



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2016; 2(6): 345-348
www.allresearchjournal.com
Received: 17-04-2016
Accepted: 18-05-2016

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Effect of Kung Fu in the Muscular Strength Endurance of the Obese Male Adolescents

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Abstract

The purpose of the study is to find out the Effects of Kung Fu in the Muscular Strength Endurance of the Obese Male Adolescents. Thirty obese male students are selected in the age group of 14- 18 years. The selected variables muscular strength and muscular strength endurance are assessed by the 1RM bench press and modified sit ups respectively. The participants are divided into two groups experimental and non experimental and the experimental group is given 12 weeks of Kung Fu training 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 the ANOVA. The statistical analysis and their result show that the both muscular strength and muscular strength and endurance are highly significant.

Keywords: Muscular strength, Muscular strength and endurance, BMI, Analysis of variance.

1. Introduction

Kung Fu, Martial art is a body, mind and spiritual practices that originated in China and it has a history of thousands years^[1]. Today, martial art is studied not only for the self-defense, but also for sports, fitness, combat skills, meditation, character development, self-confidence^[2] and treated as an alternative therapy for some medical conditions^[3]. Weiser *et al.* defined soft style Kung Fu as those emphasis philosophy and meditation, while hard style as those emphasis competition and combat^[4]. Forms training are also proved to be effective in training muscle strength and the endurance^[5]. According to the ACSM's guidelines for the strength training, a healthy person is recommended to complete 8 to 1 repetitions of 8 to 10 exercises for two days a week^[6]. Apparently, the training regimes are different in improving the muscle strength and power or endurance and further adjustment is needed in regard for a specific goal, muscle and age group.

2. Methods

In the study, thirty obese male adolescents are selected randomly as subject. 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 to be as the control group and the other as experimental group. The experimental group is given 12 weeks of Kung Fu training. Participants are categorized by the body mass index (BMI). The subjects with any cognitive, visual, mobility or genetic/growth impairment or disorder or any condition that might worsened by the exercise or testing procedures are excluded from the study. Physical fitness measures are assessed on the two occasions, pre test at the 0 weeks and post test by the end of the 12 weeks. All physical fitness test are performed within the same day, over a period of 2- 3 hours approximately, with rest periods between each physical test. The 1- repetition maximum (1RM) bench press test is used to determine the Muscular Strength in the absolute terms. Modified sit ups test is used to determine the Muscular Strength and Endurance in the absolute terms. After warm-up exercises, the Kung Fu sessions generally include footwork exercises and stances along with some suitable form of exercises.

3. Results

The Analysis of variance [ANOVA] is used to analyze the pre test data and post test data for both the groups on the selected parameters. For the study 0.05 level of confidence is fixed.

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Table 1: Testing the significance of pre and post test on the selected physical fitness variables of Control group.

Variables	Pre test (Mean and \pm S.D)	Post test (Mean and \pm S.D)	Mean Difference	Std.Error	't'-ratio
Muscular Strength(Kg)	28.93 \pm 0.88	28.93 \pm 0.96	0.0	0.169	0.0*
Muscular Strength and Endurance(N)	23.73 \pm 0.80	23.67 \pm 0.90	0.0667	0.0667	1.0*

*Significance at 0.05 level

The Table 3.1 indicates that the obtained 't' values of the fitness variables of the muscular strength and muscular strength and endurance of the control group are 0.0 (muscular strength) and (1.0) muscular strength and endurance). Hence

obtained 't' values are significant at the 0.05 levels for the degrees of freedom 1, 14 and the obtained values do not reach the critical value 2.14. Hence the values are not significant.

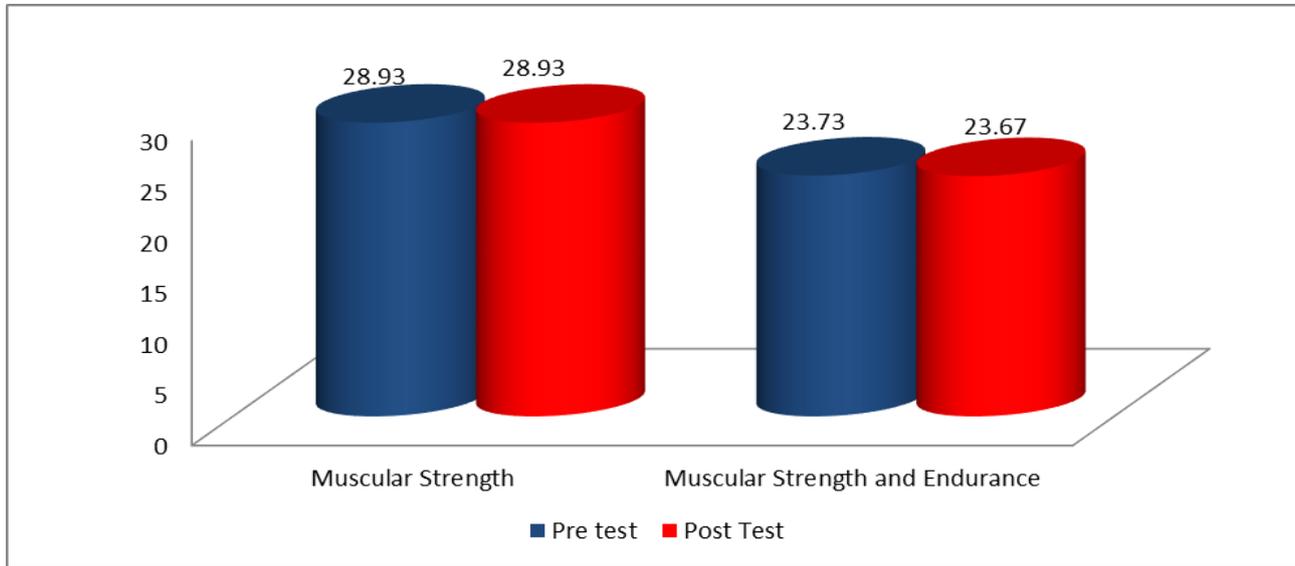


Fig 1: Bar diagram showing the pre and post test mean difference on the Physical fitness variables of the Muscular Strength and Muscular Strength and endurance of the Control group.

Table 2: Testing the significance of the pre and post test on the selected physical fitness variables of the Experimental group

Variables	Pre test (Mean and \pm S.D)	Post test (Mean and \pm S.D)	Mean Difference	Std.Error	't'-ratio
Muscular Strength(Kg)	28.93 \pm 0.80	29.93 \pm 0.80	1.0	0.098	10.25*
Muscular Strength and Endurance(N)	23.80 \pm 0.94	29.93 \pm 1.06	0.73	0.153	4.79*

*Significance at 0.05 level

The Table 3.2 indicates that the obtained 't' values of the fitness variables of the muscular strength and muscular strength and endurance of the experimental Kung Fu group are 10.25 (muscular strength) and (4.79) muscular strength

and endurance). The obtained 't' values exceed the critical value 2.14. Hence it is statistically significant. It shows that the Kung Fu training have significant effect.

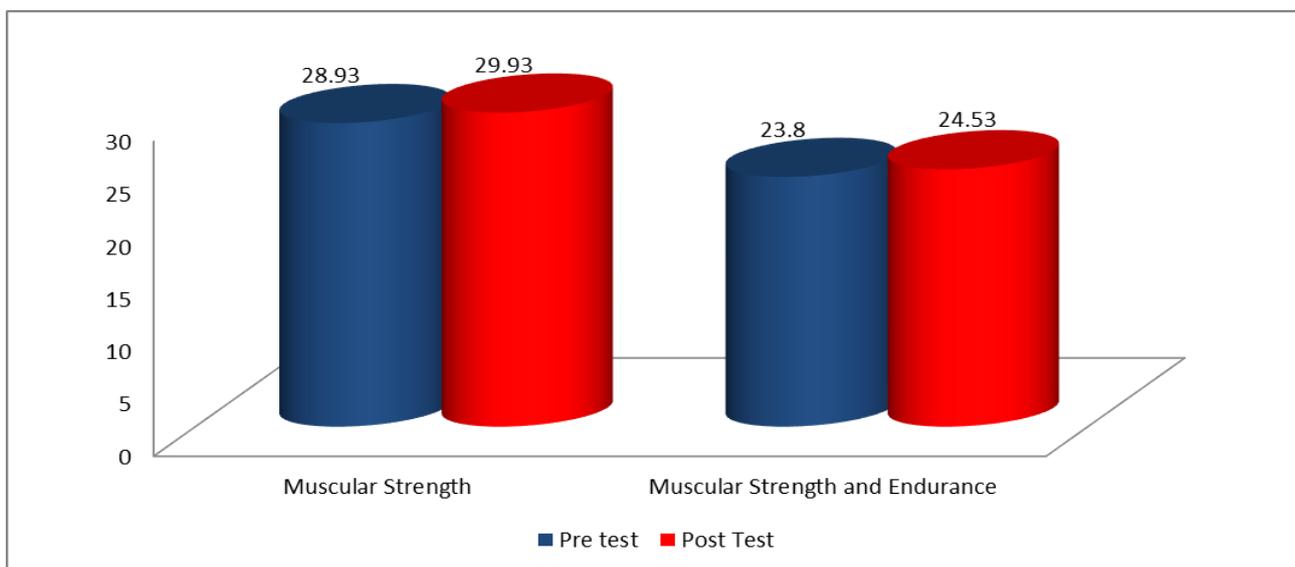


Fig 2: Bar diagram showing the pre and post test mean difference on the Physical fitness variables of the Muscular Strength and Muscular Strength and Endurance of Experimental group.

Table 3: Analysis of variance on Muscular Strength

	Control group	Experimental Group	Sources	Sum of squares	df	Mean Squares	F
Pre test	28.93	28.93	Between Groups	0.00	1	0.00	0.00
			Within Groups	19.87	28	0.71	
Post test	28.93	29.93	Between Groups	7.50	1	7.50	9.6
			Within Groups	21.87	28	0.78	
Adjusted post test	28.93	29.93	Between Groups	7.50	1	7.50	26.83
			Within Groups	7.55	27	0.28	

*Significance at 0.05 level

The Table 3.3 reveals the obtained F-ratio are 0.0 (pre test), 9.6 (post test) and 26.83 (adjusted post test). The obtained F-ratio for the control group and experimental group before the training and after completion of the training are tested at 0.05 level of significance for the degrees of freedom 1, 28 with the critical value 4.20 and adjusted post test for the degrees of freedom 1, 27 with the critical value 4.21. The obtained F

ratio for the pre test (0.0) does not reach the critical value and hence it is not significant. On the other hand the obtained F ratio for post test (9.6) and adjusted post test (26.83) exceeds the critical value. It is found to be statistically significant. From the result, it is inferred that the Kung Fu training has significant impact in improving the muscular Strength.

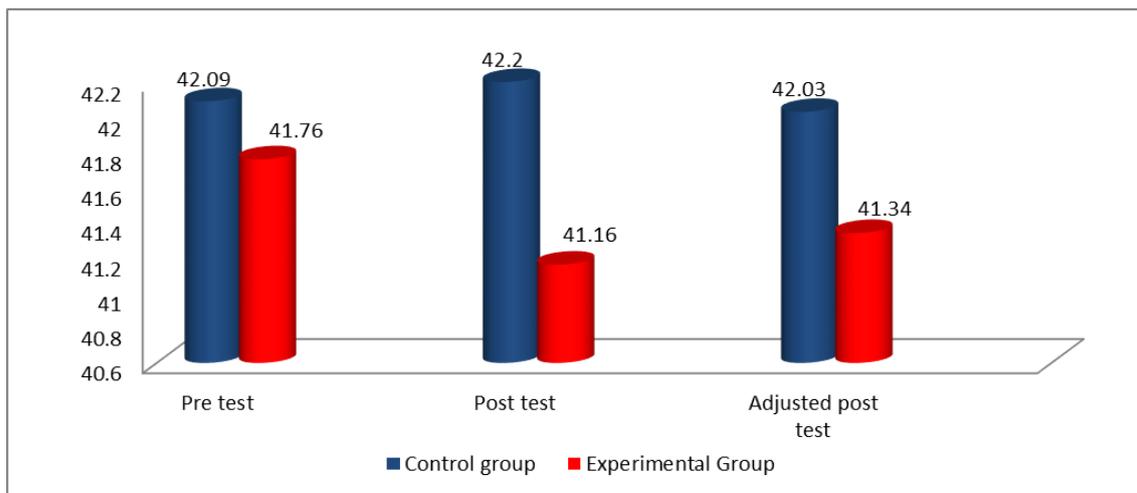


Fig 3: Bar diagram showing the mean values of the pre test, post test and adjusted post test on the Muscular Strength of the control and experimental groups.

Table 4: Analysis of variance on the Muscular Strength and Endurance

	Control group	Experimental Group	Sources	Sum of squares	df	Mean Squares	F
Pre test	23.73	23.80	Between Groups	0.03	1	0.03	0.04
			Within Groups	21.33	28	0.76	
Post test	23.67	24.53	Between Groups	5.63	1	5.63	5.83
			Within Groups	27.07	28	0.97	
Adjusted post test	23.70	24.50	Between Groups	4.80	1	4.80	22.07
			Within Groups	5.87	27	0.22	

*Significance at 0.05 level

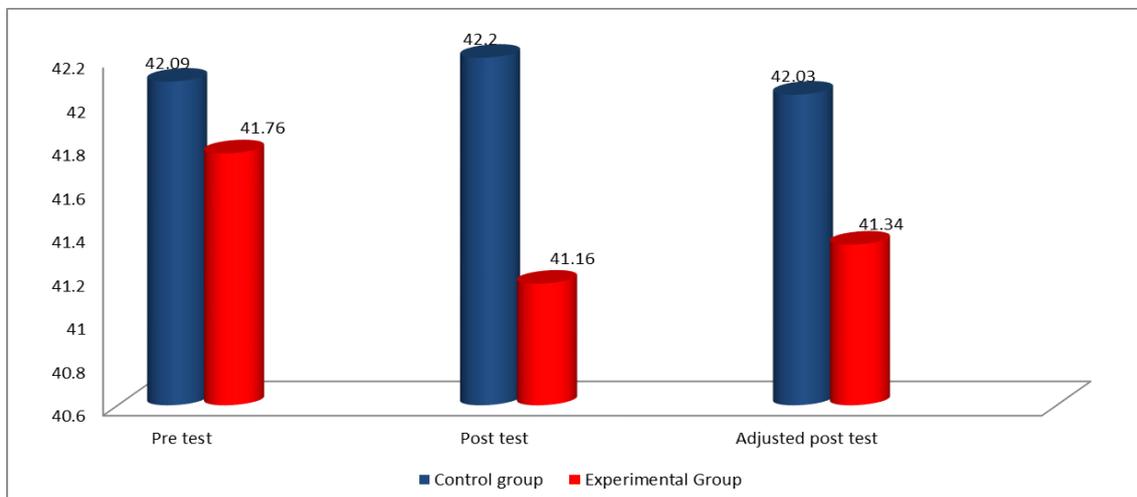


Fig4: Bar diagram showing the mean values of the pre test, post test and adjusted post test on the Muscular Strength and Endurance of the control and experimental groups.

The Table 3.4 reveals the obtained F-ratio are 0.04 (pre test), 5.836 (post test) and 22.07 (adjusted post test). The obtained F-ratio for the control group and experimental group before the training and after the completion of the training are tested at 0.05 level of significance for the degrees of freedom 1, 28 with the critical value 4.20 and the adjusted post test for the degrees of freedom are 1, 27 with the critical value 4.21. The obtained F ratio for the pre test (0.04) does not reach the critical value and hence it is not significant. On the other hand the obtained F ratio for the post test (5.83) and the adjusted post test (22.07) exceeds the critical value. It is found to be statistically significant. From the result, it is inferred that the Kung Fu training has significant impact in improving the Muscular Strength and Endurance.

4. Discussion

During the past decades, the prevalence of the obesity has grown to an epidemic proportion, not only in the adult population, but also in the children and adolescents. Increasing evidence on the negative effect of an unsuitable lifestyle concerning both the abundant and unbalanced diet, along with the reduced physical activity of the children and youth, globally demonstrate the urgency for suitable interventions in this respect. Earliest periods of growth are found to be important and sometimes decisive with respect to the interventions including both the diet and physical activity. Participants in this Kung Fu martial arts training improve muscle strength and endurance, regardless of the Kung Fu allocation. The average increase in the muscle strength from the Kung Fu participation in the trial is greater than the strength gains after an aerobic intervention (Emeset *al.*)^[7]. The gain observed is greater than the expected due to the growth at the adolescent age (Janzet *al.*)^[8], although a non exercise control group has definitely shown that the gains in the muscle function are not simply related to the accretion of the lean tissue in the adolescents. By the improvement of the Muscular Strength and Endurance, the Kung Fu subjects should theoretically be able to undertake their usual activities of their daily living with more ease, which will permit these participants to increase their physical activity habits without becoming exhausted or discouraged as readily as before.

5. Conclusion

Participants in the training improved muscular strength and endurance in comparison with the control group. It is evident from the results obtained above. The results are in good agreement with the results obtained by Seidell^[9], who insist that the obesity is a growing problem. Finally as a result of the study it can be concluded that the Kung Fu training improved muscular strength and muscular strength and endurance in the obese male adolescents with poor initial fitness, compared to the control group.

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