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Effect of the Kung Fu Training in the Body Composition of the Selected Obese Male Adolescents

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Abstract

The purpose of the study is to find out the effects of the Kung Fu in Body composition of the Obese Male Adolescents. Thirty obese male students are selected in the age group of 14- 18 years. Percentage of body fat is calculated with the formula based on BMI. The Hume formula is used to calculate the Lean body mass. The participants are divided into two groups and the experimental group is given 12 weeks Kung Fu training for about one hour for 6 days per week. Both pre test and post test are taken for both the group. Obtained data is analyzed by ANOVA. This short term Kung Fu training program improved the body compositions percentage body fat and lean body mass in the obese male adolescents with very low fitness.

Keywords: BMI, Percentage body fat, Lean body mass, Analysis of variance.

Introduction

The obesity epidemic remains one of the Nation's most serious health crises by putting millions of people at an increased risk of many chronicle diseases. Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on the health [1]. A sedentary lifestyle plays a significant role in the obesity. Obesity results from an energy imbalance. Many factors can lead to energy imbalance and weight gain. They include genes, eating habits, how and where people live, attitudes and emotions, life habits, and income. But obesity is a preventable disease. Physical exercise improves the physical fitness. Physical inactivity is a waste of human potential for health and well-being and its high prevalence is a cause for concern. Its potential contribution to the positive health not merely the absence of disease but associated with a capacity to enjoy life and to withstand challenges [2]. Exercise to improve the fitness is not new it is obvious. Previous study has reported that the intensity of the Kung Fu ranged from the moderate to vigorous, while that of Tai Chi Chun is low [3]. It is evident from the previous research that the exercise improves physical fitness. Cox [4] proposes that the variation in the quality of instruction, both philosophical and technical, could influence the outcome of personality state of the subjects. Similarly, Jones et al. [5] claims that the communication skill and teaching of the instructor are very important for instructor. Physical fitness is improved efficiently by practicing Kung Fu.

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Methodology

To achieve the purpose of the study the means and methods are used in the selection of the subjects, variables and tools used in collection of data and treatment of data are briefly explained. As subjects, thirty obese male adolescents are selected randomly. The age of the subjects is fixed in the range of 14 to 18 years. The selected subjects are divided into two groups randomly. One group is considered as the control group and the other as the experimental group. The experimental group is given 12 weeks of training. The pre test data Height, weight and Age for both the groups are collected by the standard methods at 0 weeks. The control group is left free. The experimental group is given Kung Fu training for about 6 days per week. Every day one hour training is given. Different styles of Kung fu exercises are made to practice in routine for about 50 minutes along with 5 minutes warm up and 5 minutes relaxation. After 12 weeks of vigorous Kung Fu practice post test data collected for both the groups as pre test.

Results

The collected data are analyzed by means of paired't' test and Analysis of variance (ANOVA). The results are tabulated and discussed.

Table I. Testing the significance of pre and post test on the selected physical fitness variables of the Control group

Variables	Pre test (Mean and ±S.D)	Post test (Mean and ±S.D)	Mean Difference	Std.Error	't'-ratio
Weight	63.73 ± 3.67	64.07 ± 3.86	0.33	0.159	2.092*
Percentage body fat	21.51 ± 1.62	21.69 ± 1.69	0.176	0.819	2.150*
Lean body mass	42.09 ± 2.66	42.20 ± 2.71	0.109	0.052	2.082*

***Significance at 0.05 level**

The Table I indicates that the obtained 't' values of the control group on the variables are 2.092 (weight), 2.150 (percentage body fat) and 2.082 (Lean body mass). The obtained 't' values are significant at 0.05 levels for the degrees of freedom 1, 14 and the required critical value is 2.14. The obtained 't values for weight and lean body mass are less than the critical value. Hence it is not statistically significant. But the percentage body mass exceeds the critical value. Hence it is significant.

Table II. Testing the significance of pre and post test on the selected physical fitness variables of the Experimental group

Variables	Pre test (Mean and ±S.D)	Post test (Mean and ±S.D)	Mean Difference	Std.Error	't'-ratio
Weight	63.33 ± 3.87	61.53 ± 4.29	1.8	0.312	5.775*
Percentage body fat	20.59 ± 1.97	20.59 ± 1.75	0.992	0.184	5.385*
Lean body mass	41.76 ± 2.97	41.16 ±3.16	0.590	0.102	5.781*

***Significance at 0.05 level**

The Table II indicates the obtained 't' values of the experimental group on the variables are 5.775 (weight), 5.385 (percentage body fat) and 5.781 (Lean body mass). The obtained 't' values are significant at 0.05 levels for the degrees of freedom 1, 14 and the required critical value is 2.14. The obtained values exceed the critical value 2.14. Hence it is concluded that the Kung Fu training, produces a significant improvement from its baseline to the post treatment.

Table III. Analysis of variance on Percentage Body fat

	Control group	Experimental Group	Sources	Sum of squares	df	Mean Squares	F
Pre test	21.51	21.59	**Between Groups**	0.04	1	0.04	0.01
			Within Groups	90.72	28	3.24	
Post test	21.69	20.59	**Between Groups**	9.01	1	9.01	3.04
			Within Groups	82.89	28	2.96	
Adjusted post test	21.72	20.76	**Between Groups**	10.11	1	10.11	35.03
			Within Groups	7.80	27	0.29	

The Table III reveals that the observed F ratio are 0.01 (pre test), 3.04 (post test) and 35.03 (adjusted post test). The obtained F ratio on testing the significance of the mean difference between the control group and experimental Kung Fu group on the body composition before the training (pre test, 0.01) and after the completion of the training (post test, 3.04) are found to be statistically not significant at 0.05 level of significance, since the F ratio does not exceed the required critical value 4.20 for the degrees of freedom 1,28. Further, when testing the adjusted post test mean it is found to be statistically significant at 0.05 level because the value exceeds the critical value 4.21 for the degrees of freedom 1, 27.

Figure I. Bar diagram showing the mean values of pre test, post test and adjusted post test on the percentage body fat of the control and experimental groups

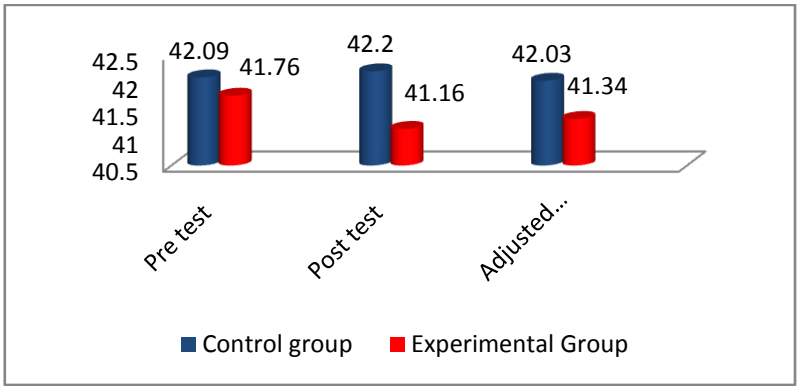
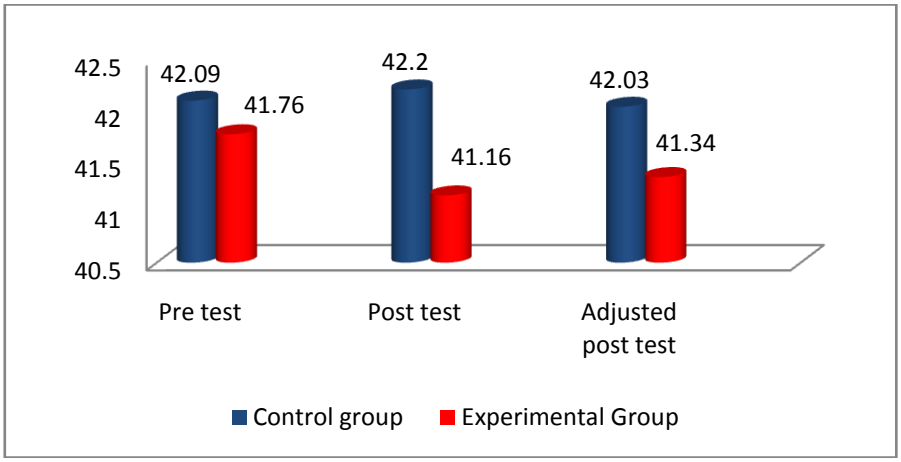


Table IV. Analysis of variance on Lean Body mass

	Control group	Experimental Group	Sources	Sum of squares	df	Mean Squares	F
Pre test	**42.09**	**41.76**	**Between Groups**	**0.84**	**1**	**0.84**	**0.11**
			Within Groups	**222.53**	**28**	**7.95**	
Post test	**42.20**	**41.16**	**Between Groups**	**8.03**	**1**	**8.03**	**0.93**
			Within Groups	**242.82**	**28**	**8.67**	
Adjusted post test	**42.03**	**41.34**	**Between Groups**	**3.52**	**1**	**3.52**	**39.23**
			Within Groups	**2.43**	**27**	**0.09**	

The Table IV depicts the analysis of variance on the lean body mass. The Table shows the F ratio of 0.11 (pre test), 0.93 (post test) and 39.23 (adjusted post test). The obtained F ratio on testing the significance of the mean difference between the control and experimental group before the training and after the training are not significant. Since F ratio does not reach the critical value 4.20 for degrees of freedom 1, 28. Added, when testing the adjusted post test mean, it is found to be statistically significant at 0.05 level as the value exceeds the critical value 4.21 for the degrees of freedom 1, 27.

Figure II. Bar diagram showing the mean values of pre test, post test and adjusted post test on the lean body mass of the control and experimental groups



Discussion

It is found that the participation in a 12 weeks, six times weekly of the martial arts Kung Fu training program appeared to attenuate the whole body and abdominal fat gain expected over six months in an overweight/obese cohort of this age (Eisenmann, 2005[6], McCarthy et al., 2006 [7]). Thus, the literature is inconsistent regarding the efficacy and potency of the isolated exercise interventions for the body fat reduction in the overweight adolescents. The modest reduction in percent BF tended to be significantly less than the hypothesized changes, although without a non-exercising control group, no definitive conclusions are drawn regarding the efficacy of the KF programs for this outcome. There are several reasons for the body fat changes and it may have been less than the anticipated. First, although dietary intake is reported to decrease in both groups, subjects allocated to the Kung Fu is reported significantly more reduction in energy, carbohydrate, and sugar intakes relative to the control group. The fact that Kung Fu training participation, is a higher intensity activity resulting in greater energy expenditure per class (Jones and Unnithan, 1998 [8]; Ribeiro et al., 2006 [9]), might have increased appetite relative to the Control Group participants. In the most trials, untreated control subjects increased body fat over time, in contrast to the small reductions in body fat observed in the Kung Fu controls. Thus, an unintended selective contamination of the controls with a dietary restriction co-intervention may have precluded from identifying the group differences. Second, the energy expenditure of the active intervention may have been insufficient to induce an energy deficit and thus fat loss. Unlike the previous trials which aimed to maintain a set intensity throughout the exercise sessions, the Kung Fu training sessions are relatively intermittent because the instructor regularly corrected, explained, and demonstrated techniques, rather than aiming to maximize the energy expenditure.

The intention of the trial is to try to replicate a general martial art class in an outpatient clinic setting, with the instructors directing the focus of activity more on the technique performance and application, rather than exercise intensity/ energy expenditure, and the intensity of the program is not monitored. It is thus possible that the dose of the exercise received by the subjects is less than the previous trials, and not enough to elicit body fat reductions of the same magnitude as the previous aerobic and intensity-focused interventions. In addition, it do not include a separate behavioral change strategy to address the barriers to change, exercise self-efficacy, motivation, decisional balance, social support, outcome expectancy, etc., all of which it is suggested as the important for lifestyle modification, including exercise adoption and adherence (Sallis et al., 2000 [10]). It would be worthwhile investigating the Kung Fu training program if further, so that for those who enjoy martial arts pursue the training continuously, health benefits and enjoyment will be maximized. Limitations of the trial is primarily related to the contamination of controls with their unintended dietary changes. Although our pilot study is underpowered, this study provides valuable information for the design and feasibility of the martial arts trials for the obese adolescent groups.

Conclusion

From the results and discussion the following conclusions are made. The selected subjects are given 12 weeks of dynamic Kung Fu training. The Kung Fu training has significant improvement in the body composition physical fitness components. The results are in good agreement with the results obtained earlier in Tracey W Tsand et al [11] and Wang et al [12]. It also serves as a moving meditation to develop the harmony of the body and mind. In contrast, practicing in competition may serve a different purpose, like improving the mental health, learning to cope with fear, stress and lose, enhancing self-confidence and self control [13].

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