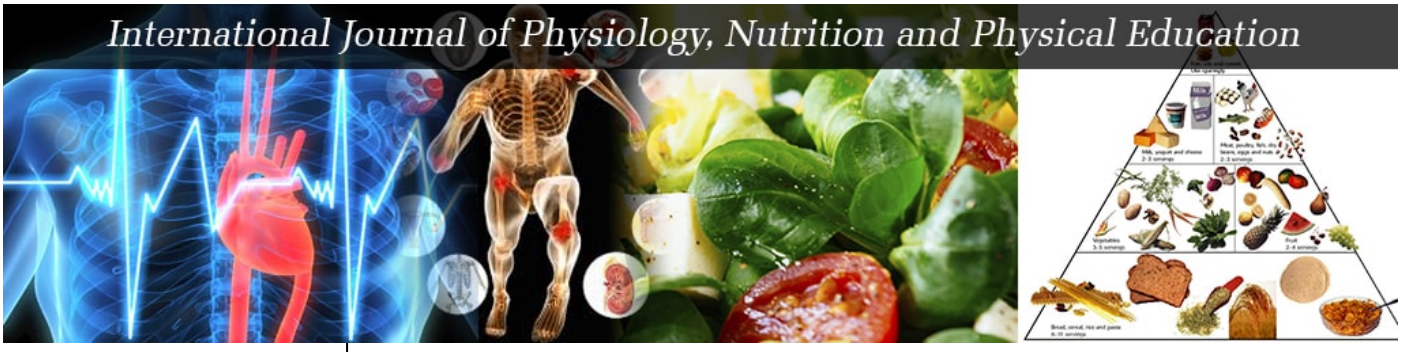

ISSN: 2456-0057
IJPNPE 2018; 3(2): 2228-2231

www.journalofsports.com
Received: 23-05-2018
Accepted: 25-06-2018

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Effect of cycling on body composition and lipid profiles among sedentary boys

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Abstract
Sixty subjects were randomly assigned to either experimental group (30) or control group (30). Physical examination and medical checkup at the initiation of the study yielded norminal results in all the subjects and none of the subjects received any medication during the period of the study. The experimental group underwent cycling training programme for a period of 16 weeks, whereas the control group maintained their regular routine activities. The training load was gradually increased from 60% to 80%. Sixteen weeks (slow continuous run) training was imparted with sessions increasing from 3 to 5 per week and the duration increasing from 30 minutes to 55 minutes. BMI, total cholesterol, HDL, LDL and triglycerides of both groups were assessed before and after the training programme. The data was statistically analyzed by using analysis of covariance (ANCOVA) using SPSS statistical computer package. The results of the study showed that there was significant difference among the adjusted post test mean of experimental and control group.

Keywords: Body Mass Index, lipid profile, HDL,LDL

Introduction
The role of physical activity in modification of coronary heart disease risk factors continues to be of considerable concern. Physical exercise induces an anti atherogenic lipoprotein profile and favorable body composition among young and older people (Baiju and Sreedhar, 2007) [1]. It is well documented that physical activity produces health benefits, but the type and amount of exercise prescribed to induce favorable changes in coronary heart disease risk factors is unclear, however this an evidence based inverse linear dose relationship between the amount of exercise, and the incidence of CVD and mortality (Haennand Lemire, 2002) [4]. The effect of endurance training on body composition and lipid profiles among 60 sedentary boys were assessed to find out the role of physical training in managing the lipid profiles and body composition.

Methodology
Sixty subjects between19-21years of age were randomly assigned to either control group (30) or experimental years of age group, (30). The height, and weight, were measured 24 hours prior (pre)and24 hours after (post) the training programme. Sixteen weeks (cycling) training was imparted with sessions increasing from 3 to 5 per week and duration increasing from 30 minutes to 55 minutes. The control group maintained the irregular routine activities. BMI, total cholesterol, HDL, LDL and triglycerides of both groups were assessed before and after the training programme. The data was statistically analyzed by using analysis of covariance (ANCOVA) using SPSS statistical computer package.

Analysis of the data and results of the study.
The height (mts) and weight (kgs) the subjects were measured in the fasting state with minimum clothing and without footwear. The body mass index (BMI) was calculated by using formula

$$\text{BMI} = \frac{Weight}{\text{Height m}^2} \text{ (kg)}$$

The number of sessions per week, duration of the session corresponding WLT are given in table-l.

Table 1: Training Schedule

weeks	No. of Sessions	Duration(min)	Bi weekly load of training (BWLT) minutes
1and 2	6	30	180
3 and 4	6	35	210
5 and 6	6	40	240
7 and 8	8	40	320
9 and 10	8	45	360
11 and 12	8	50	400
13 and 14	10	50	500
15and 16	10	55	550
Total	56		2760 min.

The process of blood sample collection from the subjects were done on two consequent days during both pre and post training 48hours before the commencement of the training programme10 ml of blood was collected into polystyrene disposable syringe with attached 21 G needle by venupuncture of a large anticubital vein in the right or left arm. The subjects were seated in the upright position at the time of sampling. Blood samples were drawn between 06.00 and 08.00 hours. All the subjects had not eaten or exercised the preceding10 hours. The collected samples were transformed into sets of sterilised and labeled tubes. Those tubes were previously heparanised and10 ml of blood was transformed into them for the purpose of plasma separation. Plasma was separated from white blood within one hour and the labeled samples were stored at 4°C. Lipoprotein analysis were completed within 24 hours of sampling. LDL cholesterol and VLDL cholesterol were calculated using the Federal equation (1972). The same procedure was repeated during the post test sampling.

LDL –C +TC – (HCL – C+ VLDL-C)
VLDL – C = TG/5

The data collected from experimental and control groups prior to and after completion of the training period on selected variables were statistically examined for significant difference if any, by applying analysis of covariance (ANCOVA). The data was analysed in the computer using 'SPSS' statistical package. The level of confidence was fixed at 0.05 level of significance as the number of subjects were limited and also as the selected variables might fluctuate due to various extraneous factors.

The data obtained from both the experimental groups and control group before and after the experimental period was statistically analysed separately for significant differences by applying analysis of covariance. Table 2 shows the body weight and BMI among experimental and control group before and after the training period.

Table 2: Analysis of covariance for the selected body composition variables among experimental and control groups.

		Exp Group	Cont Group	SOV	SS	Df	Ms	'F'-ratio
Body weight(kg)	Pre test	57.01	56.17	B	12.15	1	12.15	1.56
		(2.08)	(3.35)	W	452.03	58	7.79	
	Post test	56.765	6.43	B	1.67	1	1.67	0.23
		(2.01)	(3.22)	W	418.73	58	7.22	
	Ad post test	56.89	56.34	B	4.70	1	4.70	14.85 (P≤0.05)
				W	18.03	57	0.31	
Body mass index	Pre Test	19.94	19.73	B	0.69	1	0.69	0.61
		0.91	(1.15)	W	62.37	58	1.08	
	Post Test	19.84	19.86	B	0.01	1	0.01	.01
		(0.89)	(1.10)	W	79.34	58	3.60	
	Ad post Test	19.95	19.72	B	0.81	1	0.81	14.70 (P≤0.05)
				W	3.15	57	0.055	

The pre test means of body weight among experimental group (57.07 + 2.08) and control group (57.173.35) resulted in an 'F-ratio of 1.56 which indicate no significant difference between pre test means at 0.05 level of confidence. The post test means of bodyweight among experimental group (56.77 2.01) and control group (56.43+3.22) resulted in an 'F- ratio of 23 which was significant at 0.05 level of confidence, whereas the adjusted post test means of experimental (56.90) and control group (56.34) resulted in an 'F ratio of 14.85 which was significant at 0.05 level of confidence. This indicates that there was significant change in body weight among the experimental group when compared with the control group.

The pre test means of body mass index among experimental group (19.94 + 0.91) and control group (19.73:1.15) resulted in an F-ratio of 0.61 which indicates no significant difference between pre test means at 0.05 level of confidence. The post test means of body mass index among experimental group (19.84 + 0.89) and control group (19.86 1.10) resulted in an F- ratio of 0.01 which was not significant at 0.05 level of confidence, whereas the adjusted post means of experimental (19.95) and control group (19.72) resulted in an 'F-ratio of 14.70 which was significant at 0.05 level of confidence. This indicates that there was significant change in body mass index among the experimental group when compared with the control group.

Table 3: Analysis of covariance for lipid profiles among experimental and control groups

		Exp .group	Can group	SOV	SS	DF	MS	F-ratio
Total cholesterol	Pre test	151.93	150.00	B	56.07	1	56.07	0.23
		(18.31)	(12.08)	W	11.39628	58	240.72	
	Post test	141.50	151.43	B	1480.07	1	1480.07	9.49*
		(12.04)	(12.92)	W	9048.87	58	156.01	
	Ad post test	154.32	157.61	B	2276.01	1	2276.01	60.63* (*p≤0.05)
				W	2139.65	57	37.54	
HDL cholesterol	Pre test	55.27	53.43	B	50.42	1	50.42	3.54
		(3.82)	(3.72)	W	825.23	58	11.30	
	Post test	59.17	53.23	B	528.07	1	528.07	46.72*
		(2.65)	(3.94)	W	655.53	58	11.30	
	Ad po test	56.05	52.65	B	95.75	1	95.75	14.70 (*p≤0.05)
				W	316.24	57	5.55	
LDL cholesterol	Pre test	75.00	73.93	B	17.07	1	17.07	0.08
		(17.47)	(11.42)	W	2657.87	58	218.24	
	Post test	62.70	75.37	B	2406.67	1	158.02	15.23*
		(12.71)	(12.42)	W	9165.27	58		
	Ad po test	67.14	81.80	B	2547.96	1	2547.96	68.30* (p≤0.05)
				W	2126.27	57	2547.96	
Triglycerides	Pre test	108.53	115.07	B	680.07	1	37.30	2.24
		(20.39)	(13.83)	W	706.53	58	680.07	
	Post test	100.23	114.07	B	2870.41	1	303.56	16.77*
		(14.90)	(10.96)	W	9923.23	58	2870.41	
	Ad po test	107.65	115.76	B	7652	1	171.09	7.05* (p≤0.05)
				W	6181.83	57	7652	

108.45

Table 3 shows the lipid profile among experimental group and control group before and after the training period. There was significant reduction in TC, LDL-C,TG and significant increase in HDL-C.

The pre test means of total cholesterol among experimental group (151.93±18.31) and control group (150.00 ±12.08) resulted in an 'F'- ratio of 2.23 which indicates no significant difference between pre-test means at0.05 level of confidence. The post test means of body weight among experimental group(141.50±12.04) and control group (151.43 t 12.92) resulted in an F'-ratio of 9.49 which is significant at 0.05 level of confidence, whereas the adjusted post test means of experimental (157.61) and control groups (154.32) resulted in an 'F- ratio of 60.63 which was significant at 0.05 level of confidence. This indicates that there was significant change in total cholesterol among the experimental group when compared with the control group.

The pre test means of HDL cholesterol among experimental group (55.27 +3.82) and control group (53.43 + 3.72) resulted in an F'- ratio of 3.54 which indicates no significant difference between pre test means at 0.05 level of confidence. The post test means of body weight among experimental group (59.17- + 2.65) and control group (53.23 + 3.94) resulted in an 'F ratio of 46.72 which is significant at 0.05 level of confidence, whereas the adjusted post means of experimental (52.65) and control groups (56.05) resulted in an 'F- ratio of 17.26 which was significant at 0.05 level of confidence. This indicates that there was significant change in HDL

cholesterol among the experimental group when compared with the control group.

The pre test means of LDL cholesterol among experimental group (75.0 0t 17.47) and control group (73.93+ 11.45) resulted in an F-ratio of 0.08 which indicates no significant difference between pre test means at 0.05 level of confidence. The post test means of body weight among experimental group (62.70 + 12.71) and control group (75.37 12.42) resulted in an 'F-ratio of 15.23 which is significant at 0.05 level of confidence, whereas the adjusted post test means of experimental (89.80)and control groups (67.14) resulted in an 'F' –ratio of 68.30 which was significant at 0.05 level of confidence.

The pre test means of triglycerides among experimental group (108.33 120.39) and control group (115.07 + 13.83) resulted in an 'F - ratio of 2.24 which indicates no significant difference between pre test means at 0.05 level of Confidence. The post test mean of triglycerides among experimental group (100.23 + 14.90) and e of 16.77 which group (114.07 t 10.96) resulted in an F – ratio significant at 0.05 level of confidence, whereas the adjusted post means of experimental (115.76) and control group (107.65) resulted in an 'F-ratio of 7.06 which was significant at 0.05 level of confidence. This indicates that there was significant change in triglycerides among the experimental group when compared with the control group.

Conclusions

The endurance training resulted in significant reduction of body weight, body mass index, total cholesterol, LDL cholesterol triglycerides and also a significant increase in HDL cholesterol in the experimental group when compared with the control group.

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