EFFECTS OF HIGH INTENSITY AND LOW INTENSITY AEROBIC TRAINING ON SELECTED PHYSICAL AND PHYSIOLOGICAL VARIABLES OF SCHOOL LEVEL HAND BALL PLAYERS

R,Suresh Kumar Research Scholar, Dept of Physical Education (Part Time) Nallamuthu Gounder Mahalingam College Pollachi Coimbatore , Tamilnadu India

Dr R.Ashok Kumar Director of Physical Education(Research Guide) Nallamuthu Gounder Mahalingam College Pollachi Coimbatore Tamilnadu India

Abstract

Field sports such as football, team handball, hockey, rugby union and rugby league, Australian & Gaelic Rules football are characterised by a typically stop-start nature, with varying movement speeds, multiple changes of direction and the execution of decisions and individual skills under conditions of game pressure and/or fatigue. The nature of the movements in these sports requires the utilisation, and therefore training, of all three energy systems (ATP-PC, Glycolitic/Lactic acid and Aerobic systems). Despite the often stop-start nature of these sports, which heralds an increase in anaerobic energy contributions5 , high-intensity aerobic power and conditioning can be critical for success in many field sports.5,6,7 Due to the high-intensity and less predictable nature of movement of field sports compared to steady state "aerobic" long-distance sports (eg. triathlon, distance running, cycling, swimming etc), the aerobic and anaerobic conditioning for these sports should differ considerably to the aerobic requirements of "steady state" long-distance sports. To address this, there now appears to be a growing trend towards utilising recent research and training trends to fully develop the high-intensity aerobic power of the field sport athletes.The purpose of the present study, 45 players were selected as samples from in and around schools Pollachi Corporation in the year of 2020 - 2021. They were divided into three groups. Each group consists of 15 subjects. Group -I High intensity Training Group (STG), Group - II Low intensity Training Group (CTG) and Group III control group (CG). The ages of subjects were ranged from 15-17. The present study are significant source to maintain with its related physical and physiological such as Speed and Vo_2max. The statistical tools used are the analysis of co-variance was applied. To determine whether the training programmes produced significantly different improvements in selected variables after 8 weeks of training the analysis of co-variance was used. The result of this study indicates that there is insignificant difference in speed and Vo_2max among players of handball l game. The study stated that there would be significant difference among players of handball game. From the result of this study it is observed that there is significant improvement in speed and Vo_2max

Keyword: High and Low intensity aerobic training speed and Vo_2max

Introduction

The most recent research shows that the amount of time spent at or above the 100% Maximal Aerobic Speed (MAS) appears to be the critical factor for improving aerobic power.2-8,10 It has been determined that performing a number of short intervals at ≥100% MAS was a more effective method of building aerobic power than LSD training.10 This approach was also more effective than attempting to train only one interval continuously at 100% MAS.8 Specifically, an intensity of 120% MAS was determined to be the best single speed for short intervals that are

followed by a short respite (passive rest) interval, based upon the fact that this intensity allowed the greatest supramaximal training impulse (intensity x volume), in comparison to 90, 100, and 140% MAS.8 Especially, intervals of 120% MAS for 15-30 seconds.

Methodology

The purpose of the present study, 45 players were selected as samples from in and around schools Pollachi Corporation in the year of 2020 - 2021. They were divided into three groups. Each group consists of 15subjects. Group -I High intensity Training Group (STG), Group - II Low intensity Training Group (CTG) and Group III control group (CG). The ages of subjects were ranged from 15-17 In the present study are significant source to maintain with its related physical and physiological such as Speed and Vo_2max. The statistical tools used are the analysis of co-variance was applied. To determine whether the training programmes produced significantly different improvements in selected variables after 8 weeks of training the analysis of co-variance was used.

Training procedure

The basis of all this recent research is that high intensity intervals of typically 15-30 seconds, interspersed with 10-30 seconds of either low intensity active recovery (eg. 40% to 70%)or passive rest, continued in this manner for total set times of 4-10 minutes and repeated for 2 or more sets, greatly enhances aerobic power and capacity. This research emphasised that it didn't matter if the work/rest patterns were 20 seconds work, 10 seconds recovery or 15:15, instead the key fact was that training at, or above, 100% MAS was the key intensity parameter, and how long you spent there was the driving volume parameter under-pinning improvements in aerobic power. Consequently, high-intensity interval training at 100% (MAS Maximal Aerobic Speed)or at 120%+ (Supramaximal) now appear to be increasingly used for training elite or lower-level field sport athletes. The practical implementation of three of these methods will be detailed below.

Aerobic Training Zones Zone 1	Aerobic Recovery Zone 2	Aerobic threshold Zone 3	Aerobic Zone 4.	Anaerobic threshold Zone 5	Maximal aerobic Zone 6.
MAS Maximal Aerobic Speed) Zone	70%MAS	70% -77% MAS	78%- 85%MAS	86%-92%MAS	93%-100%MAS
Heart rate Zone	70%	70% -77%	78%- 85%	86%-92%	93%-100%

Eurofit Method with 1:1 work: Rest Ratio

Start line Marker cones for the different Groups

---------- 68m = 120% MAS, GR 6

---------- 72m = 120% MAS, GR 5

---------- 76m = 120% MAS, GR 4

---------- 79 m = 120% MAS, GR 3

---------- 83m =120%MAS, GR 2

---------- 86m = 120% MAS, GR 1

TABLE -1

F-RATIO FOR PRE-TEST AND POST-TEST AMONG THE HIGH INTENSITY TRAINING LOW INTENSITY TRAINING CONTROL GROUP ON SPEED

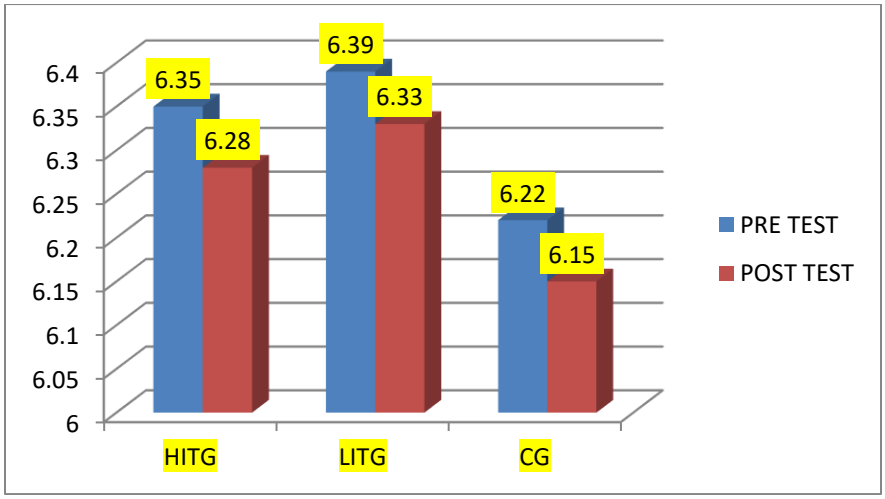
	Group	Mean	Source	Sum of Square	df	Mean Square	F-ratio
Pre-test	HITG	6.35	B/S	1.07	2	0.52	2.17
	LITG	6.39	W/S	11.35	44	0.24	
	CG	6.22					
Post test	HITG	6.28	B/S	2.19	2	1.04	4.41*
	LITG	6.33	W/S	12.19	44	0.24	
	CG	6.27					
Adjusted Post test Mean	HITG	6.15	B/S	0.9	2	0.11	46.12*
	LITG	6.19	W/S	0.97	44	0.002	
	CG	6.49					

*Significant at 0.05 level

Results of Speed

Table I reveals the F-value for pre-test 2.17 and post-test 4.41 among the experimental groups high and low intensity training group and control group on speed. To be significant at 0.05 level for degree of freedom 2, 44 the required critical value was 3.23. The F-ratio (2.17) obtained for pre-test was found to be not significant since it do not reach the required critical value 3.23.Regarding the F-ratio for post-test mean (4.41) it was found to statistically significant since it was higher than their required critical value 3.23. Based on F-ratio it was inferred that experimental group and control group are equal in this performance of speed before they were included into their respective treatment whereas, after completion of 8 week treatment period, experimental groups and control group were significantly different from one another in the performance of speed.

FIGURE -1



To identify the specific differences among the three groups as post hoc test was used. The results of post hoc testes are presented in table 2

TABLE -2

TABLE SHOWING THE SCHEFFES POST HOC TEST ON SPEED

Variables	HITG	LITG	CG	MD	C.I
	6.15	6.19	------	0.2*	
SPEED	6.15	-------	6.47	0. 37*	0.01
	------	6.19	6.47	0.26*	

Table 2 shows that the mean differences of speed among high and low intensity training group and control group were 1.2, 5.12 and 6.32 respectively. The required confidence interval value was 3.16.

Since the mean difference between speed among high and low intensity training group and control group were greater than the confidence interval value 3.16, it was observed that there was significant difference on speed between these groups. The mean value of speed among high and low intensity training group and control group were graphically represented in figure 2

FIGURE 2

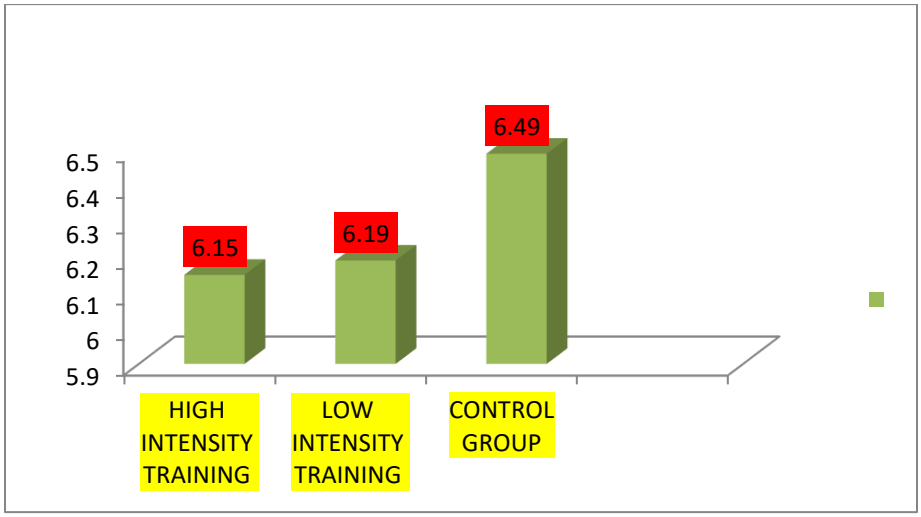


TABLE 3

F-RATIO FOR PRE-TEST AND POST-TEST AMONG THE AEROBIC TRAINING AND STRENGTH TRAINING CONTROL GROUP ON VO_2

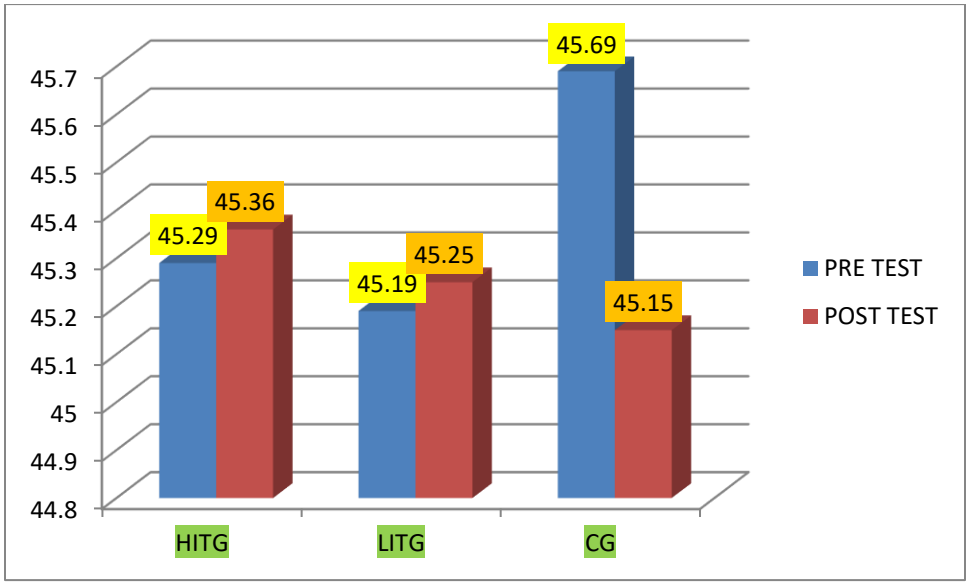
	Group	Mean	Source	Sum of Square	df	Mean Square	F-ratio
Pre-test	PSTG	45.29	B/S	2.80	2	1.40	.065
	SSHTG	45.19	W/S	907.20	44	21.60	
	CG	45.69					
Post test	PSTG	45.36	B/S	170.98	2	85.49	3.90
	SSHTG	49.25	W/S	919.60	44	21.90	
	CG	49.60					
Adjusted Mean	PSTG	45.15	B/S	166.73	2	83.37	84.78
	SSHTG	49.53	W/S	40.32	44	0.98	
	CG	48.81					

Results of VO_2MAX

Table 3 reveals that the F-value for pre-test .065 and post-test 3.90 among the experimental groups high and low intensity training group training group and control group on vo_2max. The obtained F-ratio for pre-test and post-test to be significant at 0.05 level for degree of freedom 2, 44 the required critical value was 3.23.hence, the F-ratio (0.15) obtained for pre-test was found to be not significant since it do not reach the required critical value 3.23.Regarding the F-ratio for post-test mean (3.90) was found to statistically significant since it

was higher than their required critical value 3.23. Based on F-ratio it was informed that experimental group and control group are equal in this performance of Vo_2max before they included into their respective treatment whereas, after completion of 8 week treatment period, experimental groups and control group were significantly different from one another in the performance of vo_2max.

FIGURE 3



To identify the specific differences among the three groups as post hoc test was used. The results of post hoc testes are presented in table 4

TABLE 4

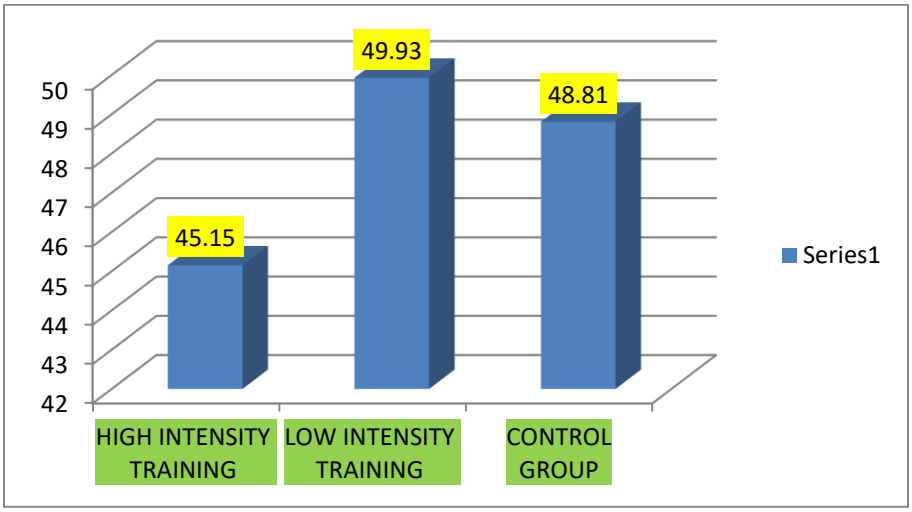
TABLE SHOWING THE SCHEFFES POST HOC TEST ON VO_2Max

Variables	HITG	LITG	CG	MD	C.I
	45.15	49.53	------	4.38	3.16
VO_2	45.15	-------	48.81	3.66	
Max	------	49.53	48.81	0.72	

Table 4 shows that the mean differences of Vo2 max among high and low intensity training group and control group were 45.15, 49.53 and 48.81 respectively. The required confidence interval value was 3.16.

Since the mean difference between VO2 max among high and low intensity training group and control group were greater than the confidence interval value 3.16, it was observed that there was significant difference on VO2 max between these groups. The mean value of VO2 max among high and low intensity training group and control group are graphically represented in figure 4.

FIGURE 4



Discussion of Findings

The pre-test before the related training showed that there was an insignificant and variation on speed and VO_2 Max among the three groups. The post-test after the related training showed significant improvement speed and VO_2 Max. In the high and low intensity training group and control group. Comparisons among these three groups resulted that the high intensity training group shows better improvement in all the selected variables than the low intensity training group and control group. The result also revealed that the speed and VO_2 Max were comparative better in the low intensity training group than the high intensity training group after the related training.

Conclusion and Recommendations

Based on the results of the study, the following recommendations have been made.

In the framing of physical exercise, while designing the training programme the effect of varied training programme is explained positively on muscle fitness parameters and physiological variables of handball players. This is due to integrating the high and low intensity training which requires the players to perform the exercises in a fatigue stage, resulting in potentially increasing the load and density. Hence the hand ball players can use this type of training as a module in order to achieve high level skill performance in the game of handball. In a combined training routine, a player performs a heavy set of scientific training exercise, which is followed almost immediately by a circuit exercise. Experienced athletes gain little in terms of enhancing their aerobic power from LSD training at 70-80% MAS. Training at, or above, their 100% MAS has been shown to be more effective. Integration of this type of training with challenging small-sided games is also highly recommended for field or court sport team athletes (handball soccer, hockey, basketball,

rugby league, rugby union etc) to complement their skill and tactical development under stressful situations akin to the real competitive environment.

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