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RESEARCH ARTICLE

PREVENTION OF MONO AND FAD DIETS TO REDUCE WEIGHT AMONG SUBJECTS (18-25 YRS) SUFFERING FROM OBESITY

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ABSTRACT

Obesity is one of emerging health problems of 21st century. World Health Organisation (WHO) has declared Obesity as one of top ten health risk in the world (2000) and this is because it increases the risk of life threatening conditions. To reduce weight many diets are available and people follow them without knowing their repercussions. A fad diet is a weight loss plan or aid that promises dramatic results. These diets typically don't result in long-term weight loss and they are usually not very healthy. In fact, some of these diets can actually be dangerous to your health. Mono diet is defined as diet in which only one type of food product is eaten per day e.g. potatoes in a day nothing else. The present study was carried out on three hundred and twenty subjects selected randomly from five hundred Obese subjects. The subjects involved in this study has made extreme efforts to lose weight. They followed mono / fad diets plus exercises as well to reduce their weight in the past. Then these subjects were counseled and given nutritionally adequate dietary guidance so that they could lose weight in a healthy way. The subjects were divided into three experimental groups E1, E2 & E3 and a control group. E1 group was doing exercise only, E2 was following hypocaloric diet and E3 followed Exercise plus hypocaloric diet. Control group followed regimen on their own. The Dietary intake of E1, E2 & E3 in terms of energy, proteins, fats, carbohydrates was calculated before and after intervention based on dietary survey method. The anthropometric measurements were also found out before and after interventions which were reduced to significant levels. The study included to judge the effect of excess weight on the nutritional status of the young adults as well as to assess the efficacy of three common weight reducing interventions i.e E1 (Exercise), E2 (Hypocaloric diet), E3 (Exercise plus Hypocaloric diet) in the subsamples of the above selected subjects. The nutrition education and dietary counselling was provided and positive reduction in weight was achieved.

INTRODUCTION

It also decreases life expectancy. WHO (2000) expert consultation an obesity warned of an escalating epidemic of obesity that would put the population of most countries at risk.

*Dr Luxita Sharma, Head, Dietetics and Applied Nutrition, Amity University, Gurgaon. In today's world the young adults are attracted towards different techniques for weight loss that are other techniques besides exercise. Slimming centres use the techniques in weight reducing such as lipolysis, laser and micro current techniques. The whole slimming industry has grown into a big market as they are result oriented and treat their patients as a target achievement (Sheth, 2006). The Slimming centre therapies are useful for the obese young adults as they are not able to exercise properly due to extra load of weight in their bodies. The slimming clinics are providing dietary regimen that is mostly in form of mono diets, with body sculpting therapies that include anti cellulite Body Massages, lymphatic drainage massages and tummy/thigh tucks (Jain, 2010). The subjects followed the mono diets in the past as prescribed to them by the Slimming clinics where they went for weight loss.

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They lost weight but gained again within a couple of months. They suffered from various diseases as Hypertension, Obesity and Hyperlipidemia as shown in Table no 4.2. The prevalence of obesity is world wide and is increasing as an epidemic day by day. Therefore the need was felt to conduct a study on obesity in young adults belonging to regions of Kurukshetra & Delhi (NCR). Obesity is the abnormal body weight i.e. more than twenty per cent of normal body weight for particular age, height and bone structure (Anrig, 2003). Body Mass Index (BMI) of a person is his weight in kilograms divided by his height in metres square and when value of BMI exceeds more than 30 kg/m² a person is said to be obese (WHO, 1998).

The adoption of western diet and lifestyle has contributed to obesity in developing countries including India (WHO, 2000). Modern societies are fascinated with a diet high in saturated fats, sugar and refined foods but low in fiber often termed as "western diet" (Mishra, 2009). Weight Management term generally encompasses the goals of prevention of excess weight gain, weight loss and optimizing health and reducing the risks of diseases (Walker, 2003). Young adults find it easier to join slimming centre as they are motivated there psychologically and through dietary guidance (Luthra, 2008). According to Sheth (2006), microcurrent therapy is applied on

the fatty area of an obese individual through machines. The other techniques involve lymphatic drainage massages, Anticellulite Massages result in 100 per cent weight loss combined with mono diets.

Review of Literature

Obesity is at least three times more common in cities than villages, as villages are also becoming urbanized day by day and are adopting the same disturbed lifestyle (Gopalan, 1998). The overall prevalence of obesity in urban young population in New Delhi has shown an increase from sixteen per cent in 2002 to about twenty four per cent in 2007 (AIIMS, New Delhi). The number of obese citizens in India has increased to twenty per cent between 1998 –2005 (Times of India, 2010). It is estimated that there are more than 250 million obese people worldwide and was found that it is not only a problem of adult population but is also affecting children and adolescents (WHO, 1998). WHO further projects that by 2015 approximately more than 700 million young adults would be obese.

MATERIALS AND METHODS

Locale of the study

The study was conducted on young adults belonging to the cities of Kurukshetra and Delhi (NCR).

Selection of the subjects

- One thousand young adults between 18 - 25 years of age were selected from different localities and institutions, namely - Kurukshetra (Ladwa), and Delhi (NCR) region and slimming centres.
- The height and weight of all the subjects were measured to find the obese subjects among them.
- From above the BMI was calculated by following the method of Quetelet (1835) and five hundred obese subjects were selected.
- All the selected five hundred subjects were (i) Obese with body mass index (BMI) of $> 29.9 \text{ kg/m}^2$ (ii) Free from any serious disease. (iii) Not following any dietary restrictions. (iv) Out of the surveyed young adults, 320 subjects were selected randomly from the regions of Kurukshetra and Delhi (NCR) both taken equally from either sex (n= 160 each). The 160 males comprised of Kurukshetra and Delhi (NCR) regions, 80 from each one. This division was also exercised for the females accordingly in the same manner. Further the subsampling of both of the subjects (males and females) into 20 each categorized as Experimental group and control group was done. The Experimental group consisted of E1, E2, E3 with the number of subjects as twenty each. While the control group numbered twenty only. (v) The objective and experimental protocol of the study was explained to the subjects, and their prior consent was taken.

Experimental plan

Field studies: These studies consists of collection of data regarding general information, physical activity pattern, health record, assessment of nutritional status by using dietary survey

and anthropometry. The study was constituted of three phases and the classification of subjects was elaborated as under:

Phase–II: In the second phase, three experimental groups were designed as shown in Fig.no.3.1 for three different weight – reducing interventions on sub samples of the selected subjects. The effect of each treatment was studied for a period of three months, at the end of which the results were compared with a control group. The study groups were.

First experimental group (E₁): This group comprised of obese male and female subjects who opted to reduce weight by doing cardio exercise (Brisk Walking or Jogging or Treadmill) They exercised for 30 -45 minutes daily, on three to four days per week. Their daily exercise routine included 8-10 minutes of warming up exercises. 15-20 minutes of moderate to vigorous workout, followed by five minutes of cooling down and 10 minutes of stretching exercises.

Second experimental group (E₂): This group comprised of male and female subjects who volunteered to reduce weight by following the advised hypocaloric diet. They were provided guidance and dietary counselling for selecting and consuming low calorie diet.

Third experimental group (E₃): This study group was constituted of obese subjects who opted to reduce weight by following the suggested *hypocaloric diet along with cardio work out*. The venue, duration and type of exercise were the same as for the first group (E₁).Dietary conselling was also provided to these subjects.

Control group (C): This group was not engaged in any weight – reducing intervention. It followed with their existing dietary and activity pattern.

Phase–III: The studies done on the parametres studied / examined on the control and the experimental groups are:

Assessment of nutritional status by anthropometry, body mass index and dietary survey both before starting and at the end of experimental period of three months. BMI was used to classify the subjects into grades/classes of over weight/obesity as classified by WHO (1998).

It was calculated by using the formula given by Quetelet (1835) –

$$\text{Body Mass index} = \frac{\text{Weight}}{(\text{Metres})^2}$$

Measurements of weight, waist and hip circumferences at the end of every month. WHR was derived using the formula:

$$\text{WHR} = \frac{\text{Waistcircumference(cm)}}{\text{Hipcircumference(cm)}}$$

The subjects with waist – hip ratio of ≥ 0.80 were recognised for having abdominal obesity (ICMR 2005)

Dietary counseling of the subjects of groups E₂ (hypocaloric diet) and E₃ (hypocaloric diet + cardio exercise) before starting and throughout the study period to help them in selecting a diet

containing approximately 1200-1300 k calories. In addition, all the subjects were asked to continue with their existing style or dietary pattern. Subjects of the control group were asked to continue with their usual dietary, activity and life style pattern throughout the study period.

RESULTS AND DISCUSSION

As it is shown in Table 4.1 the subjects were conscious about their weight gain and they had adopted various methods for weight loss. The data indicates that about 40 and 36 per cent of males from Kurukshetra and Delhi respectively made extreme attempts for weight loss, while 38 and 28 per cent of female subjects from Kurukshetra and Delhi (NCR) respectively attempted extremely. Almost an equal number of subjects from both the regions attempted to lose weight to less extreme extent. Further there were about 24 and 32 per cent of male subjects belonging to Kurukshetra and Delhi (NCR) respectively were normal about their weights and did not go for extremities. The subjects had followed these methods and extreme diets as well but they gained weight again within six months of period. The need of proper and healthy dietary counseling was felt by the investigator and the further weight reducing interventions were carried out.

the variation among the groups was non significant. The energy intake in all the subjects was high as compared to the RDA'S before the intervention. After the intervention there was a significant ($P \leq 0.01$) variation among the experimental groups over control group. The experimental group (Exercise - E1) showed the drastic decrease in energy levels. The post analysis of the data showed the difference from the control group was significant ($P \leq 0.01$) in groups E1, E3 and in E1 in males of Kurukshetra and Delhi subjects respectively. The variation among the males of experimental and control groups was significant after the intervention ($P \leq 0.01$) while the variation among the above groups before the study period in male subjects was non significant. The difference from the control group was significant ($P \leq 0.01$) in groups E2, E3 and E1 in males of Kurukshetra and Delhi (NCR) respectively. The protein intake of subjects was decreased after the dietary counselling as intake of food groups such as pulses, dairy products meat products was reduced. (Levin, 1998) stated that high protein diets have to be suggested for a limited period of time as they can have adverse effect on health. High protein weight loss diets are those that provide more than 1.6 grams per kg of desirable weight loss per day. So such mono diets were not prescribed to the subjects. According to the RDA'S (ICMR 1989) the visible fat intake was 22 g/day.

Table 4.1. Methods of weight loss and their effectiveness on the obese Subjects in Past life (n=500)

Attempts (1)	Response (2)	Number & Percentage			
		Male		Female	
		Kurukshetra (n=125) (3)	Delhi (n=125) (4)	Kurukshetra (n=125) (5)	Delhi (n=125) (6)
Extent of Attempts	Grossly excess	20 (40%)	18 (36%)	19 (38%)	14 (28%)
	Extreme	18 (36%)	16 (32%)	18 (36%)	17 (34%)
	Normal	12 (24%)	16 (32%)	13 (26%)	19 (38%)
Attempted OR NOT	Yes	22 (44%)	32 (64%)	33 (66%)	35 (70%)
	No	28 (56%)	18 (36%)	17 (34%)	15 (30%)
Methods adopted by the subjects for weight loss	Dieting	20 (40%)	21 (42%)	18 (36%)	26 (52%)
	Starvation	28 (56%)	18 (36%)	24 (48%)	22 (44%)
	Power Yoga	2 (4%)	10 (20%)	-	12 (24%)
	Kick Boxing	-	13 (26%)	-	14 (28%)
	Walking	10 (20%)	22 (44%)	19 (38%)	19 (38%)
	Drugs	7 (14%)	29 (58%)	9 (18%)	32 (64%)
		5 (10%)	2 (4%)	2 (4%)	3 (6%)

(1)	(2)	(3)	(4)	(5)	(6)
Effectiveness the Methods followed (n = 260)*	Very Effective	17 (34%)	13 (26%)	12 (24%)	14 (28%)
	Effective	28 (56%)	26 (52%)	21 (42%)	19 (38%)
	No Results	10 (20%)	20 (40%)	17 (34%)	17 (34%)

*Multiple response
Cardiovascular

The variation in intake of energy before the study period was significant ($P \leq 0.01$) in males belonging to Kurukshetra of experimental and control group while in males of Delhi region

The female subjects were taking fat in the beginning to a greater extent and after that their fat intake was reduced due to dietary intervention.

Table 4.2. Prevalence of Non Communicable diseases present in the obese subjects

Diseases	Percentage of the Subjects* (n= 500)			
	Male		Female	
	Kurukshetra (n=125)	Delhi (n=125)	Kurukshetra (n=125)	Delhi (n=125)
Hypertension	60	67	69	59
Diabetes Mellitus	12	9	18	14
Cardiovas- cular disorders	5	8	6	4
Hypothyroidism	50	45	72	68
Respiratory disorders	65	68	74	76
Sleep disorders	60	72	58	68
PCOD	-	-	70	74

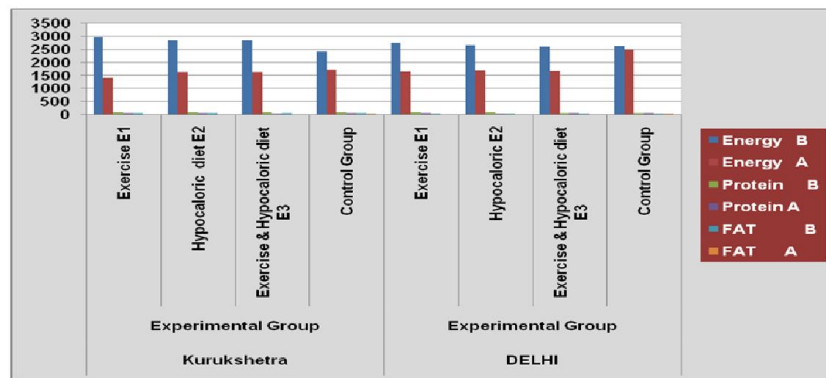


Fig. 4 (a). Mean of daily nutrient intake of young male human adults before (B) and after (A) weight reducing interventions

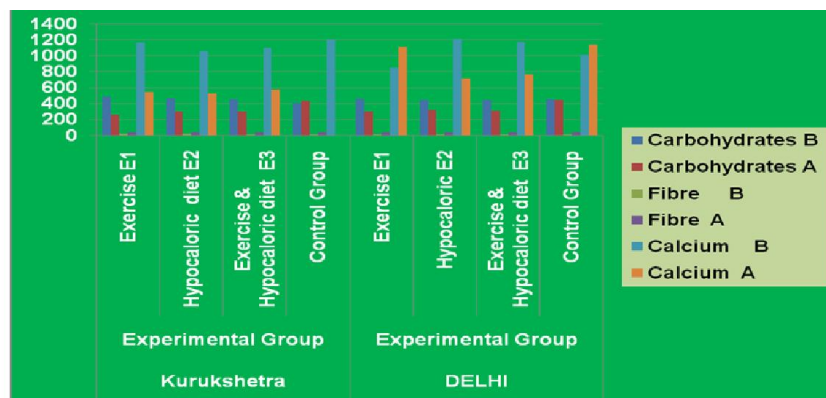


Fig. 4 (b). Mean of daily nutrient intake of young male human adults before (B) and after (A) weight reducing intervention

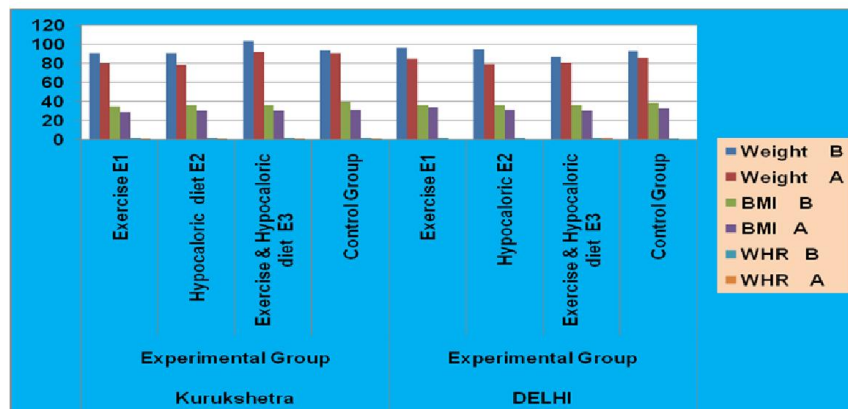


Fig. 4 (c). Mean of anthropometric parameters of the obese male human adults before (B) and after (A) weight reducing interventions

The subjects were also aware that they had to avoid fat in their diet so the variation was less among them. Low fat and very low fat diets are also recommended for fat loss. Very low fat diets such as Pritkin diet and Ornish diet are advocated not only for weight reduction but also for improving CHD risk profiles (Okens, 2005). The Ornish diet, which is very low in fat (13 per cent of calories) and saturated fat, very high in fiber (38 g) is a part of programme that includes exercise and behavior modification. It was found to reduce CHD in long term (Levin, 1998). The difference from the control group was significant ($P \leq 0.01$) in groups E2, E3 and E1, E3 in females of Kurukshetra and Delhi (NCR) respectively. Statistically in the start of the study there was a non significant variation among all the groups with respect to carbohydrate intake. While at the end of the study period there was highly significant ($P \leq 0.01$) variation in the carbohydrate intake among the experimental and control group. The mean difference between the groups before and after intervention was non significant. The subjects were taking refined carbohydrates like roots and tubers, rice, white bread so the after dietary counselling the subjects were taking whole cereals, pulses and more of complex carbohydrates than the simpler forms.

The subjects were advised to avoid the food products of high glycemic index such as rice, cornflour, refined flour products as these were converted to fatty acids in the body hence causing weight gain in the subjects. The variation among the females of experimental and control groups was significant after the intervention ($P \leq 0.01$) while the data showed insignificance before the study was conducted. The mean difference between the groups before and after intervention was significant ($P \leq 0.01$). The difference from the control group was significant ($P \leq 0.01$) in groups E2, E3 in females of Kurukshetra respectively. The subjects were found to be ignorant towards fibre intake and had no knowledge of fibre rich food groups in the beginning of the study. So after dietary guidance the food groups such as whole cereals, sprouts, lotus stem vegetable, fruits such as guava and papaya, figs were inducted in their daily dietary schedule. According to Mishra (2009), High fibre diet results in weight loss as it is low in calories and our body burns calories while digesting fibre. Moreover fibre increases peristalsis movement of intestines which enhances digestion. Sharma (1998) also supported increase in fibre intake among obese subjects after imparting dietary counseling.

According to the RDA'S (ICMR 1989) the calcium intake was 400 g/day. Statistically in the start of the study there was a non significant variation among all the groups with respect to calcium intake. The post analysis of the data showed the difference from the control group was significant ($P \leq 0.01$) in groups E1, E2 and in E1, E2 in females of Kurukshetra and Delhi (NCR) subjects respectively. According to the graphs the intake of dairy products was very high so calcium levels also exceeded more than the RDA'S. After imparting nutrition education and dietary counseling the calcium intake came almost normal. The subjects were suffering from lower back pain and joint pains therefore after regulating the calcium intake in diet these diseases were also lessened. The ICMR (1989) standards of weight for the males was 60 kgs and in the study it was found that the weight exceeded the reference limit. The variation in body weight among the groups was non

significant before the study but was highly significant ($P \leq 0.01$) after intervention. Significant difference existed between the control and experimental groups – E1, E2, E3 ($P \leq 0.01$) and E1, E3 ($P \leq 0.01$) in males of Kurukshetra and Delhi (NCR) respectively. The magnitude of weight loss achieved varied with the type of treatment provided. The maximum weight loss ($12.9 \pm 1.2\%$) and ($17.7 \pm 7.1\%$) occurred in the subjects who were following hypocaloric diet in male subjects belonging to Kurukshetra and Delhi (NCR). Significant difference existed between the control and experimental groups – E1, E2 ($P \leq 0.01$) and E1, E3 ($P \leq 0.01$) in females of Kurukshetra and Delhi (NCR) respectively. The percent decrease in BMI in females of Kurukshetra and Delhi (NCR) was almost equal in E2 and E3. It was ($4.01 \pm 0.001\%$) in E1 i.e. the exercise group and negligible change in control group. The variation in WHR among the groups was non significant before the study but was highly significant ($P \leq 0.01$) after intervention. Significant difference existed between the control and experimental groups – E2, E3 ($P \leq 0.01$) and E2 ($P \leq 0.01$) in females of Kurukshetra and Delhi (NCR) respectively.

Conclusion

Prevention strategies for obesity in young adults include reduction of energy dense foods, fast foods and alcohol intake. Further the patients should be encouraged to reduce sedentary behaviour that includes cutting down of TV viewing (Dietel, 2007). Low Calorie diets (800 – 1200 kcal/day) and Very Low Calorie diets (less than 800 kcal /day) are associated with weight loss which also come under the category of MONO DIETS. And these diets achieve weight loss but a close medical and dietary supervision is required for very low calorie diets as long term side effects are proved in many studies. The diets should never be prescribed below 1200 kcals / day for weight reduction. (Galloway, 2000). A combination of active support for diet plus behavioural therapy (self monitoring, stimulus control, slowing rate of eating, social support) is more effective for weight loss in young adults as compared to diet intervention alone (Paul, 2009). After the weight reducing interventions the subjects reduced their Weight and Anthropometric indices back to the normal.

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