



INFLUENCE OF TAI CHI WITH AND WITHOUT GREEN TEA SUPPLEMENTATION ON MUSCULAR ENDURANCE AND MUSCULAR STRENGTH OF OBESE MEN

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ABSTRACT

This study aimed to find out the effect of tai chi with and without green tea supplementation on muscular endurance and muscular strength of obese men. Forty five obese men with 30 kg/m² to 40kg/m² of Body Mass Index were randomly selected from Chennai District, Tamil Nadu. They were randomly divided into three groups consisting of fifteen (n=15) subjects each. Experimental Group I underwent tai chi without green tea (TC) for five days per week. Experimental Group II underwent tai chi with green tea (TCwGT) for five days per week and group III acted as Control Group. Subjects who were in the control group were not exposed to any experimental training. Prior to the experimental treatments, all the subjects were measured of their muscular endurance through sit ups test and muscular strength through pull ups tests and scored recorded were considered as initial scores. The experimental group I underwent 13 specific exercises and the training sessions lasted for 40 minutes. Experimental group II in addition to the tai chi training was provided with green tea supplementation. The experimental treatments lasted for 16 weeks with respective experimental treatments and immediately after completion of experimental treatment, the subjects was once again tested of their muscular endurance and muscular strength which formed the final scores. The difference between the initial and final scores was considered as the effect of experimental treatment. To test significance, ANCOVA was used and in all cases 0.05 level was fixed to test the significance of the study. The results of this study proved that there were significant improvement in muscular endurance and muscular strength of obese men due to tai chi and tai chi with green tea supplementation and comparing with control group the improvement were significant at 0.05 level. It was concluded that TC and TCwGT were improved muscular endurance and muscular strength of the obese men.

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INTRODUCTION

Tai chi, a traditional Chinese exercise, has been practiced for centuries in China by the elderly and young to attain agility, balance, and posture control. Its beneficial effects on health have been observed, and the maintenance of balance control in older people in particular has drawn increasing attention from scientific researchers. A number of cross sectional and longitudinal studies have provided positive evidence that tai chi practitioners not only have better cardiorespiratory function, but also perform better in balance control, flexibility, and muscle strength tests. Moreover, a study identified that the intervention of tai chi reduced the risk of multiple falls by as much as 47.5%. Although many studies have confirmed the effects of tai chi exercise on balance control for the elderly, little effort has been devoted to determining the underlying mechanism. Tai chi exercise requires continuous, slow

movement with small to large expressions of motion, the shift of body weight from unilateral to bilateral, and circular movements of the trunk and extremities, involving both isometric and isotonic contractions. All forms of tai chi emphasise conscious awareness of body position and movement, which seem to contain the characteristics of proprioceptive exercise.(Paul Lam and Nancy Kayne, 2006). Green tea, one of the most popular drinks around the world, may benefit bone health and the researchers suggest it has the potential to help prevent and treat osteoporosis and other bone diseases suffered by millions of people worldwide. Other studies have already suggested that chemicals in green tea benefit health in many ways, for example by preventing cancer and heart disease, but this is the first study to pinpoint which of those chemicals may also improve bone health by stimulating formation and slowing the breakdown of bone.

There are several studies which prescribe different sets of exercises to reduce obesity and there are researches that diet

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regulations have significant influence to reduce obesity. To manage obesity every one is expected to be encouraged for suitable physical activity and diet regulations for the all round health development. Obesity determines their physical activities and dieting pattern which has become a health concern. Researches have been undertaken to find out the effect of Tai Chi and green tea supplementation on selected health related physical fitness among obese men. However, researches comparing the effect of tai chi without green tea supplementation and tai chi with green tea supplementation are sparse in determining the beneficial effects for obese men. In this research the investigator was interested to find out the effect of tai chi with and without green tea supplementation on muscular endurance and muscular strength of obese men.

METHODOLOGY

Experimental Design

Forty five obese men with 30 kg/m² to 40kg/m² of Body Mass Index were randomly selected from Chennai District, Tamil Nadu. The subjects were from different family background and homogeneous in their activities. They were divided into three equal groups consisting of fifteen (n=15) subjects each. The selection of control and experimental groups were done at random. Experimental Group I underwent tai chi without green tea (TC) for five days per week. Experimental Group II underwent tai chi with green tea (TCwGT) for five days per week and group III acted as Control Group. Subjects who were in the control group were not exposed to any experimental training Prior to the experimental treatments, all the subjects were measured of their muscular endurance through sit ups test and muscular strength through pull ups tests and scored recorded were considered as initial scores. The experimental group I underwent 13 specific exercises and the training sessions lasted for 40 minutes. Experimental group II in addition to the tai chi training was provided with green tea supplementation The experimental treatments lasted for 16 weeks with respective experimental treatments and immediately after completion of experimental treatment, the subjects was once again tested of their muscular endurance and muscular strength which formed the final scores. The difference between the initial and final scores was considered as the effect of experimental treatment. To test significance, ANCOVA was used and in all cases 0.05 level was fixed to test the significance of the study.

RESULTS

Table 1 Effects of TC and TC2GT on Muscular Endurance and Muscular Strength among obese men

	Tc group	Tcwtg group	Control group	Source of variance	Sum of squares	Df	Mean squares	Obtained f
Muscular endurance								
Pre Test Mean	10.87	10.80	11.67	Between	6.98	2	3.49	
				Within	145.47	42	3.46	1.01
Post Test Mean	13.40	14.07	10.73	Between	93.33	2	46.67	
				Within	173.47	42	4.13	11.30*
Adjusted Post Test Mean	13.60	14.32	10.28	Between	132.59	2	66.29	
				Within	78.29	41	1.91	34.72*
Mean Diff	2.53	3.27	-0.93					
Muscular Strength								
Pre Test Mean	4.07	4.07	3.93	Between	0.18	2	0.09	
				Within	40.80	42	0.97	0.09
Post Test Mean	5.60	5.73	3.80	Between	34.98	2	17.49	
				Within	36.93	42	0.88	19.89*
Adjusted Post Test Mean	5.58	5.71	3.85	Between	32.15	2	16.08	
				Within	24.56	41	0.60	26.83*
Mean Diff	1.53	1.67	-0.13					

* Significant at 0.05 level.

The results presented in Table I proved that there was significant differences between initial and final means of muscular endurance as the obtained F values for post test scores 11.30 and 34.72 were significant at 0.05 level. Similarly on muscular strength the obtained F values 19.89 and 26.83 were significant at 0.05 level. Since significant results were obtained, the data was further subjected to post hoc test and the results detailed below.

Table 2 Multiple Comparisons of Paired Adjusted Means and Scheffe's Post Hoc Analysis Results on Muscular Endurance and Muscular Strength among Obese men

Tc group	Tcwtg group	Control group	Mean diff	Reqd. C.i
Muscular Endurance				
13.60	14.32		-0.72	1.28
13.60		10.28	3.31*	1.28
	14.32	10.28	4.03*	1.28
Muscular Strength				
5.58	5.71		-0.13	0.71
5.58		3.85	1.73*	0.71
	5.71	3.85	1.86*	0.71

*Significant at 0.05 level

DISCUSSIONS

Chenchen *et al.* (2004) conducted the physical and psychological effects of tai chi determined that significantly increases the balance and strength, cardiovascular and respiratory function, flexibility, immune system, symptoms of arthritis, muscular strength, and psychological effects. Zachary and Shi (2007) investigated the efficacy of 12 weeks of Tai Chi practice determined that significantly increases the lower limb muscular strength and strength ratios in an older population. Chung, *et al.* (2008) investigated the effect of green tea extract (GTE) on obese women and to explore the relationship between GTE and obesity-related hormone peptides and showed no statistical difference in % reduction in body weight, body mass index between the GTE and placebo groups after 12 weeks of treatment. Daniela, *et al.* (2005) investigated the effect of the addition of two cups of green tea GT (containing approximately 250 mg of total catechins) to a controlled diet in a group of healthy volunteers and suggested the ability of GT, consumed within a balanced controlled diet, to improve overall the antioxidative status and to protect against oxidative damage in humans. The results of this study proved that there were significant improvement in muscular endurance and muscular strength of obese men due to tai chi and tai chi with green tea supplementation and comparing with control group the improvement were significant at 0.05 level.

Though it was found that tai chi with green tea supplementation had scored better than tai chi the differences were not significant. The findings of this study were in agreement with the previous findings in this regard.

CONCLUSIONS

It was concluded that though tai chi with green tea scored better than tai chi the improvements were not significant and recommended for further research with larger samples.

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