

Study of Effect of Nutrition and Lifestyle Modification of Obesity Management: An Empirical study with Pre and Post Test effects

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ABSTRACT

Obesity is a public health problem that has become epidemic worldwide. Overweight and obesity prevention or reduction essentially involves lifestyle modification through behavioral change at the individual level. Lifestyle weight management programmes for overweight or obese adults are multi-component programmes that aim to reduce a person's energy intake and help them to be more physically active by changing their behaviour. A comprehensive program of lifestyle modification is considered the first option for achieving this goal. Lifestyle modification, also referred to as behavioral weight control, includes primary components: diet, exercise, and behavior therapy. This study was conducted Develop nutrition and complete lifestyle modification package for overweight adult people with combination treatment of electronic devices, diet and physical exercise. All available subjects attending a commercial weight reduction clinic were selected. The sample comprised one hundred eighty adult (180) peoples (90 male and 90 female) in the age group of 30-40 year. We aimed to examine the effectiveness of combined nutrition and complete lifestyle modification package (NCLMP) for overweight adult people. In NCLMP we combined electronic Devices, diet and physical exercise programs with at least 6 months of follow-up, conducted in overweight adults (body mass index >25). Results revealed that in Pre-intervention phase majority of the subjects (75 percent) were found to be in the category of high risk while minority of the respondents (25 percent) had normal WHR (< 0.8). The mean WHR was 0.83 ± 0.0 . and the fat values exceed the normal range of fat, diet of subjects in comparison to the balanced diet was substantially inadequate in food groups, representing the excess fat deposition in the subjects owing to obesity. Intervention phase results revealed effect of electronic devices, physical exercise and nutritionally balanced weight loss diet on body composition of males were showed body Fat (%) before intervention was 31.10 ± 3.2 and after intervention 29.26 ± 4 and decrease after intervention - 1.84. Effect of electronic devices, physical exercise and nutritionally balanced weight loss diet intervention on body composition of females were found body Fat (%) before intervention was 33.83 ± 4.6 and after intervention 32.2 ± 4.5 and decrease after intervention - 1.59.

1. Introduction

Obesity is a chronic health problem which now affects many Indians. Some say the rates are so high that we have reached an obesity epidemic. Overweight and obesity are dangerous conditions as they can contribute to a number of different health problems (eg, heart disease and diabetes). It is therefore extremely important that obesity is treated aggressively. Lifestyle changes remain the mainstay of treatment and are important for the long term maintenance of weight loss.

Lifestyle modifications aim to reduce the burden of obesity and reduce the associated conditions. In general, the greater the degree of weight loss achieved, the greater the health benefits. However, even a small amount of weight loss (5-10% of body weight) can lead to significant benefits. Some people consider this small amount of weight loss unsatisfactory, but the health benefits are much more important than physical appearance. The overall success of a weight loss program really depends on whether the weight loss is sustained in the long term. For this to be achieved you must be well educated about obesity and be extremely dedicated to your lifestyle changes. It may be useful to elicit the help of your friends and

family to keep you motivated. Lifestyle treatments for weight loss focus on reducing energy intake and increasing physical activity through diet, exercise and behavioral measures. In general, a combination of treatments is the most effective way to achieve weight loss.

Dietary control has probably been the main treatment used for weight loss in the past. Diets are based on the principles of metabolism and work by reducing the intake of calories (energy) to create a negative energy balance (i.e. more energy is used than is consumed). Most diets produce some weight loss and are successful in the short-term. However, less than 10% of patients will maintain the weight loss in the long term. Once again it must be emphasized that permanent changes to eating habits are required. You must be careful whilst dieting to ensure that you still receive all the essential proteins, vitamins and trace elements. The best way to achieve this is by eating a well-balanced diet with a wide variety of nutritious foods. A successful weight loss program may include cutting fats and sugars from your diet while ensuring you eat lots of healthy foods such as wholegrain, fruits and vegetables. Some diet programs may also require you to take vitamin or mineral supplements.

In addition to reducing your energy intake, increased physical activity is essential for the maintenance of weight loss and should form part of any weight loss program. However, to achieve significant weight loss from exercise alone, a very high level of activity is required, which can be challenging. You should gradually build up your exercise as your personal fitness allows. You can start with simple measures such as walking to nearby places rather than driving, or climbing the stairs rather than using an elevator or escalator. Thirty minutes of walking 3-5 times per week is a good starting point.

Behavioral techniques may be useful in conjunction with diet and exercise programs to improve long-term weight loss. Behavioral treatment is usually performed by a psychologist who analyses your eating, physical activity and thinking habits. Comprehensive lifestyle modification programs typically provide weekly individual or group treatment sessions designed to modify eating and activity habits. Overweight and obese individuals, as well as persons of average weight, often report not having time to exercise. Practitioners should emphasize that, for weight control, this activity can be performed at a moderate intensity and in short bouts, as brief as 10 minutes. When included as part of a comprehensive weight loss program, multiple short bouts of activity throughout the day are as effective as 1 long bout (>40 minutes) for achieving weight loss.

2. Objectives

1. To assess the nutritional status of overweight adult people.
2. To find out the effectiveness of nutrition and complete lifestyle modification package on nutritional status of overweight adult people.
3. To find out the gender difference in the effectiveness of nutrition and complete lifestyle modification package on overweight adult people.

3. Material and Methods

A total of 180 (90 males, 90 females) overweight subjects comprised within a wide range of age (30-40 y) and BMI (25.0 kg m^{-2}). For the assessment of overweight and nutritional

status of adult people, an interview schedule was developed to collect the information about subjects. Basic anthropometric measurements such as height, waist and hip circumference measurements were taken using standard methods given by Jelliffe (1966)

Weight and Body composition of the subjects was determined using bioelectrical impedance using Body composition analyzer. In body composition parameters viz. fat mass, muscle mass, bone mass, lean body mass, total body water and visceral fat rating were determined. In intervention phase subject were divided into 2 group male (90) and Female (90). On the basis of energy requirement of the subject for weight loss diet plan was prepared for one week and then given to the subject. Along this electronic muscle exerciser is used to exercise the muscle by passing an impulse through the muscle, which stimulates the muscle (motor nerves control muscle activity). For active exercise walk and yoga methods was used.

In post intervention phase All the nutritional, biochemical and atherogenic factors, that were assured prior to the intervention period were assessed again and recorded in the - "Nutrition and complete lifestyle modification package", used in the pre experiment phase, after 6 months.

4. Results and Discussion

The general information of the survey group obtained through a structured questionnaire. Study was conduct in Pre-intervention, intervention and Post-intervention phases so as to accomplish the objectives of the study.

Pre-Intervention phase: Results pertaining to anthropometric measurements as obtained in present study are given below:

Table-1 Anthropometric Measurements

S. No	Male (90)	Female (90)	Percentage (n=180)
Normal BMI <25.0	(00)	3.3(03)	1.66(03)
Grade 1 BMI 25.0-29.9	61.1 (55)	71.1(64)	66.1(119)
Grade 11 BMI 30.0-39.9	33.3 (30)	22.2(20)	27.7(50)
Grade 111 BMI >40.0	5.5 (05)	3.3(03)	3.8(07)

Table-2 Distribution of subjects with respect to grade wise BMI

S. No	Body Measurements	Mean \pm SE	
		Male	Female
1	Weight (kg)	85.6 \pm 9.6	72.83 \pm 11.1
2	Height (cm)	173.2 \pm 6.8	161.72 \pm 6.7
3	BMI (kg/m^2)	28.3 \pm 1.9	28.06 \pm 1.9
4	WHR	0.96 \pm 0.12	0.86 \pm 0.05
5	Body composition		
a)	Fat (%)	33.8 \pm 0.6	39.4 \pm 0.6

b)	Body fat mass(kg)	30.1 ±0.8	27.9 ± 0.9
c)	Total body water(kg)	29.9 ±0.9	27.9 ± 0.9
d)	Fat free mass(kg)	50.5 ±0.6	40.6± 0.6

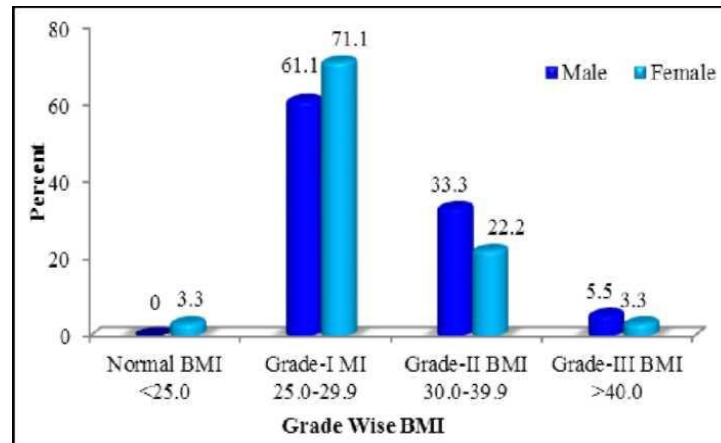


Fig 2: Distribution of subjects with respect to grade wise BMI

Dietary intake: The nutritional status of any individual is directly affected by his/her food intake. The components of the diet should be chosen judiciously so that it provides all the nutrients in adequate amount and in proper proportion (ICMR, 2010) [2].

Nutrient intake: Life cannot be sustained without adequate nourishment. Man needs sufficient food for growth, development and to lead an active and healthy life. (ICMR, 2010) [2].

Physical activity: Physical activity is a key determinant of energy expenditure and thus is fundamental to energy balance and weight control. Therefore, approximate time spent on various physical activities by the subjects was also studied to have an idea about the general lifestyle pattern of the subjects.

Intervention and post intervention phase: This phase was fundamentally the execution phase in which the nutritionally balanced weight loss diet (personalized plan) were given to the subjects. It provides enough energy to meet the person's metabolic needs and activity level. It includes a balanced variety of foods, but limits of carbohydrates and fat. A Nutritionally balanced weight loss diet helps to reduce half to one kg weight per week. In the present study, diet plans were prepared for one week according to the energy requirement of the subjects for weight loss and then given to the subjects. Results revealed that greater percent of the subjects (70 percent) lost half kg weight in the first week, so similar diet plan was given for next week whereas 30 percent subjects did not lose weight.

Table-3 Distribution of Subject after treatment in context to Grade wise BMI

S. No	Male (90)	Female (90)	Percentage (n=180)
Normal BMI<25.0	38.8 (25)	42.2 (38)	40.5 (73)
Grade 1 BMI 25.0-29.9	44.4 (40)	30 (27)	37.7 (67)
Grade 11 BMI 30.0-39.9	20 (18)	13.3 (12)	16.6 (30)
Grade 111 BMI >40.0	6.6 (06)	4.4 (04)	5.5 (10)

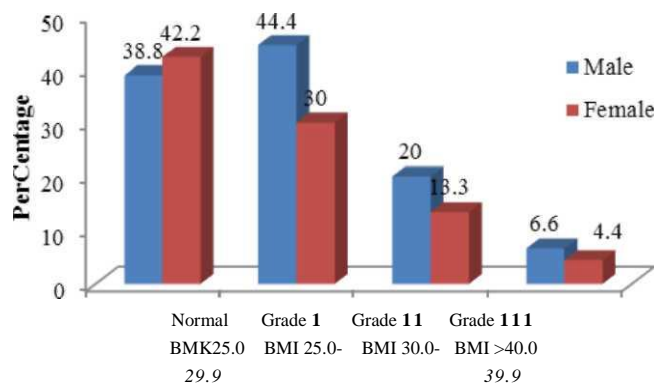


Fig 3: Distribution of subjects after treatment with respect to grade wise BMI

Table 3 presents the grades of obesity in male and female subjects after treatment. It was observed that the number of male subjects with normal BMI increased 38.8% and female subjects with normal BMI increased to 42.2% as compared to 3.3% before treatment. Similarly subjects in Grade 1 were 37.7% as compared to 66.1% before treatment. On the other hand percent of subjects suffering from Grade 11 obesity fell

from 27.7% to 16.6% after treatment, also in Grade 111 from 3.8% to 5.5%.

Electronic muscle exerciser was also used to exercise the muscle by passing an impulse through the muscle, which stimulates the muscle (motor nerves control muscle activity). Results pertaining to effect of nutrition complete life style modification programme as obtained in present study are given below:

Table-4 Effect of Nutrition and Lifestyle change on Males

Body composition	Mean \pm SE			Paired 't' value
	Before intervention	After intervention	Increase/decrease after intervention	
Body Fat (%)	31.10 \pm 3.2	29.26 \pm 4.1	- 1.84	2.36**
Fat mass (kg)	24.4 \pm 1.5	21.5 \pm 1.4	- 2.9	6.51**
Total body water (kg)	30.9 \pm 0.6	31.2 \pm 0.6	+ 0.3	1.18NS
Fat free mass (kg)	39.9 \pm 1.1	41.1 \pm 1.1	+ 1.2	5.90**

Table-5 Effect of Nutrition and Lifestyle change on Females

Body composition	Mean \pm SE			Paired 't' value
	Before intervention	After intervention	Increase/decrease after intervention	
Body Fat (%)	33.83 \pm 4.6	32.2 \pm 4.5	- 1.59	3.73
Fat mass (kg)	27.4 \pm 1.5	24.5 \pm 1.4	- 2.9	7.51**
Total body water (kg)	30.9 \pm 0.6	31.2 \pm 0.6	+ 0.3	1.18NS
Fat free mass (kg)	39.9 \pm 1.1	41.1 \pm 1.1	+ 1.2	5.90**

Table's exhibits that fat free mass of the male subjects increased from 39.9 \pm 1.1 at pre intervention to 41.1 \pm 1.0 kg and female subjects increased from 37.9 \pm 1.1 at pre intervention to 39.1 \pm 1.1 at the end of the study. Thus, in the present investigation, there was an increase in the fat free mass with the subsequent decline in the body fat, as a beneficial impact of electronic muscles exercise and nutritional balanced weight loss diet.

Results of fat mass of the male subjects decreased from 24.5 \pm 1.5 at pre intervention to 21.5 \pm 1.4 kg and fat mass of the female subjects decreased from 27.4 \pm 1.5 at pre intervention to 24.5 \pm 1.4kg. Results of TBW of the subjects calculated before and after the intervention showed slightly higher value in both subjects 31.2 \pm 0.6 kg were found at the end of the intervention.

5. Conclusion

The findings of this study demonstrate that nutrition and complete lifestyle modification package for overweight adult people with combination of diet, active and electronic exercise has a positive effect on body weight in people with overweight and obesity. Although exercise alone improved weight loss only marginally, when combined with nutrition and complete lifestyle modification programme the amount of weight loss achieved with exercise increased substantially. The diet and exercise programs produce a 3-5 fold greater change in body composition than exercise program. It can be thus concluded that weight loss can be brought about by exercise and diet. For sustained weight loss along with exercise and diet behaviour modification is required.

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