IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 9, Issue 4 Ser. IX (Jul. – Aug. 2020), PP 20-30
www.iosrjournals.org

The Impact of Nutritional-Behavioral Counseling with Motivational Lifestyle Modification on Health Outcomes Post Bariatric Surgery

Mona Mohamed Ibrahim[1]&Monira Samir Abdelhady[2]

1. *Lecturer, Medical Surgical Nursing, Faculty of Nursing Aswan University, Egypt*
2. *Lecturer, Medical Surgical Nursing, Faculty of Nursing Fayoum University, Egypt*

Abstract:
Bariatric surgery is a recognized and accepted approach for both weight-loss and many of the conditions that occur as a result of severe obesity. ***Aim:*** *Assess the efficacy of nutritional and behavioral counseling and lifestyle modification education on health outcomes for patients undergoing bariatric surgery. This study was carried out at general surgery units "10 for males and 25 for females" at Aswan University Hospital.* ***Tools:****five tools used Socio-demographic and medical clinical baseline data, Borg's rating of Perceived Exertion Category-Ratio scale, Ontario Bariatric Eating Self-Efficacy Scale, Change Ratings, and Three-Factor Eating Questionnaire.* ***Results****: After three months post-test patients all patients whose weight was more than 150KG their weight decreased to become more than 100KG. After 6 months post-test (71.4%) of patients their weight was >100KG and (9.5%) of patients their weight decreased to reach =<100kg with a highly statistically significant difference (p.v 0.001**).****Conclusion:****nutritional behavioral counseling and lifestyle modifications have a great effect on the patients' outcome post-bariatric surgery.****Recommendation:*** *Further studies needed to evaluate the effect of lifestyle modification on health outcomes post-bariatric surgery.*

Keywords: Nutritional-Behavioral, Counseling, Motivation, Lifestyle Modification, Health Outcomes, and Bariatric Surgery.

Date of Submission: 01-08-2020 Date of Acceptance: 16-08-2020

I. Introduction

Bariatric surgery is the most effective treatment for morbid obesity and associated metabolic complications. Patients have to be prepared to implement extensive lifestyle changes to ensure long-term postoperative success.Moreover, these same procedures have also been recognized as affecting metabolic or hormonal changes that play a significant role in hunger. Bariatric surgery is a known and approved approach for both weight loss and many of the complications arising from severe obesity; however, not all people with severe obesity are suitable for bariatric surgery. **(Wolfe et al, 2016).**

The U.S. National Institutes of Health recommends bariatric surgery for obese people with a body mass index (BMI) of at least forty and patients with a BMI of at least 35 and severe coexisting medical conditions such as diabetes.However, research is emerging that suggests bariatric surgery could be appropriate for those with a BMI of 35 to 40 with no comorbidities or a BMI of 30 to 35 with significant comorbidities. The new American Society for Metabolic & Bariatric Surgery recommendations recommends the BMI Consensus Position statement as an indicator for bariatric surgery. The latest recommendations recommend that any patient with a comorbidity BMI greater than 30 is a candidate for bariatric surgery. **(Robinson, 2009).**

Surgery should be considered as a treatment option for patients with an BMI of 40 kg / m2 or greater who have undergone but have failed a successful exercise and diet regimen (with or without adjunctive drug therapy) and who have obesity-related comorbid conditions such as hypertension, decreased glucose tolerance, diabetes mellitus, hyperlipidemia, and obstructive sleep apnea.A doctor-patient review of choices for surgery should include long-term side effects such as reoperation, gallbladder disease and malabsorption**(Thaller and Cohen, 2013).**

Immediately after bariatric surgery, the patient is limited to a clear liquid diet which includes foods such as clear broth, diluted fruit juices or sugar-free drinks and gelatin desserts. This diet carries on until the gastrointestinal tract has recovered somewhat from the treatment. The next stage offers a mixed or pureed sugar-free diet for at least two weeks.High protein, liquid or soft foods such as protein shakes, soft meats, and dairy products may be used. Foods that are high in carbohydrates are usually avoided during the initial weight-loss period, where possible.**(Egberts et al, 2012).**

Post-surgery, overeating is curbed, because it causes nausea and vomiting to exceed the stomach capacity. Diet limitations following surgery recovery partially depend on the type of operation. To account for

the decreased absorption of essential nutrients, many patients will have to take a daily multivitamin pill for life. Because patients cannot eat a large amount of food, doctors usually reconsidera diet that is relatively high in protein and low in fats and alcohol.**(Tucker et al, 2007).**

It is very normal for a patient to experience fluid loss and dehydration within the first month after surgery. Patients are having trouble drinking the right amount of fluids as they adapt to their new gastric volume. Limitations on oral fluid intake reduced calorie intake, and increased incidence of vomiting and diarrhea are all factors that contribute significantly to dehydration. **(Petering and Webb, 2009).**

Recommended eating behaviors include taking small bites, dividing food intake into 4–6 meals throughout the day, chewing well in a relaxed way, and ending meals when feeling "comfortably full." Eating balanced meals with high protein content is advisable to reach the recommended daily intake of protein. Solid foods should be preferred, as it helps to satiety us. Instructions should be provided to minimize the intake of high-calorie dense foods and beverages (e.g., smoothies, ice cream, milkshakes, juices, chocolate, cream cakes, cookies) and to limit added sugars. Therefore, they should avoid carbonated drinks. A drink 15 min before or 30 min after meals should distinguish liquids and solids. **(McGrice et al, 2015).**

Nutritional advice after bariatric surgery would emphasize improving eating habits, including adequate drinking and chewing, as well as preventing overindulgence in high-fiber foods, in particular, citrus piths and persimmons. Lastly, it is essential to maintain regular intakes of vitamin and mineral supplements. Particular attention should be paid to grazing, which is regarded as an unwelcome, negative eating pattern. The word "grazing" is often derived from the circumstances of "Western life" (e.g., eating when depressed or bored, eating when watching TV, or working on the computer). It is well established that a grazing pattern of eating behavior after surgery reduces the long-term surgical success. Another very important issue to be discussed by a dietitian is eating disorders, because they may arise or re-emerge after surgery and affect the outcomes of surgery.**(Verma et al, 2013).**

Aim of the study:

Assess the efficacy of nutritional and behavioral counseling and lifestyle modification education on health outcomes for patients undergoing bariatric surgery.

II. Subjects and Methods

Thirty-five morbidly obese patients who underwent bariatric surgery admitted to general surgery units "10 for males and 25 for females" at Aswan University Hospital during the period of the beginning of April 2016 to end of December 2016 were included in this study. The sample size is estimated to detect the mean percent of weight loss among patients (X=17.3±12.9) according to **Jassil et al (2015)**, with a 95% level of confidence (αn error = 5%), and a study power of 90% (β error=10%).

All of the subjects were evaluated three timesduring the study, first times one month after surgery (before applying nutritional and behavioral counseling), the second time three months after the program, and the third time six months after the program.

Research design:

Quasi-experimental (pre –post-test) research design.

Setting:

This study was carried out at general surgery units "10 for males and 25 for females" at Mansura and Aswan University Hospital.

Tools of data collection:

Five tools were used for data collection they accomplished after reviewing the recent relevant literature:-

Tool (I): Socio-demographic and medical clinical baseline data:

This tool was developed by the nursing researchers after reviewing relevant literature.It was comprised of two parts including:-

Part I: Demographic characteristics questionnaire:

It revealed data about the following items: patient's: age, gender, marital status, level of education, occupation……etc.

Part II: Health history:

It revealed all data about past medical history and the presence of chronic diseases that related to morbid obesity "comorbidities". It also assesses the obesity level through body weight, body mass index (BMI).

Tool (II): Borg'srating of Perceived Exertion Category-Ratio scale (RPE) scale.

This scale was developed by **Borg (1982)** and used to document the patient's exertion during a test, and sports coaches use the scale to assess the intensity of training and competition. The original scale introduced by Gunnar Borg rated exertion on a scale of 6-20. This is especially used in the clinical diagnosis of breathlessness

and dyspnea, chest pain, angina, and musculoskeletal pain. The scale is best suited when there is an overriding sensation arising either from a specific area of the body, for example, muscle pain, ache or fatigue in the quadriceps orfrom the pulmonary response. The Borg RPE scale is a numerical scale that ranges from 6 to 20, where 6 means "no exertion at all" and 20 means "maximal exertion." When a measurement is taken, a number is chosen from the scale by an individual that best describes their level of exertion during physical activity.

Tool (III): Ontario Bariatric Eating Self-Efficacy Scale (OBESE):

The scale was developed by **(Cassin, 2013)** The OBESE Scale consists of 28 self-report items designed to measure eating self-efficacy inbariatric populations. This measure is adapted from the Weight Efficacy Lifestyle (WEL) Questionnaire **(Clark, et al, 1991),** a scale that assesses confidence inone's ability to resist overeating in tempting situations. In addition to rating confidence in one'sability to resist overeating in 19 tempting situations (Part I), the OBESE scale includes 9additional items to assess confidence in one's ability to follow bariatric surgery dietaryguidelines (Part II). Respondents are asked to rate their confidence on a Likert-type scale from 1("Not confident") to 10 ("Very confident"). Although the psychometric properties of the OBESEScale have yet to be examined, the subscales of the WEL Questionnaire demonstrated highinternal consistency (α), ranging from .90 for the Social Pressure Scale to .70 for the PositiveActivities Scale, and high concurrent validity with the Eating Self-Efficacy Scale. Internal consistency (α) of the OBESE scale in the current sample was 0.97for Part I (eating self-efficacy) and 0.80 for Part II (guideline adherence), which is considered tobe 'very high' and 'good', respectively.

***Tool (IV): Change Ratings*:**

It was developed by**Miller &Rollnick, (2002).** It consisted of Importance Rating:Participants were asked to respond to the question, "How important is it for you to consistentlyfollow the post-operative bariatric surgery dietary guidelines?" on a visual analog scale from 0("*Not at all important*") to 10 ("*Extremely important*"). *Readiness Rating:* Participants wereasked to respond to the question, "How ready are you to consistently follow the post-operativebariatric surgery dietary guidelines?" on a visual analog scale from 0 ("*Not at all ready*") to 10("*Extremely ready*"). *Confidence Rating:* Participants were asked to respond to the question, "Ifyou decide to change, how confident are you that you will be able to consistently follow the postoperativebariatric surgery dietary guidelines?" on a visual analog scale from 0 ("*Not at all confident*") to 10 ("*Extremely confident*")

Tool (V): Three-Factor Eating Questionnaire (TFEQ-R18):

One of the most widely used measures in the field of eating behavior research is the Three-Factor Eating Questionnaire, TFEQ, developed by **Stunkard and Messick,(1985)**. The TFEQ-R18 was a step forward in the psychometrics of eating behavior. The TFEQ assesses three factors; Restraint, Disinhibition, and Hunger. Restraint refers to an individual's concern overweight control and strategies which are adopted to maintain body weight and restrict eating, for instance, using small portions, avoiding fattening foods, and stopping eating before reaching satiation, to limit food intake. Disinhibition reflects a tendency towards overeating and eating opportunistically in an obesogenic environment, for example, eating in response to negative affect, being unable to resist food cues, and overeating in response to the palatability of food. Hunger is concerned with the extent to which hunger feelings are perceived and the extent to which such feelings then evoke food intake. For example, intense feelings of hunger resulting in consumption over three meals per day, feeling an absence of satiety or creating unpleasant gastric sensations. Although it was constructed using data from obese adults, it applies to other populations as well. Eating behaviors were assessed by using the Three-Factor Eating Questionnaire (TFEQ-R18) which consists of 18 questions with response categories on a 4-point Likert scale (e.g., 1 = never, 2 = rarely, 3 = sometimes, 4 = always). The TFEQ-R18 identifies 3 different eating behavior scales corresponding to CR (conscious and regular restriction of one's food intake in an attempt to control body weight and body shape), UE (overconsumption of food due to a variety of stimuli, associated feelings of being out of control, and subjective feelings of hunger), and EE (tendency to eat in response to negative emotional feelings or mood such as depression, anxiety or sadness).

Post-operative nutritional and behavioral counseling and lifestyle modification educational Booklet:

This booklet developed by the researcher based on the review of the relevant literature to provide bariatric surgery patients with needed instructions to obtain accurate nutritional counseling and to improve the outcome of patients post-bariatric surgery.

The educational booklet includes the following:

A. An introduction includes:

- Definition of bariatric surgery

- Indications of bariatric surgery.
- Advantages of bariatric surgery.
- Complications of bariatric surgery.

B. Nutritional counseling after surgery include:

- General dietary guidelines after surgery.
- Diet in the hospital.
- Diet for the first two weeks post-surgery.
- Diet for weeks two to four post-surgery.
- Recommended meal plan for weeks two to eight until two months post-surgery.
- Recommended meal plan for two to six months post-surgery.
- Taking Vitamin and Nutrient Supplements
- Long-term dietary guidelines.

C. Behavioral counseling after bariatric surgery include:

- Controlling Snacking and Emotional Eating.
- Medications adherence.
- A healthy sleep pattern.

D. Lifestyle modifications:

- Controlling weight and monitoring body mass index.
- Resistance Training and regular exercises.
- No Smoking or Drinking alcohol.
- Follow up Appointments Post Weight Loss Surgery.

Ethical Considerations:

- The study was approved by the Faculty of Nursing ethics committee, written consent was obtained from patients to participate in the study after explaining the aim and nature of the study to them. Data confidentiality and anonymity was assured and patients were informed that their participation in the study is voluntary and will not affect the care they receive if they decided to withdraw from the study.

A pilot study:

- A pilot study to test the research tools ' feasibility, objectivity, validity, and applicability were performed on 10 percent of the sample. No changes were made; the pilot study sample was included in the study. The patient's voluntary involvement agreement was acquired after explaining the objective and nature of the research.

Fieldwork:-

The study was conducted for 9 months from the beginning of April2016 to the end of December 2016. All enrolled patients gave their informed consent before participation in the study after a complete explanation regarding the aim of the study by the researcher. Patients were interviewed by the researcher 3days a week till discharge. Each day the researcher spent 30 minutes with the patient from 10-10.30 am, each patient was interviewed individually.

The study consisted of six sessions:

The 1st session (pretest): patients were interviewed to collect socio-demographic data, medical history, and assess their knowledge about disease conditions and lifestyle modification, nutritional- behavioral habitschanges postoperatively.***The time allowed: from 15-20 minutes.***

The 2nd to 4th session (the instructional sessions): The researcher interviewed patients, provided them with thepostoperativenutritional and behavioral counseling andlifestyle modificationeducation. The researcher began to explain items of modification that must be followed postoperatively as nutritional modification, how to maintain weight, and follow up adherence. The researcher gave special attention to patients who can't read or write and provided them with a detailed explanation and answered all their questions.***The time allowed: from 30-45 minutes for each session***.

The 5th session (posttest): Patients were interviewed at follow up 3 months postoperatively by meeting them at follow up visits after applying the instructional guide regarding nutritional and behavioral changes and lifestyle education for reassessment and questionnaire were filled again.***The time allowed: from 15-20 minutes.***

The 6th session (follow up): Patients were interviewed at follow up 6months postoperatively by meeting them at follow up visits to evaluate the effect of instructional guide on lifestyle modification after discharge and also to evaluate instructional guide for necessary modification and to ensure maximum benefits for patients.

Statistical design:
Using the Anderson-Darling test, the data were checked for normality and variances inhomogeneity before further statistical analysis. Categorical variables were defined by number and percentage (Number& percent), where the mean and standard deviation (Mean, SD) were described as continuous variables. Chi-square test and Fisher exact test used to compare categorical variables, t-test, Pearson, and Spearman correlation coefficients were applied to continuous variables, a two-tailed $p < 0.05$ was deemed statistically significant. All analyses were performed with the IBM SPSS 20.0 software.

III. Results:

Table 1: Frequency distribution of demographic data for patient participants n=35:

Variables	N	%
Age (means ±SD)	34.31±9.43	
Sex		
male	10	28.6
female	25	71.4
Marital status		
single	8	22.9
married	23	65.7
divorces	3	8.6
widow	1	2.9
Residence		
urban	20	57.1
rural	15	42.9
Education level		
illiterate	5	14.3
middle education	21	60.0
high education	9	25.7
Occupation		
working	19	54.3
not working	16	45.7
N OJ		
manual work	7	20.0
mental work	12	34.3
no	16	45.7

Table (1):shows that more than half of the study sample was females, married their mean age was 34.31±9.43 years. More than half of the study sample (60%) has a middle education and live in urban areas. Regarding occupation, more than half of the patients were working and (34.3%) of them perform mental work.

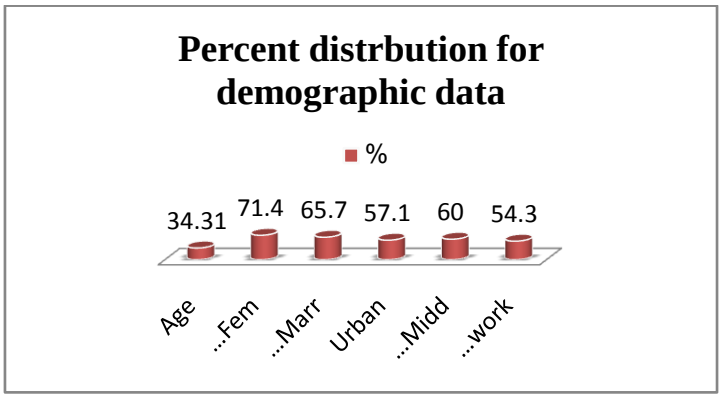

Fig. 1: Frequency distribution of demographic data for patient participants

Table 2: Frequency distribution for chronic disease for patient participants n=35:

Variables	Yes		No	
	N	%	N	%
Chronic disease				
HTN	12	34.3	23	65.7
Cardiac	1	2.9	34	97.1
Thyroid	2	5.7	33	94.3
Diabetes	29	82.9	6	17.1

Table (2): clarify that the majority of patients (82.9%) have diabetes,also, more than one-third of patients(34.3%) have hypertension.

Table 3: Frequency distribution of body weight pre, after three and after six months among participant n=35:

CWT		Follow up			Total	p.v
		pretest	After three month	after 6month		
=<100	N	0	0	10	10	0.001**
	%	0.0%	0.0%	28.6%	9.5%	
>100KG	N	23	35	25	83	
	%	65.7%	100.0%	71.4%	79.0%	
>150KG	N	12	0	0	12	
	%	34.3%	0.0%	0.0%	11.4%	

Chi-Square Tests **= highly significance, p≤0.01

Table 3:demonstrates that more than half of patients (65.7%) their weight was >100KGwhile more than one-third of the study (34.3%) sample their weight was>150KG.After three months of post-test patients all patients whose weight was more than 150KG their weight decreased to become more than 100KG. After 6 months post-test(71.4%) of patients their weight was >100KG and (9.5%) of patients their weight decreased to reach=<100kg with a highly statistically significant difference (p.v0.001**).

Table 4: Frequency distribution of body mass index pre, after three and after six months among participant n=35

BMI		Follow up			Total	Sig.
		pretest	After three months	after 6months		
.00	N	0	5	7	12	0.001**
	%	0.0%	14.3%	20.0%	11.4%	
>30	N	1	20	28	49	
	%	2.9%	57.1%	80.0%	46.7%	
>40	N	17	10	0	27	
	%	48.6%	28.6%	0.0%	25.7%	
>50	N	17	0	0	17	
	%	48.6%	0.0%	0.0%	16.2%	

Chi-Square Tests **= highly significance, p≤0.01

Table 4: shows that more nearly one-half of patients **(**48.6%) their body mass index was >40 and nearly the other half of them **(**48.6%) have >50 BMI. After three months posttest more than half of the patients (57.1%) their BMI decreased to reach>30 and after 6 months posttest this percentage increased to reach (80.0%) of patients with BMI >30with a highly statistically significant difference (p.v 0.001**).

Table 5: Frequency distribution ofBORG scale pre, after three and after six months among participant n=35

BORG scale		Follow up			P.v
		pretest	Post three month	after 6month	
nothing at all(0-2.5)	N	35	0	0	.001**
	%	100.0%	0.0%	0.0%	
moderate (3-6)	N	0	24	12	
	%	0.0%	68.6%	34.3%	
extremely strong (7- 12)	N	0	11	23	
	%	0.0%	31.4%	65.7%	

Chi-Square Tests **= highly significance, p≤0.01

Table 5: shows that all patients (100.0%) experienced a nothing at allexertion on BORG scale after three months post-test more than two-thirds of patients (68.6%) experiencing a moderatelevel while nearly two-thirds of them (65.7%)experience an extremely strongexertion levelon the same scale.There was a highly statistically significant difference (p.v 0.01**).

Table 6: Frequency distribution the mean score ofOntario bariatric eating self-efficacy scale pre, after three and after six months among participant n=35

Total obese	Total score range 28-84				
	N	Mean±	Minimum	Maximum	p.value
pretest	35	40.71±3.005	32.00	44.00	.001**
After three months	35	57.60±2.735	51.00	63.00	
after 6months	35	76.94±1.551	74.00	80.00	

One way ANOVA Tests **= highly significance, p≤0.01

Table 6 demonstrated that there was a highly statistically significant difference (p.v 0.001**) regarding the mean score of the Ontario bariatric eating self-efficacy scale pre, after three and after six months among participant as the mean after 6 months (76.94±1.551) was increased compared with the mean pretest (40.71±3.005).

Table 7: Frequency distribution of Change Ratingpre, after three and after six months among participant n=35

Variables		Pretest		After three month		After 6 month		P.v
		N	%	N	%	N	%	
CR1	not at all important	--	-	-	-	-	-	-----
	moderate	-	-	-	-	-	-	
	extremely important	35	100.0	35	100.0	35	100.0	
CR2	not at all confident	35	100.0	11	31.4	0	0.0	.001
	moderate	0	0.0	24	68.6	0	0.0	
	extremely confident	0	0.0	0	0.0	24	68.6	
CR3	not at all confident	15	42.9	0	0.0	0	0.0	.001
	moderate	14	40.0	0	0.0	0	0.0	
	extremely confident	6	17.1	35	100.0	35	100.0	

Chi-Square Tests **= highly significance, p≤0.01

Table 7 demonstrates that there are statistically significant differences regarding change rating pre, after three and after six months among participant

Table 8: Frequency distribution of total score TFEQ pre, after three and after six months among participant n=35

	Total score TFEQ (18- 72)				P.v
	N	Mean±SD	Minimum	Maximum	
pretest	35	48.54±2.355	44.00	52.00	0.001**
After three month	35	42.85±1.647	39.00	46.00	
after 6month	35	31.85±1.004	30.00	33.00	

One way ANOVA Tests **= highly significance, p≤0.01 *= significance, p≤0.05

Table 8 shows thatthere is a statistically significant difference regarding total score TFEQ pre, after three and after six months among participant

Table 9:Relation between body weight and demographic data pre, after three and after six months among participant n=35

Bodyweight		Pretest	After 3 month	After 6 month	P1	P2	P3
		Mean ± SD	Mean ± SD	Mean ± SD			
age	>100KG	33.95±9.18	33.36±10.90	34.52±9.38	.075	.159	.032*
	>150KG	34.85±10.11	34.75±8.90	33.94±9.97			
gender	>100KG	1.61±.49	1.81±.40	1.70±.46	2.357	.820	.011*
	>150KG	1.85±.36	1.66±.48	1.72±.46			
Marital status	>100KG	1.95±.74	2.00±.89	1.94±.74	.171	.266	.217
	>150KG	1.85±.53	1.87±.53	1.83±.61			
residence	>100KG	1.42±.50	1.45±.52	1.41±.50	.000**	.042*	.036*
	>150KG	1.42±.51	1.41±.50	1.44±.51			
education	>100KG	2.04±.74	1.72±.46	2.05±.55	.579	7.117	.548
	>150KG	2.21±.42	2.29±.62	2.22±.73			
job	>100KG	1.33±.48	1.54±.52	1.58±.50	3.370	.482	1.36
	>150KG	1.64±.49	1.41±.50	1.38±50			

**= highly significance, p≤0.01 *= significance, p≤0.05

Table 9 revealed that there was a positive relationship between body weight and demographic data pre, after three and after six months among participants regarding age, gender,and residence.

Table 10: Relation between body weight, body mass index, TFEQ and obesitypre, after three and after six months among participant n=35

	Bodyweight	Pretest	After 3 month	After 6 month	P1	P2	P3
		Mean ± SD	Mean ± SD	Mean ± SD			
BMI	>100KG	2.57±.50	1.45±.52	.70±.46	.000**	3.6	1.8
	>150KG	2.57±.64	1.12±.44	.88±.32			
TotalTFEQ	>100KG	48.52±2.44	42.90±1.70	31.88±1.05	.003**	.015*	.020*
	>150KG	48.57±2.31	42.83±1.65	31.83±.98			
Totalobesity	>100KG	40.52±3.12	57.00±2.40	77.00±1.41	.206	.767	.044*
	>150KG	41.00±2.90	57.87±2.87	76.88±1.71			

**= highly significance, p≤0.01 *= significance, p≤0.05
**= highly significance, p≤0.01 *= significance, p≤0.05

Table 10 showed that there was a positive relationship between body weight and body mass index pre-test, also, a positive relation was found between body weightand total TFEQpre, after three and after six months. Additionally,there was a positive relationship between body weight and total obesityafter six months.

III. Discussion:

Obesity is now known as the world's most common metabolic disease, reaching epidemic proportions in developed and developing countries alike. Several approaches for the treatment of obesity are recommended, including nutritional therapy, regular physical activity (PA), behavioral therapy (BT), pharmacotherapy and bariatric surgery, and variations of these techniques**(Jensen et al, 2013).**

The present study revealed that; more than half of the study sample was females, married their mean age was 34.31±9.43 years**.(Merrill et al, 2010)** were in the same line as they mentioned that "more than half of the study sample > 40 years with the majority of women presence".The majority of patients have diabetes; also, more than one-third of patients have hypertension**. (Gianos et al, 2012)** were agreeing with the present study results as they mentioned that "More than half of patients had type 2 diabetes, one patient was glucose intolerant, and more than half if they had arterial hypertension".

Also, **(Gatineau et al,2017)** was agreeing with the current study results as they mentioned that"obesity is believed to account for 80-85% of the risk of developing type 2 diabetes, while recent research suggests that obese people are up to eighty times more likely to develop type 2 diabetes than those with a BMI of less than twenty-two". Also **(Yiannikouris et al,2012)** reported that "Obesity causes cardiovascular and renal diseases through several mechanisms, including hypertension, hyperglycemia, inflammation, dyslipidemia, and atherosclerosis, which are disorders that may coexist, especially in the presence of excess visceral fat to cause metabolic syndrome and are characterized by alterations in fat metabolism via lipid accumulation".

More than half of patients their weight was more than 100KG while more than one-third of the study sample their weight was more than 150KG.After three months post-test all patients whose weight was more than 150KG their weight decreased to become more than 100KG. After 6 months post-test more than two-thirds of patients their weight was >100KG and nearly ten percent of them their weight decreased to reach less than or equal 100kg with a highly statistically significant difference (p.v 0.001**).**(Sjöström, 2007)**reported that" Weight-loss (bariatric) surgery is currently the most effective way to lose weight and has the highest rates of weight maintenance in the long term. The Swedish Obese Subjects study was an early reporter of bariatric surgery leading to sustainable weight loss and decreased overall mortality when compared with lifestyle intervention alone.

Nearly one-half of patientstheir body mass index was >40 and nearly the other half of them have >50 BMI. After three months posttest more than half of the patients their BMI decreased to reach >30 and after 6 months posttest this percentage increased to reach eighty percent of patients with BMI >30with a highly statistically significant difference (p.v 0.001**). **(Cruz-Muñoz et al, 2013)** were in the same line with the present study and mentioned that"Overall, female and male BMI loss was very similar 1 year after surgery (10.5 kg/m2 and 10.7 kg/m2, respectively); BMI was reduced from 49.7 kg/m2 to 39.2 kg/m2 among males and from 45.1 kg/m2 to 34 4 kg/m2 among females. Similarly, when the sample was stratified by ethnicity (Hispanic versus non-Hispanic) BMI among Hispanics was reduced from 45.8 kg/m2 to 35.5 kg/m2 and among non-Hispanic whites from 47.3 kg/m2 to 35.2 kg/ m2".

(Duarte-Guerra et al, 2015) were in the same line as they mentioned that"Mild to moderate obesity (BMI 30–40 kg / m2) will show some progress in the short to medium term with changes in lifestyle (dieting and exercising) and behavioral therapy. Bariatric surgery, as these procedures are usually unsuccessful for severe obesity, is the most effective treatment for weight loss and maintenance in the morbidly obese person. To be eligible for surgery, in the case of serious obesity-related comorbidity, the patient must have failed prior measures of nonsurgical weight loss and either has a BMI > 40 or have a BMI > 35. The primary goal of bariatric surgery is not only to make the patient lose weight but also to sustain the loss. A secondary goal is to change the patients ' eating behavior and engage themin frequent exercise to promote a greater lifestyle change".

All patients experienced nothing at allexertionon the BORG scale, after three months post-test more than two-thirds of patients experiencing a moderate level while nearly two-thirds of them experience an extremely strong level of exertion on the same scale. There was a highly statistically significant difference (p.v 0.01**). While, **(Oliveira et al, 2016)** were disagreeing with our study results as they reported that" Concerning Borg's perceived exertion scale, the perception from initial exertion in the intervention group was about 14.1±1.5 and in the end, it was reduced to 12.2±1. The initially perceived exertion was around 13.2±1.7 in the control group and about 12.2±1.5 in the final one. The initially perceived exertion was no different from the control g in the contrast between the assessed groupsthe initially perceived exertion was not different from the control group".

The present study results revealed that there was a positive relationship between body weight and demographic data pre, after three and after six months among participants regarding age, gender,and residence.**(Sartorio et al, 2015, andLafortuna, 2014)**showed that after the same short-length lifestyle interventions,males lost a higher amount of their initial body weight than females.

(Baillot et al, 2015) were in the same line as they mentioned that"Intervention in the lifestyle is successful in improving health in obese subjects of Class II and III. Although bariatric surgery is more successful than lifestyle treatments for managing severe obesity and its comorbidities, some individuals have striking reactions to lifestyle interventions, and the amount of surgeries performed is inadequate to treat all severely obese people. Therefore, lifestyle programs in the hospital and/or primary care settings should be developed and supported". Unfortunately, **(Wolfe et al, 2016)** were disagreeing with the study results as they revealed that"While bariatric surgery remains the most effective treatment for reducing and sustaining weight loss, as well as improving comorbidities and mortality, lifestyle management is recommended as a first step towards achieving weight loss and managing obesity-related comorbidities in subjects with extreme obesities. Therefore, given the limited resources, lifestyle modification is still an important choice to help more subjects with severe obesity and subjects could also prefer less invasive treatment than bariatric surgery".

IV. Conclusion:

- More than half of the study sample was females, married their mean age was 34.31±9.43 years.
- The majority of patients have diabetes; also, more than one-third of patients have hypertension.
- After three months post-test patients all patients whose weight was more than 150KG their weight decreased to become more than 100KG. After 6 months post-test (71.4%) of patients their weight was >100KG and (9.5%) of patients their weight decreased to reach =<100kg with a highly statistically significant difference (p.v 0.001**).
- There was a positive relationship between body weight and demographic data pre, after three and after six months among participants regarding age, gender, and residence.
- There was a positive relationship between body weight and body mass index pre-test, also, a positive relation was found between body weight and total TFEQ pre, after three and after six months. Additionally, there was a positive relationship between body weight and total obesity after six months.

V. Recommendations

- Further studies needed to evaluate the effect of lifestyle modification on health outcomes post-bariatric surgery.
- More studies should be performed on larger probability areas to generalize the study results.

References:

[1]. Baillot A, Romain AJ, Boisvert-Vigneault K, Audet M, Baillargeon JP, Dionne IJ, et al. (2015) Effects of Lifestyle Interventions That Include a Physical Activity Component in Class II and III Obese Individuals: A Systematic Review and Meta-Analysis. PLoS ONE 10(4): e0119017. doi:10.1371/journal. pone.0119017

[2]. Borg GA (1982). "Psychophysical bases of perceived exertion". Med Sci Sports Exerc. 14 (5): 377–81

[3]. Cassin SE, Sockalingam S, Wnuk S, Strimas R, Royal S, Hawa R, (2013): Cognitive behavioral therapy for bariatric surgery patients: preliminary evidence for feasibility, acceptability, and effectiveness. Cognitive and Behavioral Practice. Vol.20:529–543.

[4]. Clark, M. M., Abrams, D. B., Niaura, R. S., Eaton, C. A., & Rossi, J. S. (1991). Self-efficacy in weight management. Journal of Consulting and Clinical Psychology, 59, 739-744.

[5]. Cruz-Muñoz ND, Lopez-Mitnik G, Phil M, ArheartkL, Lipshultz S E and Messiah S A,(2013): Effectiveness of Bariatric Surgery in Reducing Weight and Body Mass Index Among Hispanic Adolescents Obes Surg. February; 23(2): 150–156. doi:10.1007/s11695-012-0730-0Digestive Surgery, (Suppl 1):43-47 DOI: 10.1590/0102-6720201600S10012

[6]. Gatineau M, Hancock C, Holman N, Outhwaite H, Oldridge L, Christie A and Ells L (2017): Adult obesity and type 2 diabetes, Public Health England,https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/338934/Adult_obesity_and_type_2_diabetes_.pdf

[7]. Gianos M, Abdemur A, Fendrich I, Gari V, Szomstein S, Rosenthal RJ.(2012): Outcomes of bariatric surgery in patients with body mass index <35 kg/m2. SurgObesRelat Dis. 8(1):25-30. doi: 10.1016/j.soard.2012.08.012.

[8]. Jassil FC, Manning S, Lewis N, Steinmo S, Kingett H, Lough f, Pucci a b, Cheung W H (2015): Feasibility and Impact of a Combined Supervised Exercise and Nutritional-Behavioral Intervention following Bariatric Surgery: A Pilot Study. Journal of Obesity; Article ID 693829, 12 pages. http://dx.doi.org/10.1155/2015/693829.

[9]. Jensen MD, Ryan DH, Apovian CM, Loria CM, Ard JD, Millen BE, et al. (2013): AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. J Am CollCardiol.

[10]. Duarte-Guerra, L. S., Coêlho, B. M., Santo, M. A., & Wang, Y. P. (2015). Psychiatric disorders among obese patients seeking bariatric surgery: results of structured clinical interviews. Obesity Surgery, 25(5), 830-837.

[11]. Lafortuna CL. (2014): Aerobic and anaerobic performance before and after a short-term body mass reduction program in obese subjects. Diab, NutrMetab.; 14: 51–57. PMID: 11345166

[12]. McGrice M, Don Paul K.(2015): Interventions to improve long-term weight loss in patients following bariatric surgery: challenges and solutions. Diabetes MetabSyndr Obes;8:263–74.

[13]. Merrill RM, Aldana SG, Bowden DE.(2010): Employee weight management through health coaching. Eating and Weight Disord.; 15: e52–e59.

[14]. Miller, W.R., &Rollnick, S. (2002). Motivational Interviewing: Preparing People for Change, the 2nd Edition. New York: Guilford Press.

[15]. Oliveira JJ, Freitas AC, Almeida AA (2016): Postoperative effect of physical therapy related to functional capacity and respiratory muscle strength in patients submitted to bariatric surgery.
[16]. Egberts, K., Brown, W. A., Brennan, L., & O'Brien, P. E. (2012). Does exercise improve weight loss after bariatric surgery? A systematic review. Obesity surgery, 22(2), 335-341.
[17]. Petering R, Webb CW (2009). "Exercise, fluid, and nutrition recommendations for the post gastric bypass exerciser". Current Sports Medicine Reports. 8 (2): 92–7. doi:10.1249/JSR.0b013e31819e2cd6.
[18]. Robinson M K (2009). "Editorial: Surgical treatment of obesity—weighing the facts". The New England Journal of Medicine. 361 (5): 520–521. doi:10.1056/NEJMe0904837. PMID 19641209.
[19]. Sartorio A, Maffiuletti NA, Agosti F, Lafortuna CL.(2015): Gender-related changes in body composition, muscle strength, and power output after a short-term multidisciplinary weight loss intervention in morbid obesity. J EndocrinolInvestig.; 28: 494–501.
[20]. Sjöström L,(2007). Effects of bariatric surgery on mortality in Swedish obese subjects. The New England Journal of Medicine.;357:741.
[21]. Stunkard AJ, Messick S. (1985): The three-factor eating questionnaire to measure dietary restraint, disinhibition, and hunger. J PsychosomRes.; 29:71–83. doi: 10.1016/0022-3999(85)90010-8.
[22]. Thaller S and Cohen M(2013): Cosmetic Surgery after Massive Weight Loss, medical publisher, ch. 3, pp.157-180.
[23]. Tucker ON, Szomstein S, Rosenthal RJ (2007). "Nutritional consequences of weight-loss surgery". The Medical Clinics of North America. 91 (3): 499–514, xii. doi:10.1016/j.mcna.2007.01.006.
[24]. Verma H, Burns D, Nepomnayshy D. (2013): Coconut bezoars in patients with prior bariatric surgery: report of two cases. Abstracts submitted for the 78th Annual Scientific Meeting of the American College of Gastroenterology; 2013 October 11–16; San Diego, CA. Am J Gastroenterology;108:S220.
[25]. Wolfe B M, Kvach E, and Eckel R H (2016): Treatment of Obesity: Weight Loss and Bariatric Surgery, Circ Res. 118(11): 1844–1855. doi:10.1161/CIRCRESAHA.116.307591.
[26]. Yiannikouris F, Karounos M, Charnigo R, English VL, Rateri DL, Daugherty A and Cassis LA (2012): Adipocyte-specific deficiency of angiotensinogen decreases plasma angiotensinogen concentration and systolic blood pressure in mice. Am J PhysiolRegulIntegr Comp Physiol 302: R244-R251.

Mona Mohamed Ibrahim, et. al. "The Impact of Nutritional-Behavioral Counseling with Motivational Lifestyle Modification on Health Outcomes Post Bariatric Surgery." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 9(4), 2020, pp. 20-30.