ASSESSMENT OF SOME APPROACHES FOR WEIGHT REDUCTION AMONG ADULT FEMALES;AN INTERVENTIONAL STUDY AT ZAGAZIG UNIVERSITY HOSPITAL

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ABSTRACT

Background: Obesity and overweight are growing global epidemic,Resulting in significant morbidity and mortality and reduce quality of life Managing one's weight is one factor in preventing chronic diseases **Aim & Objectives**: Assessment of some approaches for weight reduction to decrease the prevalence of obesity to avoid its inherent hazards ,through the following objectives1-To assess overweight and local obesity .2- To educate participants about healthy lifestyle(dietary habits).3-To apply diet restriction ,acupuncture and mesotherapy **Courses** . 4-to assess the effect of the previous approaches in preventing obesity. **Subjects & Methods:** An interventional study was conducted in obesity clinics at Zagazig University Hospital during the academic year between 2011 and 2012.This study designed to compare the weight reduction effects of 3 approaches (mesotherapy, acupuncture and diet restriction) versus control for 460 adult women with body mass index BMI <35, treated for 8 successive weeks and obesity indexes including body weight, BMI and waist/hip ratio(WHR) were evaluated. Versus baseline, The study was carried out through 3 phases **Results:**. the obesity indexes decreased at the end of each treatment course (diet and acupuncture)($p < 0.05$), while no decrease at BMI at the end of the mesotherapy course($p>0.05$) with significant reduction at WHR ($p<0.01$). **Conclusion:** This study revealed that, that acupuncture then dietary caloric restriction reduced body weight while mesotherapy are effective body contouring approaches .
Keywords: weight reduction, diet restriction, acupuncture, mesotherapy.

INTRODUCTION

Obesity is a chronic genetically related disease(1)**.**defined as abnormal or excess fat accumulation in adipose tissue, to the extent that impair health **(2)**According to the WHO, there will be about 2.3 billion overweight people aged 15y and above, and over 700 million obese people worldwide in 2015**(3).**

Numerous studies have compared the appropriateness of various anthropometric indices for assessing obesity and predicting obesity related health risks, including BMI,WHR ,WC ,WHtR **(5,4).**

Obesity caused by an impaired balance between food intake and energy expenditure**.** Its etiology is multifactorial ,involving complex interactions among the genetic background , hormones and different social and environmental factors, such as sedentary lifestyle and unhealthy dietary habits **(6).**

Lifestyle modification, including diet, exercise and behavioral modification, are the cornerstone of obesity treatment; however, these modifications result in modest weight loss. Even patients who success of weight loss have actual difficulty maintaining long-term weight reduction of weight and they regain most of lost weight again **(7).**

Dietary treatment and physical activity are fundamental to the management of obesity. Compliance with it is the major problem, especially during the phase of weight maintenance after the excess weight loss has been lost **(8).**

Many individuals can lose weight successfully through dietary manipulation but the incidence of recidivism in morbidly obese approach 95%. **(9).**

acupuncture is one of the most popular complementary treatment, to control obesity by safe and effective modalities ,by stimulating particular points on the skin called acupoints for acupoints stimulation **(10)**

The effects of acupuncture application therapy on obesity is effective in procuring weight loss. It affect appetite, intestinal motility, and metabolism, as well as emotional factors such as stress.**(11)**

mesotherapy techniques are applied to treat fat in the face, neck, and elsewhere in the body and are the primary application of mesotherapy in the United States (12).by preventing fat cells from storing fat and help break down existing ones through inducing rupture and cell death of adipocytes (13).

The aim of this study is Assessment of some approaches for weight reduction to decrease the prevalence of obesity to avoid its inherent hazards ,through the following objectives1-To assess overweight and local obesity .2- To educate participants about healthy lifestyle(dietary habits).3-To apply diet restriction, acupuncture and mesotherapy Courses . 4-to assess the effect of the previous approaches in preventing obesity.

SUBJECTS AND METHODS

I. Technical design:

t study design: : An interventional study was coconducted in obesity clinics at Zagazig niuniversity Hospital during the academic year between 2011 and 2012. On 460 volanteer systematically random collected females.

Selection criteria

Target groups: --Adult female (18-50)y ,Localized obesity ,overweight and mildly obese(BMI<35 kg/m2), Aberrantly health(no history of chronic medical ,surgical or psychological disease) No special habits (alcohol, smoking, and drug abuse).No contraindication to mesotherapy or acupuncture**.**

II. Operational design:

A. 1st phase ;Data collection:

1) *Well constructed questionnaire -Detailed personal history including;(age ,residence, marital status ,socio economic class SEC).*
-past history (medical and surgical history)
-obstetric and menstrual history.
-family history of hypertension and diabetes
Present history of overweight and obesity .
*2-general examination vital sign; (*blood pressure, respiratory rate, pulse, temperature)*.*
3-Anthropometric measurement including*;* Body height, weight, WHR, BMI ,body composition analyzer(TANITA) **.**
4-local examination(evaluate skin status)to exclude any abnormality.
5-Investigation(to exclude any disease)- Including (complete blood picture ,fasting or random blood sugar , lipid profile) **.**liver function test and thyroid stimulated hormones (when needed), and pregnancy test(when suscepted).

2nd phase (Intervention phase):

1) **Health education**
1- Arabic booklet to all participant About healthy life style(dietetic hahits) for proper health and well-being, and reduced risk of chronic diseases later in life. It covered the following items;
A- Anatomy of My Pyramid ,variety (6 food groups and the needed intake for all age group), moderation, personalization, proportionality, gradual improvement .
B- Engage in regular physical activity and reduce sedentary activities Infection control (hand washing and protective equipments).
C-ideas about supplementation, drugs.
 2-group and individual discussion.

2) **Application of weight reduction Approaches(8 weeks)** in subjects who informed about the study, then divided into four equal groups(115)

according to the suitable method for treatment into;

a-acupuncture group;(somatic and ear acupuncture(5-8)points stimulation every session for (8-12) sessions.

b-diet restriction group; (low caloric diet with caloric deficit about 500kcal of different types changed every7-10days

c-mesotherapy group**;** 2 sessions of injection at area of localized obesity

d-control group ;nothing only health education.

3rd phase (Post intervention)

Follow up and final assessment ;

a-clinical (blood pressure, local changes).
b-anthropometric changes
   c-lab investigation changes (sugar and lipid profiles).

III. Administrative design and Ethical issues:

An official permission from Zagazig University, Faculty of medicine was taken to obesity clinics. The title and objectives of this study was explained to them to insure their cooperation. The local authority and manager of outpatient clinics at Zagazig university hospital was informed about the nature and steps of the study and written consent was taken. The study group was informed about the nature and the purpose of the study and verbal consent was taken before interview. The study group was not exposed to any harm or risk. Patient's data was confidential.

IV. Statistical analysis of the recorded data:

The collected data were computerized and statistically analyzed using SPSS program (Statistical Package for Social Science) version **16** **[14]**. For the statistical calculations Data coding was done, and Qualitative data were represented as frequencies and percentages, Chi-square test (χ^2), Mc Nemar test was carried out for testing the association between the qualitative data whenever possible. Quantitative data were compared using Analysis Of Variance(F test), Kruskall Wallis test and paired t test . The test results were considered significant when p-value **<0.05**.

RESULTS

Table(1) Fig (1)presents some socio-demographic characteristics, among the studied cases of the chosen approach. It is clear from the tables that *acupuncture group(G1)* among the 115 studied cases about half of them 56(48.7%) were (25-35y).more than half of them were married 65 (56.5%) and were of moderate social class 60(52.2%) . *diet group(G2)* among the 115 studied cases about half of them 57(49.6%) were (25-35y).the majority of them were married 93 (80.9%) and of moderate social class 57(49.6%). *Mesotherapy group(G3)* 45(39.1%) were (25-35y) , 101 (87.8%)were married ,and 61(53.0) of moderate social class 60(52.2%)

.**Fig(2) shows** the main causes of weight gain among studied causes and the chosen approach for weight reduction .**G1** WG due to dietary, behavioural, and compound causes by 32.2,32.2, and 26.1% respectively .**G2** WG due to behavioral, dietary compound causes by 35.9,30.4,25.2% respectively. In **G3** WG due to behavioural, dietary, compound in order33.9,30.4,25.2% respectively.**G4** WG due to compound ,behavioural, dietary by32.2,29.6,27.0%respectively.

Table (2)presents; the anthropometric Measures changes before and after the studied approaches for weight reduction, *mean waist changes(cm) (P < .05).* **in G1** *decreased* from 86.7 to 82.8cm,**G2** decreased from 87.1. to 86.4,**G3** decreased from 86.7 to 82.9 .**G4** no changes .*mean weight changes(CM) P < .05)* reduced from 86.2 to 77.8 **G1**, from81.4 to 74.3 **G2**, from 80.4 to 77.9 **G3**, increased from 82.9 to 84.6 **G4**. .*mean water changes%(P < .05),* **G1**increased from 44.9 to 50.1.**G2** increased from43.8 to 49.4, G3 increased from 43.3 to 48.5 ,G4 no changes .

Table 3, F =12.,9, *P < .05*). Pre-post intervention decreases occurred for BMI, as median weight loss at **G1(** 8.5 kg),G2 (4kg), G3 (0 kg),G4 (-1kg).

Table 4,(p<.05) *presents some clinical changes pre and post intervention joint pain ,blood pressure, skin status.*
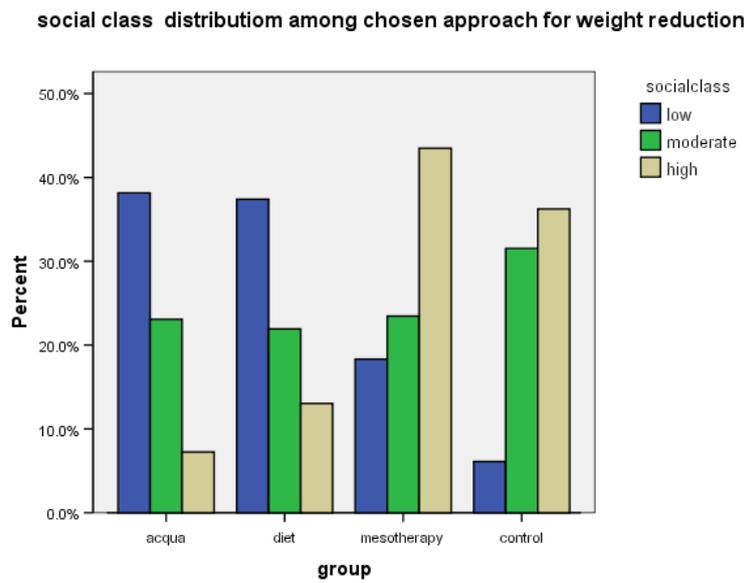
Table 5, *presents the causes that limiting the application of studied approaches for weight reduction*

Table (1) frequency distribution of some sociodemographic characteristics and the chosen approaches among the studied groups

Variable	G1	G2	G3	G4	X2/f	P
Age(y)	31.8±8.2 (18-50)	32.1±8.618 _49)	33.0±8.5 19-49	32.2±8.8 18-48	.35	.79
<25Y	20(17.4)	19.8)(23	24(20.9)	33(28.4)		
25-35	56(48.7)	57(49.6)	45(39.1)	40 (34.5)		
35-45	30(26.1)	28(24.3)	31(27.0)	23(19.8)		
>45	9(7.8)	7(6.1)	15(13.0)	19(16.4)		
Marital						
Unmarrie	48(41.7)	21(18.1)	13(11.3)	23(19.8)		
Married	65(56.5)	93(80.9)	101(87.8)	89(76.8)	37.4	.00*
Widow	2(1.7)	1(.9)	1(.9)	3(2.6)		

*significant difference.

Fig(1) shows

social class distributiom among chosen approach for weight reduction

Fig(2)

the cause of weight gain among chosen approach for weight reduction
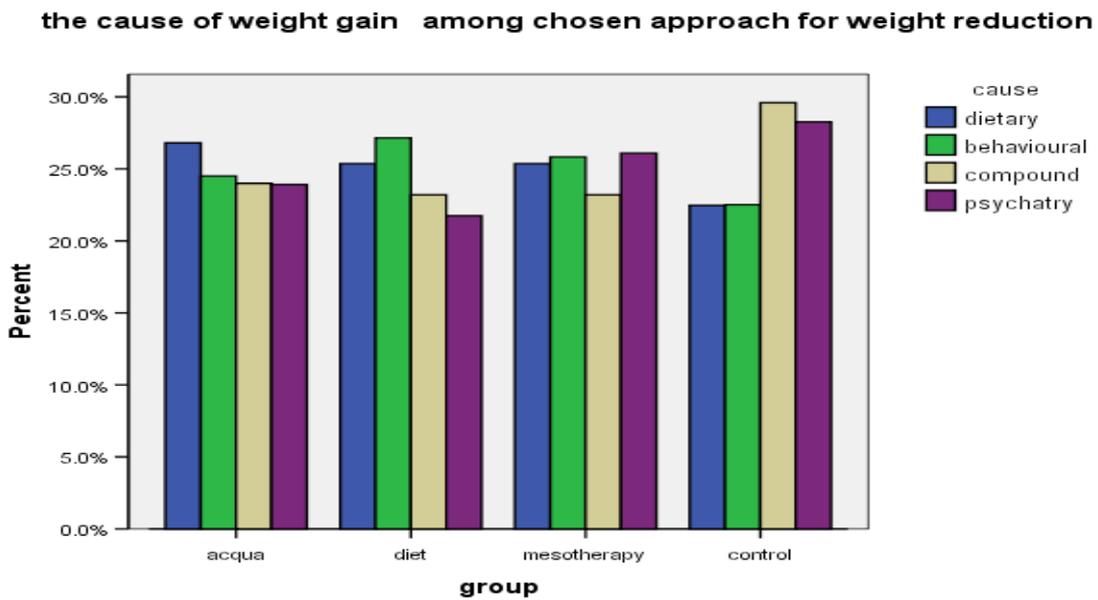
Table (2) shows the anthropometric measures changes among the studied groups before and after the intervention

Variable	G1	G2	G3	G4	F	P
Waist(cm)	86.7 ±10.1 (78-104)	87.4±7.2 (73-99)	86.7±10.0) (75-110)	88.7±10.7 (78-120)	8.21	.00*
After waist(cm)	82.8 ± 11.1 (68-113)	86.4±7.2 (70-98)	82.9±8.9 (65-100)	88.8±9,5 (76-123)	9.63	.00*
Weight (kg)	86.2±14.3 (67-110)	81.4±7.8 (67-108)	80.4±7.1 (66-109)	82.9±10.8 (67-110)	11.8	.00*
After weight(kg)	77.8±12.4 (61-99)\	74.3±10.5) (60-105)	77.9±7.7 (66-107)	84.6±12.1 (65-109)	3.62	.01*
Pre water(%)	44.9±5.8 34-52)(	43.8±5.9 33.7-50)(	43.3±4.4 33-48)(	44.2±4.1 (32-49)	.74	.40
Post water(%)	50.1±6.4 (44-67)	49.4±5.2 (39-55)	48.5±5.1 (41-52)	44.8±4.1 (38-50)	5.59	* .02

*significant relationship

Table (3) shows the   total weight loss among the studied before and after the intervention

Variable	G1	G2	G3	G4	/k/ F	P
BMI	27.5±4.3 (23-34)	26.4±2.7 (22.4±34)	25.4=_2.7 22-34	27.8±3.9 (22-34.6)	3.07	.01
AFTER BMI	24.8±3.7 (20-31)	24.3±3.5 (21.5-33)	23.3±3.5 (21.9 -33	27.2±3.9 22-35	16.21	.00*
TOTAL WT loss	8.5 (4-11)	4 (-2/10)	0 (-1/2)	-1 (-3/3)	125.9	.00*

Table (4) shows the changes of some clinical findings among the studied groups after the weight reduction approach application

Variable	G1	G2	G3	G4	X2	P
Pre Joint pain	32(27.8)	18(15.7)	24(20.9)	29(25.2)	5.87	.12
Post Joint pain	25	15(15.7)	24(20.9)	30(25.2)	4.37	.22
Within groups MCNemar(p)	.34	1.00	.125	.125		
od pressure						
rtensive	90(78.3) 25(14.7)	54(47.0) 61(53.0)	68(59.1) 47(40.9)	65(65.5) 50(43.1)	70.8	.00*
od pressure						
rtensive	99(78.3) 17(14.7)	63(47.0) 52(53.0)	67(58.3) 48(40.9)	65(65.5) 50(43.1)	70.8	.00*
Within groups MCNemar(p)	0.03*	0.00*	1.00	1.00		
Skin status Good Saggy	69(60.0) 41(41.0)	32(27.8) 83(72.2)	12(10.4) 103 (89.6)	35(30.2) 80(69.1)	71.6	.00*
Post Skin status Good Saggy	70(60.9) 45(39.1)	31(27.) 84(73.0)	26(22.6) 89 (77.4)	35(30.2) 80(69.1)	71.6	.00*
Within groups McNemar p	1.00	1.00	0.00*	1.00		

Significant difference *

Table (5) presents the causes limiting the application of each intervention

	diet G2	AcpunctureG1	MesotherapyG3
Patient preference technique	Supplementation> Without	Ear>somatic ones	Multi-injector applicator>single
Cost	45(39.1)	36(31.3)	84(73.0)
No of visit	7-8	2	8-15
Duration(min)	10-20	30-45	15-30
Visit constrain	10(8.9)	33(28.7)	3(2.6)
Poor compliance	43(38.0)	7(6.1)	15(12.2)
Causes of poor compliance	Hunger Headache Fatigue Constipation Poor results Behavioral Cultural	Ear pain Don't trust Frequent visits	-Local skin reaction -risks of side effect -pain

DISCUSSION

Obesity is associated with many other health problems. (**15**) and even small reductions in weight can lead to significant improvements in quality of life of obese individuals (**16**)

Because obese individuals often have other associated health issues, guidelines for obesity management prefer modest and safe weight loss and good weight maintenance to target an ideal weight (**17**)**.**

This thesis provides beginning guidelines for safe and effective control of overweight and obese] at zagazig university hospital.by the following 4 approaches ;

Rolls,(18) suggests that the promotion of diets that reduce the energy density of foods consumed and address the effects of portion size on the intake of nutritious low-energy dense foods may be an effective future strategy to both prevent and treat obesity.

The participants at G2 experienced a weight loss of 4 kg, on average ranged from (-2/11.5), which was slightly less than the rapid weight loss recommendations of approximately 2% to 3% of initial body weight per week for overweight and obese adults (**19**) (**Hemmingsson E et al .(20)** and slightly greater than the weight loss guidelines of the Department of Health and Human Services of 1 to 2 lb per week (**21**) .Although BMI significantly decreased from 26.4 ± 2.7 to 24.3 ± 3.5 kg/m^2 , the participants may remained in the overweight category pre-post intervention**.**

Pre-post changes in the waist-to-hip ratios were not clinically meaningful, (0.84 to 0.83) remained in the at-risk category throughout the study period.(**22**)**23**)**.**

Despite the significant decreases in triglycerides and HDL cholesterol levels pre-post intervention, both lipid profile indices were at optimal or near-optimal levels throughout study period,< 100 mg/dL for triglycerides and < 60 mg/dL for HDL cholesterol. In addition, a decrease in HDL cholesterol is expected when participants are participating in a calorie-restricted, low–calorie-density dietary intervention, that consistant with (**24**)(**25**)

Consistent with our results at G1, indicating the greater efficacy of body acupuncture therapy for reduction of anthropometric parameters in cases when compared with controls, there are other studies reporting similar findings(**Hsu et al.,26).**

Concerning the effects on lipid profile in both cases and controls, positive changes (increase in levels of HDL-C and decrease in other parameters including triglycerides, total-cholesterol and LDL-C) were observed, however, the changes were significantly different between 2 groups being higher for acupuncture body group, indicating that whilst diet had important effects on the lipid profile but the combination of diet restriction and acupuncture therapy, leads to a further improvement in lipid profile levels. Moreover(**Li and Wang 27)** have reported significant changes in total and LDL cholesterol in during acupuncture therapy when compared with control subjects. In other study, it was reported that a significant decrease of triglyceride, total cholesterol, LDL-C but no changes in HDL-C in acupuncture group when compared with controls (**28**)In several studies, a similar pattern of changes in triglyceride, total-cholesterol, LDL-C, and HDL-C changed has been reported as our study following acupuncture(**29)(30)(31) (32)(33)** however, 2 of these studies did not find any changes for HDL-C(**30)(31)**this may be explained by application of different acupoints. It has been suggested that these changes in lipid metabolism may be caused by increase in the serum betaendorphin levels [(**31)**

The results of the present study AT G3, WC mean improvement from86.7cm and 10.0 standard deviation to 82.9 cm and 8.9cm standard deviation was not associated with a statistically significant reduction in the body weight and body mass index in the studied group .This means that fat reduction was not due to weight reduction but due to the lipolytic effect of the injected materials.

Our results were in agreement with **Heinrich (34)**.Our results are in agreement with **Hexsel et al (35)** who assessed the use of phosphatidylcholine in 205 patients with different patterns of localized fat deposits. Venous blood samples were taken in 13 of the patients treated with subcutaneous injections and all results showed no significant alterations in either hepatic function or lipid profile.

Regarding the factors influencing dietary intervention effect were; the constraints of time (6-8 visit, 4-5 small frequent meals), knowledge about healthy dietary habits , and costs of promoting and/or delivering nutritional interventions(high protein diet , supplementation, and doctor visita) as well as providing their patients with meal plans(>60.1% consume >3 meals) that fit their lifestyle(41.7% no exercise), nutritional preferences or eating habits(their cause of GW dietary and behavioural factors 30.4%,35.7% in order), and economic status(as 42.2% were of low social class).this constrains is

supported by **(Laddu D et al.,36)(Mary and Jeanmarie 37)**

Problems include the aversion to needles, the fear of infection by needles and the occasional reported case of damage to vital organs by needle penetration makes . Needling of ear acupuncture points more preferable, although it can become quite painful and may risk infection of the auricular cartilage. Attendance for conditions that require frequent treatment(8-15 session ,average around 30 min) can become costly and inconvenient. However, in weight control, frequent acupuncture is essential for treatment to be effective. Embedded needles run similar risks and have been shown to lose effect over time. this constrains is consistence with **(Hollinshead W H,1982)**.

Follow up of the patients who were included in this study showed no serious reactions. No local irregularities or dimples were seen. The most commonly encountered side effects were stinging pain, swelling, bruises and erythema Skin reactions. All these reactions were transient, lasting for not more than one week after the injection session. Localized urticarial reaction occurred in only one case and resolved after 3weeks with systemic antihistamines and topical steroid treatment. Diarrhea occurred in only two case and resolved within one week without treatment. The patient who developed diarrhea was injected with 1000mg dermastabilon / session.

Similar results were reported by **Palmer et al (38)**

Recommendation Research is still needed to determine whether an abbreviated behavioral intervention is efficacious.

-further study is necessary to understand fully the relationship between the acupuncture points and weight reduction, including the use of appropriate control s.

-further study necessary to ensurethe long term effect of injection lipolysis without side effects

In conclusion, In conclusion, body acupuncture in combination with diet restriction was found to be effective for weight loss and also reduction of the obesity-associated risks factors, such as dyslipidemia. However, these effects can be achieved by other modalities but due to lack of adverse events and continued effects after the therapy, acupuncture could be used as a proffered or synergic treatment option for obesity control infection rates in ICUs by almost 50%, during the intervention period.

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