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RESEARCH ARTICLE

IMPACT OF DIET RECOMMENDED IN NATUROPATHY CENTERS ON THE NUTRITIONAL STATUS OF OBESE PATIENTS

***Nutan**

Asst. Prof., Deptt. of Food and Nutrition, BPSMV, Khanpur, Haryana

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ABSTRACT

Obesity is the synergistic product of interaction between overeating and easy lifestyle. Naturopathy is the best solution to cure obesity as it is primarily concerned with both the aspects. Keeping this in view 60 patients of 25-40 years who had enrolled in naturopathy centers and to whom were recommended a treatment of one month were selected for the purpose of study. In naturopathy centers subjects were doing *yoga* (i.e. Exercise and *Pranayam*) and were drinking *amla* and lemon water in fasting state, undergoing mud, water and diet therapies. Their food habits and life style information was collected by interview cum questionnaire method before and after naturopathic treatment of each subject. Height, waist, and hip circumference was measured and BMI was calculated. Their lipid profile and blood glucose were determined from blood serum in fasting state. Nutrient intake of each subject was assessed by 24 hour recall method for three consecutive days. After getting treatment in naturopathy center. The male subjects, mean body weight reduced from 90.81 to 79.43 kg (11.40%) and BMI from 31.01 to 27.06.For female subjects, reduction in weight was from 81.53 to 72.23kg (12.52%) and of BMI was from 31.79 to 28.18.Percentage reduction as compare to RDA of carbohydrate, energy, protein and fat intake in male subjects was 36.66, 41.66, 58.41 and 36.89 percent. Corresponding values for female were 47.15, 47.76, 44.92 and 26.10 percent. Contrary to the intake of carbohydrate, energy and fat, Vitamin C intake increased by seven folds, Vitamin A too raised by two folds because of this hemoglobin moved up significantly at both levels in spite of iron intake being below R.D.A. So, naturopathic treatment is a powerful weapon to combat obesity as well as maintaining and improving the nutritional status of the obese patients.

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INTRODUCTION

Obesity is defined as an abnormal or excessive accumulation of fat that may impair health. According to world health organization (WHO), any individual with a body mass index greater than or equal to 30kg/m^2 is obese and severe or class III obesity (Alam *et al.,* 2014). Obesity is a pathological condition in which excess body fat accumulated, leading adverse effects on health and life expectancy. It is a chronic disorder with complex interaction between genetic and environmental factors. (Hasalm *et al.,* 2005). It is being characterized by high cholesterol, fatty acid levels, Insulin desensitization; high blood pressure; and excessive adipose mass accumulation. Currently more than 1 billion adults are overweight and at least 300 million of them are clinically obese. It is defined by body mass index and further evaluated by both percentage body fat and total body fat.

****Corresponding author: Nutan,***
Asst. Prof., Deptt. of Food and Nutrition, BPSMV, Khanpur, Haryana.

Obesity is a risk to many secondary conditions like cardiovascular disorder, insulin pathological resistance, retinopathy, neuropathy and cancer (Gupta *et al.,* 2011). There is varied spectrum of treatments available for obesity like diet, exercise, yoga, drugs food supplements and surgical intervention. Naturopathy is a system of health care and called as science of healthy living. It is a drugless system of healing based on well-founded philosophy (Rastogi *et al.,* 2012). Lack of specific guidelines, improperly designed protocols, poor research methodologies and lack of trained man power are some of the limitations which act as the main set back in developing naturopathy system as the scientific ones. The main modalities of Naturopathy includes naturopathy diet therapy, fasting therapy, hydrotherapy, Massage therapy, Mud therapy, Chromo therapy, Air therapy which are applied in various forms and with equipment for the treatment purpose (Pradeep *et al.,* 2014). Naturopathy advises on life style change dietary pattern or method of purifying the body. Davidson considers naturopathy responsible for removal of ill health altogether by living according to the laws of nature. Naturopathy believes that living being are composed of five basic elements namely earth, water, fire, air and sky.

To maintain proper health status these must be replenished through natural foods like fruits vegetables, nuts and cereals and other foods which are the sources of these elements. Johanna to supported vegetarianism as a measure against obesity. Present study has focused the productive population of (i.e. 25 to 40 years) of our country. It has claimed effective weight reduction and assessed the nutritional adequacy of the diet recommended in naturopathy centers as well as the beneficial impact of combining various positive life style components on the patients weight reduction after one month of treatment at naturopathy centre.

MATERIALS AND METHODS

The study was designed to assess adequacy of diet and the health and nutritional status of participants enrolled in naturopathy centers under a treatment of one month duration at:

- Prakritik Jeevan Kendra, Pattikalyana, G.T. Road, Panipat.
- Navneet PrabhakarYog Chikitsa Dham, Bassi, Jaipur, Rajasthan.

Selection of Subject

The sample size comprised 60 participants 30 females and 30 males selected by purposive sampling under the age group of 40-60 years in each category.

Collection of general information

A structured pre-tested questionnaire pertaining to age, occupation, obesity, glycemic profile, lipid profile status and food preferences was used to elicit general information on these aspects.

Diet Survey

Information on meal pattern of the subjects before attending the naturopathy center for treatment was collected on a sub-sample of 30 subjects by 24 hour recall method; diet survey was done for 3 consecutive days. Based on data the amount of raw foods consumed by each individual was calculated using the formula:

$$\text{Food consumed by individual} = \frac{\text{Total quantity of raw food used by family for cooking of cooked portion}}{\text{Total quantity of cooked food}}$$

Total quantity of cooked food

The adequacy of foods and nutrients of diet consumed before and during the treatment was calculated and compared with requirements and Recommended Dietary Allowances, respectively.

ANTHROPOMETRY

Height, weight, waist and hip circumference, WHR and BMI were recorded before and after the treatment as:

$$\text{BMI} = \frac{\text{Weight (kg)}}{(\text{Height in meters})^2}$$

$$\text{WHR} = \frac{\text{Waist in Cm}}{\text{Hip in Cm}}$$

The subjects were graded as per normal values and standardized tables.

HAEMOGLOBIN EXAMINATION

Blood samples of all subjects were taken and hemoglobin was determined using cynomethemoglobin method and the subjects were screened as per WHO standard hemoglobin values for adults.

STATISTICAL ANALYSIS

The results were expressed as mean, S.D. and significance of difference was calculated using t-test

RESULTS AND DISCUSSION

ANTHROPOMETRY

The mean height and weight of male and female participants were 1.712m and 90.80 kg and 1.60 m and 81.53 kg respectively. Before joining the naturopathy center majority of subjects i.e. 71.66 per cent (70% male and 73.3% female) fall in obese category followed by grade 1 obese (36.66%), grade 3 obese. Comparison of BMI values after the complete treatment showed a reduction in the number of high normal and normal categories .The mean WHR and waist of male and female participants were 1.040 and 108.20cm respectively. After the joining the naturopathy center majority of the subject: 27.06 male and 28.18 female and waist of male 0.93 and 0.825 female respectively.

The mean hip ratio of male and female Before joining the naturopathy center majority of subjects i.e. (103.58 male and 110 female) fall in obese category. after joining the naturopathy center majority of subject (102.35 male and 191.8 female) respectively. Kinjal *et al.* (2016) studied that abdominal obesity is strongly associated with other metabolic disorders like diabetes, hypertension, and cardiovascular diseases and has higher rates of mortality and morbidity compared to non-obese individuals. This pilot study is an attempt to elicit the impact of six days Naturopathic treatment protocol on abdominal obesity. Twenty participants with Waist Circumference cut-off point with 90cms for men and 80cms for women, and completed the full 6 days of treatment protocol, were taken for final analysis. Height, weight and waist circumference were recorded before and after the interventions. Statistically significant average reduction in weight of 2.52 Kilograms and 1.95 Kilograms for male and female respectively was observed. Waist Circumference primary parameter used for this study shows a significant change of 5.05cms in male and 4.25cms in female participants respectively. Significant changes in BMI also observed.

Table 1. Mean anthropometric measurements and haemoglobin levels of all Subjects before and after getting treatment from the naturopathy center (N=60)

Sr. No.	Parameter	Standard value		Before Naturopathic Treatment		After Naturopathic Treatment	
		Male	Female	Male	Female	Male	Female
				(n=30)	(n=30)		
1	Height (M)	1.712	1.60	1.71±0.47	1.60±0.027	1.71±0.47	1.60±.03
2	Weight (Kg)	63.0	58.1	90.80±11.61	81.53±3.87	79.43±10.64	72.42±11.45
3	BMI	23.1	22.69	31.01±3.57	31.79±4.44	27.06± 3.50	28.18± 8.45
4	WHR	0.87	0.79	1.040±0.37	0.86±0.09	0.93±0.11	0.825±0.04
5	Waist (cm)	_	_	108.20±17.73	95.07±14.08	96.21±16.01	84.0 + 12.44
6	Hip	_	_	103.58± 11.11	110±8.61	102.35±21.70	101.8±17.13
7	Hb (Mg/dl)	13.0	12.0	13.30 ± 1.6	10.30 ± 1.7	13.65 ± 1.6	11.07 ± 1.9

Table 2. Categorization of subjects studied as per BMI (wt./ h^2) before and after joining naturopathy center

Classification	Category	Before naturopathic treatment		After naturopathic treatment	
		Male	Female	Male	Female
		n=30	n=30	n=30	n=30
Normal	20-25	0	0	18(59.94)	14(46.627)
Grade 1 obese	25-30	9(30)	7(23.31)	9(29.97)	12(39.96)
Grade 2 obese	30-40	21(70)	22(77.33)	3(9.99)	4(13.32)
Grade 3 obese	>40	_	1(3.33)	_	_

*Figure in parenthesis indicate percentages

Table 3. Categorization of subjects studied as per BMI (wt./ h^2) before and after joining naturopathy center Total percentage (n=60)

Category	Before Joining Naturopathy Center	After Joining Naturopathy center
Normal	0	32(53.34)
Grade 1 Obesity	16(36.66)	21(35)
Grade 2 Obesity	43(71.66)	7(11.66)
Grade 3 Obesity	1(11.66)	_

Source: (WHO 1998+NIH 1998)
*Figure in parenthesis indicate percentages

Table 4. Mean nutrient intake of subjects before and during treatment

Nutrients	% RDA			
	Female (n =30)		Male (n =30)	
	At home	At Naturopathy center	At home	At Naturopathy center
Energy (kcal)	121.16	47.76	132.44	41.66
Protein(gm)	97.21	44.92	132.19	58.41
Ca(mg)	257.75	144.75	229.115	218.55
Fe(mg)	34.33	94.66	40.85	66.67
Vit A (mg) β Carotene	71.29	139.90	75.41	143.54
VitC(mg)	78.88	765	184.75	855
Carbohydrate(gm)	102.4	47.15	103.9	36.66
Fiber(gm)	34.7	105	31.80	88.63
Fat (gm)	200.86	26.10	247.78	36.89

Further studies with larger sample size are indicated to establish mechanism of action and impact of naturopathic treatments for managing abdominal obesity.

Obeszity Status

All subjects were the victim of obesity and reported to have a feeling of fitness after joining naturopathy center. Initially none of the subjects having normal BMI but after one month of treatment 53.33 per cent of the subjects were under the normal category. This is due to summative effect of vegetarian diet, *yogasana* and *pranayam*. Per cent weight reduction as per their standard weight was more for female (12.52%) than male (11.40%) because of high lean body mass of male body.

Hemoglobin Level

Among the female subjects, hemoglobin level was 10.30 per cent and in male subjects it was 12.17 per cent at the commencement of naturopathic treatment, which increases significantly ($P \leq .05$) after the naturopathic treatment.

Food Intake

Plenty of seasonal fruits and a lot of fluid intake was recommended. They took *amla* water and lemon honey water in fasting state. They were provided cow milk once a day.

Nutrient Intake

Intake of food had reflected in the nutrient intake level as per cent R.D.A. female and obese patients in naturopathy center was 97.21 and 132.91 per cent. Protein intake by female was correspondingly lower as they consume less calories then male so amount of food eaten is less of other nutrients also. Calcium intake is far above required level at home and naturopathy center but it is comparatively lower in naturopathy center diet as dairy products were considerably reduced but this depression in calcium intake is overcome by inclusion of leafy vegetables, jaggery and curd etc.

Although iron intake has increased to a great extent but could not come to the level of R.D.A., still rise in hemoglobin level is observed due to liberal intake of raw vegetables and a fruit, vitamin C intake has been raised 8 folds. As vitamin C is a facilitator for iron absorption. This could have been the reason for the increase in haemoglobin level in patients. As vitamin C is facilitator for iron absorption. This could have been the reason for the increase in hemoglobin level in patients.

Conclusion

Results of the present study advocate food therapy in naturopathy center treatment as reliable tool for effective weight reduction by changing their food habits and incorporation of healthful food stuffs in their dietary resume. Since nutrition and dietary pattern of individual is an emerging field of interest in dietetics more studies pertaining to vegetarian diet, yoga and meditation. Findings of the study are firmly based upon the intake of only satvik (natural and simple free from any kind of strong chemicals may be natural or synthetic) food in limited quantity so as to serve dual purpose of weight reduction, cleansing and strengthening of physiology as a whole.

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