Evaluation of dietary modification on metabolic markers and body composition for obese women

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ABSTRACT

As an improper or excessive buildup of body fat, obesity is one of today's most pressing public health concerns as the condition is linked to so many dangerous illnesses and disorders. The purpose of this research was to assess how modifications to eating habits affected the factors that were linked to obese women's outcomes. ***Design****: It is a quasi-experimental design; one group was pre- and after the diet control.* ***Setting****: Nutritional clinic in National Liver Institutes, Menoufia University, Egypt.* ***Subjects****: One hundred women with obesity, ranging in age from 35 to 50, were chosen at random.* ***Study instruments****: One of them was structured by interviewing questionnaire, and the second, an anthropometric assessment and body composition were performed by using a Bioelectric Impedance Analysis (BIA) device. The third, is lipid profile, liver functions, CBC, etc. were determined.* ***Results:*** *The percentage of BMI reduction was about 20% while fat composition was between 14 to 21% according to the body fat position. The reduction percentage of tested biochemical parameters between the pre and post-test protocol study was in the range of 15-23 %. Serum Iron, Total Iron Binding Capacity, and Transferrin Saturation values were significantly (P value 0.05) improved at the range of 12 -17%.* ***Conclusion****: Modification of obese women's diet represented beneficial ways to reduce body weight, BMI, body fat composition, and the tested biochemical parameters.* ***Recommendation****: Women ought to regulate their inactive lifestyles and engage in healthy eating habits, regular exercise, and routine physical activity to prevent obesity.*

Keywords: *Obesity; BIA device; anthropometric measurements; modification meal; CBC*

INTRODUCTION

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may hurt health, leading to reduced life expectancy and/or increased health problems. An improper or excessive deposit of fat that poses a health concern is referred to as obesity. When people consume large amounts of energy—especially fats and sugar—and fail to burn the energy through physical activity, a large portion of that extra energy is kept by the body as fat. A complex relationship of environmental, cultural, and genetic variables leads to obesity. Additionally, unhealthy eating habits, a lack of exercise, and a sedentary lifestyle are risk factors for obesity (**Rush et al., 2009; Kalra and Unikrishnan, 2012)**. **Dansinger et al., (2016)** reported that while undernutrition continues to be a major concern in rural communities, the occurrence of overweight and obesity is emerging as a significant health problem in urban populations. **Wadden and Wilson, (2015)** demonstrated Body Mass Index (BMI) is the most frequently used practical metric to assess nutritional status and body composition and further classify individuals as underweight, overweight, and obese. **Trottier et *al*., (2010)** stated that when fat accumulation is excess (locally, globally, or both), the risk to one's health increases. As discussed below, body weights and fat distributions that result in the expression of co-morbid diseases occur at different thresholds depending on the population, therefore it is the point at which health risks develop that is most crucial. According to **Christensen and Pettijohn (2011),** Considering obesity is a risk factor for numerous diseases, including cardiovascular disease, diabetes, hypertension, and many types of cancer, it is a major health issue around the world. dietary habits are the main factor posing a threat to mortality, morbidity, and health. Additionally**, Lee et al., (2019)** observed obesity and many non-communicable diseases (NCDs) are outcomes of poor eating practices and insufficient physical exercise. To accomplish deliberate weight loss, first-line therapy necessitates the application of lifestyle changes, notably the alteration of food, frequent exercise, and low-fat meals **(Wadden and Wilson, 2015**) and Low carbohydrate, low glycemic load regimens, low fat, and Mediterranean diets are included in lifestyle modification **(Dansinger *et al*., 2016).** Changing lifestyle along with modification to the diet is important in the management of obesity by natural components like nutraceuticals. These days, nutraceuticals are very interesting due to their potential nutrition, therapeutic, and safety effects **(Trottier et *al*., 2010).**

Therefore, the current study evaluates the nutritional condition of obese women from various careers from the National Liver Institute at Menoufia University in Egypt undertaken before and during nutritional modification.

SUBJECTS AND METHODS

Inclusive Subjects

Random one hundred adult women diagnosed with obesity, subject's age from 35 years to 50 years, and ability to complete the participation in the research regardless of educational level.

Exclusive subjects

The patient didn't have diabetes mellitus, liver disease, or other chronic diseases.

Methods

Research design

A descriptive research design was utilized in this study. All the parameters were calculated before and after the modification diet which was restricted in fat, protein, carbohydrates, water, and total calories.

Setting

The study was conducted in the Nutritional Clinic at the National Liver Institute, Menoufia University, from January 2022 to May 2022

Tools

The participant underwent weekly conversations and underwent a 3-month-long follow-up at the Nutrition Clinic with a Nutritionist. Patients' information was gathered using a pre-made structured questionnaire:

First tool: Patient assessment sheet

After examining the literature, the researcher created it; it contained personal information. According to **Wei et al. (2016),** socio-demographic information included details about marital status, which was divided into four categories: single, married, divorced, and widowed; occupation, which included employee or unemployed; education level, which covered not educated and educated; and place of residence, which incorporated urban and rural areas.

Second tool: Anthropometric assessment sheet

According to **Tai et al., (2010),** The anthropometric evaluation included weight measurement, which was done to the nearest 0.5 kg using a beam balance (Beurer BG42) scale with the bare minimum of clothing. Weight in (kg) / height in (m2) (kg/m2) is the measure used to determine body mass index (BMI). As stated by **Smith (2016),** the participant was classified as obese class 1 when their BMI was 30-34.9kg/m2, obese grade 2 when their BMI was 35-39.9kg/m2, and morbidly obese when their BMI was beyond 40kg/m2. In the report of Bering et al. (2018), Bioelectric impedance analysis was used to determine the body's composition before and after therapy, including the percentages of body fat, water, and muscle in the body. as stated by Smith, (2016) By dividing the waist circumference by the hip circumference, the waist/hip ratio (WHR) is calculated.

Third tool: Dietary assessment

This sheet is intended to cover details relating to the patient's nutritional status. It includes risk factors that may affect nutritional status, the 24-hour recall method, which collects specific amounts of food and drinks that the patient took in the three days prior to data collection, and estimates of daily nutrient intake based on standard recipes (in 24-hour) **(Martin, 2005).** These estimates were then compared to dietary reference intake **(DRI) (2002).**

Fourth tool: Biochemical analysis

Blood specimens were immediately taken and delivered to the analysis laboratory. To calculate serum triglycerides, total cholesterols, HDL cholesterols, and LDL cholesterols using the methods of **McGowam (1983); Schettler and Nussel (1975); Warnick et al., (1983); Demacker et al., (1983)** respectively. Following the guidelines **of Bergmeyer et al., (1978); and King (1965),** liver function examinations, alkaline phosphatase, Alanine aminotransferase (ALT), Aspartate aminotransferase (AST), and gamma-glutamyl transferase (GGT) were also observed. Serum iron, Total Iron Binding Capacity (TIBC), and Transferrin Saturation. Hematological analysis, (red blood cells (RBC), hemoglobin (Hb), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), mean corpuscular volume (MCV), and white blood cells (WBC) stuff, lymphocytes stuff, and platelet count by following the method of **Buttarello (2016); Brancaleoni *et al*., (2016); Kawabata (2016); Fazal *et al*., (2017); Herklotz *et al*., (2006).**

Statistic evaluation

The researcher entered data using a suitable personal computer. The statistical packages for the social sciences (SPSS) version 17.0 (Chicago, Illinois, USA) software were used to enter and analyze all of the data. The researcher examined, separated, and then coded each tool's material. For qualitative and quantitative variables, respecttively, means and standard deviations were used to present the data using descriptive statistics. The interrelationships between the quantitative variables were evaluated using Pearson's correlation analysis. According to **Snedecor and Cochran (1980**), statistical significance was taken into account when the P-value was less than 0.05.

RESULTS AND DISCUSSIONS

Obese women's diets recommended for 12 weeks, were planned as shown in **Table (1**). Their diet before modification contained 100.53, 368.74, 91.58, 2035.56, and 2701.3 as protein, carbohydrates, fat, water, and calories respectively while the planned diets are significantly lower in carbohydrate, protein, fat, and total calorie intake. The percentage of diet composition before the application of the program was 179.5, 100, 274.76 and 135.07 % from DRI (2002) while after the program, the percentage was 146.07, 72.05, 81.82 and 81.80% from DRI (2002). The restricted percentage of protein, fat, carbohydrates, and calorie intake was recorded as 18.63, 70.22, 27.90, and 39.43%

of the actual nutrient intake. According to **Fruh (2017),** regarding the protein quality in the diet, the protein ratio in this study was set at 10 to 20% of the calories in the diet type. It was underlined that getting enough protein will help maintain muscle mass and give you a feeling of fullness, both of which can help you regulate your weight (Kalra and Unnikrishnan, 2012). while the daily fat intake was about 15 % of total calories. This result was in harmony with the data of **Rush et al. (2009)**, who stated that daily fat intake for persons with obesity should be 10-15% of total calories from fat. Trans-fat and saturated fat intake should also be minimized, and the diet should be enhanced with MUFAs and omega-3.

Data from Figure (1), about some socio-demographics of patients, revealed that all patients were married,69 % of patients were employees, and 31%as workers were in the same place. For the level of education, it was found that 43% were high education level, 33% secondary level, and 26% were only written and read. In the case of their residence, about 47% from urban, and 53% are rural.

Nearly 100 females in total, with a mean age of roughly 42 years were studied. The descriptive qualities of obese women before and after diet modification are shown in **Table 2**. There were significant variations in BMI and body weight between the two groups. 17.89% of both the weight and BMI were lost. Increased energy intake is the primary factor contributing to excessive weight gain and obesity, claim **Romieu et al. (2017)**. According to **Wong et al., (2018),** calorie-restrictive diets frequently help people lose weight. This conclusion was also reached by **Ciobanu et al., (2017**), who discovered that caloric restriction is a dietary strategy that is thought to reduce overall energy intake while maintaining a healthy diet. It is linked to lowering the risk of several illnesses, including cardiovascular and obesity-related ailments. According to **Barter and Genest (2019),** metabolic regulation in a low-energy diet is believed to play a role in weight loss.

Table (3) displays the descriptive characteristics; the body composition of women after the planned diet showed significant differences in their body composition as the circumference of the right thigh, the circumference of the left thigh, the waist circumference, correct mid-arm circumference, left mid-arm circumferences as compared to the same women before the planned diet. The reduction percentage was 11.7, 11.7, 16.18, 15.45, and 17.37 % respectively. It was observed that all mean values of fat distribution in different body places were reduced after diet modification while water, bone, and muscle levels were increased by increasing the fat level. this has led to improved Physique Rating Basal Metabolic Rate and a decrease in the metabolic age from about 55 to about 47 to increase the rate of calories burned and a healthy diet. Both BMI and MUAC (middle upper arm circumference), which offer a quick and practical number for evaluating nutritional health, are calculated with the aid of anthropometric measurements. The proportions of fat, bone, and muscle in a person's body are referred to as body composition. The body fat percentage is the one that interests people the most because it is very useful for determining health. If your metabolic age is younger than your actual age, your body is healthy. According to **Nordmann et al. (2006),** certain adults can have a metabolic age of 15 years old or younger, meaning their bodies are among the best in the class at burning calories. Particularly in obese people, diet adjustments lead to a better body composition, which is shown by a decrease in body fat. Without a doubt, low-calorie diets could alter body composition measurements by reducing body fat. Despite the energy deficits caused by these diets, they can be used to enhance body composition (**Noakes and Windt, 2017).** Implementing a diet with a negative energetic value causes a drop in body mass that results in both the anticipated reduction in body fat and an unfavorable reduction in muscle mass. As far as comparing the effectiveness of the diets in terms of body mass reduction and body fat index is concerned, the relevance of enough proteins in both diets is remarkable since it improves or maintains muscle mass within the healthy range **(Noakes, 2013; Mark et al., 2016).**

The lipid profile of obese women is demonstrated in **Table (4)**. A decrease is observed in total triglycerides, total cholesterol, and low, very low lipoproteins after modification diet for three months in comparison to the levels before treatment and the percent of reduction were 22.67, 45.81, 33.54 and 45.81% respectively. However, the high-density lipoprotein was higher after treatment than before modification and the percent of improvement was 30.40%. All metrics showed a statistically significant difference (p 0.05) between the pre- and post-diet modification periods. A statistically significant higher decrease in body weight and triglycerides, as well as a greater increase in HDL, were observed with the low-fat and low-carbohydrate diets. Long-term high-fat diets have detrimental effects on one's health since they elevate LDL and total cholesterol and create dyslipidemia. The results were consistent with meta-analyses performed by **Barter and Genest (2019)**, which demonstrated a similar benefit of low-carbohydrate diets on weight reduction, LDL, and triglycerides while taking into account their unfavorable effects of raising LDL and total cholesterol levels. Increased insulin sensitivity and lower blood insulin concentrations are two advantages of the low-calorie diet. This advantage may be related to improved satiety and is confirmed by research showing that diets with higher insulin response are less satiating **(Srour et al., 2019).** Dietary carbohydrates are the major stimulants for the production of insulin. According to Ebbeling et al. (2018), more benefits of a diet low in calories include lower levels of ghrelin and leptin as well as an increase in energy utilization during losing weight. Researchers also discovered that to fully understand the differences between low-carbohydrate and low-fat diets, one must be done to take additional systems, including energy expenditure, hormone release, adipogenesis, and the metabolism of fatty acids, into consideration.

Mean values showed the pronounced effect of the modification diet on liver enzymes and other biochemical parameters (**Table 5**). In this table, the means of liver enzymes show a significant increase before applying diet control. Likewise, clear means that the serum liver functions as Total Bilirubin, Direct Bilirubin, Serum Albumin, and Total protein encoded high levels. During the study, a significant decrease in All the liver enzymes and other functions was observed and the reduction levels were 14.17, 31.19, 28.28, 81.55, 10.8, 27.40, 27.78, and 24.76% for AST, ALT, ALP, Gamma –GT, Total Bilirubin, Direct Bilirubin, Serum Albumin, and Total protein respectively. Obesity may decrease the efficacy of hepatitis C treatment options and increase the damage caused by other illnesses such as non-alcoholic fatty liver disease. Ingesting excessive amounts of calorie-dense foods can hinder the liver's ability to function. It can eventually lead to inflammation, which can then result in liver damage known as cirrhosis **(Srour et al., 2019). Barter and Genest, (2019)** found that A balanced diet can aid in bringing down high levels of enzymes produced by the liver, which lowers the chance of acquiring liver disease. They discovered that compared to those on a conventional diet, teenage males with fatty livers who had a low-sugar diet for 8 weeks had lower levels of liver enzymes. Dietary restriction is anticipated to have several interconnected positive impacts on the liver's production of free fatty acids, insulin sensitivity, and inflammation in fat cells. Hepatic enzymes and other liver functions were improved by a decrease in body mass index over three months **(Eckard et al., 2013**).

The mean of hematological analysis of obese women before diet modification showed significant variations as compared with their levels after consuming the modified diet (**Table 6**). The mean values of serum Iron, Transferrin Saturation, Hemoglobin, MCV, MCH, and MCHC show significantly lower values before diet modification consumption than after consumption. The means and standard deviation values of these parameters were improved. A non-significant trend before and after treatment was observed for red blood cells. As a result of the explored diet, the other values of parameters dropped that improved the immune level and blood composition. Obesity is linked to higher platelet counts, a higher risk of venous thromboembolism (VTE), and red blood cell rates. It is additionally associated with iron deficiency (ID). According to **Stoffel et al. (2020),** increased hepcidin levels caused by long-term inflammation that contributed to elevated lymphocyte, monocyte, and total leucocytic counts could be the cause of the link between obesity and iron deficiency. In patients who are overweight or obese, weight loss brought on by an energy-restricted diet and/or exercise may help with obesity-related hypoferremia and aid in establishing iron homeostasis. Additionally, in those who are overweight or obese, a decrease in adipose tissue is linked to changes in the levels of pro-inflammatory cytokines, which may reduce hepcidin release and improve iron status **(Teng et al., 2020).**

CONCLUSION

A modified diet consisting of 20% protein, 15% fat, and 65% carbs resulted in decreased body weight, maximum health, and a strong immune system to lower the disease risk. The results of this study showed that the modified diet that was advised led to improvements in weight loss, BMI decrease, body fat, fat storage, and body muscle in obese women.

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Table (1): Composition of diet before and after diet program compared to DRI

Diet composition	DRI	Before	After
Protein (g)	56	100.53± 5.93 [a]	81.80± 7.33 [b]
% of DRI		179.5%	146.07%
Carbohydrates (g)	369	368.74± 11.45 [a]	265.86± 8.43 [b]
% of DRI		100%	72.05%
Fat (g)	33.33	91.58± 5.09	27.27± 4.12 [b]
% of DRI		274.76%	81.82%
Calories (kcal)	2000	2701.3± 14.78 [a]	1636.072± 17.34 [b]
% of DRI		135.07%	81.80%
Water (ml)	2250	2035.56± 20.97 [a]	2956.67± 16.43 [b]
% of DRI		90.44%	131.41%

Values are means ± SD (n = 100). Values in the same row with superscript letters were significantly different at p ≤ 0.05.

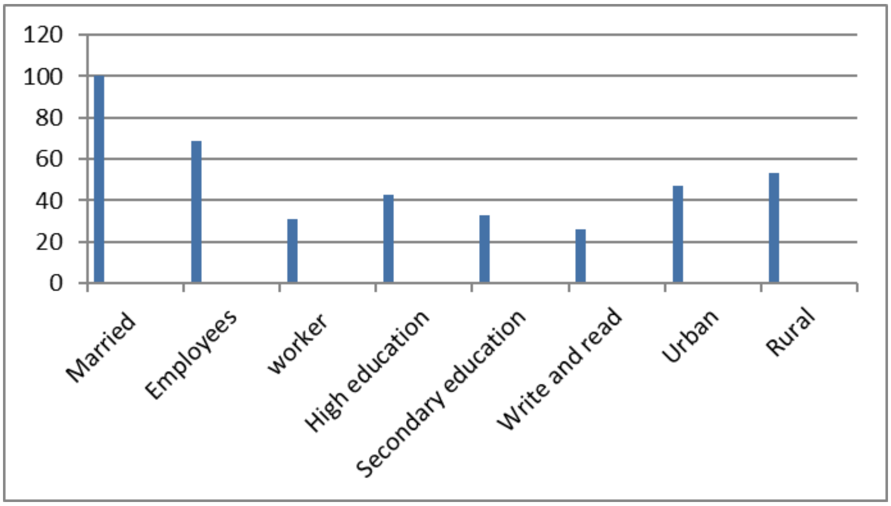

Fig. (1): Socio-demographic data of participators

Table (2): Age, height, weight, and BMI of obese women after and before diet modification

Variable	Before	After
Age (y)	42.5± 3.98 [a]	42.5± 2.94 [a]
Height (cm)	1.65± 0.98 [a]	1.65± 0.07 [a]
Weight (kg)	98.58± 7.23 [a]	80.94± 4.87 [b]
BMI (kg/cm^2)	36.21± 4.87 [a]	29.72± 3.65 [b]

Values are means ± SD (n = 100). Values bearing superscripts at the same row are significantly different at p ≤ 0.05.

Table (3): Anthropometric measurements and body composition of obese women before and after diet modification

Anthropometric measurements	Before	After
Circumference of the right thigh	80.32± 6,21[a]	70.89± 4.76[b]
Circumference of the left thigh	79.53± 4.99 [a]	70.16± 2.44[b]
Waist circumference	115.09±13.98 [a]	96.47± 8.34[b]
Right mid-arm circumference	37.47± 2.96[a]	31.68± 2.65[b]
Left mid-arm circumference	36.95± 7.82[a]	30.53± 3.02[b]
Fat Range (%) (Fat R)	39.14± 2.11[a]	30.95± 5.77[b]
Fat Mass (Kg) (Fat M)	47.72± 4.75[a]	38.8± 3.95[b]
Visceral Fat Level (V Fat L)	11.47± 1.88[a]	10.02± 1.03[b]
Metabolic Age (years) (Meta Age)	55.84± 7.66[a]	47.58± 6.03[b]
Free Mass / (Kg) (FM Fat)	60.46± 4.32[a]	49.34± 6.55[b]
Body Water (Kg)(TBW)	40.19± 4.76[b]	51.57± 4.22[a]
Muscle Mass (Kg)(PMM)	54.45± 8.03[b]	65.15± 3.88[a]
Bone Mass (BoneM)	3.90± 0.87[a]	5.49± 0.98[b]
Physique Rating % (Phys Rate)	18.02± 2.66[b]	20.24± 1.44[a]
Basal Metabolic Rate (KJ)(BMR)	5867.98± 18.96[a]	6120.66± 21.76[b]
Phase	6.87± 1.76[a]	6.01± 1.77[b]
Extracellular water (ECW)	19.7± 1.99[a]	18.7± 1.54[b]
Intracellular water (ICW)	22.9± 1.44[a]	22.6± 1.21[a]
***Imperial measurements*) (Imp)**	549.84± 11.45[b]	715.21± 12.76[a]

Values are means ± SD (n = 100). Values bearing superscripts at the same row are significantly different at p ≤ 0.05.

Con. Table (3): Anthropometric measurements and body composition of obese women before and after diet modification

Anthropometric measurements	Before	After
RL FatP (Right Leg Fat Percentage)	42.15± 2.78[a]	31.76± 1.56[b]
RL Fat M (Right Leg Fat Mass)	6.66± 1.76[a]	5.01± 0.32[b]
RL FFM (Right Leg Fat-free Mass)	9.15± 0.65[a]	6.83± 0.48[b]
RL PMM (Right Leg Segmental Muscle Mass)	10.08± 0.76[a]	8.43± 0.21[b]
RL Imp (Right Leg Impedance)	183.23± 11.65[a]	130.76± 9.61[b]
LL Fat P (Left Leg Fat Percentage)	32.89± 2.87[a]	27.04± 2.01[b]
LL Fat M (Left Leg Fat Mass)	7.79± 0.65[a]	5.93± 0.18[b]
LL FFM (Left Leg Fat-Free Mass)	9.88± 0.52[a]	7.83± 0.22[b]
LA Fat M (Left Aem Fat Mass)	3.22± 0.04[a]	2.79± 0.01[b]
LA FFM (Left Aem Fat-Free Mass)	3.46± 0.11[a]	2.43± 0.92[b]
LA PMM (Left Aem Segmental Muscle Mass)	3.21± 0.01[a]	2.32± 0.007[b]
LA Imp (Left Aem Impedance)	292.13± 9.12[a]	269.78± 9.22[b]
TR FatP (Trunk Fat Percentage)	31.33± 1.76[a]	21.56± 1.11[b]
TR Fat M (Trunk Fat Mass)	20.07± 1.45[a]	16.45± 3.54[b]
TR FFM (Trunk Fat-Free Mass)	28.87± 0.32[a]	20.65± 0.44[b]
Power Measuring Module (TR PMM) (Trunk Segmental Muscle Mass)	33.69± 0.91[a]	25.76± 1.22[b]

Values are means ± SD (n = 100). Values bearing superscripts at the same row are significantly different at $p \leq 0.05$.

Table (4): Effect of diet modification on lipid profile mg/dl of obese women

Biochemical parameter	Normal range	Before	After
Total Serum Cholesterol	Less than 200	197.11± 2.11 [a]	152.42± 2.43[b]
% change of mean normal range		98.55	76.21
Serum Triglycerides	Less than150	203.21± 4.54 [a]	110.11± 2.54[b]
% change of mean normal range		135.47	73.41
Serum HDL	35-80	41.31± 5.63[b]	53.87± 6.87[a]
% change of mean normal range		71.84	93.68
Serum LDL	Less than 100	115.16± 2.44[a]	76.53± 4.67[b]
% change of mean normal range		115.16	76.53
VLDL	2-30	40.64± 6.23[a]	22.02± 1.87[b]
% change of mean normal range		254	137.62

Values are means ± SD (n = 100). Values bearing superscripts at the same row are significantly different at $p \leq 0.05$.

Table (5): Effect of diet modification on liver functions of obese women

Biochemical parameter	Normal range	Before	After
Aspartate aminotransferase (AST) (U/L)	8 - 40	43.05± 6.42 [a]	36.95± 2.54 [b]
% change of mean normal range		179.37	153.95
Alanine aminotransferase(ALT) (U/L)	7-55	46.97± 8.45 [a]	32.32± 1.87 [b]
% change of mean normal range		151.51	104.25
Alkaline Phosphatase (ALP) (U/L)	44-147	97.96± 9.04 [a]	70.26± 5.19 [b]
% change of mean normal range		102.57	73.57
Gamma –Globulin (g/dl)	0.7-1.6	2.06± 0.87 [a]	1.57± 0.07 [b]
% change of mean normal range		179.13	136.52
Total Bilirubin (mg/dl)	0.1-1.2	0.981± 0.04 [a]	0.875± 0.04 [b]
% change of mean normal range		150.92	134.61
Direct Bilirubin (mg/dl)	Less than 0.3	0.613± 0.26 [a]	0.445± 0.11 [b]
% change of mean normal range		204.33	148.33
Serum Albumin (mg/dl)	3.4-5.4	5.02± 0.76[a]	3.92± 0.56 [b]
% change of mean normal range		114.09	89.09
Total protein (g/dl)	5-8.3	7.08± 0.87 [a]	5.49± 1.54 [b]
% change of mean normal range		106.46	82.55

Values are means ± SD (n = 100). Values bearing superscripts at the same row are significantly different at $p \leq 0.05$.

Table (6): Effect of diet modification on hematologic indices of obese women

Biochemical parameter	Normal range	Before	After
Serum Iron (mcg/dL)	60-170	80.42± 3.98[b]	100.65± 11.34 [a]
Total Iron Binding Capacity (TIBC)(mcg/dL)	240-450	312.98± 22.98 [a]	269.98± 9.83[b]
Transferrin Saturation%	15-50	19.03± 3.11[b]	27.11± 4.21 [a]
Hemoglobin(g/dl)	12.1-15.1	10.66± 3.98[b]	12.99± 1.22 [a]
Red cell count(cells/mcL)	4.2-5.4	4.39± 2.98 [a]	4.43± 0.03 [a]
Eosinophils(cells/mcL)	less than 500	300.39± 12.98 [a]	276.73± 14.7[b]
Neutrophils/microliter	2500-7000	5200.43± 5.98 [a]	5032.45± 22.98[b]
Staff	2.5-6	3.18± 5.98 [a]	2.89± 0.22[b]
Sag (milliseconds)	50-167	46.53± 9.02[b]	51.95± 4.67 [a]
Lymphocytes%	20-40	35.74± 7.66[a]	29.97± 1.98[b]
Monocytes%	2-8	5.95± 1.06[a]	3.23± 0.08[b]
Total leucocytic count (WBC/mm^{3})	4.5-10.5	6.46± 0.98[a]	5.031± 1.54[b]
Platelets count/ microliter	150-450	284.63± 11.98 [a]	247.37± 12.87[b]
Packed cell volume (PCV%)	35.5-44.9	50.88± 7.98 [a]	39.8± 6.54[b]
Mean corpuscular volume (mcvfl)	80-100	66.86± 3.87[b]	79.9± 2.87 [a]
Mean corpuscular hemoglobin (MCH pg)	27-31	21.29± 2.76[b]	29.12± 3.76 [a]
Mean Corpuscular Hemoglobin Concentration (Mchc g/dL)	33-36	25.48± 2.65[b]	34.06± 2.09 [a]

Values are means ± SD (n = 100). Values bearing superscripts at the same row are significantly different at $p \leq 0.05$

تقييم تعديل النظام الغذائي على علامات التمثيل الغذائي وتكوين الجسم للنساء البدينات

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2- قسم التغذية- مستشفي أمراض الكبد – شبين الكوم – محافظه المنوفيه - مصر
3- فسم تمريض صحة المجتمع - مستشفي جامعه المنوفيه – شبين الكوم – محافظه المنوفيه - مصر
4- قسم الميكروبيولوجي -مستشفي أمراض الكبد – شبين الكوم – محافظه المنوفيه - مصر
5- قسم الباثولوجيا الاكلنيكية - مستشفي أمراض الكبد – شبين الكوم – محافظه المنوفيه- مصر

المستخلص العربي

تعرف السمنة على أنها تراكم غير طبيعي أو مفرط في دهون الجسم وتعد من أكثر القضايا الصحية شيوعا لارتباطها بالعديد من الأمراضوالإضرابات الجسدية .تهدف هذه الدراسة إلى تقييم تأثير تعديل الوجبات على المتغيرات المرتبطة بالسيدات المصابة بالسمنة. خطة التجربة: هي تجربة وصفية تدور على مجموعة واحدة قبل وبعد تعديل الوجبة . مكان الدراسة : العيادة الغذائية في معهد الكبد القومي–جامعة المنوفية-مصر. عدد الحالات 100 سيدة أعمارهم كانت بين 35 سنة إلى 50 سنة وتم اختيارهم عشوائيا . كانت الأداةالأولى من خلال الاستبيانات الثانية من خلال تقييم المقاييس الجسمانية ومكونات الجسم التي تم من خلال استخدام جهاز تحليل الجسم .الثالثة عن طريق تقدير دهون الدم ,وظائف الكبد وصورة الدم الخ في معمل معهد الكبد القومي. النتائج: وجد أنهناك تحسن معنوي في كتلة الجسم وتوزيع الدهون الجسم بعد تعديل الوجبة بالمقارنة بقيمها قبل إجراء الدراسة. معدل انخفاض كتلة الجسم كانت 20% بينما دهون الجسم كانت بين 14 إلى 21% حسب موضع الدهون في الجسم . كما ظهرت اختلافات معنوية بين قبل وبعد الدراسة بالنسبة الكوليستيرول , الجليسريدات الثلاثية, الليبوبروتينات العالية الكثافة والمنخفضة والمنخفضة جدا , البيلروبين الكلى , البيلروبين المباشر , البروتين الكلى , الالبومبين الكلى, الانين ترانسفيرين, اسبرتام ترانسفيرين , الكالين فوسفاتيز وجاما جلوتاميت. كانت النسبة المئوية للانخفاض تتراوح بين 12 إلى 23% . قيم حديد السيرم, قدرة الارتباط بالحديد الكلية وقيم الترانسفيرين قد تحسنت معنويا عند المقارنة بقيمها قبل التعديل الغذائي وذلك في مدى بين 12 إلى 17%. الخلاصة : تعديل محتوى الدهون , الكربوهيدرات والسعرات في وجبة السيدات المصابة بالسمنة أثرت بصورة مفيدة لخفض وزن الجسم ,كتلة الجسم ودهون الجسم والقياسات البيوكيميائية المختبرة. التوصيات: يجب الانتباه الى السمنة كمسبب لعديد من الامرض من خلال تغيير أسلوب الحياة, اختيار الغذاء الصحى وزيادة النشاط البدني وخاصة في الأعمار الصغيرة.

الكلمات الافتتاحية : *السمنة––المقاييس الجسمانية – الوجبة المعدلة- صورة الدم الكاملة*