
**EFFECT OF THREE WEIGHT REDUCTION SYSTEMS ON SOME
BLOOD CATEGORIES IN OBESE ADULTS IN ASSUIT
GOVERNORATE**

(THIS RESEARCH IS FROM MY MSc)

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Abstract

Aim: Evaluate the effect of three weight reduction (WT) systems of obese adults through one of the three systems [nutrition, or nutrition & exercise, or surgery] on serum lipids (cholesterol and triglycerides) and blood pressure level in obese patients.

Patients & Methods: 90 obese male or female individuals (weight increases 20% of ideal weight) from Assiut University Hospitals, and follow methods for weight reduction. Their ages ranged from 25-55 years, they did not have any chronic diseases like (diabetes, high blood pressure, heart diseases). They were submitted to socioeconomic history taking, clinical, and laboratory investigations. They were equally divided to three groups as follow: **group(1):** 30 patients follow the nutritional system only for weight reduction : 17 females 13 males. **(2):** 30 patients follow the nutritional system beside practicing exercises for weight reduction: 21 females 9 males. **(3):** 30 patients were treated surgically by liposuction or lipectomy or both: 30 females. Statistical analysis and nutrition education were applied. The sample included 56 individuals from urban and 34 individuals from rural who are coming from different five villages (Abnab, Manfalot, Aboteeg, Albadary, Alfath).

Results: It has been revealed that mean level of total cholesterol (chol) was significantly reduced in the all groups post (WT) reduction program at

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($P < 0.01$). The Hemoglobin (Hgb) was significantly increased post (WT) reduction program in nutrition and nutrition & exercise groups respectively at ($P < 0.01$) but in surgery group was significantly reduced at ($P < 0.01$) . While mean glucose was significantly decreased in nutrition and nutrition & exercise groups respectively post (WT) reduction program at ($P < 0.05$), but in surgery group was significantly increased at ($P < 0.05$). The three systems for (WT) reduction decreased the blood pressure.

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Introduction:

Obesity may be defined as adiposity in excess of that consistent with health (Mclaren, 1981). But Weinsier et al., (1993) defined the obesity as an excess weight which has been associated with a number of health problems, ranging from hypertension to Cancer, while the author defined the obesity according to body mass index (BMI) that it is generally defined as a (BMI) over 25,8 for women and 26,4 for men. This definition is different from the definition (Report of a WHO, 1998; Eckel, 2003) where reported that obesity is defined as a body mass index of more than or equal to 30 kg/m² for women and men.

Another definition mention that obesity is an excess amount of body fat. In the normal young-adult men, about 15-18% of body weight is fat. But normal young-adult women are about 20-25% fat by weight. Fat content significantly higher than these levels is defined as obesity (Alpers et al., 1995, and Report of a WHO; 1998).

Sardesai, (1998) reported that obesity is the medical term for over-fatness frequently resulting in a significant impairment of health. Obesity is defined by Wildman & Medeiros, (2000) as a physical state of excessive body fat or over fatness. Boyd, (2001) defined obesity as an excess of body fat. Desirable body fat ranges are better agreed on than the ranges for obesity. Men are considered to be in healthy fat ranges when between 10%

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and 20% of their body weight is composed of fat; for women, the range is 17% - 25%. Men are considered obese when 25% or more of their body weight is in the form of fat; women are considered obese at 32% fat or higher. The last definition mentions that obesity is usually defined as a condition in which accumulation of body fat causes a person to weight more than 20% of their ideal, healthy weight (Kerkut, 1998; Zimmermann, 2001; Abdalla, 2005).

So, it was found many of systems for treat obesity and weight loss. Some of systems are effective and healthy but the others are not effective. This research studies three systems which are on physicans supervision.

The present study aimed to evalute the effect of (WT) reduction systems[nutrition , or nutrition & exercise, or surgery] on serum lipids (cholesterol and triglycerides) and blood pressure level in obese patients.

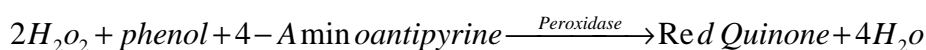
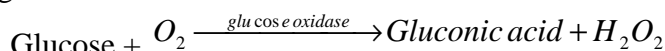
Patients and Methods:

Patients: This study was conducted on 90 obese patients from both sexes ,were selected from Assiut University Hospital and specialized clinicals. Their ages ranged from (22-55yrs). All patients were subjected to socio-economic data which were taking like age, education level, occupation, family size, district, number of home equipments , and costs for (WT) reduction, causes of (WT) reduction, and fat deposition of obese subjects of the sample. Blood pressure, laboratory investigations (chol, Hgb, glucose) were determined pre and post (WT) reduction system. A consent form approved by the Faculty of Medicine Ethical Committee at Assiut University, was signed by the patients prior the study.

Methods:

- Patients were devided to three groups (each 30): Group(1) follow the nutritional system only for weight reduction : 17 females 13 males. (2): follow the nutritional system beside practicing exercises for weight reduction: 21 females 9 males. (3): were treated surgically by liposuction or lipectomy or both: 30 females. All patients did not have any chronic disease like (diabetes, high blood pressure, heart disease).

- Cholesterol was determined after enzymatic hydrolysis and oxidation. The indicator quinoneimine was formed from hydrogen peroxide and 4-aminophenazone in the presence of phenol and peroxidase (Schettler & Nussel, 1975).
- Hemoglobin was determined by cyanomethamoglobin which has been adopted as a standard method. Hemoglobin from a whole blood sample is released from the erythrocytes and is oxidized by ferricyanide to the stable cyanomethamoglobin. The absorbance of cyanomethamoglobin is measured at 540 nm and is directly proportional to the hemoglobin concentration in the sample. (Van Kampen et al., 1961; International Committee for standardization in Hematology, 1967).
- Enzymatic colorimetric determination of glucose according to the following reactions:



(Trinder, 1969).

- Nutrition information were given to all patients by the researcher as (eating vegetables and fruits 6times/day except no foods between meals, following a low carbohydrate diet and practicing exercise) (Al Said, 1992).
- Statistical analysis were performed using IBM-PC computer; statistical package software SPSS windows. Analysis of variance (ANOVA one way) was applied in this study for comparison among mean, of different groups, (Vandallen, 1994).

Results:

Table (1):Socio- economic And Demographic Data Of Obese Patients (90 Patnts):

	Items			Descreption
1	Age (yrs) mean±S.D (min-mix)			37.31 ± 3.58 (25 -55.00)
2	Education level - Illiterate -basic -secondary -high			9 (10.0%) 6 (6.67%) 21 (23.3%) 54 (60.0%)
3	Occupation	Sedentary	Government employee	25 (27.8%)
			Student	7 (7.8%)
			Housewives	18 (20%)
		Active	Physican	14 (15.6%)
			Teacher	26 (28.9%)
4	Family Size < 4 >4			53 (58.9%) 37 (41.1%)
5	District -Urban - rural			29 (14.5%) 71 (85.5%)
6	Number of home equipments -≤ basic (7) ->7			30(33.3%) 60 (66.7%)
7	Costs for (wt) reduction Mean pounds±S.D (min-mix)	< 25% income		77 (85.6%)
		> 25% income		13 (14.4%)

Table (1): Represent

- 1- the mean age of obese patients of the sample was 37.31 years.
- 2- Education level was 10.0% of obese whose education level illiterate, followed by 6.67%, 23.3%, and 60.0% of obese were having basic, secondary and high education levels respectively.
- 3- 27.8% of patients work as government employees, followed by 7.8%, 20.0%, 15.6%, and 28.9% as students, as housewives, as physican, and as teachers.
- 4- 58.9% of obese have < 4 persons in family and 41.1% have >4 persons in family.
- 5- Regarding district, 14.5% of patients live in urban community, and 85.5% in rural districts.
- 6- According to the number at home equipments, 33.3% of obese had ≤ 7 basic home equipments which were considered of low socioeconomic class and 66.7% had >7 .
- 7- The mean cost for obesity treatment was 85.6% of obese spend < 25% income and 14.4% of obese spend > 25% income.

Table (2): Causes of (WT) reduction And Fat Deposition Of Obese Patients Of the Sample:

		Categories		Descreption
1	Causes of (WT) reduction	Physican recommendation		25 (27.8%)
		Self image, marriage		65 (72.2%)
2	Fat Deposition	Abdomen	F	48 (53.3%)
			M	22 (24.4%)
		Buttocks	F	42 (46.7%)
			M	2 (2.22%)
		Upper back	F	12 (13.3%)
			M	3 (3.33%)
		Chest and shoulder	F	17 (18.9%)
			M	6 (6.7%)

Table (2):

- 1- Illustrates that self image and marriage were the major cause of (WT) reduction, we could be seen that (72.2%) of the total sample followed weight reduction program for self image and marriage. But only (27.8%) of the total sample followed weight reduction system for physician recommendation.
- 2- According to fat deposition of obese it could be seen that the highest percentage of males located excessive fat in the central abdominal area of the body (24.4%) followed by (6.67%), (3.33%), (2.22%) respectively in chest and shoulder, upper back, and buttocks. But the highest percentage of female located excessive fat in the central abdominal area of the body (53.3%) followed by (46.7%), (18.9%), (13.3%) respectively in buttocks, chest and shoulder, and upper back.

Table (3): Some blood Parameters of obese subjects pre & post (WT) Reduction System

No	Groups	Sex	Total CHOL (mg/dL)		Mean HGB (g/dL)		Mean glucose (m.mol/L)		Mean blood pressure (m.m. Hg)			
			Pre	Post	Pre	Post	Pre	Post	Systolic		Diastolic	
									Pre	Post	Pre	Post
1	Nutrition	F	204.47	178.76	11.73	11.95	5.35	4.8	132.35	123.24	86.47	84.71
		M	206.77	183.77	12.49	12.92	4.86	4.91	131.92	123.85	84.62	80.77
		All	205.62	181.27	12.11	12.44	5.11	4.85	132.14	123.54	85.54	82.74
2	Nutrition & Exercise	F	207.53	179.92	11.32	11.78	5.35	4.79	132.5	122.71	85.21	82.5
		M	206	181.14	12.34	12.54	5.22	5.01	131.39	123.44	86.72	81.22
		All	206.77	180.53	11.83	12.16	5.28	4.89	131.94	123.08	85.97	81.86
3	Surgery	F	183	160.57	11.64	9.98	4.19	5.29	128.83	116	80.33	79.67
		M	0	0	0	0	0	0	0	0	0	0
		All	183	160.57	11.64	9.98	4.19	5.29	128.83	116	80.33	79.67
P. value between pre & post			** P<0.01	** P<0.01	N.S.	** P<0.01	** P<0.01	* P<0.05	N.S.	** P<0.01	* P<0.05	* P<0.05

Table (3): represents blood analysis & pressure of obese subjects pre & post (WT) reduction system. The mean of total (CHOL) levels were significantly decreased in all obese patients groups at ($P<0.01$).

The mean HGB was significantly increased in groups (1,2) at ($P<0.01$), but in group (3) was significantly decreased at ($P<0.01$). While the mean glucose levels were significantly decreased in groups (1,2) at ($P<0.05$), but was significantly increased in groups (3) at ($P<0.05$).

The mean systolic blood pressure was significantly decreased in the three groups at ($P<0.01$). Also, the mean diastolic blood pressure was significantly decreased in the three groups at ($P<0.05$).

Discussion:

Obesity is often defined simply as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired (Garrow, 1988). WHO (1998) reported that obesity can be defined simply as a disease in which excess body fat has accumulated to an extent that health may be adversely affected.

Thomas, (1996) says that obesity is a serious public health problem because of its prevalence and associated health risk. This definition is similar to one used by Pelkman et al., (2004) in the United States who say that obesity is a chronic ailment and constitutes a major public health crisis in the united states in recent years because of the associated increase in risk of major chronic diseases, such as coronary heart disease and diabetes. Another definition mentions that obesity is an excessive accumulation of body fat for a given body size based on muscle and bone (fram size) (Ronzio, 1997).

So, it was found many systems for treat obesity and weight loss. Some of systems are affective and healthy but the others are not effective. This research studies three systems which are on physicans supervision.

The present study, showed that the patients whose high education level had obesity more than those education level is secondary or basic or

illiterate. This may be return to style of life which mainly are sedentary life which due to obesity.

Schousboe et al., (2003) reported that education – associated differences in BMI and in weight change were clear in 1975 and 1981, respectively. This result disagrees with Wardle et al., (2002) who conclude that in England higher education attainment were associated with a lower risk of obesity in both men and women.

Also, this result disagrees with (Gutierrez-Fisac et al., 2004) who reported in elderly people in Spain that the prevalence of obesity was higher in persons with no education than in those with third level education (University studies). This result may be return to people who have high medical educational information about the risk obesity.

Regarding occupation, the highest percentage in the obese patients were sedentary (55.6%), but the lowest percentage in the obese patients who kind occupation was active (44.5%). This result is in agreement with (Haapanen et al., 1997) who states in a group of over 5000 working-aged men and women that the risk of body mass index gain was higher in men and women who decreased their physical activity during the 10-years follow-up or were inactive all the time than in subjects who were active all the time.

Concering family size, it is noticed that the highest percentage of obese subjects were from families have (< 4) persons (58.9%) of the total sample, but the rest of group were from families have (> 4) persons (41.1%) of the total sample. This agrees with (Ravelli & Belmont, 1997) who reported that the individuals from one- child families (only children) were uniquely at risk for obesity.

Dealing with the single room for practicing exercise of obese. It could be seen that the high percentage (32.2%) of the total sample have single room for practicing exercise. Which explained that high percentage of obese their socioeconomic is high. This result disagrees with (Rosmond &

Bjrntrup, 2000) who mentioned in Dutch males 19-year-old that lower socioeconomic status was associated with visceral obesity.

Regarding number home equipments, it was clear that a large percentage of obese subjects (66.7%) were found having No. home equipments (> 7) but (33.3%) of obese patients were found having No. home equipments (basic 7). It could be explained that the most of obese subjects were considered medium or high socioeconomic. This agrees with (Balli & Mishra, 2006) who reported in middle aged men that adulthood socioeconomic status were associated with women's BMI and weight change. Social mobility was associated with BMI. Also, agrees with (Silventonen et al., 2004) who reported that the socioeconomic status of origin is associated with adult BMI.

The present study scoped on that fat deposition of obese patients it could be seen that the males located excessive fat in the central abdominal area of the body. This result is agreement with (Sardesai, 1998 and Abdalla, 2005) who mentioned that fat accumulation in the central abdominal area of body is most common in males and this type of obesity is called android, apple shaped or upper body obesity. The females, also, located excessive fat in the abdomen area of the body. This result disagrees with (Sardesai, 1998 and Abdalla, 2005) who mentioned that the females obese have fat accumulation in the hips and thigh areas and this type of obese is called gynoid, pear shaped or lower body obesity. This may be return to body fat distribution which is influenced by genetics (Dudek, 2001).

The present research indicates that blood analysis & pressure of obese subjects pre & post (WT) reduction system. The total blood (CHOL) in obese patients was significantly reduced at ($P<0.01$) in all groups which agrees with (Wildman et al., 2004) who reported in Chinese adults that total (CHOL) were higher with each unit increase in BMI and waist circumference in both men and women. In contrast, total (CHOL) were lower with each decrease in BMI and waist circumference. In nutrition group. This result may be return to meals which the obese eat it under physican supervision become without fats (cholesterol is a type of fat) and

with low- carbohydrate. This result is in agreement with (Foster, 2003) who reported that the increased in high-density lipoprotein cholesterol concentration and the decrease in triglyceride concentrations were great among subjects on the low-carbohydrate diet.

Regarding nutrition & exercise group, it was clear that (CHOL) also, was significant decreased post (WT) reduction system. This is because the exercise can lower cholesterol by burning up fat in the body. And cholesterol is just a type of fat in the body, so through exercise, by burning fat, you reduce your cholesterol (James & Rippea, 1989). Also, agrees with (Janssen et al., 2002) who reported in obese women that significant reduction in total (CHOL) after following an energy-restrictive diet with or without exercise. Also, this result is in agreement with (Sartorio et al., 2001) who demonstrated that after program consisted 3 week intergrated energy-restricted diet, associated with moderate aerobic exercise to obese patients there are substantial reductions of total cholesterol (16.7%). Also, it noticed that total cholesterol was significantly decreased in surgery group. This result is in agreement with (Cerventz et al., 2006) who reported in 15 healthy nonobese women who underwent liposuction that liposuction improves the levels of cholesterol. This is because the fat is sucked out of the body through a tube, seems to have additional health benefits, can significantly change a person's cholesterol level (Hoppichler, 2003). But this result disagrees with (Mentz, 2002) who reported that lipid changes following liposuction showed slight increases of cholesterol ratios.

Concering the mean (HGB) was significantly increased in nutrition and nutrition & exercise groups at ($P < 0.01$). This agrees with (Boeing et al., 2000) who reported in 1773 middle-aged men and women was nondiabetic that (HGB) values might be modifiable by diet and other factors. This may be return to that balanced diets which are under physican supervision contain a good source of iron. Also, agrees with (matsuo et al., 2002) who suggests (in rats) that long-term resistance exercise is an effective in improving blood hemoglobin concentration in severely iron-deficient rats. Resistance exercise may be a useful therapy for iron deficient anemia.

According to surgery group, it could be seen that mean (HGB) was significantly reduced at ($P < 0.01$) post the operation. This may be return to blood loss in the operation. This result is in agreement with (Ignatowicz, 2005) who reported that the liposuction has some of risks such as potential bleeding and blood loss. Also, agrees with (Karmo et al., 2001) who showed that the blood loss accompanies liposuction procedures. But this result disagrees with (Kanter M. & Kanter W, 1990) who reported that blood loss usually is not clinically significant during liposuction, but the need for transfusion increases with the amount of tissue removed.

Regarding the mean glucose pre (WT) reduction system was significantly reduced at ($P < 0.05$) in groups (1), and (2). This agrees with (Foster et al., 2003) who reported in 63 obese men and women that the following low-carbohydrate diet for one-year decreased glucose load. Also, agrees with (Abdalla, 2005) who showed that very low caloric diet with practicing exercise improves glucose level. In contrast, the mean glucose was significantly increased in surgery group. This result disagrees with (Cerventez et al., 2006) who reported in 15 healthy nonobese women who underwent liposuction that liposuction to be a safe surgical procedure because it improves the level of glucose after 3 postoperative weeks. This may be return to a large amount of post operative fluids glucose.

It has been observed that the systolic blood pressure was significantly reduced at ($P < 0.01$) in the three groups after (WT) reduction. And also the diastolic blood pressure was significantly reduced at ($P < 0.05$) in the three groups. This result is in agreement with (Sacks et al., 2001) who reported (in 412 persons with and in without hypertension) that the Dash diet (which is rich in vegetables, fruits, and low-fat dairy products) was associated with a significantly lower blood pressure. Also, agrees with (Sartorio et al., 2001) who reported that after program consisted 3 week intergrated energy-restricted diet, associated with moderate aerobic exercise to obese patients there are substantial reductions of blood pressure (8.7%). This is because once the muscles have stopped contracting there is no muscle pump action to massage blood back to the heart and there for blood remains in the active

limbs (Arrol & Beaglehole, 1992). Also, agrees with (Stevens, 2001) who reported that clinically significant long-term reductions in blood pressure and reduced risk for hypertension can be achieved with even modest weight loss. And also, agrees with (Giese et al., 2001) who reported in fourteen women with (BMI) of greater than >27 kg/m² underwent liposuction that over a 4-month period, liposuction decreased systolic blood pressure. But, this result disagrees with (Klein et al., 2005) regarding surgery group, where the author reported in 50 obese women that there was no immediate health benefit. Post-operative blood pressure levels were similar to pre-operative levels. Also, disagrees with (Must et al., 1999) which conclude that after liposuction there were risk factors for heart disease include high blood pressure.

Conclusion:

The present research indicates that mean level of total cholesterol (chol) was significantly reduced post in three systems for (WT) reduction. The Hemoglobin (Hgb) was significantly increased post (WT) reduction program in nutrition and nutrition & exercise groups, but surgery group was significantly reduced. While mean glucose was significantly decreased in nutrition and nutrition & exercise groups post (WT) reduction program, but surgery group was significantly increased. The three systems for (WT) reduction were decreased the blood pressure.

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تأثير بعض أنظمة إنقاص الوزن علي بعض تحاليل الدم في مرضي السمنة البالغين بمحافظة أسيوط في مستشفى جامعة أسيوط

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الملخص العربي :

اشتمل هذا البحث علي ٩٠ مريض سمنة (أوزانهم أكثر من ٢٠٪ عن الوزن المثالي) أعمارهم ما بين (٢٥ - ٥٥) سنة في مستشفى جامعة أسيوط وقد أتبعوا طرق مختلفة لأنقاص الوزن ولا يعانون من أمراض مزمنة مثل (السكر أو الضغط أو أمراض القلب). وقد تم دراسة العوامل الاجتماعية والاقتصادية وبعض التحاليل المعملية وقياس مستوى ضغط الدم.

تم تقسيم العينة وفقا للطرق المتبعة لإنقاص الوزن الي ثلاث مجموعات متساوية : المجموعة الأولى: أتبع النظام الغذائي بمفرده (١٣ ذكور + ١٧ أنثى)، المجموعة الثانية: أتبع النظام الغذائي بجانب الرياضة (٩ ذكور + ٢١ أنثى)، المجموعة الثالثة: أجريت لهم عملية شفط الدهون أو أستئصالها أو كليهما (٣٠ أنثى). واشتملت العينة علي ٥٦ مريض من المدينة، ٣٤ مريض من قري ريفية مختلفة (أبنوب، منفلوط، أبوتيج، البداري، الفتح) بمحافظة أسيوط. كما تم إعطاء تثقيف غذائي وأجريت التحاليل الأحصائية المناسبة.

أظهرت النتائج أن مستوى الكوليسترول أنخفض بوضوح في الثلاث مجموعات عقب نظام إنقاص الوزن، بينما الهيموجلوبين ارتفع في المجموعتين الأولى والثانية فقط. كما أظهرت النتائج أن مستوى الجلوكوز أنخفض بمعدل ملحوظ في المجموعتين الأولى والثانية علي عكس المجموعة الثالثة. أما بالنسبة لمستوي ضغط الدم فقد أنخفض في الثلاث مجموعات عقب فترة أتباع نظام إنقاص الوزن.

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