (Elferink, et al. 2010).

Methodology

The goal of the study was to see how game-specific training affected certain skill performance characteristics in hockey players. Thirty men hockey players from Tamilnadu, India, were chosen at random as subjects for the current study, and their ages ranged from 18 to 25 years. The participants were split into two groups of fifteen each. Group I was designated as the Experimental Group I (Game-specific training), while Group II was designated as the Control Group. The experiment lasted for a total of 12 weeks. Subjective assessment was used to evaluate dribbling and hitting. All of the subjects were examined on their skill performance factors after the experimental treatment. The subjects' post-test scores were derived from the final test scores. The results of the pre- and post-tests were analysed statistically using the dependent 't' test. To test

hypotheses, a 0.05 threshold of significance was used in all cases.

Results

According to table-I, the obtained 't' ratios for dribbling and hitting were 7.23 and 5.01, respectively. At the 0.05 level of significance for 14 degrees of freedom, the obtained 't' ratios on the specified variables were determined to be greater than the needed table value of 2.14. As a result, it was determined to be substantial.

According to table-II, the obtained 't' ratios for dribbling and hit were 0.26 and 0.36, respectively. At the 0.05 level of significance for 14 degrees of freedom, the obtained 't' ratios on the specified variables were determined to be smaller than the required table value of 2.14. As a result, it was determined to be inconsequential.

Table – I - 't' ratio of game-specific training group

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Dribbling	3.26	5.80	2.53	1.35	0.35	7.23*
2	Hit	4.00	6.20	2.20	1.69	0.43	5.01*
* Significant at 0.05 level							

Table – II- 't' Ratio of Control Group

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Dribbling	3.46	3.53	0.06	0.96	0.24	0.26
2	Hit	3.53	3.60	0.06	0.70	0.18	0.36
* Significant at 0.05 level							

Figure I - Graphical Illustration of Experimental Group

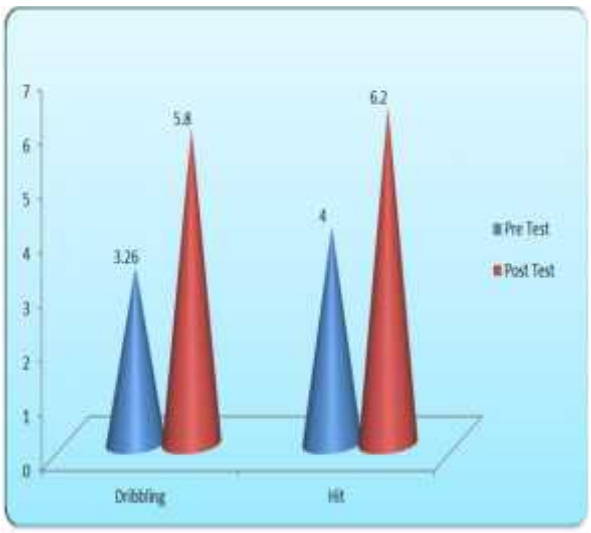
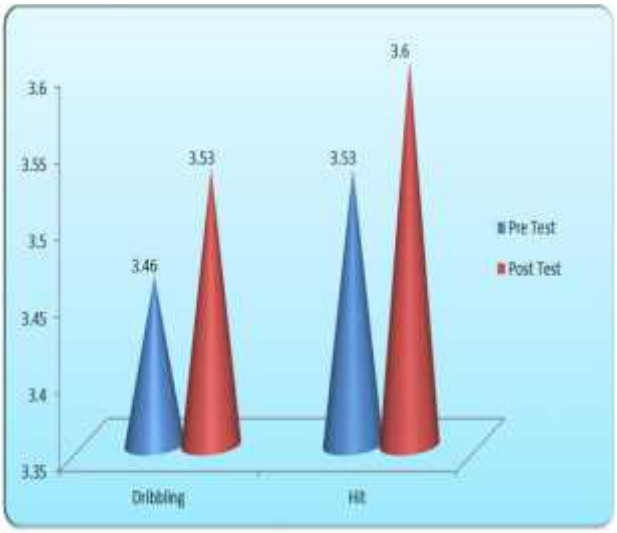


Figure II - Graphical Illustration of Control Group



Conclusion

Dribbling and hitting had improved significantly in the game-specific training group.

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Influences on Agility Response to Ladder and Plyometric Training among Volleyballers

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Abstract

The purpose of the study was to investigate the impacts of ladder and plyometric training on agility among volleyballers. To assist the study, thirty volleyballers from Agricultural College and Research institute, Eachangkottai, Thanjavur, Tamilnadu, India were selected as subjects at random and their ages between 18 to 25 years. The subjects were separated into three equal groups. Group-I performed ladder training, group-II performed plyometric training and group-III was control. Agility was assessed by Illinois agility run test. The subjects were involved with their respective training for a period of eight weeks. At the end of the eighth weeks of the training post-tests were taken. The significant differences between the means of experimental group and control group for the pre-test and post-test scores were determined by paired „t" ratio and ANCOVA. The level of significance was fixed at 0.05 level of confidence for the degree of freedom 14. The ladder training and plyometric group produced significant improvement in agility. The 'f' values of the selected variables have reached the significant level. In the control group the obtained 'f' value on agility were failed to reach the significant level.

Keywords: Agility, Ladder, Plyometric & volleyballers.

Introduction

A ladder is an outstanding piece of training equipment and is useful to enhance body control and agility and increase the foot speed. For this training need not to go out and purchase the own Ladder, it is just as easy to use throw-down lines and as far as juniors are concerned, they may be found to be enhanced as there is no chance of their getting tangled up in the Ladder. The added advantage of lines is that the distance between them can be changed to suit various exercise patterns. Using a building block system of skill development is very important to achieve success in training with a Ladder. The training start with general expansion up to advanced skill development, from a full range of motion to smaller, quicker movements. Keeping in mind the principle of working from slow and controlled movements and moving onto fast, explosive movements as a teaching and learning progression will have a greater amount of success.

Plyometrics is the term given to exercises designed to increase the power of an athlete. It is defined as the equal of explosive strength and referred to by others as "speed-strength". In layman"s terms, the aim of plyometrics is to increase the explosiveness of the muscle allowing an athlete to run faster, jump further, or generate force at a greater rate. Plyometric training is a form of training that is used to help develop and enhance explosive power, which is a vital component in a number of athletic performances. This training method is meant to be used with other power development methods in a complete training program to improve the relationship between maximum strength and explosive power. The modern history of Plyometrics is somewhat brief but not relatively new. This technique was originated in Russia and Eastern Europe in the middle of 1960. The Soviets were very successful in the use of Plyometrics in their training programmes, especially in track and field. This technique was originally known as the "Shock Method of Training". Yuri Verhoshansky, a Russian coach whose success with jumpers is legendary, could very well be called the "Father of Plyometrics". He had tried and succeeded in

increasing his athletes‟ reactive abilities by experimenting with exercises like the depth jump. He has been the leading researcher and coach most recognized with the spread of Plyometrics. He also has been credited with most of the forms of plyometric training that are still in use today (Coetzee, 2007).

Methodology

The idea of the study was to investigate the impacts of ladder and plyometric training on agility among volleyballers. To assist the study, thirty volleyballers from Agricultural College and Research institute, Eachangkottai, Thanjavur, Tamilnadu, India were selected as subjects at random and their ages between 18 to 25 years. The subjects were separated into three equal groups. Group-I performed ladder training, group-II performed plyometric training and group-III was control. Agility was assessed by Illinois agility run test. The subjects were involved with their respective training for a period of eight weeks. At the end of the eighth weeks of the training post-tests were taken. The significant differences between the means of experimental group and control group for the pre-test and post-test scores were determined by paired „t‟ ratio and ANCOVA. The level of significance was fixed at 0.05 level of confidence for the degree of freedom.

Results

Table-1 shows that the obtained‘t’ values 4.91, 3.84 and 0.39 respectively of the ladder, plyometric and control groups are higher than the table value (2.14) required for significant at 0.05 level for 14 degrees of freedom. It exposed that significant mean differences existed on agility between the pre and post test scores of experimental groups. On the other hand, insignificant differences were found between the pre-test and post-test means of control group on agility as, the obtained‘t’ value 0.39 is lesser than the table value (2.14) required for significance. The result of the study produced 11.11%, 9.20% and 0.32% of improvement due to ladder, plyometric and control group on agility. The magnitude of changes on agility of ladder, plyometric and control groups are graphically shown in figure I for superior understanding.

The data collected from the three groups on agility was statistically analyzed by ANCOVA and the outcomes are presented in table 2. Table-2 reveals that the indicated that the obtained F-ratio for the pre-test means among the groups on agility were 18.25 for experimental group – I,

18.14 for experimental group – II and 18.21 for control group. The obtained F-ratio 0.13 was lesser than the table F-ratio 3.21. Hence the pre-test mean F-ratio was insignificant at 0.05 level of significance for the degree of freedom 2 and 42.

The post-test means were 16.21 for experimental group – I, 16.47 for experimental group – II and 18.15 for control group. The obtained F-ratio was higher than the table F-ratio 3.21. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. The adjusted post-test means were 16.17 for experimental group – I, 16.45 experimental groups – II and 18.13 for control group. The obtained F-ratio 7.12 was higher than the table F-ratio 3.22. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. It was concluded that there was a significant mean difference among ladder training group, plyometric training group and control group, in developing agility of the volleyballers. Table-3 shows the post hoc analysis obtained on adjusted post-test means. The mean difference required for the confidential interval to be significant was 0.98.

It was observed that the ladder training and plyometric training group significantly improved agility better than the control group.

Discussion on Findings

The result of the study indicates that the experimental group namely ladder training group and plyometric training group had shown significant enhancement in agility among the volleyballers. The control group volleyballers had not shown significant changes in agility. The analysis of the study indicates that the ladder and plyometric groups had shown significant level difference in agility among volleyballers.

It is contingent from the literature and from the outcome of the present study.

Table – I - 'Descriptive Analysis of the Data on Agility.						
Name of the Group	**Testing Period**	**Mean Score**	**SD**	**MD**	**Obtained 't' Ratio**	**Magnitude of Changes**
Ladder Training Group	Pre	18.25	0.93	2.04	4.91*	11.11
	Post	16.21	0.38			
Plyometric Training Group	Pre	18.14	0.75	1.67	3.84*	9.20
	Post	16.47	0.54			
Control Group (CG)	Pre	18.21	1.01	0.06	0.39	0.32
	Post	18.15	1.06			
Table Value for 11 degrees of freedom is 2. 20 *Significant at 0.05 level of significance						

Table 2: Analysis of Covariance on Agility of Experimental and Control Groups				
Ladder Training	**Plyometric Training**	**Control Group**	**MD**	**C I**
16.17	16.45	--	0.28	0.98
16.17	--	18.13	1.96*	0.98
--	16.45	18.13	1.68*	0.98

Table 3: Scheffe"s Post Hoc Test on Agility of Experimental and Control Groups				
Ladder Training	**Plyometric Training**	**Control Group**	**MD**	**C I**
16.17	16.45	--	0.28	0.98
16.17	--	18.13	1.96*	0.98
--	16.45	18.13	1.68*	0.98

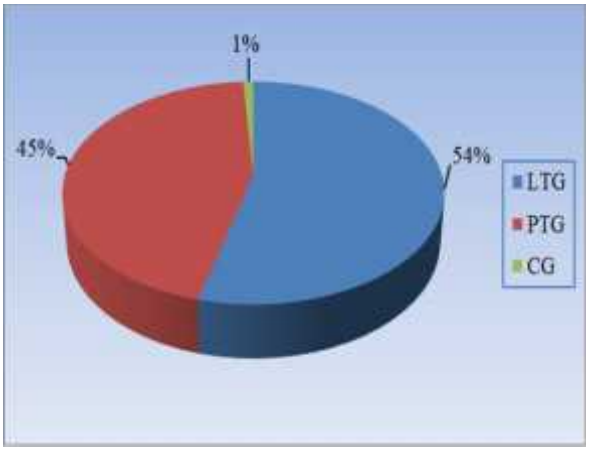

Figure 1: Pie Diagram Showing the Percentage of Changes on Agility

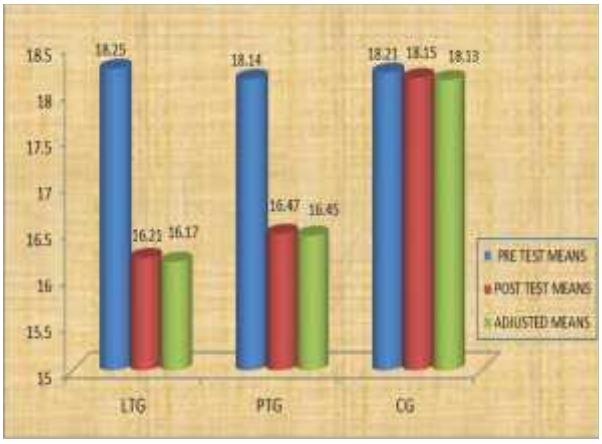

Figure 2: Graphical Representation of the Mean Values on Agility of Ladder, Plyometric and Control Groups (Unit of Measurements:

That methodically 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 Abdul Halik (2021)1, Jenith (2021), Senthil Kumaran (2018), Ooraniyan (2018) and Guruvupandian (2017).

Conclusions

The ladder training group produced significant improvement in agility. The 'f' values of the selected variables have reached the significant level.

The plyometric training group produced significant improvement in agility. The 'f' values of the selected variables have reached the significant level.In the control group the obtained 'f' value on agility were failed to reach the significant level

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Effect of Own Body Exercise Program onBody Composition and PhysiologicalVariables of School Boys

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Abstract

Own body weight exercises are strength training exercises that do not require any weights the practitioner's own weight provides the resistance for the movement. Movements such as the push-up, the pull-up, and the sit-up are some of the most common bodyweight exercises. The force–velocity relations of muscles are one of the critical factors to determine the physical performance and the mechanical power of muscle movements. This study was designed to effect of own body exercise program on body composition and physiological variables of school boys. To achieve the purpose of the study 30 school boys were selected from Government Higher Secondary School, Bhavani. Their age ranged between 15 and 16 years and they were divided into two equal groups consists of 15 each. Group I underwent the Own body exercise program and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. The data were collected from the subjects was statistically analyzed with dependent 't' test to find out significant improvement if any at 0.05 level of confidence. The results speculated that the Body Mass Index and Vital Capacity of school boys improved significantly due to the influence of own body exercise program with the limitations.

Keywords: Own body weight program, Body Mass Index and Vital Capacity.

1. Introduction

Resistance training is of utmost importance and necessity for the athletic condition, rehabilitation program, and general fitness. It is recommended by the American college of sports medicine (ACSM), for 8-12 repetitions of an exercise for each major muscle group at an intensity of 40% to 80% of IRM max, 2-3 of rest between the sets and 2-4 sets is recommended for each muscle group[1]. Despite previous misconceptions on the effectiveness and safety of youth resistance training, more recent studies show convincing evidence of RT on markers of performance and health in healthy children and adolescents, if appropriately prescribed and supervised[2]. Resistance training is an important tool for improving health and performance for one and all. Strength training is of utmost importance for athletes with regard to their training program[3]. Upper body strength is a very important part of the training program for the following sports men and women globally. The force–velocity relations of muscles are one of the critical factors to determine the physical performance and the mechanical power of muscle movements. It is well known that velocity of shortening depends on generated muscle force[4].

2. Methodology

Purpose of the study was to find out the Own body exercise program on selected physical fitness variables among school boys. To achieve the purpose of the study 30 school boys were selected from Government Higher Secondary School, Bhavani. Their age ranged between 15 and 16 years and they were divided into two equal groups consists of 15 each. The selected variables namely, Body mass index was

measured by Electronic Weighing Scale test and Vital capacity was measured by Spiro meter test. Group I underwent the Own body exercise program and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. All the subjects involved in this study were carefully monitored throughout the training program, none of the reported with tear and muscle soreness. The data was statistically analyzed with dependent't' test to find out the significant improvement between pre and post test. In all cases the criterion for statistical significance was set 0.05 level of confidence.

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 speed and explosive power of the pre and post test means of experimental and control groups have been analysed and presented in Table I.

Table I shows that the pre test mean values of experimental group and control group 24.00, 4.06 and 24.29, 3.95 respectively and the post test mean values are 23.03, 5.25 and 24.28, 3.92 respectively. The obtained dependent t-test, t value on body mass index and vital capacity of experimental group are 3.76 and 8.55 respectively. The table value required for significant difference with degrees of freedom 14 at 0.05 level of confidence is 2.14. The obtained 't' test value of experimental group was greater than the table value. The results clearly indicated that the body mass index and vital capacity of the experimental group improved due to the own body exercise program on school boys.

The result of the study on selected variables namely body mass index and vital capacity indicates experimental group (Own body resistance training) caused significant improvement after the Own body resistance training. Based on the mean value, the experimental group was found in better increasing on body mass index (Ashutosh et al., (2017) and Seron et al.,(2014)) and vital capacity (Dinesh et al., (2015) and Maryam et al., (2013)) when compared to the control group.

Table – I Analysis of 'T' Ratio for Body Mass Index and Vital Capacity

Variables	Group	Test	Mean	SD	DM	t-ratio
Body Mass Index	Experimental Group	Pre test	24.00	1.49	0.96	3.76*
		Post test	23.03	1.37		
	Control Group	Pre test	24.29	1.14	0.23	0.82
		Post test	24.28	1.20		
Vital Capacity	Experimental Group	Pre test	4.06	0.78	1.20	8.55*
		Post test	5.25	0.58		
	Control Group	Pre test	3.95	0.74	0.03	0.57
		Post test	3.92	0.75		
(Significance at 0.05 level of confidence for df of 14 is 2.14)						

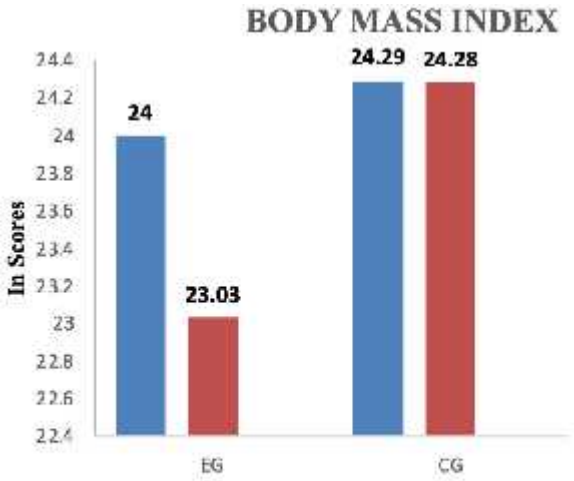

Figure –I Bar Diagram of Experimental and Control Group on Body Mass Index

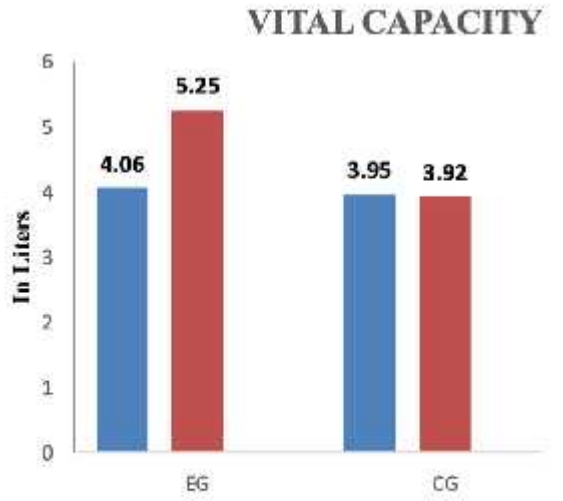

Figure-II Bar Diagram of Experimental and Control Group on Vital Capacity

4. Conclusion

Based on the findings and within the limitations imposed by the experimental conditions following conclusion were drawn.

Own body exercise program have lot of exercises and movements related with body mass index and vital capacity, the exercises can develop our body mass index and vital capacity also. So own body exercise program helped to develop the body mass index and vital capacity. The results of the study Own body exercise program group had significant improvement on body mass index and vital capacity when compared to the control group.

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Effect of Strength Training on Physical Fitness Variables of Adolescent Male Volleyball players

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Abstract

The study was designed to investigate the effect of strength training on physical fitness variables of adolescent male tennis players. To investigate the study, thirty adolescent male volleyball players were randomly selected from National Sports School, Ajjanoor, Coimbatore and their age were ranged between 14 and 17 years. The subjects were randomly assigned to two equal groups (n=15). All the subjects were divided in to two groups with 15 subjects each as experimental and control group. Group-I underwent strength training for a period of eight weeks and group-II acted as control who did not participate in any special training other than the regular routine. The physical fitness variables such as arm strength and abdominal strength were selected as dependent variables. Pre and post-test random group design was used for this study. The dependent't' test was applied to determine the difference between the means of two group. To find out whether there was any significant difference between the experimental and control groups. To test the level of significant of difference between the means 0.05level of confidence was fixed. The result of the study shows that, there was a significant improvement takes place on arm strength and abdominal strength of adolescent male volleyball players due to the effect of twelve weeks of strength training. And also concluded that, there was a significant difference exists between experimental and control groups in arm strength and abdominal strength. The control group did not improve the selected criterion variables.

Keywords: Strength training, Arm strength and Abdominal strength

1. Introduction

Volleyball quickly gained popularity among various YMCA branches in the States and it was subsequently spread to other parts of the world during the World War I by the American troops. Since, it is not a very vigorous sport, women also took interest in the sport and started playing Volleyball. Volleyball is played by two teams in a rectangular court, divided into two equal halves across the length by a net tightly stretched between two poles fixed at either sides of the court. Volleyball is a sport dominated by strength and power. Players need power in their legs to get high in the air and strength in their upper body to spike, block, and dig balls. Strengthening volleyball-specific muscles ensures that athletes are able to reach their maximum performance potential. Passing is often thought of as the most important skill in volleyball. If you can't pass the serve, then you won't ever put your team in a position to score a point. The importance of passing, volleying and serving is often undervalued (Anderson S., 2006).

Strength Training

Strength training is a type of exercise that improves muscular fitness through the use of resistance to the muscle. It involves activities that make your muscles do more work than they usually do. Strength training has been reported to cause muscle fiber hypertrophy, associated with an increase in contractile protein, which contributes to an increase in maximal contractile force (Sale et al., 1990).

Strength training is the ability of the muscles to repeat identical movement and pressures as to maintain a certain degree of

tension over a period of time (Johnson Barry L, et al., 1982) Strength training as the capacity of the whole organism is to withstand fatigue under the long lasting exhaustion of strength. Consequently it is characterized by a relatively high ability to express strength together with a faculty of preserve (Marget J Safnit, 1988).

The strength Training involved in playing volleyball will strengthen the upper body and lower body as well as the muscles of the thighs and lower legs. Playing volleyball also tones and strengthens the cardiovascular and respiratory systems. Improved circulation circulates more blood, oxygen and nutrients throughout the body, improving the body's functions and your overall health and well-being..

2. Methodology

The purpose of the study was to find out the effect of strength training. To achieve the purpose of the study, thirty adolescent male volleyball players were randomly selected from National Sports School, Ajjanoor, Coimbatore. The subjects were randomly assigned in to two equal groups namely, strength training group (STG) (n=15) and Control group (CG) (n=15). A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of eight weeks. The control group was not given any sort of training except their routine.

Training protocol

The training programme was conducted for 45 minutes for session in a day, 3 days in a week for a period of twelve weeks duration. These 45 minutes included 10 minutes warm up, strength training for 25 minutes and 10 minutes warm down. Every three weeks of training 5% of intensity of load was increased from 65% to 80% of work load. The volume of strength training prescribed based on the number of sets and repetitions. The equivalent in strength 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 twelve weeks on the above said variables due to the effect of strength training was statistically analysed with 't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. ($P<0.05$).

Table I reveals the computation of mean, standard deviation and 't' ratio on selected physiological variables namely arm strength abdominal strength of experimental group. The obtained't' ratio on arm strength and abdominal strength were 14.78, 14.69respectively. 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 computation of mean, standard deviation and 't' ratio on selected physical fitness variables namely arm strength and abdominal strength of control group. The obtained 't' ratio on arm strength and abdominal strength were1.46, 2.09respectively. 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 lesser than the table value it was found to be statistically not significant.

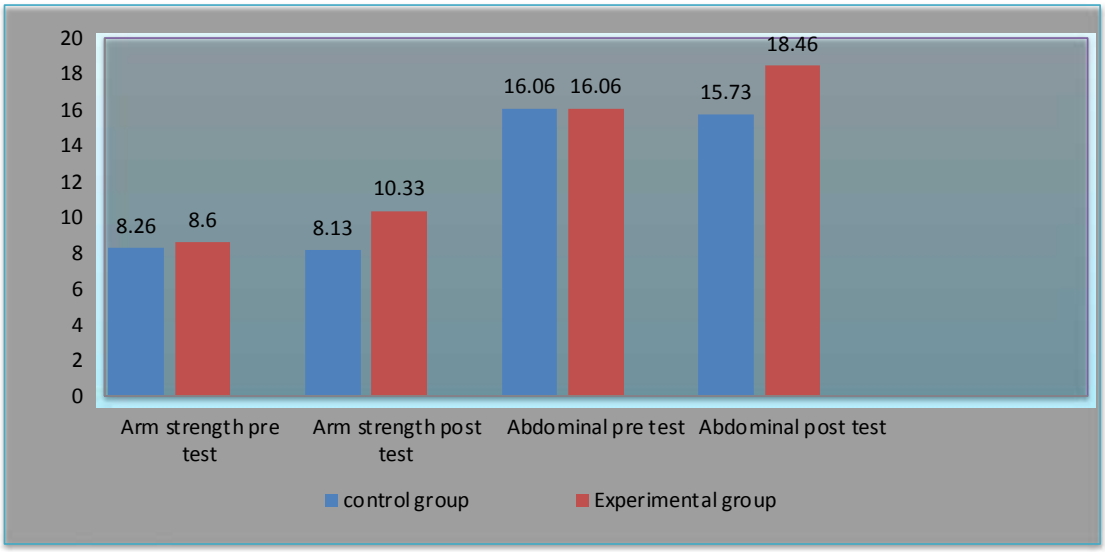
3. Results and Discussion

The results of the study indicated that the selected physical fitness variable arm strength and abdominal strength were improved significantly after undergoing strength training. The changes in the selected parameters were attributed the proper planning. Preparation and execution and execution of the training package given to the players. Malliou et al.,(2010)potential improvement on service performance while, the qualitative findings showed significant improvement in service technique.Bhadreshet al.,(2017)potential of using strength training to improve speed, agility and muscular endurance, particularly in male inter collegiate kabaddi players. Muthusubramanian et al.,(2015) potential concluded that novice high jumpers experience significant improvement in lower extremities strength and power.

Table I Computation of 'T' Ratio on experimental group and Control group Selected physical fitness variables of adolescent male volleyball players.

Group	Variables		Mean	N	Std. Deviation	Std. Error Mean	t ratio
Experimental Group	Arm strength	Pre	8.6	15	0.79	0.15	14.78*
		Post	10.33	15	0.72		
	Abdominal strength	Pre	16.06	15	0.96	0.16	14.69*
		Post	18.46	15	0.74		
Control group	Arm strength	Pre	8.26	15	0.79	0.09	1.46
		Post	8.13	15	0.74		
	Abdominal strength	Pre	16.06	15	0.79	0.15	2.09
		Post	15.73	15	0.79		

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



Logeswaran and Saravanan et al.,(2016) isometric strength training significantly improved vertical jump, leg explosive power and muscular power of school level adolescent basketball players.Ravindra et al., (2018) study provides support that 6- week strength training can be effective training program to improve strength in badminton player. Significant improvement in lower extremities strength and power. The finding of the present study had similarity with the findings of the investigations referred in this study.

4. Conclusion

Based on the findings and within the limitation of the study it is noticed that practice of strength training helped to improve physical fitness variables of adolescent male volleyball players. It was also concluded that the significant improvement in the arm strength and abdominal strength adolescent male volleyball players due to the influence of strength training further it also concluded that the eight weeks of the strength training significant improve the strength training on physical fitness variables of adolescents male volleyball players..

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