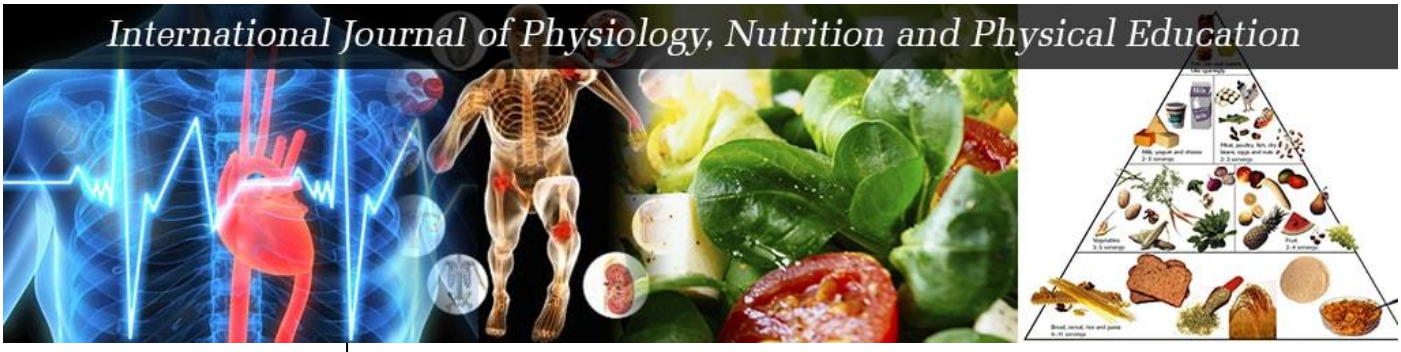

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Effect of prescribing and monitoring direct and indirect physical activity on selected health related fitness and cardio respiratory variables among obese school boys

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Abstract
The purpose of the present study was to examine the effect of prescribing and monitoring direct and indirect physical activity on selected health related fitness and cardio respiratory variables among obese school boys. The 75 obese school boys were selected from Chennai city only. Their age ranged between 25 to 35 years. To achieve the purpose of the study 75 obese school boys were selected randomly and divided into three equal group each group consist of 25 subject Group – I (Direct physical activity, 25), Groups – II (Indirect physical activity, 25), and Control Group - (Not Exposed to any Experimental Training, 25). Selected for the variables of the study selected health related fitness Cardiovascular endurance, Muscular strength, Muscular endurances, Flexibility and Body Compositions. The cardio respiratory variables selected for the studies were Blood pressure, Pulse rate, and Vital capacity were also taken into consideration. Experimental training periods was for six weeks. After the experimental treatment. The collected data was statistically analyzed by using final test score formed as post test scores of the subject Analysis of covariance (ANCOVA) was used to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant Scheffe's Post hoc test was used. In all cases 0.05 level of significance was fixed to test hypothesis. The result of the study proved that there was significant improvement in selected health related fitness cardiovascular endurance, Muscular strength, Muscular endurances, flexibility and body compositions. The cardio respiratory variables selected for the studies were Blood pressure, Pulse rate, and Vital capacity.

Keywords: school boys, health related, fitness

Introduction
Obesity is a recognized as a major health problem in many parts of the world and the incidents of the condition is escalating at an alarming rate. Obesity is a condition with excess accumulation of body fat in relation to the lean body mass. The center for disease control and preventing defined overweight as at or above the 95th percentile of BMI for age and at risk for overweight as between 85th to 95th percentile of BMI for age. European researcher's classified overweight as at or above 85th percentile and obesity as at or above 95th percentile BMI (Flegal, Wei, & Ogden, 2002).
Overweight and obesity ranges are determined by using an individual's weight and height in an equation to calculate BMI. An adult who has a BMI between 25 and 29.9 is considered obese. That is roughly 30 or more pounds over a healthy weight (Alexandra G. Kazaks, 2013).

Role of physical activity on reduce obesity
Good nutrition, physical activity, and a healthy body weight are essential parts of a person's overall health and well-being. Together, these can help decrease a person's risk of developing serious health conditions, such as high blood pressure, high cholesterol, diabetes, heart disease, stroke, and cancer. A healthful diet, regular physical activity, and achieving and maintaining a healthy weight also are paramount to managing health conditions so they do not worsen over time.

As a result of these behaviors, the Nation has experienced a dramatic increase in obesity. Today, approximately 1 in 3 adults (34.0%) and 1 in 6 children and adolescents (16.2%) are obese. Obesity-related conditions include heart disease, stroke, and type 2 diabetes, which are among the leading causes of death. In addition to grave health consequences, overweight and obesity significantly increase medical costs and pose a staggering burden on the U.S. medical care delivery system.

The health impact of eating a healthful diet and being physically active cannot be understated. Together, a healthful diet and regular physical activity can help people:

- Achieve and maintain a healthy weight
- Reduce the risk of heart disease and stroke
- Reduce the risk of certain forms of cancer
- Strengthen muscles, bones, and joints
- Improve mood and energy level

Chief among the benefits of a healthful diet and physical activity is a reduction in the risk of obesity. Obesity is a major risk factor for several of today's most serious health conditions and chronic diseases, including high blood pressure, high cholesterol, diabetes, heart disease and stroke, and osteoarthritis. Obesity also has been linked to many forms of cancer.

The most people have been led to believe that changing your body just involves strict dieting healthy and consistent nutrition *is* a huge part, but without exercise you aren't able to achieve the actual body shape you want. calorie restriction without effective exercise will just leave you in a saggy human shell, you simply go from being overweight to being a skinny fat person the skinny fat person is a tragic waste of a human body we are made to be brilliant but by lacking the muscle and bone structure not to mention a healthy mindset to hold yourself with strength or confidence you don't feel empowered or positive about your body because underneath the smaller sized clothing is still the side effects of being overweight. The flabby flesh and lose skin, wobbly bits and lack of muscle tone are still lurking underneath. the outside may have changed but the inside still feels unworthy and punished. (James, 1989)

Hypotheses

1. It was hypothesized that there may be a significant improvement on selected health related fitness variables due to the direct and indirect physical activity among obese school boys.
2. It was hypothesized that there may be a significant improvement on selected cardio respiratory variables due to the direct and indirect physical activity among obese school boys.
3. It was hypothesized there they would be a significant difference in the improvement on selected health related fitness variables between the two experimental tanning among obese school boys.
4. It was hypothesized there they would be a significant difference in the improvement on selected Cardio Respiratory variables between the two experimental tanning among obese school boys.

Review of related literature

A research study (Gouveia EA 2017) to examine the role of potential correlates of Hrolf in a large representative sample of older adults, and (2) to investigate whether the relationships between Hrolf and potential factors differ as a function of Hrolf component (physical vs. mental) and/or age cohort (young-old vs. old-old). This cross-sectional study included 802 older adults aged 60-79 years old. HRQoL was assessed using the SF-36 questionnaire. Functional fitness was assessed using the Senior Fitness Test. Physical activity was measured via the Baecke questionnaire. Demographic information, mental and health features were obtained through questionnaires. A multiple regression analysis showed that BMI ($\beta = -0.15$, $p = 0.001$), body strength ($\beta = 0.21$, $p < 0.001$), aerobic endurance ($\beta = 0.29$, $p < 0.001$), physical activity ($\beta = 0.11$, $p = 0.007$), depressive symptoms ($\beta = -0.19$, $p < 0.001$), falls ($\beta = -0.19$, $p < 0.001$), and living alone ($\beta = -0.16$, $p < 0.001$) were all significantly related to HRQoL-SF-36 total score. The positive relation with aerobic endurance was significantly higher for the physical component of Hrolf, while the negative relation with living alone was significantly higher for the mental component. The positive relation of Hrolf with physical activity was significantly higher in old-old compared to young-old adults. This data suggest that body composition, functional fitness, psycho-social factors, and falls are important correlates of Hrolf in old age. There are Hrolf-component and age-cohort differences regarding these correlates, underlying the need for specific strategies at the community level to promote Hrolf in older adults.

A research study examined (Avloniti A 2017) [2] Adults demonstrate an up regulation of their pro- and anti-oxidant mechanisms in response to acute exercise while systematic exercise training enhances their antioxidant capacity, thereby leading to a reduced generation of free radicals both at rest and in response to exercise stress. However, less information exists regarding oxidative stress responses and the underlying mechanisms in the pediatric population. Evidence suggests that exercise-induced red sox perturbations may be valuable in order to monitor exercise-induced inflammatory responses and as such training overload in children and adolescents as well as monitor optimal growth and development. The purpose of this review was to provide an update on oxidative stress responses to acute and chronic exercise in youth. It has been documented that acute exercise induces age-specific transient alterations in both oxidant and antioxidant markers in children and adolescents. However, these responses seem to be affected by factors such as training phase, training load, fitness level, mode of exercise etc. In relation to chronic adaptation, the role of training on oxidative stress adaptation has not been adequately investigated. The two studies performed so far indicate that children and adolescents exhibit positive adaptations of their antioxidant system, as adults do. More studies are needed in order to shed light on oxidative stress and antioxidant responses, following acute exercise and training adaptations in youth. Available evidence suggests that small amounts of oxidative stress may be necessary for growth whereas the transition to adolescence from childhood may promote maturation of pro- and anti-oxidant mechanisms. Available evidence also suggests that obesity may negatively affect basal and exercise-related antioxidant responses in the per pubertal period during pre- and early-puberty.

Methodology

The purpose of the study was the find out effect of prescribing and monitoring direct and indirect physical activity on selected health related fitness and cardio respiratory variables among obese school boys. The 75 obese school boys were selected from Chennai city only. Their age is ranged between 14 to 18 years. They were divided into three equal groups. Each group consists of twenty five subjects. Pre test was conducted for all the seventy five subjects on selected health

related fitness variables namely cardiovascular endurance, flexibility, muscular strength, muscular endurances and body compositions, cardio respiratory variables namely blood pressure, pulse rate, and vital capacity. This initial test score formed as per test scores of subjects. Experimental Group I was exposed to (Direct physical activity), experimental Group II was exposed to (Indirect physical activity), and the control group was not exposed to any experimental training other than their regular daily activities. Experimental training periods was for six weeks. After the experimental treatment, all the subjects were measured on the effect of direct and indirect physical activity on selected health related fitness and cardio respiratory variables among obese school boys. This final test score formed as post test scores of the subject Analysis of covariance (ANCOVA) was used to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant Scheffe's Post hoc test was used. In all cases 0.05 level of significance was fixed to test hypothesis.

Table I: Analysis of co-variance of the means of two experimental groups and the control group on cardio respiratory endurance

Test	Direct physical activity	Indirect physical activity	control group	SV	SS	df	MS	F
Pre test	790.6	1091.24	685.040	Between	2221048	2	1110524	1.041579
				Within	76765910	72	1066193	
Post test	874.6	1133.240	685.040	Between	2530924	2	1265462	1.169965
				Within	77876886	72	1081623	
Adjusted	940.079	895.986	856.814	Between	86649.076	2	43324.54	80.35934
				Within	38278.590	71	539.1351	
mean gain	-84	-42	0					

*Table value 3.12, Significant at 0.05 level.

Table I shows that the pre test mean scores of cardio respiratory endurance of experimental group I (direct physical activity) Group was 790.6, experimental group II, (indirect physical activity) Group was 1091.24 and control Group was 685.040. The post test means showed difference due to six weeks training; mean values recorded were 874.6, 1133.240 and 685.040 respectively. The obtained F value on pre test scores 1.041579 was lesser than the required F value of 3.12 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as they obtained F value 1.169965 was greater than the required F value of 3.12 this proved that the difference between the post means of the subjects were significant. Taking in to consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 80.35934 was greater than the required F value of 3.12. This proved that there were significant differences among the means due to six weeks training on cardio respiratory endurance. Since significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's confidence interval test. The results were presented in Table I. From Table- I it is very clear that obtained F-ratio 80.35934 greater than the table value 3.12. Hence it was significant at 0.05 level of confidence for the degree of freedom 2 and 71.

Table II: Scheffe's post-hoc test for cardio respiratory endurance

Direct physical activity	Indirect physical activity	control group	MD	CI
940.08	895.99	-	44.09	
940.08	-	856.81	83.27	
	895.99	856.81	39.17	

*Significant

Table II shows the Scheffe's post hoc test ordered and final means difference of Cardio respiratory endurance of different groups. The first comparison between the direct physical activity group and indirect physical activity, the mean difference 44.09 was not greater than the confidential interval value 16.69. The second comparison between the direct physical activity group and control group, the obtained mean difference 83.27 was greater than the confidence interval value 16.69. The third comparison between the direct physical activity and control group, the mean difference 39.17 greater than the confidence interval value 16.69. Hence the three comparisons was significant.

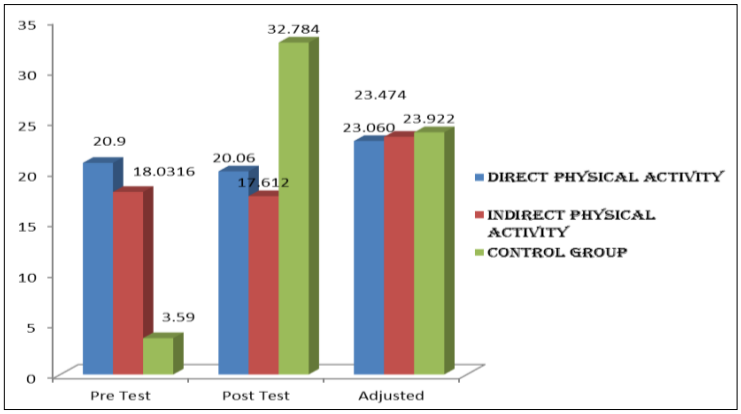

Fig 1: Bar diagram showing the mean values of experimental group i& ii and control group on cardio respiratory endurance

Table III: Analysis of co-variance of the means of two experimental groups and the control group on muscular strength

Test	Direct physical activity	Indirect physical activity	control group	SV	SS	df	MS	F
Pre test	6.4	4.48	4.480	between	61.44	2	30.72	2.588
				within	854.48	72	11.867	
Post test	9.76	6.160	4.480	between	363.84	2	181.92	10.931
				within	1198.16	72	16.641	
Adjusted	8.273	6.904	5.224	between	111.178	2	55.589	88.029
mean gain				within	44.835	71	0.631	

*Table value 3.12, Significant at 0.05 level.

Table III shows that the pre test mean scores of muscular strength of experimental group I (direct physical activity) Group was 6.4, experimental group II, (indirect physical activity) Group was 4.48 and control Group was 4.480. The post test means showed difference due to six weeks training; mean values recorded were 9.76, 6.160 and 4.480 respectively. The obtained F value on pre test scores 2.588 was lesser than the required F value of 3.12 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the initial stage was equal. The post test scores analysis proved that there was a significant difference between the groups, as the obtained F value 10.931 was greater than the required F value of 3.12 this proved that the difference between the post means of the subjects were significant. Taking in to consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 88.029 was greater than the required F value of 3.12. This proved that there were significant differences among the means due to six weeks training on muscular strength. Since significant improvement was recorded, the results were subjected to post hoc analysis using Schaffer's confidence interval test. The results were presented in Table III.

Table IV: Scheffe's post-hoc test for muscular strength

Direct physical activity	Indirect physical activity	control group	MD	CI
8.27	6.90	-	1.37	0.57
8.27	-	5.22	3.05	
	6.90	5.22	1.68	

*Significant

Table IV shows the Scheffe's post hoc test ordered and final means difference of muscular strength of different groups. The comparison between the control group and experimental group-I (direct physical activity) mean difference 1.37 was lesser than the confidential interval value 82.26 hence the two comparison was significant. The comparison between the control group and experimental group-II (indirect physical activity) obtained mean difference 1.68 was greater than the confidence interval value 0.57. The comparison between the experimental group-I (direct physical activity) and experimental group-II (indirect physical activity) mean difference 1.37 was greater than the confidence interval value 0.57. Hence the two comparisons was a significant.

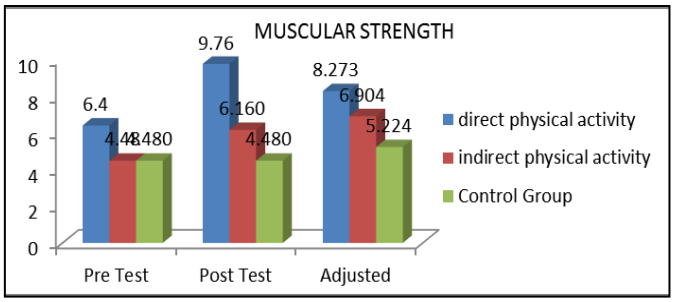

Fig 3: Bar diagram showing the mean values of experimental group i& ii and control group on muscular strength

Table V: Analysis of co-variance of the means of two experimental groups and the control group on muscular endurance

Test	Direct physical activity	Indirect physical activity	Control group	SV	SS	df	MS	F
Pre test	6.72	5.8	5.200	between	29.30667	2	14.653	0.988
				within	1067.04	72	14.82	
Post test	10.08	7.480	5.200	between	298.1067	2	149.053	7.441
				within	1442.08	72	20.028	
Adjusted	9.149	7.602	6.009	between	120.071	2	60.035	94.728
mean gain				within	44.997	71	0.633	

*Table value 3.12, Significant at 0.05 level.

Table V shows that the pre test mean scores of muscular endurance of experimental group I (direct physical activity) Group was 6.72, experimental group II, (indirect physical activity) Group was 5.8 and control Group was 5.200. The post test means showed difference due to six weeks training; mean values recorded were 10.08, 7.480 and 5.200 respectively. The obtained F value on pre test scores 0.988 was lesser than the required F value of 3.12 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as they obtained F value 7.441 was greater than the required F value of 3.12 this proved that the difference between the post means of the subjects were significant.

Table VI: Scheffe's post-hoc test for muscular endurance

Direct physical activity	Indirect physical activity	control group	MD	CI
9.15	7.60	-	1.55	
9.15	-	6.01	3.14	
	7.60	6.01	1.59	

*Significant

Table VI shows Scheffe's post hoc test ordered and final means difference of muscular endurance of different groups. The comparison between the control group and experimental group-I (direct physical activity) mean difference 1.55 was significant as it was greater than the confidential interval value 0.57. The comparison between the control group and experimental group-II (indirect physical activity) obtained mean difference 3.14 was significant as it was greater than the confidential interval value 0.57. The comparison between the experimental group-I (direct physical activity) and experimental group-II (indirect physical activity) mean difference 1.59 was significant as it was greater than the confidential interval value 0.57. Hence the out of three comparison, two were significant.

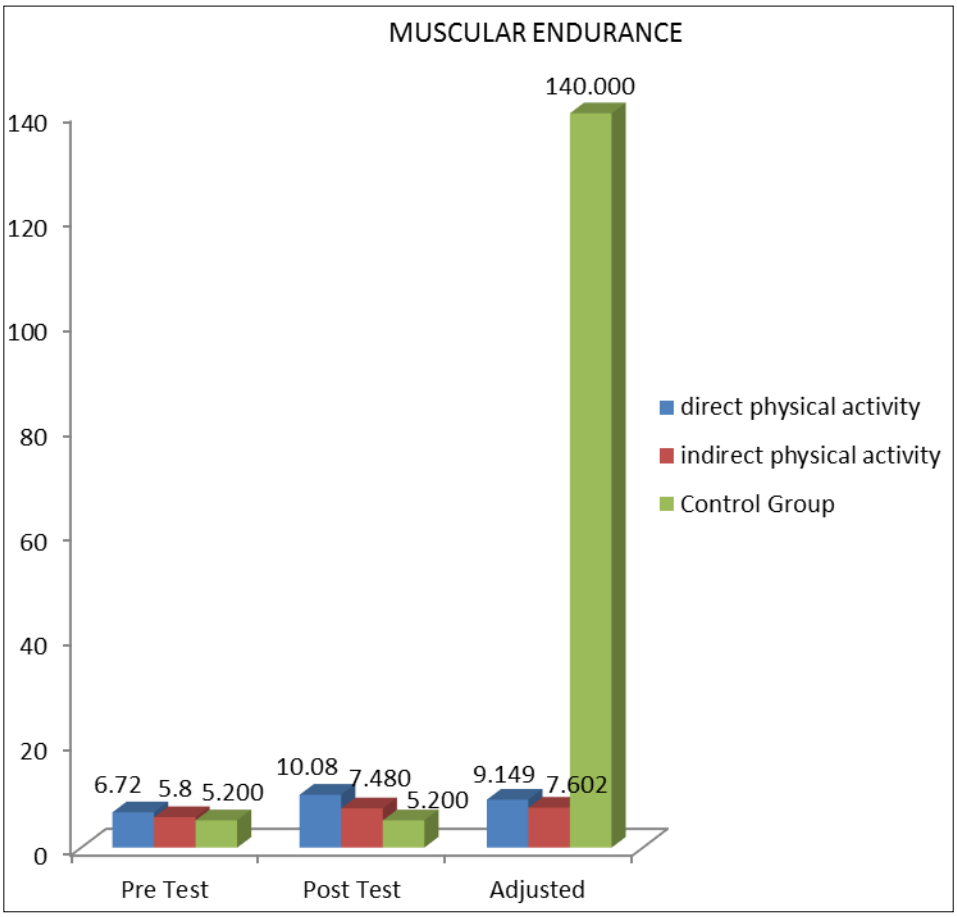

Fig 4: Bar diagram showing the mean values of experimental group i& ii and control group on muscular endurance

Table VII: Analysis of co-variance of the means of two experimental groups and the control group on flexibility

Test	Direct physical activity	Indirect physical activity	control group	SV	SS	df	MS	F
Pre test	0.56	-1.348	-0.160	between	46.4184	2	23.2092	3.822696
				within	437.1424	72	6.071422	
Post test	2.28	-0.388	-0.280	between	114.0291	2	57.01453	11.61697
				within	353.3664	72	4.907867	
Adjusted	1.799	0.178	-0.366	between	61.107	2	30.55367	9.786059
mean gain				within	221.674	71	3.122163	

*Table value 3.12, Significant at 0.05 level.

Table VII shows that the pre test mean scores of flexibility of experimental group I (direct physical activity) Group was 0.56, experimental group II, (indirect physical activity) Group was -1.348 and control Group was -0.160. The post test means showed difference due to six weeks training; mean values recorded were 2.28, -0.388 and -0.280 respectively. The obtained F value on pre test scores 3.822 was greater than the required F value of 3.12 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as they obtained F value 11.616 was greater than the required F value of 3.12 this proved that the difference between the post means of the subjects were significant. Taking in to consideration the pre and post test scores among the groups, adjusted mean scores

were calculated and subjected to statistical treatment. The obtained F value of 9.786 was greater than the required F value of 3.12. This proved that there were significant differences among the means due to six weeks training on flexibility. Since significant improvement was recorded, the results were subjected to post hoc analysis using Scheffe's confidence interval test. The results were presented in Table VIII.

Table VIII: Scheffe's post-hoc test for flexibility

Direct physical activity	Indirect physical activity	control group	MD	CI
1.80	0.18	-	1.62	1.27
1.80	-	-0.37	2.16	
	0.18	-0.37	0.54	

*Significant

Table VIII was Scheffe's post hoc test ordered and final means difference of flexibility of different groups. The comparison between the control group and experimental group-I (direct physical activity) mean difference 1.62 was no significant as it was lesser than the confidential interval value 2.16. The comparison between the control group and experimental group-II (indirect physical activity) obtained ratio mean difference 0.54was significant as it was greater than the confidential interval value 1.27. The comparison between the experimental group-I (direct physical activity) and control group mean difference 1.62 was no significant as it was greater than the confidential interval value 1.27. Hence out of the three comparisons, two comparisons were significant.

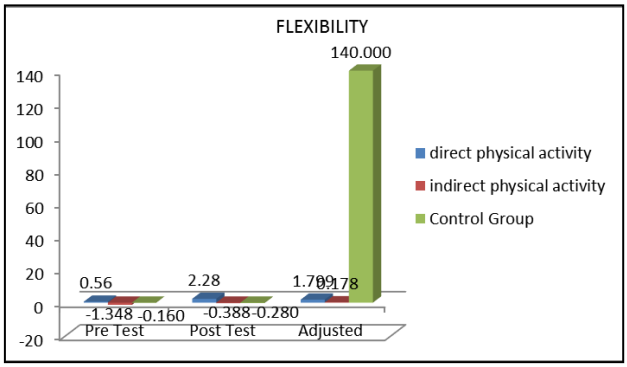

Fig 5: Bar diagram showing the mean values of experimental group i& ii and control group on flexibility

Table IX: Analysis of co-variance of the means of two experimental groups and the control group on body composition

Test	Direct physical activity	Indirect physical activity	control group	SV	SS	df	MS	F
Pre test	20.9	18.0316	32.784	between	3059.087	2	1529.544	1.744
				within	63129.16	72	876.794	
Post test	20.06	17.612	32.784	Between	3317.471	2	1658.736	1.898
				Within	62894.04	72	873.5283	
Adjusted	23.060	23.474	23.922	Between	9.046	2	4.523215	80.829
mean gain				Within	3.973	71	0.05596	

*Table value 3.12, Significant at 0.05 level.

Table IX shows that the pre test mean scores of body composition of experimental group I (direct physical activity) group was 20.9, experimental group II, (indirect physical activity) Group was 18.0316 and control group was 32.784. The post test means showed difference due to six weeks training; mean values recorded were 20.06, 17.612 and 32.784 respectively. The obtained F value on pre test scores 1.744 was lesser than the required F value of 3.12 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the initial stage was equal. The post test scores analysis proved that there was no significant difference between the groups, as the obtained F value 1.898 was lesser than the required F value of 3.12 this proved that the difference between the post means of the subjects were significant. Taking in to consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 80.829 was greater than the required F value of 3.12. This proved that there were significant differences among the means due to six weeks training on body composition.

Table X: Scheffe's post-hoc test for body composition

Direct physical activity	Indirect physical activity	control group	MD	CI
23.06	23.47	-	-0.41	0.17
23.06	-	23.92	-0.86	
	23.47	23.92	-0.45	

*Significant

Table X shows the Scheffe's post hoc test ordered and final means difference of body composition of different groups. The comparison between the control group and experimental group-I (direct physical activity) mean difference -0.41 was significant as it was greater than the confidential interval value 0.17. The comparison between the control group and experimental group-II (indirect physical activity) obtained ratio mean difference -0.86 was not significant as it was lesser than the confidential interval value 0.17. The comparison between the experimental group-I (direct physical activity) and experimental group-II (indirect physical activity) mean difference -0.45 was significant as it was lesser than the confidential interval value 0.17.

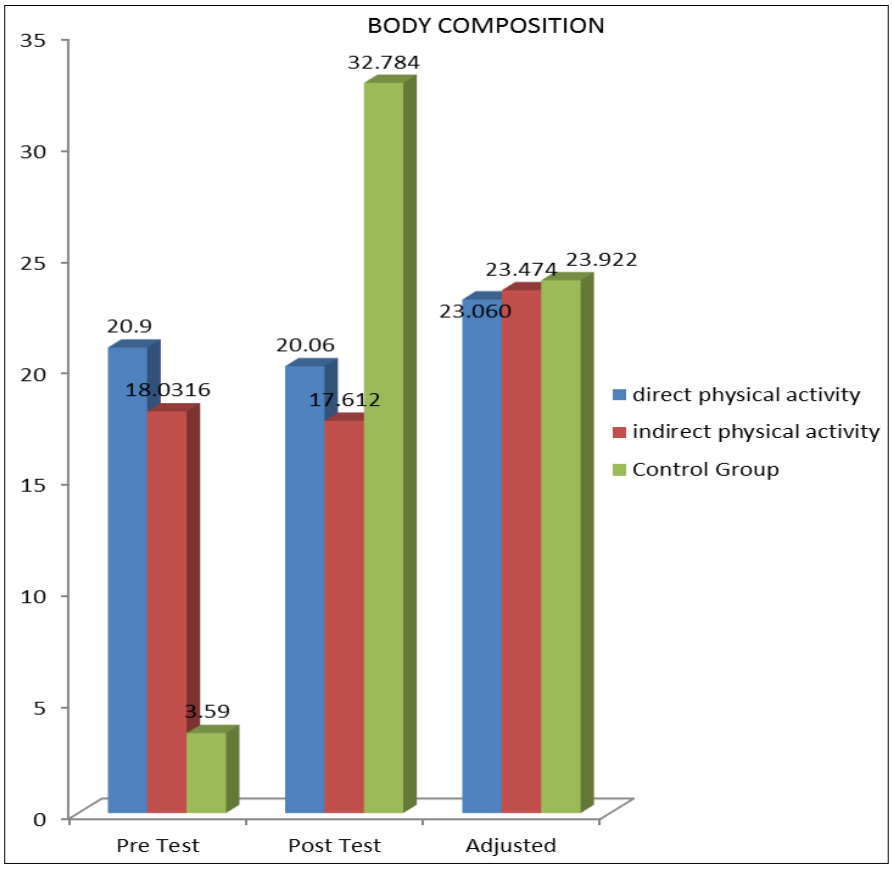

Fig 6: Bar diagram showing the mean values of experimental group i& ii and control group on body composition

Table XI: Analysis of co-variance of the means of two experimental groups and the control group on blood pressure

Test	Direct physical activity	Indirect physical activity	control group	SV	SS	df	MS	F
Pre test	80.2328	78.2628	73.888	between	527.302	2	263.651	0.2112
				within	89881	72	1248.34	
Post test	78.5528	77.423	73.888	between	296.100	2	148.05	0.121149
				within	87987.9	72	1222.05	
Adjusted	75.811	76.630	77.423	between	32.328	2	16.164	172.4542
mean gain				within	6.655	71	0.093	

*Table value 3.12, Significant at 0.05 level.

Table XI shows that the pre test mean scores of blood pressure of experimental group I (direct physical activity) Group was 80.2328, experimental group II, (indirect physical activity) Group was 78.2628 and control Group was 73.888. The post test means showed difference due to six weeks training; mean values recorded were 78.5528, 77.423 and 73.888 respectively. The obtained F value on pre test scores 0.2112 was lesser than the required F value of 3.12 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the initial stage was equal. The post test scores analysis proved that there was no significant difference between the groups, as the obtained F value 0.121149 was lesser than the required F value of 3.12 this proved that the difference between the post means of the subjects were significant. Taking in to consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 172.4542 was greater than the required F value of 3.12. This proved that there were significant differences among the means due to six weeks training on Blood pressure.

Table XII: Scheffe's post-hoc test for blood pressure

Direct physical activity	Indirect physical activity	Control group	MD	CI
75.81	76.63	-	0.82	0.22
75.81	-	77.42	-1.61	
	76.63	77.42	-0.79	

*Significant

Table XII shows Scheffe's post hoc test ordered and final means difference of blood pressure of different groups. The comparison between the control group and experimental group-I (direct physical activity) mean difference 0.82 was greater than the confidential interval value 0.22. The comparison between the control group and experimental group-II (indirect physical activity) obtained ratio mean difference -1.61 was greater than the confidence interval

value 0.22. The comparison between the experimental group-I (direct physical activity) and experimental group-II (indirect physical activity) mean difference 0.82 greater than the confidence interval value 0.22.Hence the three comparisons were significant.

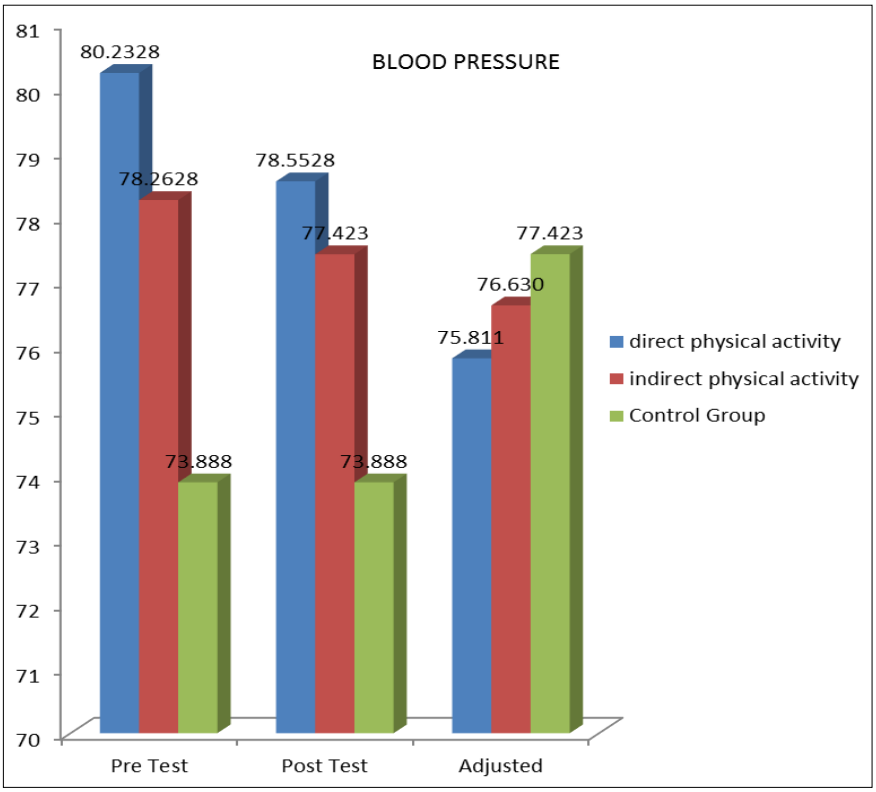

Fig 7: Bar diagram showing the mean values of experimental group i& ii and control group on blood pressure

Table XIII: Analysis of co-variance of the means of two experimental groups and the control group on pulse rate

Test	Direct physical activity	Indirect physical activity	Control group	SV	SS	df	MS	F
Pre test	65.12	65.28	62.840	between	93.14667	2	46.57333	0.051302
				within	65363.04	72	907.82	
Post test	68.48	66.960	62.840	between	425.7867	2	212.8933	0.22358
				within	68558.56	72	952.2022	
Adjusted	67.756	66.073	64.451	between	136.457	2	68.22828	162.726
mean gain				within	29.769	71	0.419283	

*Table value 3.12, Significant at 0.05 level.

Table XVII shows that the pre test mean scores of pulse rate of experimental group I (direct physical activity) Group was 65.12, experimental group II, (indirect physical activity) Group was 65.28 and control Group was 62.840. The post test means showed difference due to six weeks training; mean values recorded were 68.48, 66.960 and 62.840 respectively. The obtained F value on pre test scores 0.051302 was lesser than the required F value of 3.12 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the initial stage was equal. The post test scores analysis proved that there was no significant difference between the groups, as the obtained F value was 0.22358 lesser than the required F value of 3.12 this proved that the difference between the post means of the subjects were significant. Taking in to consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of was 162.726 greater than the required F value of 3.12. This proved that there were significant differences among the means due to six weeks training on pulse rate.

Table XIV: Scheffe's post-hoc test for pulse rate

Direct physical activity	Indirect physical activity	Control group	MD	CI
67.76	66.07	-	1.68	0.47
67.76	-	64.45	3.31	
	66.07	64.45	1.62	

*Significant

Table XIV shows Scheffe's post hoc test ordered and final means difference of pulse rate of different groups. The comparison between the control group and experimental group-I (direct physical activity) mean difference 1.68 was greater than the confidential interval value 0.47. The comparison between the control group and experimental

group-II (indirect physical activity) obtained ratio mean difference 3.31 was greater than the confidence interval value 0.47. The comparison between the experimental group-I (direct physical activity) and experimental group-II (indirect physical activity) mean difference 1.68 was lesser than the confidence interval value 0.47.

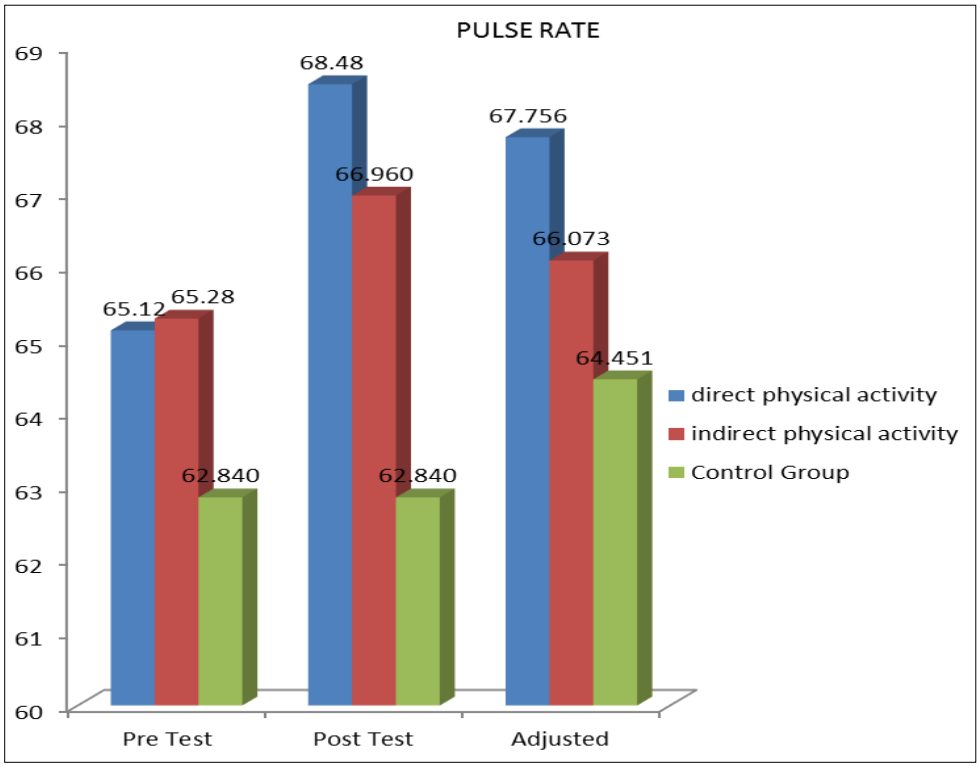

Fig 8: Bar diagram showing the mean values of experimental group i& ii and control group on pulse rate

Table XV: Analysis of co-variance of the means of two experimental gro ups and the control group on vital capacity

Test	Direct physical activity	Indirect physical activity	Control group	SV	SS	df	MS	F
Pre test	1824	1632	62.840	between	46673430	2	23336715	43.86961
				Within	38300855	72	531956.3	
Post test	1992	1716.000	62.840	between	54423102	2	27211551	45.89132
				within	42692855	72	592956.3	
Adjusted	1305.046	1231.633	1234.161	between	71950.300	2	35975.15	49.55898
mean gain				within	51539.311	71	725.9058	

*Table value 3.12, Significant at 0.05 level.

Table XV shows that the pre test mean scores of vital capacity of experimental group I (direct physical activity) group was 1824, experimental group II, (indirect physical activity) Group was 1632 and control group was 62.840. The post test means showed difference due to six weeks training; mean values recorded were 1992, 1716.000 and 62.840 respectively. The obtained F value on pre test scores 43.86961 was greater than the required F value of 3.12 to be significant at 0.05 level. This proved that there was a significant difference between the groups at initial stage and the initial stage was equal. The post test scores analysis proved that there was a significant difference between the groups, as the obtained F value was 45.89132 greater than the required F value of 3.12 this proved that the difference between the post means of the subjects were significant. Taking in to consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of was 49.55898 greater than the required F value of 3.12. This proved that there were significant differences among the means due to six weeks training on vital capacity.

Table XVI: Scheffe's post-hoc test for vital capacity

Direct physical activity	Indirect physical activity	Control group	MD	CI
1305.05	1231.63	-	73.41	19.37
1305.05	-	1234.16	70.89	
	1231.63	1234.16	-2.53	

*Significant

Table XXVI shows Scheffe's post hoc test ordered and final means difference of vital capacity of different groups. The comparison between the control group and experimental group-I (direct physical activity) mean difference 73.41 was significant greater than the confidential interval value 19.37. The comparison between the control group and experimental group-II (indirect physical activity) obtained mean difference 70.89 was greater than the confidence interval value 19.37.

The comparison between the experimental group-I (direct physical activity) and experimental group-II (indirect physical activity) mean difference 73.41 was greater than the confidence interval value 19.37.Hence the three comparison was significant.

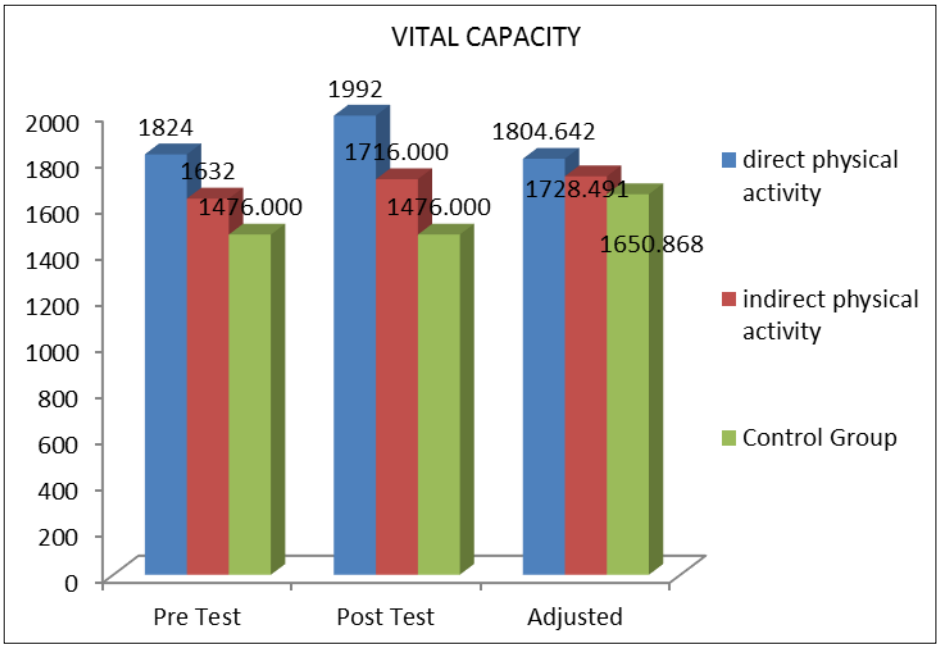

Fig 9: Bar diagram showing the mean values of experimental group i& ii and control group on vital capacity

Conclusions

1. The direct and indirect physical activity improved cardiovascular endurance of the obese school boys.
2. The direct physical activity was better in the improvement of cardiovascular endurance than the indirect physical activity of the obese school boys.
3. The direct and indirect physical activity improved muscular strength of the obese school boys.
4. The indirect physical activity was better in the improvement of muscular strength than the indirect physical activity of the obese school boys.
5. It was concluded the direct and indirect physical activity of improved muscular endurance of the obese school boys.
6. There was no difference between the direct and indirect physical activity in the improvement of cardiovascular endurance of the obese school boys.
7. The direct and indirect physical activity of improved flexibility of the obese school boys.
8. There was no difference between the direct and indirect physical activity in the improvement of flexibility of the obese school boys.
9. The direct and indirect physical activity of reduced the body composition of the obese school boys.
10. The direct physical activity was better in the improvement of body composition than the indirect physical activity of the obese school boys.
11. The direct and indirect physical activity of reduced the blood pressure of the obese school boys.
12. The indirect physical activity was better in the improvement of blood pressure than the indirect physical activity of the obese school boys.
13. The direct and indirect physical activity of reduced the pulse rate of the obese school boys.
14. There was no difference between the direct and indirect physical activity in the improvement of pulse rate of the obese school boys.
15. The direct and indirect physical activity of reduced the vital capacity of the obese school boys.
16. There was no difference between the direct and indirect physical activity in the improvement of vital capacity of the obese school boys.

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