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Effect Of Sports Specific Plyometric Training On Physiological And Anthropometric Variables Of Cricket Players

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Abstract

Plyometric training, characterized by explosive movements like jumps and bounds, enhances neuromuscular coordination, agility, and explosive power. In cricket, this translates to improved sprinting speed, rapid directional changes, and elevated jumping ability, which are vital for quick singles, agile fielding, and effective bowling. In order to assess the real facts the investigator made an attempt to examine the impact of sports specific plyometric training on physiological and anthropometric variables of thirty cricket players were selected from Coimbatore district in Tamil Nadu state. They were age ranged between 14 to 17 years. Treatment group I underwent combined sports specific plyometric, group II acted as control group. All thirty subjects were inducted for pre and posttest on physiological and anthropometric variables are (vital capacity and calf girth). The sports specific plyometric training programme was given to the experimental group for 3 days per week (Monday, Wednesday and Friday) for the period of eight weeks. The control group was not given any sort of training except their routine work. The physiological variables vital capacity (wet spirometer test) thigh girth was assessed by Lufkin Anthropometric Tape Test were assessed before and after training period. The result from 't' test and inferred that 8 weeks sports specific plyometric training treatment produced identical changes over physiological and anthropometric variables of cricket players. Further, the findings confirmed the sports specific plyometric training is suitable protocol to bring out the desirable changes over vital capacity and calf girth variables of cricket players.

Key Words: Sports Specific Plyometric Training, Physiological Variables, Anthropometric Variables, Vital Capacity, Calf Girth and Cricket Players.

INTRODUCTION

Specificity of training is considered to be a fundamental component of any detailed goal oriented conditioning program. Whether one is training to improve functional ability. rehabilitate a musculoskeletal injury, or develop sport specific physiological attributes. The specific nature of the prescribed training regimen and the exercises contained within. Will dictate the magnitude of the adaptive response expressed at the myofibril level. When preparing to develop and enhance an athlete's capacity to execute movement skills and physical attributes positively correlated to successful athlete performance. The athlete must participate in a conditioning program that is special to tie demands of their particular athletic event. It is widely accepted that jumping ability constitutes an integral component of explosive performance **(fatouros** *et al* **2000)** it has also been stated that as competition and performance enhancement motivation levels increase. Activity and sport Specific movement patterns require increased power. Agility and speed **(Myer** *et.al.* **2006). Potteiger** *et al.* report that explosive leg power and vertical jump height are critical components of successful performance in many different athletic events **(Potteiger** *et al.,* **I999).**

A study focusing on young cricketers demonstrated that a sixteen-week plyometric program significantly improved their agility and reduced ground contact times, indicating enhanced explosive strength. Such an integrated approach not only enhances physical capabilities but also contributes to prolonged athletic longevity, as evidenced by players like Jimmy Anderson, whose sustained performance at the highest level is attributed to rigorous fitness and conditioning programs . Therefore, this study aims to fill the existing research gap by evaluating the effect of sport-specific plyometric training on various performance metrics in cricket players

2. MATERIALS AND METHODS

2.1Participants

In order to address the hypothesis presented herein, we selected 30 cricket players from various academies in Coimbatore District. Their age ranged from 14 to 17 years. The subjects were randomly assigned in to two equal groups namely, sports specific plyometric training group (SSPTG) (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 eight weeks. The control group was not given any sort of training except their routine.

2.2 Research Design

The evaluated physiological and anthropometric parameters were vital capacity were assessed by wet spirometer test in liters and calf girth were assessed by Lufkin Anthropometric Tape Test unit of measurement in meters. The parameters were measured at baseline and after 8 weeks of sports specific plyometric training group were examined. The intensity was increased once in two weeks based on the variation of the exercises.

2.3 Training Protocol

The training programme was lasted for 60 minutes for session in a day, 3 days in a week for a period of 8 weeks duration. These 60 minutes included warm up for 10 minutes, and 10 minutes warm down remaining 40 minutes allotted for training programme. The equivalent in sports specific plyometric training group is the length of the time each action in total 3 day per weeks (Monday, Wednesday and Friday).

2.4 Statistical Analysis

The collected data on physiological and anthropometric variables due to the effect of sports specific plyometric training group was statically analyzed with "t" test to find out the significant improvement between pre& posttest if any. In all case the criterion for spastically significance was set at 0.05level of confidence ($P<0.05$)

3. Results

All subjects completed the study according to the aforementioned methodology. The 15 training subjects averaged 96% attendance and no injuries occurred from the training program. There were no significant differences in height or weight between groups either before or after the training and detraining periods.

TABLE - I

COMPUTATION OF 'T' RATIO ON VITAL CAPACITY OF CRICKET PLAYERS ON EXPERIMENTAL GROUP AND CONTROL GROUP

(Scores in liters)

Group	Test		Mean	Std. Deviation	T ratio
Vital Capacity	Experimental Group	Pre test	3.36	0.12	5.28*
		Post test	3.51	0.12	
	Control Group	Pre test	3.37	0.11	0.49
		Post test	3.37	0.15	

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

Table I reveals the computation of mean, standard deviation and 't' ratio on vital capacity of experimental and control group. The obtained 't' ratio on vital capacity were 5.28 and 0.49 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the experimental group 't' values were greater than the table value of 2.14, it was found to be statistically significant. The control group 't' value is less then table value of 2.14 it was found to be statistically insignificant.

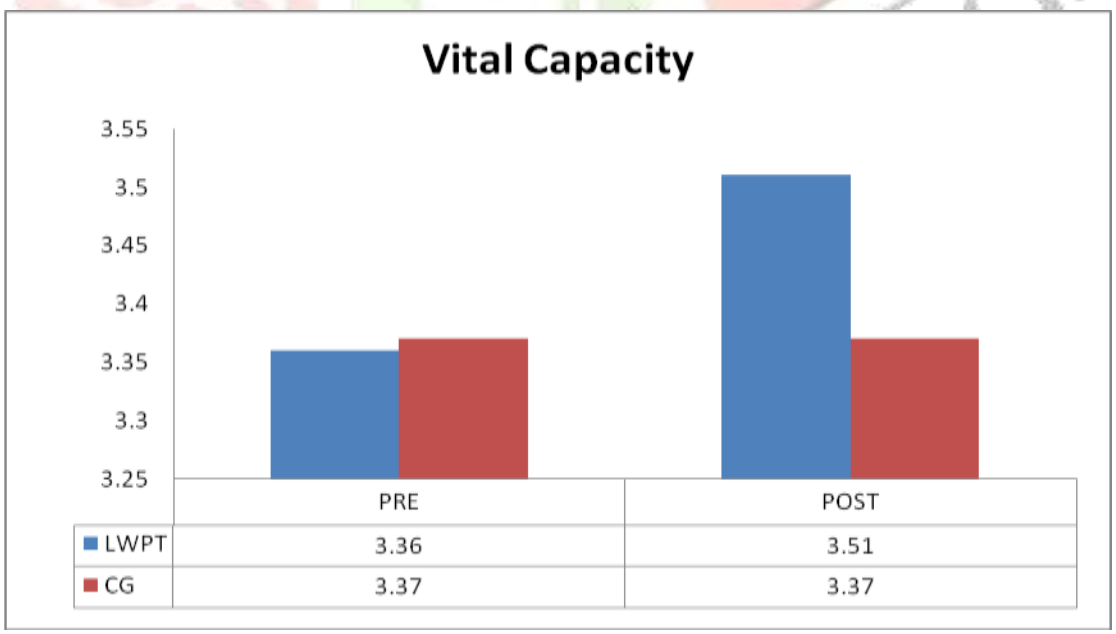

FIGURE- I

BAR DIAGRAM SHOWING THE MEAN VALUE ON VITAL CAPACITY OF KHO KHO PLAYERS ON EXPERIMENTAL GROUP AND CONTROL GROUP

TABLE - II

COMPUTATION OF 'T' RATIO ON CALF GIRTH OF CRICKET PLAYERS ON EXPERIMENTAL GROUP AND CONTROL GROUP

(Scores in Meters)

Group	Test		Mean	Std. Deviation	T ratio
Calf Girth	Experimental Group	Pre test	24.66	0.89	11.00*
		Post test	26.88	0.87	
	Control Group	Pre test	24.70	0.98	0.36
		Post test	24.69	0.66	

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

Table III reveals the computation of mean, standard deviation and 't' ratio on calf girth of experimental and control group. The obtained 't' ratio on calf girth were 11.00 and 0.36 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the experimental group 't' values were greater than the table value of 2.14, it was found to be statistically significant. The control group 't' value is less then table value of 2.14 it was found to be statistically insignificant.

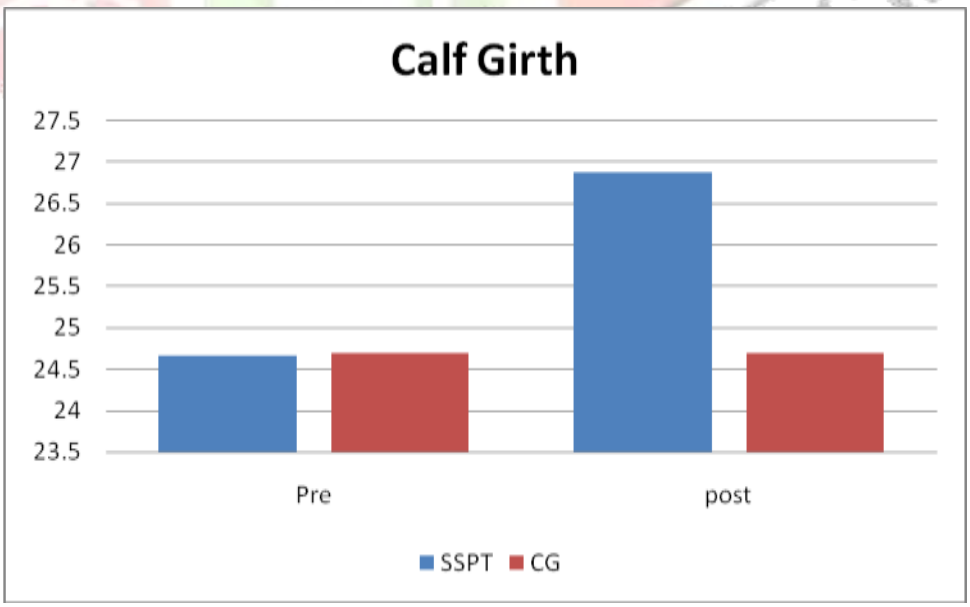

FIGURE- II

BAR DIAGRAM SHOWING THE MEAN VALUE ON CALF GIRTH OF CRICKET PLAYERS ON EXPERIMENTAL GROUP AND CONTROL GROUP

4. DISCUSSION

The present study experimented the effect of sports specific plyometric training on selected physiological and anthropometric variables of cricket players. The findings of the present study had similarity with the findings of the investigations referred in this study. However, there was a significantly changes of subjects in the present study the physiological and anthropometric variables was significantly improved of subject in the group may be due to the in sports specific plyometric training.

Specific training programme composed of multiple skill training components has shown significant effect in improving anaerobic power and capacity and beneficial effect on agility and vertical jump height. However, sports specific circuit training is useful for coaches with players in developing physical and physiological levels and to improve athlete's performance **(Brojwasi and Borker 2022).**

The results of the present study shown significantly higher session average of VO_2 Max, vital capacity and anaerobic power after a team sport specific training session conducted. It is also more likely that HR and VO_2 Max saturation response are a reflection of specific training session. It is well documented that effects of sports specific training and isotonic strength training are reduced heart rate and improved VO_2 Max possibility because of a lower intensity of exercises selected.

Upon further examination of the physiological response to strength training and sports specific plyometric training, it is apparent that there were different effects of ST and SSPT. Although heart rate for the entire session significantly higher on isotonic this was elevated as a result of a significantly higher HR in the drills.

These results are in agreement with several previous studies in ST and SSPT to improve physiological parameters as acquired fitness through the types of training leads to better physiologically performance.

Sports specific exercises are considered to be most effective training model that allows young cricket players to improve fitness. Participants in the present study have benefited with fitness improvement and refined their skills in the game due to properly designed training suited for college level men handball players. Moreover the SSPT offers an effective strategy of multicomponent training in order in induce positive effects on specific skill development of team sports related physical fitness.

Performing a sports specific conditioning session on a sand surface can result in a greater physiological responses (Vital Capacity and HR) without any additional decrement to next day performance **(Binnie** *et al.,* **2013).**

5. Conclusions

Based on the results and discussion of the study, the following conclusions were drawn:

It can be concluded that the implementation of sports specific plyometric exercises brought about significant improvements in both physiological and anthropometric variables of school-level cricket players.

These findings highlight that players with better adaptability to sports specific plyometric training tend to perform more effectively during crucial phases of the game, thereby contributing to overall athletic development. The outcomes of this study provide a scientific basis for incorporating structured sports specific plyometric training into cricket training regimens, ensuring improved physiological (Vital Capacity) efficiency and anthropometric variables (Calf Girth) changes for enhanced competitive performance.

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