



EFFECT OF WEIGHT TRAINING ON PERCENT BODY FAT AMONG MIDDLE AGED OVERWEIGHT MEN

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ABSTRACT

The purpose of the study was to find out the effect of weight training on percent body fat among middle aged overweight men students. To achieve the purpose of the study, 24 subjects were randomly assigned to experimental group (12) and control group (12). Physical examination and medical checkup at the initiation of the study yielded normal results in all the subjects. The experimental group underwent a Weight Training Program for a period of 24 weeks, whereas the control group maintained their regular routine activities. The subjects of both the groups were tested on selected criterion variable such as percent body fat 24 hours before and after the period of experimentation. The analysis of covariance (ANCOVA) was used to find out the significant differences if any, between the experimental group and control group on selected criterion variable. In all cases, 0.05 level of significance was fixed to test the significance, which was considered as an appropriate. The result of the present study has revealed that there was significant difference among the experimental and control group on percent body fat.

KEYWORDS : weight training, percent body fat, middle aged, overweight men

INTRODUCTION

Man lives for happiness. Happiness gives him enjoyment and satisfaction, which depends on his physical and mental ability. The primitive man may due to the very nature of his daily activities, builds a strong physique superior to the civilized man. In modern civilized machinery world, the chance for the physical activities is less because of the invention of computer and so many other devices and the basic need of participation in the physical activity to maintain a good health is almost forgotten. The Health is defined as a state of complete physical, mental and social well being and not merely free from diseases or infirmity. Everybody desires a long and healthy life and exercise has a great part to play in this. In one aspect the body can be said to commence ageing from the moment it is born, although it is usual to say it really begins in about the mid-thirties. However different systems of the body age at different rates, no doubt depending upon how they are used or not used. Many people continue a very active life, both physically and mentally, well in to their old age. The barrier of these activities often seems to be physiological rather than physical, and when a person thinks he is too old to do something physically he may well be completely wrong, although too much of exercise could do harm. The only way to find out if one can do something is to try.

Physical Training implies participation in a program of regular and vigorous physical activity with the primary intention of improving either physical performance or health through the development of some component of fitness such as cardio-vascular function or muscle strength. Physical activity is defined as "bodily movement produced by skeletal muscles that requires energy expenditure" and produces healthy benefits. Exercise, a type of physical activity, is defined as a planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness. Physical inactivity denotes a level of activity less than that needed to maintain good health.

Better performances are primarily the outcome of efficient technique, the progression of speed and the maturing competitive attitude on a sound basis of general endurance, all round strength and general mobility. The development of all round strength is best achieved via circuit training and then progressing this through strength training. Strength training

is exercise that uses weights to condition the muscles by improving muscle tone, strength and endurance. Strength training not only tones muscles, it reduces fat, speeds metabolism, increases endurance, improves posture, strengthens bones, and cuts the risk of injury and fight the signs of aging. One can replace muscle lost to aging by strength training. Studies show that two to three months of strength training can replace 3 pounds of muscle. By lifting weights, you also counter your body's natural metabolic decline of 2 to 5 percent each decade.

Weight training is crucial to weight control, because individuals who have more muscle mass have a higher metabolic rate. Muscle is active tissue that consumes calories while stored fat uses very little energy. Strength training can provide up to a 15% increase in metabolic rate, which is enormously helpful for weight loss and long-term weight control. Strength training provides similar improvements in depression as anti-depressant medications.

Weight training is important for cardiac health because heart disease risk is lower when the body is leaner. Studies have found that cardiac patients gained not only strength and flexibility but also aerobic capacity when they did strength training three times a week as part of their rehabilitation program. All these studies have prompted the American Heart Association to recommend strength training as a way to reduce risk of heart disease and as a therapy for patients in cardiac rehabilitation programs.

Weight training is also known as resistance training or strength training. Strength is the ability to overcome resistance or to act against resistance. Strength should not be considered as a product of only muscular contractions. Strength is a conditional ability that depends mostly upon the energy liberalization process in the muscles.

The terms resistance and strength training encompass a wide range of training modalities including poly metrics and will refer only to normal resistance training using free weights or weight machines. Individuals who participate on a resistance-training program expect the program to produce certain benefits, such as increased strength, increased muscle size, improved sports performance, increased fat free mass and

decreased body fat. A well designed and consistently performed resistance training program can produce these enriching outcomes. Most of the people taking part in a strength training program are concerned with improving their appearance through increasing muscle mass and definition. The later is achieved by reducing body fat so the shape of the muscles becomes more apparent. A low body fat percentage is major aim for weight trainers, body builders and for the most competitive sports people.

The people taking exercise training have a good posture, increased efficiency of heart and lungs, reduced cholesterol levels, increased muscle strength, reduced blood pressure and reduced risk of major illness such as diabetics, and heart diseases. Body composition is a key component of an individual's health and physical fitness status. Lean body weight and fat weight are the two component systems of the muscle, bone, internal organs and connective tissues in the body. Fat weight usually is expressed relative to the total body weight of the individuals. Excessive body fat leads to obesity and enhances the risk of developing Coronary Heart Diseases. It is important to realize that individuals may be overweight even though they do not appear to be overweight. This may be caused by lack of physical activity.

One of the aims of exercise and training is to cause changes in the body composition. The regular physical exercise has a favorable effect on body composition for individuals of all ages. The most efficient way to reduce body fat by means of exercise is to employ the longer duration endurance activities at a well-designed and consistently performed weight training program can produce all these benefits. Both the recreational weight trainers and the athlete expect gains in strength or muscle size (muscular hypertrophy) from a weight training program. Many different types of resistance training (e.g. isokinetic, variable resistance and isometric) can produce gains in strength. In addition, many different training systems (e.g. combinations of sets, repetitions and resistances) can produce significant increases in strength or muscular hypertrophy as long as the system presents and can continue to present an effective training stimulus to the muscle. The effectiveness of a specific type of resistance modality or training system depends on its proper use in the total exercise prescription or training program.

MATERIALS AND METHODS

A total number of 41 potentially overweight men volunteered for the study. In the first phase all of them were informed in detail the nature of the study and what their contribution will be. Out of which 9 subjects opted out. In the second phase the height, weight and pulse rate of all the 32 subjects in fasting state without shoes and with minimum clothing were measured. All the measurements were performed in the erect position by the researcher. The Body Mass Index (BMI) was computed as the weight (Kgs) divided by height square (m²). Out of the 32 subjects 29, who were having BMI above 27 were selected for the third phase. In the third phase a written explanation of the experimental procedure and potential risk factors were given to each subjects. Five of them opted out of the study due to personal reasons. All the other 24 volunteered as subjects for the study and their informed consent was obtained.

The 24 subjects were randomly assigned to either Experimental group ('EXP', No: 12) or Control group ('CON', No: 12). Physical Examination and Medical checkup at the initiation of the study yielded normal results in all the subjects and none of the subjects received any period of the study. The baseline characteristics of the medication during the subjects were given in Table-I

	Experimental Group		Control Group		Total	
	Mean	SD	Mean	SD	Mean	SD
Age	39.17	2.29	41.75	2.45	40.45	2.67
Height	168.42	6.14	166.92	5.70	167.67	5.84
Weight	88.00	9.02	87.83	7.80	86.10	8.79
BMI	30.96	2.07	31.52	1.89	31.24	1.96

The selected subjects were randomly divided into three groups of 12 subjects each group. Group one acted as experimental group, and group II acted as control group. The experimental group subjects were underwent regular weight training practice for twenty four weeks. The subjects were tested on selected criterion variable such as percent body fat prior to and immediately after the training period. Analysis of covariance (ANCOVA) was applied for analyze the data. The 0.05 level was used to test this significance.

Percent Body Fat

Skinfold Measurement

The skinfold measurement were made using a Lange Caliper (Cambridge, Scientific instruments, Cambridge, MD, USA) at the following sites as recommended by Larry G. Shaver (1981).

Abdominal skinfold - at the midaxillary line at waist level

Chest skinfold - at the level of xiphoid in the midaxillary line

Arm skinfold - at the midpoint between the tip of acromion and the tip of the oceranon with the arm hanging at the side

All the measurements were made on the right side of the body by same tester. The calipers were applied about 1 cm from the fingers folding the skinfold and a depth that is about equal to the thickness of the fold. All measurements were taken with the skinfold in a vertical position, except when the natural folding of the skin is opposition in which case, the measurement is made with skinfold along the line of the natural folding. The readings of the three skinfold measurement was recorded in millimeter and separately recorded under different heads as follows:

Abdominal skinfold - A

Chest skinfold - B

Arm skinfold - C

Calculation of Density

The Density was measured by substituting the three skin fold measurements i.e. Abdominal skin fold (A), Chest skin fold (B) and Arm skin fold (C) in the formula

$$\text{Density} = 1.1017 - (0.000282) \times (A) - (0.000736) \times (B) - (0.000883) \times (C)$$

Calculation of Percent Body Fat

Once body density was determined, the percent body fat was computed from the equation given below.

$$\text{Percent body fat} = \left[\frac{4.570}{\text{Density}} \right] 4.142 \times 100$$

RESULTS FINDINGS

The mean and standard deviation scores of pretest, posttest and adjusted posttest of total cholesterol on weight training and control group are given in table. 'F' ratio test computed in regards to the total cholesterol on weight training and control group in the pretest, posttest and adjusted post test are also presented in table.

The data collected prior to and after the experimentation period on percent body fat among experimental and control groups were statistically analyzed and presented in table II.

Analysis of Covariance for Percent Body Fat Among Experimental & Control Groups

		Control Group	Exp. Group	F ratio
Pre	Mean	24.79	25.22	0.22
	SD	2.24	2.24	
Post	Mean	25.04	22.81	11.95*
	SD	1.81	1.32	
Adj Post	Mean	23.47	26.54	22.89*

Table II shows that the Pre Test means of Percent Body Weight among Experimental group (24.79 ± 2.24) and Control group (25.22 ± 2.24) resulted in F - ratio of 0.22 which indicates no significant difference between Pre Test means at .05 level of confidence. The Post Test means of Percent Body Weight among Experimental group (25.04 ± 1.81) and Control group (22.81 ± 1.32) resulted in a F — ratio of 11.95 which is significant at .05 level of confidence, whereas the adjusted post is means of Experimental (23.47) and Control groups (26.54) resulted in a F - ratio of 22.89 which was significant at .05 level of confidence. This indicates that there is a significant change in Percent Body Weight among experimental group when compared with the control group. After going through the results, it was concluded that Weight Training Programme has significantly reduced Percent Body Weight among over weight middle aged.

DISCUSSION ON FINDINGS

The Pre Test means and Post Test means of Percent Body Fat among Control group (24.79 ± 2.24 vs 25.04 ± 1.81) shows an increase of 0.25 (0.01%) , While the Pre Test means and Post Test means of Percent Body Fat among Experimental group (25.22 ± 2.24 vs 22.81 ± 1.32) shows a decrease of 2.41 (9.56%) . Furtherer more when the adjusted post test means of Experimental (23.47) and Control groups(26.54) were analyzed by means of Analysis of Covariance , The obtained results indicates a significant decrease in Percent Body Fat in the Experimental group when compared with the Control Group (P > 0.05).

On the basis of the results obtained it was concluded that Weight Training Program resulted in a significant decrease in Percent Body Fat among Overweight middle aged men. Carbohydrates and Fats are the main fuels oxidized by skeletal muscles to provide energy during prolonged exercise (Newstone, E.A. and Leech, A.R, 1988). The extra amount of energy as demanded by the exercise training places the muscle groups to search for energy which it derives from fatty acid stores and it leaves to the reduction of body fat. The obtained results were in conformation with the findings of Chilibeck PD, et al. (1996,1998), and Cullinen, K. and Caldwell, M. (1998),and in contradiction to the findings of Hurley BF et al. (1988), Boy den TW, et al. (1993) and Goldberg L, et al. (1984).

DISCUSSION ON HYPOTHESIS

On the basis of the results obtained it was concluded that Weight Training Program resulted in a significant decrease in Percent body Fat among Overweight middle aged men. In hypothesis it was stated that there will be a significant reduction in percent body fat. The result of the study shows similar results and hence the hypothesis is accepted.

CONCLUSIONS

We can say that for 1m³M20 grade of concrete consumption of fine aggregate is 775.96 kg. Here in specimen M-3 we replace fine aggregate by 24.62 kg of crumb rubber for 1m³M20 grades of concrete. So, we can say that up to 15% foundry sand utilized for economical and sustainable development of concrete.Uses of crumb rubberin concrete can reduce the harmfulness to the environment and produce a 'greener' concrete for construction. An innovative supplementary Construction Material is formed through this study.

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