ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access e-journal)

Effect of Circuit Training and Circuit Weight Training With and Without Protein Supplementation on Coronary Heart Risk Factor of College Men Players

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Received 1st November 2014, Accepted 27th December 2014

Abstract

The purpose of the study was to find out the impact of circuit training and circuit weight training with and without protein supplementation on coronary heart risk factor of college men players. The study was conducted on sixty (N=60) college students studying in the Department of Physical Education and Sports Sciences, Annamalai University, Annamalainagar, Tamil Nadu were selected as subjects. The age of the subjects were ranged from 18 to 21 years. The subjects were assigned at random into four groups of fifteen each (n=15). Group-I underwent Circuit Training with supplementation of protein, Group-II underwent Circuit Training without supplementation of protein, Group-III underwent Circuit weight Training with supplementation of protein and Group-IV underwent Circuit weight Training without supplementation of protein. All the four Experimental groups underwent their respective training for 8 weeks. Among the Coronary Heart Risk Factors only High Density Lipoprotein Cholesterol Levels (HDL-C) were selected as dependent variables and it was assessed by Boehringer Mannheim Kit method at Kannan Medical Laboratory at Chitambaram, Tamilnadu. All the subjects were tested prior to and after the training for all the selected variables. The data collected from the four groups prior to and post experimentation was statistically analyzed by using Analysis of Covariance (ANCOVA). Scheffe's post hoc test was applied to determine the significant difference between the paired means. In all the cases 0.05 level of significance was fixed. The results of the study showed that there was a significant difference was found among all the experimental groups. Circuit weight Training with supplementation of protein groups is found to be better than other experimental groups.

Keywords: Circuit training, High Density Lipoprotein (HDL-C), placebo.

Introduction

Regular activity and exercise make for a healthier heart. A healthy heart is a strong heart that works efficiently. The heart pumps blood, which carries oxygen to muscles and carries away waste. How well the heart performs is a good indication of how healthy a person's cardiovascular system is. Circuit Training is probably the most common training regime used by wide variables of sports activities in order to improve performance. A circuit consists of a number of different stations at which the athlete performs a given exercises as many times as possible with in a given time period. When the time is completed, the individual moves on to the nest station and performs a different exercise for a similar period of time and so on around the various stations (Connolly & Einzing, 1986). Coronary heart disease is caused by a thickening of the inside walls of the coronary arteries. This thickening, called atherosclerosis narrows the space through which blood can flow, decreasing and sometimes completely cutting off the supply of oxygen and nutrients to the heart. Atherosclerosis usually occurs when a person has high levels of cholesterol, a fat-like substance, in the blood. Cholesterol and fat, circulating in the blood, build up on the walls of the arteries. The buildup narrows the arteries and can slow or block the flow of blood. When the level of cholesterol in the blood is high, there is a greater chance that it will be deposited onto the artery walls. This process begins in most people during childhood and the teenage years, and worsens as they get older (Peltonen et al., 1981). Cholesterol is also a key precursor or intermediate compound in the production of numerous biologically important substances collectively called steroids. These include various essential hormones and bile acids, the major excretory product of cholesterol metabolism, which is also important in the digestion and absorption of dietary lipids (Stefanick, 1994).

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Methodology

Sixty (N=60) College students from Department of Physical Education and Sports

Sciences, Annamalai University, Annamalainagar, Tamil Nadu were selected as subjects. The age of the subjects were ranged from 18 to 21 years. The subjects were assigned at random into four groups of fifteen each (n=15). Group-I underwent Circuit Training with supplementation of protein (placebo), Group-II underwent Circuit Training without supplementation of protein, Group-III underwent Circuit weight training with supplementation of protein (placebo) and Group-IV underwent Circuit weight training without supplementation of protein. All the four Experimental groups undergo their respective training for 8 weeks. Among the Coronary Heart Risk Factors only High Density Lipoprotein Cholesterol Levels (HDL-C) were selected as dependent variables and it was assessed by Boehringer Mannheim Kit method at Kannan Medical Laboratory at Chitambaram, Tamilnadu. The 0.5 gm of placebo capsules were supplemented to the placebo groups respectively throughout the experimental period.

Analysis of the Data

The data collected from the experimental groups 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. The Analysis of covariance (ANCOVA) on High Density Lipoprotein Cholesterol Levels (HDL-C) of Experimental Groups, have been analyzed and presented in Table -I.

Table I. Values of Analysis of Covariance for Experimental Groups on High Density Lipoprotein Cholesterol Levels (HDL-C)

Adjusted Post test Means				S o V	Sum of Squares	df	Mean Squares	'F' Ratio
Circuit Training with supplementation of protein Group – (I)	Circuit Training without supplementation of protein Group – (II)	Circuit weight Training with supplementation of protein Group – (III)	Circuit weight training without supplementation of protein Group – (IV)					
46.28	44.04	50.89	48.40	B W	366.81 219.12	3 55	122.27 3.98	30.72*

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

***(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 mean value of High Density Lipoprotein Cholesterol Levels (HDL-C) for Circuit Training with supplementation of protein (placebo), Circuit Training without supplementation of protein, Circuit weight training with supplementation of protein (placebo) and Circuit weight training without supplementation of protein are 46.28, 44.04, 50.89 and 48.40 respectively. The obtained F-ratio of 30.72 for the adjusted post test mean is more than the table value of 2.77 for df 3 and 55 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 Experimental Groups on the increase of High Density Lipoprotein Cholesterol Levels (HDL-C). To determine which of the paired means had a significant difference, 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 tests paired means on High Density Lipoprotein Cholesterol Levels (HDL-C)

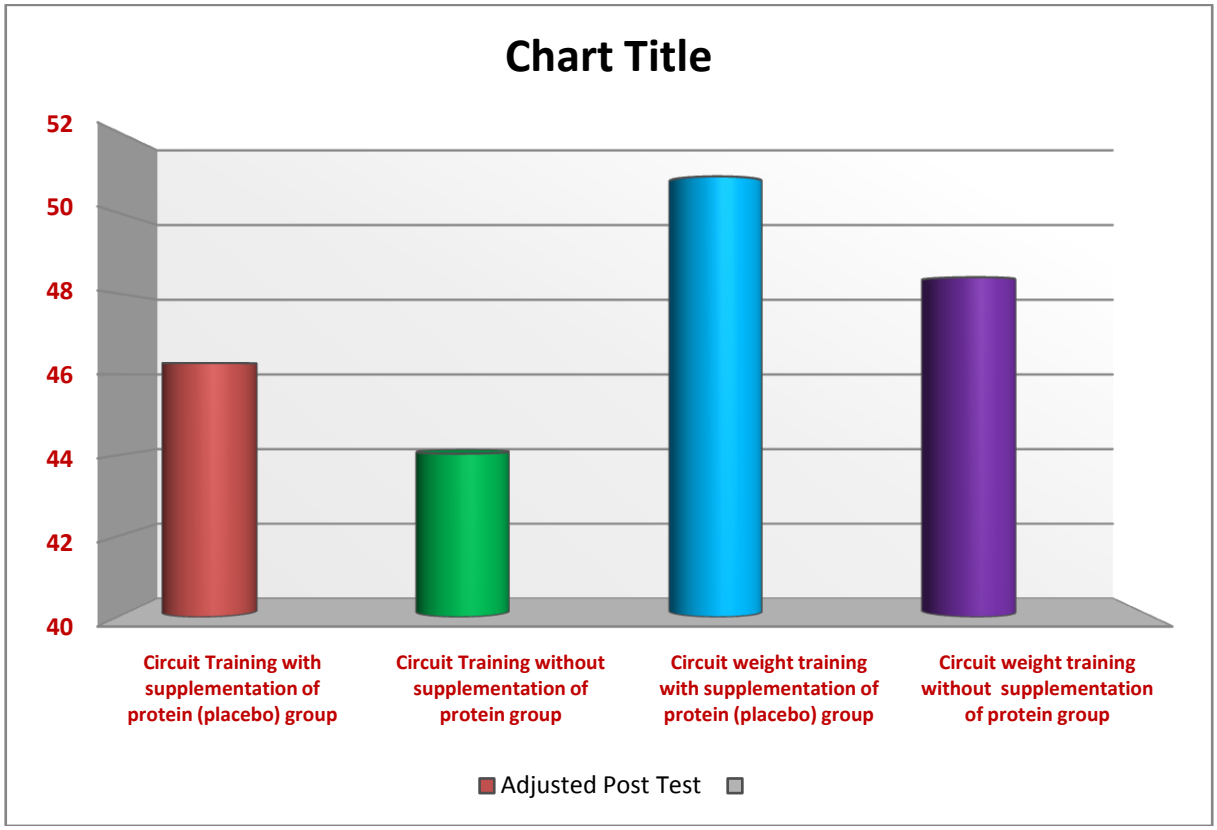
Adjusted Post test Means				M D	C I
Circuit Training with supplementation of protein Group – (I)	Circuit Training without supplementation of protein Group – (II)	Circuit weight Training with supplementation of protein Group – (III)	Circuit weight training without supplementation of protein Group – (IV)		
46.28	44.04	--	--	2.24*	2.09
46.28	--	50.89	--	4.61*	2.09
46.28	--	--	48.40	2.12*	2.09
--	44.04	50.89	--	6.85*	2.09
--	44.04	--	48.40	4.36*	2.09
--	--	50.89	48.40	2.49*	2.09

**** Significant at.05 level of confidence***

Table II shows that the adjusted post test mean difference on Circuit Training with supplementation of protein (placebo) group and Circuit Training without supplementation of protein group, Circuit Training with supplementation of protein (placebo) group and Circuit weight training with supplementation of protein (placebo) group, Circuit Training with supplementation of protein (placebo) group and Circuit weight training without supplementation of protein group, Circuit Training without supplementation of protein group and Circuit weight training with supplementation of protein (placebo) group, Circuit Training without supplementation of protein group and Circuit weight training without supplementation of protein group, Circuit weight training with supplementation of protein (placebo) group and Circuit weight training without supplementation of protein (placebo) group are 2.24, 4.61, 2.12, 6.85, 4.36 and 2.49 respectively and they are greater than the confidence interval value 2.09, 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 High Density Lipoprotein (HDL-C) between the adjusted post test means of Circuit Training with supplementation of protein (placebo) group and Circuit Training without supplementation of protein group, Circuit Training with supplementation of protein (placebo) group and Circuit weight training with supplementation of protein (placebo) group, Circuit Training with supplementation of protein (placebo) group and Circuit weight training without supplementation of protein group, Circuit Training without supplementation of protein group and Circuit weight training with supplementation of protein (placebo) group, Circuit Training without supplementation of protein group and Circuit weight training without supplementation of protein group, Circuit weight training with supplementation of protein (placebo) group and Circuit weight training without supplementation of protein (placebo) group. However, the improvement in High Density Lipoprotein Cholesterol Levels (HDL-C) was significantly higher for Circuit weight training with supplementation of protein (placebo) group than other Experimental Groups. It may be concluded that the Circuit weight training with supplementation of protein (placebo) group is better than the other Experimental Groups in improving High Density Lipoprotein Cholesterol Levels (HDL-C). The adjusted post test mean values of Experimental Groups on High Density Lipoprotein Cholesterol Levels (HDL-C) are graphically represented in the Figure -I.

Figure I. The Adjusted Post Tests Mean Values of Experimental Groups on High Density Lipoprotein Cholesterol Levels (Hdl-C)



Conclusion

From the analysis of the data, the following conclusions were drawn.

1. The Experimental groups namely, Circuit Training with supplementation of protein (placebo), Circuit Training without supplementation of protein, Circuit weight training with supplementation of protein (placebo), Circuit weight training without supplementation of protein had significantly improved High Density Lipoprotein Cholesterol Levels (HDL-C).
2. The Circuit weight training with supplementation of protein (placebo) was found to be better than the Circuit Training with supplementation of protein (placebo), Circuit Training without supplementation of protein and Circuit weight training without supplementation of protein in increasing High Density Lipoprotein Cholesterol Levels (HDL-C).

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Please cite this article as: K. Jayachandran. Effect of Circuit Training and Circuit Weight Training With and Without Protein Supplementation on Coronary Heart Risk Factor of College Men Players *International Journal of Recent Research and Applied Studies*, 2014, 1, 7(28), 111 - 114.