Impact of Submaximal and Maximal Aerobic Training on Selected Body Composition And Physiological Variables Among Under 14 Years Cricketer

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Abstract- *The purpose of the study was find out the impact of submaximal and maximal aerobic training on selected body composition and physiological variables among under 14 years cricketer. Forty five under 14 years cricketer were selected randomly as subjects from YMCA, Cricket Academy at Chennai city, Tamilnadu, India. The subjects were selected random group design were divided in to three groups of fifteen each named as selected submaximal aerobic training group, maximal aerobic training group and control group. The subjects were tested prior to and after the twelve weeks of experimentation. The training program is scheduled at 6.30 am to 7.30 am on alternate days. Percent body fat and ventilator capacity variables measured by skinfold caliber and spirometer. The obtained data from the experimental and control group initial and final ridings were statistically analyzed with analysis of covariance (ANCOVA) with scheffes post hoc test applied to examine the difference between groups and testing condition. The level of confidence was fixed 0.05 level of confidence. Result the experimental group had achieved significant improvement on percent body fat and ventilator capacity when compared to control group. It was also observed that the 12 weeks of submaximal and maximal aerobic training program have significantly improved the body composition and physiological variables are percent body fat and ventilator capacity among under 14 years cricketer. The experimental group had achieved significant improvement on body composition and physiological variables are percent body fat and ventilator capacity when compared to control group.*

Keywords- percent body fat, spirometer, Weighing machine and Skinfold calibre.

I. INTRODUCTION

The term fitness is an important aspect to be developed in the minds of all the people irrespective of age and sex. Much attention has to be focused on youth physical fitness. A sound and well organized physical education program in the schools and colleges will be right solution for these problems. (Bucher, 2002).

CRICKET IN INDIA

Although cricket was introduced to India by European merchant sailors in the 18th century, and the first cricket club was established in Calcutta in 1792, India's national cricket team did not play its first Test match until 25 June 1932 at Lord's, becoming the sixth team to be granted Test cricket status. In its first fifty years of international cricket, India was one of the weaker teams, winning only 35 of the first 196 Test matches it played. From 1932 India had to wait until 1952, almost 20 years for its first Test victory. Traditionally much stronger at home than abroad, the Indian team has improved its overseas form since the start of the 21st century, winning Test matches in Australia, England and South Africa. It has won the Cricket World Cup twice – in 1983 under the captaincy of Kapil Dev and in 2011 under the captaincy of Mahendra Singh Dhoni. After winning the 2011 World Cup, India became only the third team after West Indies and Australia to have won the World Cup more than once and the first cricket team to win the World Cup at home. It has won the 2007 ICC World Twenty20 and 2013 ICC Champions Trophy, under the captaincy of Dhoni. It was also the joint champions of 2002 ICC Champions Trophy, along with Sri Lanka. As of 7th March 2017, India is ranked first in Tests, fourth in ODIs and second in T20Is by the ICC. Virat Kohli is the current captain of the team across all formats, while former Test captain Anil Kumble is the head coach. The Indian cricket team has rivalries with other Test-playing nations, most notably with Pakistan, the political arch-rival of India. However, in recent times, rivalries with nations like Australia and England have also gained prominence. (Sheringham and Sam, 2011).

VENTILATION CAPACITY

In respiratory physiology, ventilation is the movement of air between the environment and the lungs via

inhalation and exhalation. Thus, for organisms with lungs, it is synonymous with breathing. (Panis L, 2010).

II. METHODOLOGY

The purpose of the study was find out the impact of submaximal and maximal aerobic training on selected body composition and physiological variables among under 14 years cricketer. Forty five under 14 years cricketer were selected randomly as subjects from YMCA, Cricket Academy at Chennai city, Tamilnadu, India. The subjects were selected random group design were divided in to three groups of fifteen each named as selected submaximal aerobic training group, maximal aerobic training group and control group. The subjects were tested prior to and after the 12 weeks of experimentation. The training program is scheduled at 6.30 am to 7.30 am on alternate days. Percent body fat and ventilator capacity variables measured by skinfold caliber and spirometer. The obtained data from the experimental and control group initial and final ridings were statistically analyzed with analysis of covariance (ANCOVA) with scheffes post hoc test applied to examine the difference between groups and testing condition. The level of confidence was fixed 0.05 level of confidence.

III. RESULTS AND DISCUSSIONS

Table 1. ANALYSIS OF COVARIANCE ON PERCENT BODY FAT OF EXPERIMENTAL AND CONTROL GROUP

Mean	Submaximal Aerobic Training Group	Maximal Aerobic Training Group	Control Group	SOV	Ss	df	M.sq	'F' ratio
Pre-test Mean	15.93	15.40	15.83	B	2.84	2	1.42	0.37
S.D.	1.66	2.09	2.01	W	157.46	42	3.74	
Post-test Mean	13.40	14.06	16.00	B	54.71	2	27.35	9.08*
S.D.	1.45	1.90	1.81	W	126.53	42	3.01	
Adjusted post-test Mean	13.25	14.36	15.85	B	51.04	2	25.52	65.88*
				W	15.88	41	0.38	

*Significant at 0.05 level of confidence

*The required value for significance at 0.05 level of confidence for 2 and 42 and 41 are 3.22 and 3.23.

The table I reveals that the pre-test means in percent body fat of the submaximal aerobic training group, maximal aerobic training group and control group are 15.93, 15.40 and 15.83 respectively. The 'F' ratio of 0.37 for pre test scores was less than the table values of 3.22 for df 2 and 42 required for significant at 0.05 level of confidence on percent body fat.

The post-test means of the submaximal aerobic training group, maximal aerobic training group and control group are 13.40, 14.06 and 16.00 respectively. The 'F' ratio of 9.08 for post test scores was greater than the table values of 3.22 for df 2 and 42 required for significant at 0.05 level of confidence on percent body fat.

The adjusted post-test means of the submaximal aerobic training group, maximal aerobic training group and control group are 13.25, 14.36 and 15.85 respectively. The 'F' ratio of 65.88 for adjusted post test scores was greater than the table values of 3.23 for df 2 and 41 required for significant at 0.05 level of confidence on percent body fat. Among the three groups the hypothesis has been accepted.

Table 2. Scheffes Post-Hoc Test For Mean Difference Between Paired Means On Percent Body Fat

Submaximal Aerobic Training Group	Maximal Aerobic Training Group	Control Group	Mean difference	Confidence Interval value
14.36	13.25		1.11*	0.56
14.36		15.85	1.49*	0.56
	13.25	15.85	2.6*	0.56

*Significant at 0.05 level of confidence.

Scheffes post hoc test however showed that the adjusted post test paired mean differences on percent body fat between submaximal aerobic training group, maximal aerobic training group, submaximal aerobic training group and control group and maximal aerobic training group and control group were 1.11, 1.49 and 2.60 respectively. Which are higher than the confidence interval of 0.56 required for significance at 0.05 levels.

It is inferred that the twelve weeks of submaximal aerobic training group, maximal aerobic training groups have significantly decrease the percent body fat as compared to the control group. The result also reveals that the decrease in percent body fat is significantly more for maximal aerobic training group was higher than submaximal aerobic training group.

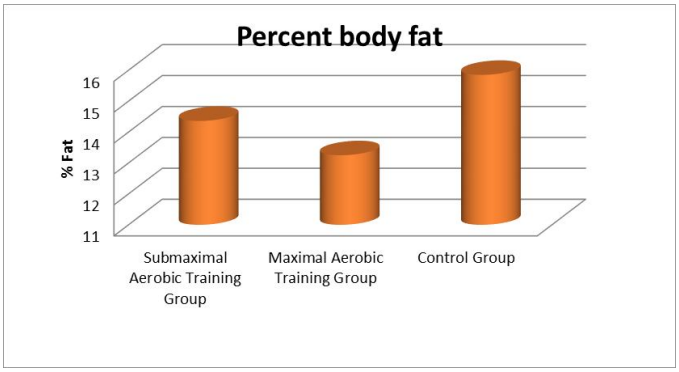

Figure 1.

Table 3. Analysis Of Covariance On Ventilatory Capacity Of Experimental And Control Group

Mean	Submaximal Aerobic Training Group	Maximal Aerobic Training Group	Control Group	SOV	Ss	df	M.sq	'F' ratio
Pre-test Mean	3.165	3.155	3.157	B	0.001	2	0.0005	0.45
S.D.	0.100	0.104	0.090	W	0.408	42	0.010	
Post-test Mean	3.597	3.734	3.168	B	2.624	2	1.312	72.24*
S.D.	0.104	0.175	0.113	W	0.763	42	0.018	
Adjusted post-test Mean	3.593	3.788	3.170	B	2.615	2	1.308	100.37*
				W	0.534	41	0.013	

*Significant at 0.05 level of confidence

*The required value for significance at 0.05 level of confidence for 2 and 42 and 41 are 3.22 and 3.23.

The table III reveals that the pre-test means in ventilatory capacity of the submaximal aerobic training group, maximal aerobic training group and control group are 3.165, 3.155 and 3.157 respectively. The 'F' ratio of 0.045 for pre test scores was less than the table values of 3.22 for df 2 and 42 required for significant at 0.05 level of confidence on ventilatory capacity.

The post-test means of the submaximal aerobic training group, maximal aerobic training group and control group are 3.597, 3.734 and 3.168 respectively. The 'F' ratio of 72.24 for post test scores was greater than the table values of 3.22 for df 2 and 42 required for significant at 0.05 level of confidence on ventilatory capacity.

The adjusted post-test means of the submaximal aerobic training group, maximal aerobic training group and control group are 3.593, 3.738 and 3.170 respectively. The 'F' ratio of 100.37 for adjusted post test scores was greater than the table values of 3.23 for df 2 and 41 required for significant at 0.05 level of confidence on ventilatory capacity. Among the three groups the hypothesis has been accepted.

Table 4. Scheffes Post-Hoc Test For Mean Difference Between Paired Means On Ventilatory Capacity

Submaximal Aerobic Training Group	Maximal Aerobic Training Group	Control Group	Mean difference	Confidence Interval value
3.593	3.738		0.145*	0.104
3.593		3.170	0.423*	0.104
	3.738	3.170	0.568*	0.104

*Significant at 0.05 level of confidence.

Scheffes post hoc test however showed that the adjusted post test paired mean differences on ventilatory capacity between submaximal aerobic training group and maximal aerobic training group, submaximal aerobic training group and control group and maximal aerobic training group and control group were 0.145, 0.423 and 0.568 respectively. Which are higher than the confidence interval of 0.104 required for significance at 0.05 levels.

It is inferred that the twelve weeks of submaximal aerobic training group, maximal aerobic training groups have significantly increase the ventilatory capacity as compared to the control group. The result also reveals that the increase in ventilatory capacity is significantly more for maximal aerobic training group was higher than submaximal aerobic training group.

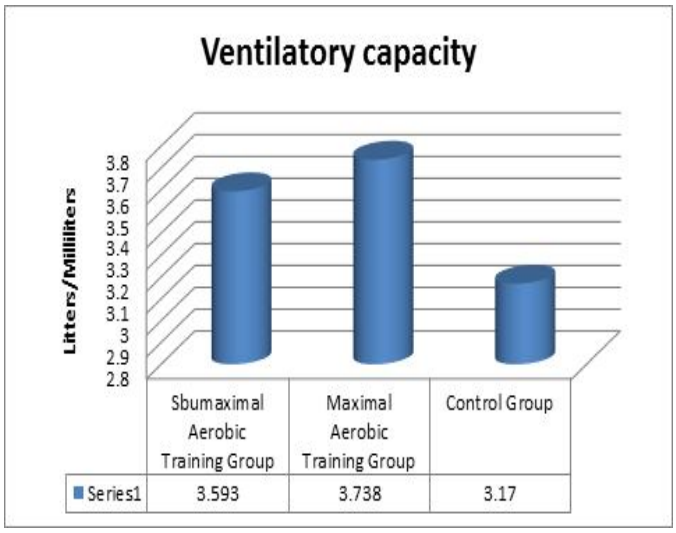

Figure 2.

IV. CONCLUSION

Body composition and physiological variables namely percent body fat and ventilator capacity. There was significantly decrease in percent body fat and increase in ventilator capacity for both submaximal aerobic training and maximal aerobic training group as compared to control group.

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