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STRATEGIES OF WEIGHT REDUCTION USED BY THE INFERTILE, OVERWEIGHT AND OBESE WOMEN AT REPRODUCTIVE AGE AT KHARTOUM STATE

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Abstract:

This exploratory study aims at identifying the strategies that are used by the infertile overweight and obese women to reduce weight for conception. It also focuses on the barriers to use successful weight reduction strategies. Structured interviews were used to collect the primary data through questionnaires, and anthropometric data (weight and height) were used to determine inclusion of women in the study. Purposive sampling was done and analysis used Statistical Package for Social Sciences (SPSS). Findings revealed that knowledge of the target about the relationship of obesity to fertility and the effect of weight reduction on infertility was high. The majority did not use any strategy for weight reduction. Those who did, concentrate on (diet restriction with exercise). It was recommended that following weight reduction should be under scientific advices. More care should be paid to children and women's nutrition, especially after delivery, to prevent obesity.

Keywords: Obesity, Weight Reduction & Infertility

Statement of Problem:

Obesity and overweight, as diseases of malnutrition, has many definitions. Many definitions agree on the concept of the "accumulation of body fat beyond what is considered normal for a person's age, sex and body type". If a person is 20-30% above the ideal weight he/she would be classified as obese (Donatelle et al, 1998). It represents a major health problem worldwide (Nilson, 2006), and there is increasing rates of obesity among women of reproductive age in developed and developing countries (Rasmussen, 2007).

Infertility, defined as "the inability of the couple to conceive after one year time of marriage" (Alexander et al, 2001), can either be primary or secondary (Thibodeau et al, 1992). Fertility has been declining substantially in all developing countries during the last three decades. Sudan has also witnessed a rapid decline in fertility levels during this period (Badri et al, 1999). Infertility in Sudan is estimated by 10-14.6 % (Grais et al, 2006).

Obesity causes infertility (through reduction of ovulation) and losing weight may restore fertility (Jones, 2009).So, it is main risk factor for infertility in women (Boyles, 2007). In Sudan no previous studies or statistical data is available about the prevalence of obesity among women at reproductive age (Elmubarak, 2007).

Rationale for the Choice of the Problem:

Obese infertile women face growing stress and suffering (Patrik, 2009). So, finding the more appropriate strategy for weight reduction is fundamental, since weight reduction helps to improve women's chance of conception (Jones, 2009), aside from helping in improving their general health. Moreover, as obesity proved to be higher among the low socioeconomic levels (Powers et al, 2004), and Sudan is one of the developing countries that has high levels of poverty (Abu Bakr et al, 2007), so knowledge about the proper weight reduction strategies (as tools to restore fertility), will serve as best way to fulfill this aim. Other Assisted Reproductive Techniques (ART)

for restoration of fertility, e.g In Vitro Fertilization (IVF), are very expensive, and most women in Sudan may not afford to pay for it. Beside that these methods are without any guarantee of success (Abdulla, 2004). No previous studies conducted in identification of the strategies used by the infertile, overweight and obese women to restore their fertility.

Study Objectives:

1. To identify weight reduction strategies used by the infertile overweight and obese women in the study area.
2. To classify the target group according to their overweight status in study area.
3. To determine the obstacles to successful weight reduction.
4. To determine the food consumption patterns that correlates with weight reduction among the study group.

Literature Review:

Overweight and Obesity:

The WHO defines overweight and obesity as "abnormal or excessive fat accumulation that may impair health" (WHO, 2009). If a person is 20-30% above the ideal weight, he/she is classified as obese. Women have higher rates of body fats which may be attributed to the normal structure of female body and to sex hormones (Donatelle et al, 1998). The least amount of fat needed for ovulation is estimated by only 12% (Williams, 1995).Body Mass Index (BMI), defined as "an index of weight-for-height that is commonly used for classifying overweight and obesity in adult population and individuals", is obtained by dividing weight in kilograms by the squire of height in meters. A BMI of 25-29.9 is considered overweight, but if it exceeds 30 it is considered as obesity (WHO, 2009).

Approximately, 1.2 billion people in the world are overweight and at least 300 million of them are obese (Jordan et al, 2009). Obesity affects one fifth of female population at the reproductive age in UK, and 55% of American women being overweight, and 27% are obese. About 300,000 deaths each year in USA are caused by excessive body weight (Donnelly et al, 2009). It is considered as a major health problem worldwide (Nilson, 2006), and maternal morbidity, mortality and fetal anomalies are increased with obesity (Rassunussen, 2007). It is determined as risk factor for infertility. It reduces ovulation, lowers response to fertility treatments, decreases pregnancy rate, and risks pregnancy outcome (Jones, 2009).

Obesity and overweight increase the risk of morbidity from number of diseases e.g: coronary heart diseases, hypertension, congestive heart failure, high blood lipids, stroke, varicose veins, type 2 diabetes, osteoarthritis, gallbladder diseases, sleep apnea, and respiratory problems, n addition to endometrial, breast, prostate and colon cancers (Powers et al, 2004; NHLBI, 2009).

Causes of Overweight and Obesity:

Energy imbalance between calories consumed and calories expended is fundamental in causing obesity and overweight. Increased intake of energy-dense foods and decreased physical activity are major factors (NHLBI, 2009). Genetics also affect body weight causing obesity (Jordan et al, 2009; Lowe, 2009). Conditions like type 2 diabetes mellitus, hypothyroidism and tumors of the adrenal gland, pancreas, or pituitary gland are considered to be some of the clinical causes of obesity. Abnormal function of the brain's appetite control center is one of the causes (Lowe, 2009; Williams, 1995). Obesity also increases with age, and women have higher rates of obesity than men (Park, 2007).

Preventing Overweight and Obesity:

Prevention should start since conception (Nilson, 2006). It includes treatment of the conditions that assist in delivering obese babies e.g: maternal obesity and gestational diabetes. Promotion of exclusive breast feeding, limiting the use of formula feeding, and promotion of good food habits assist in prevention during childhood. During adolescent and adulthood it includes consumption of healthy foods (that contain complex carbohydrates, unsaturated fatty acids, more fruits and vegetables and grains), avoidance of snacks, and big meals before sleep are important measures. Decreasing the amount of food in each meal and restriction of sugars and salt in the food, meal planning, avoidance of emotional eating, and routine physical activity are additional modes of preventing obesity (Ross, 2008; McFerland, 1987; Alexander et al, 2001; Hoeger et al, 2002; Williams, 1995).

Management of Overweight and Obesity:

Weight loss is the most cost effective treatment strategy for obese infertile women (Scott et al, 2009; Jones, 2009). The basic principles of weight management is that, caloric input should be lower than output. The best approach depends on how much overweight the person is (Hoeger, 2002).Management of overweight and obesity can be achieved through one or more of the following strategies: Diet restriction, Exercise or any physical activity, diet restriction combined with exercise, medications, herbs and surgery (Boyles, 2007; Hales, 1997; McFerland, 1987). For extreme obesity, medical treatment, including surgery may be necessary (Hoeger, 2002).

During weight reduction, fat cell size (not numbers) decreases. The increase in fat cell numbers is associated with greater difficulty in losing and maintaining weight loss (Smythies, 1998; Powers et al, 2007), and too rapid weight loss is undesirable (Burton et al, 1988).

Diet Restriction:

Diets that are high in protein and complex carbohydrates may be more beneficial for weight loss and maintenance (Jakicic et al, 2001). Loss of one pound of weight needs decrease in caloric intake by 3500 calories. Dietary means only (without exercise) are not beneficial in weight loss (Hoeger et al, 2002). Most dieters regain the lost weight by dietary means alone (Burton et al, 1988). If diet is combined with exercise, close to 100% of the weight loss will be in form of fat. Loss of lean body mass weakens the organs and muscles and slows the metabolism. Also after terminating each diet, most of the regain of weight is in fat (Donatelle, 2001).

American Dietary Association Guidelines (2009), recommended some strategies for weight loss includes: balancing the food eaten with physical activity, eating balanced food, choose a diet with plenty of grain products, vegetables and fruits, choose a diet low in fats, saturated fat and cholesterol, eat a variety of foods, and choose a diet moderate in salt and sugars (Donatelle, 2001).Severe dieting (with 500-1000 kcal/day) decreases metabolic rate by up to 20%, making weight loss more difficult (Lea and Febiger, 1995).

Exercise:

It is a type of "physical activity that requires planned, structured and repetitive bodily movement to improve or maintain physical fitness". Walking, jogging, cycling, swimming, robe skipping, stair climbing or some specialized exercise using specialized equipments, are good examples of aerobic exercises (Hoeger et al, 2002). Regular physical activity improves more than 50 different physiological, metabolic and psychological aspects of human life (Gates, 1992). Physical activity prevents obesity by increasing caloric expenditure, decreasing food intake, and increasing metabolic rate

(Hales, 1999; Powers et al, 2004). Regular exercise can lower the levels of total cholesterol, low density lipoproteins (LDL), and triglycerides and it raises high density lipoprotein (HDL) concentration (JACC, 2004).Aerobic exercises suppresses appetite, so the person is not as tempted to eat. It also helps dieters to lose fat rather than lean muscle tissues (Yarian, 1999; Hales 1999; Powers et al, 2004).

During prolonged exercise, there is a shift from carbohydrate metabolism towards fat metabolism (Ross, 2008). The Free fatty acids from adipocytes are the primary source of energy during low intensity exercise (Powers et al, 1997).

Exercise should be 5 days/week for at least 30 minutes (ACSM and CDC, 1993). The number of calories being used in exercise depends on the amount of muscle mass moved, the amount of weight being moved and the amount of time the activity takes. Losing weight through exercise alone is far more successful at keeping the weight off than losing it through dieting alone (Stephenson, 1997).

Lifestyle Approach to Management of Overweight and Obesity:

Life-long changes through proper healthy diet, exercise, behavioral modification, stress reduction has been found to be most effective in weight loss, because it leads to combination of reduction of energy intake with increase in energy expenditure (Jakicic et al, 2001). Putting reliable and feasible goals for weight reduction is important. A loss of maximum one kg/week is perfect. Reduction of a 10% of baseline body weight, may correct the hormonal imbalances, hence increases women's chance of conception (Boyles, 2007).

Clinical Approach:

Medications used for management of obesity and overweight are formulated to reduce energy intake, increase energy output, decrease the absorption of nutrients, or suppresses appetite (Jordan et al, 2009; Ross, 2008). The use of medications is mainly limited to patients with BMI more than 30, or BMI of more than 27 with additional risk factors like hypertension, dyslipidaemia, or type 2 diabetes (Jakicic et al, 2001). Surgery may be needed for obese people with a BMI of 40 or more (Jordan et al, 2009).

Herbs and Extracts:

Calcium and green tea extracts are clinically proven to have effect on weight loss. Calcium suppresses fat metabolism and weight gain during periods of high calorie intake, and increases fat metabolism during calorie restriction. Green tea extracts stimulate adipose tissue thermogenesis (Jordan et al, 2009). Caffeine contained in coffee, tea and cola, is accused of reducing fertility (Burton et al, 1988).

Obstacles to Successful Management of Overweight and Obesity:

Personal motivation, safety of the strategy, availability of exercise areas, cost, lack of time, and health concerns are some of the reported barriers to weight loss (Donatelle et al, 1998). Attitudes towards obesity, poor knowledge about weight reduction, lack of information and educational materials provided to patients about weight loss services, and lack of support by family members are additional obstacles (Hoffman et al, 2009).

Infertility:

Infertility, defined as "the inability of the couple to conceive after one year time of marriage" (Alexander et al, 2001), is either primary infertility "couple did not conceive from the start", or secondary infertility "woman had conceived before, but failed to conceive after that" (Paulsen, 1999).

Globally, 60-80 million couples suffer from infertility each year (Nilson, 2006). It is more stressful for women (Patrik, 2009). 10-20% of couples worldwide are considered infertile (WHO, 2009). In Africa the rate is 20-30% (Leke, 2008). It is one in

six couples in the America and 10% in Cuba (Donatelle et al, 1998). In Sudan it is estimated by 10-14.6% (Sulaiman, 2006).

Causes of Female Infertility:

Causes include: Infections (which lead to damage or blockage of the fallopian tubes), endometriosis, obesity (reduce ovulation, lower response to fertility treatments, decrease pregnancy rate, and increase risks to pregnancy outcome) (Abdulla, 2004; Boyles, 2007). Polycystic Ovary Syndrome (PCOS), caused by obesity causes un-ovulatory infertility (Homburg, 2003). Moreover, hormonal imbalances cause ovulation disorders due to disruption in the part of the brain that cause ovulation, leading to low levels of Leutinizing Hormone (LH) and Follicle Stimulating Hormone (FSH), which prevents ovaries from releasing eggs (anovulation). Hyperprolactinaemia (Kovacs, 2006), Hyperinsulinaemia, excess of Leptin hormone (Boyles, 2007), immune anti-bodies against the sperm are additional causes ((Badri et al, 1996; Homburg, 2003).

Moreover, conditions like Cushing's syndrome, some cancers, sickle cell disease, pernicious anemia, severe malnutrition, folate deficiency, hypothyroidism and diabetes can all affect women's fertility negatively (Kovacs, 2006; Donatelle, 1998; Badri et al, 1996). Some medications (Hales, 1999), and stress (Panzar, 2009) are also other causes. Unexplained infertility reaches 60% in some societies (Rowe et al, 1988).

Management of Female Infertility:

Most of infertility (95%) is due to preventable conditions. Management depends on the nature of its cause (ICMR, 2000): Weight loss is the most effective way to manage obesity and infertility. 5-10% weight reduction is enough to trigger ovulation (Balen, 2007; Boyles, 2007). Infertility pills or hormone therapy are important to induce ovulation. In blockage of fallopian tubes surgical intervention may be needed in addition to Intra-fallopian Insemination (Kulkarni, 2007). Artificial Reproductive Techniques (ART) like In Vitro Fertilization is another expensive ways to manage infertility, though their success is not always guaranteed (Balen, 2009; Donatelle et al, 1998). So, Prevention of infertility is cost effective and should be the main goal to reduce the impact of infertility (Leke, 2008).

Methodology:

Study Design and Area:

This cross-sectional, explorative study used quantitative methods of data collection through questionnaires in addition to anthropometric methods.

The Khartoum Infertility Centre (KFC) located at Khartoum-2, is the area where the primary data was collected. The centre introduces integrated services ranging from infertility management, operation, medications, follow-up services and laboratory investigations. KIC is not the only center for treatment of infertility in Khartoum State, but it was selected specially for this study because of its location first (being at the center of Khartoum State) and because many women from different parts of Sudan, are attending it.

Study Population and Sample:

The overweight and obese infertile women, who were married and have more than one year time of marriage, aged (15-49) years. The women selected were those who come to the center especially for infertility management.

Purposive selection for the target yielded a sample of 120 overweight and obese infertile women. Based on the advice of a statistician, 30% of the average attendance of women to the center yielded about 120.

Data Collection:

The main instruments used in primary data collection are: questionnaires that filled by the researcher, after asking women their consent to participate in the study, and anthropometric data (weight and height). Secondary data were collected from library sources and the Internet.

The questionnaire included sections like background information and socioeconomic data (age, education, residence, working status, occupation, duration of marriage, and number of parities). Anthropometric data, status of obesity, views about relation of obesity to infertility, relation of weight reduction to fertility restoration, strategies used for weight reduction and their success. In addition types of diet restriction, duration and frequency of each strategy, barriers faced, and the food consumption patterns that correlates with weight reduction.

Body Mass Index:

BMI defined as "the simple index of weight-for-height that is commonly used for classifying overweight and obesity in adult population". It is one of the most accurate indicators of a person's health risk due to excessive weight (Donatelle et al, 2001). It is obtained by dividing weight in kilograms by the square of the height in meters (WHO, 2009). This measurement was used to determine overweight and obesity: BMI of (26-29.9) is classified as overweight, BMI of (30-34.9) as obesity grade 1, BMI of (35-39.9) as obesity grade 11, and BMI of (>40 or equal) as morbid/severe obesity (Alexander et al, 2001). The instruments used for taking these measures were: the Electronic Weighing Scale by Kilogram unit, and the Length Scale by Centimeter unit. BMI was achieved by this formula:

$$= \frac{h \quad (\qquad)}{[h \quad h \quad (\qquad\qquad)]}$$

(WHO, 2009; Donatelle et al, 2001).

Data Analysis:

Questionnaires data was analyzed using the Statistical Package for Social Sciences (SPSS) to determine the percentages and frequencies. Anthropometric data (weight and height) was analyzed using the BMI Tables to determine levels of overweight and obesity. Frequency tables and cross tabulation of specific variables, was done. Final results were presented in tables.

Data from questionnaires was analyzed using the Statistical Package for Social Sciences (SPSS) to determine the percentages and the correlations between variables. The anthropometric data (weight and height) was analyzed using the BMI tables to determine the levels of overweight and obesity. Frequency tables and cross tabulation of specific variables with other ones, was done. Final results were presented in tables.

Limitation of the Study:

This study concentrated only on the overweight and obese infertile women, it would have been more effective if it had included the under-weight women too as the two extremes that affect fertility. But due to time limits and cost constraints this was difficult to apply. Other studies can put this issue into consideration.

Moreover, statistical tests for correlation could not be covered out due to the small number of cases in individual cells (<3).

Results and Discussion:

Obesity (BMI of 30 or more) represents 63.3% among the study group, and 36.7% were overweight (BMI 26-29.9) (Table 1).

Table (1): Respondents' obesity status (BMI)

Status	Frequency	Percent
Overweight BMI (26-29.9)	44	36.7
Obese Grade 1 BMI (30-34.9)	44	36.7
Obese Grade 2 BMI (35-39.9)	22	18.3
Morbidly Obese BMI (40 and more)	10	8.3
Total	120	100%

Table (2): Respondents' Number of Parities

Parities	Frequency	Percent
1-2 parities	43	35.8
3-4 Parities	12	10
5-6 Parities	5	4.2
> 6 Parities	4	3.3
None	56	46.7
Total	120	100

Results showed that 46.7% of the respondents were primary infertile while 53.3% were secondary infertile (Table 2). A study conducted by the KIC, showed that 62.4% of the Sudanese couples had primary infertility and 37.6% had secondary infertility (Abul Hassan, 2008).

Overweight and Obesity History:

The respondents who become obese after marriage represent 40%, 31.7% were obese since childhood, and 20% gained weight during adolescent (Table 3). Moreover, 45.5% of the overweight got obese after marriage, and 60% of the morbidly obese were obese since childhood (Table 4)**.** These results reflect that the overweight women may become so due to high intake of energy-rich foods or due to being sedentary. These two cases can be controlled. But for the morbidly obese, the effects of genetics, (which is difficult to be controlled), contribute to their being extremely obese. Genetic tendency contributes to about 25-40% of the reasons for being obese according to Smythies (1998). Women face greater potential for weight fluctuations (due to hormonal changes) all the time **(**Donatelle, 2001), so their gaining weight during adolescence and after delivery is probable (Jakicic, 2001).

Table (3): Time of Gaining Weight

Time of gaining weight	Frequency	Percent
Childhood	38	31.7
Adolescence	24	20
After Marriage	48	40
After the 1st pregnancy	9	7.5
Other	1	0.8
Total	120	100%

Table (4): Cross tabulation of BMI with Time of Gaining Weight

Responses	Childhood		Adulthood		After marriage		After 1st pregnancy		Other	
	#	%	#	%	#	%	#	%	#	%
Over weight	12	27.3%	8	18.2%	20	45.5%	4	9.1%	0	0
Obesity G1	9	20.5%	11	25%	20	45.5%	3	6.8%	1	2.3%

Obesity G2	11	50%	4	18.2%	7	31.8%	0	0	0	0
Morbid obesity	6	60%	1	10%	1	10%	2	20%	0	0
Total	38		24		48		9		1	

Table (5): History of following up of Strategies for Weight Reduction

Responses	Frequency	Percent
Yes	78	65.5
No	42	34.5
Total	120	100%

Regarding history of following up a strategy for weight reduction, (34.5%) had not followed any strategy before (Table 5), and 70% of them were not following any strategy for weight reduction at the time of the study (Table 6). So, many of the respondents are considered inactive. A study conducted by Badawi (2008), in Om Durman among female adolescents indicated that only 15% of the studied group had practiced weight loss plan. This reflects that women in this area are more sedentary.

Table (6): Current Following up of Weight Reduction Program

Responses	Frequency	Percent
Yes	36	30
No	84	70
Total	120	100%

Table (7): Types of Strategies Followed (in the Past)

Responses	Frequency	Percent
Diet alone	22	28.2
Exercise alone	14	17.9
Diet and exercise	35	44.9
Medications	1	1.3
Herbs + exercise	2	2.6
Diet + Herbs	2	2.6
Diet +Exercise +medication	1	1.3
Diet+medication+exercise+herbs	1	1.3
Total	78	100%

Table (8): Cross tabulation of Strategies Used (in the past) and their Success in Weight Reduction as Viewed by the Respondents

Responses	Succeed		Not succeed		Total	
	No	%	No	%	No	%
Diet alone	19	86.4%	3	13.6%	22	100%
Exercise alone	12	85.7%	2	14.3%	14	100%
Diet & Exercise	32	97%	1	3%	33	100%
Medications	0	0%	1	100%	1	100%
Other combinations	8	100%	0	0%	8	100%
Total	71	91.%	7	9%	78	100%

Concerning types of strategies followed in the past 44.9% followed (diet and exercise), 28.2% followed (diet alone) and 17.9% followed (exercise alone), Table (7). Those who were using (diet and exercise) reduced to 30.6% at the time of the study. However, 97% of the respondents indicated that (diet and exercise) combination was most successful in weight reduction (Table 8). This proved that this combination was the best among

the other strategies. In Badawi study (2008), the female adolescents who followed (exercise and dieting) for weight loss contributed to 51%.

Strategies of Diet Restriction Used by Respondents

It was found that only 4.3% of the respondents currently restrict amounts of foods, 12.9% restrict high density foods (e.g: fats) (Table 9).The proper combinations of diet restriction that enhance weight reduction and involves restriction of High density foods (fats/sugary foods), consumption of more fruits and vegetables, and avoidance of big meals before sleep, was not followed by any of the respondents. This explains why their efforts in weight reduction were not so effective. Because, restriction of fats is major in weight reduction, as it yields more energy. Moreover, Consumption of complex carbohydrates (starch) is better for weight reduction, because it can also provide the body with the fibers needed to reduce weight. It is recommended that restriction should concentrate more on sugars and fats rather than starch.

Table (9): Current Use of Strategies of Diet Restriction

Responses	Frequency	Percent
1.Restricts amounts of foods	3	4.3
2.Restrict high density foods	9	12.9
3.Restrict medium density foods	2	2.9
4. Avoid snacks	1	1.4
5.Consume more vegetables/ fruits	1	1.4
6.Make meal replacement	1	1.4
7.Avoid emotional eating	1	1.4
8.Avoid big meals before sleep	4	5.7
9.More than one	48	68.6
Total	70	100%

Regarding skipping of meals, 61.6% of the respondents skip meals (Table 10). Good results in weight reduction can be achieved by planning the meals to be balanced, rather than skipping them (Schipper, 2009). Skipping breakfast is not good for general health and for weight control, because the metabolism slows down while the person is in sleep, and it does not return back until the person eats again (Schipper, 2009). According to a study done by University of Penn State, the person will be more likely to eat something sweet (or from bread group) if he/she skipped breakfast (Erdam, 2009), giving negative consequences on weight reduction. In Badawi study (2008) among female adolescents, 24% of the group skipped meals to lose weight, and 45% take snacks.

Table (10): Number of Meals Taken by the Respondents

Responses	Frequency	Percent
1 meal	5	4.1
2 meals	69	57.5
3 meals	44	36.7
No responses	2	1.7
Total	120	100%

Table (11): Type of Snacks Taken by the Respondents

Responses	Frequency	Percent
High density foods	28	82.4
Medium density foods	1	2.9
Low density foods	2	5.8
More than one	3	8.9
Total	34	100%

About 82.4% of the respondents take High density foods (e;g: sweets/pastries and fast foods) as snacks (Table 11). This food category is famous for its high-caloric content, which facilitate increase of weight instead of reducing it.

About one quarter (27.2%) of the overweight, 34% of the obese grade 1, and 40% of the morbidly obese do take snacks (Table 12). This shows that taking snacks is higher among the morbidly obese women, which is logical in explaining their reaching the extremes in weight gain, with probable additional impact of genetic factors.

Table (12): Cross tabulation of BMI with Taking Snacks

Responses	Take Snacks		Do not take snack		No Response		Total	
	No	%	No	%	No	%	No	%
Overweight	12	27.2	31	70.5	1	2.3	44	100
Obese G1	15	34	27	61.4	2	4.6	44	100
Obese G2	3	13.6	19	86.4	0	0	22	100
Morbid Obese	4	40.0	6	60.0	0	0	10	100
Total	34	29.1	83	70.9	3	2.5	120	100

Table (13): Most Favorite Foods by the Respondents

Responses	Number	Percent
Meat group/meat substitutes	32	26.7
Milk/diary products	4	3.3
Bread/cereals/pastries	17	14.3
Fruits/vegetables	12	10
Potato chips	4	3.3
More than one	8	6.6
None	2	1.7
All Types of foods	41	34.1

About 17.5% of respondents do not eat cheese, 20% do not consume yoghurt and only 3.3% prefer diary products (rich of calcium) (Table 13). A study conducted by the University of Tennessee found that people who ate 1200 mg of calcium from diary products lost an average of 24 pounds (11% of their body weight) (Schipper, 2009). As none of the respondents in our study took the amount of mg of diary products needed to provide the 120 mg of calcium which enhances weight loss, so it seems that it is difficult to reduce weight.

About two thirds of the respondents (71.7%) consume potato chips (mostly home-made) Table (14), in addition to 14.3% prefer pastries (Table 14). These food items contain proportionately large amounts of carbohydrates contribute positively to weight gain.

Table (14): Food Consumed by the Respondents

Responses	Number	Percent
Meat group/meat substitutes	106	88.3
Milk/diary products	97	80.8
Bread/cereals/pastries	90	75.0
Fruits/vegetables	110	91.6
Potato Chips	86	71.7
Beverages	91	95.8
Hot drinks (tea and coffee)	75	62.5

Almost all (91.6%) of the respondents consume vegetables/fruits (Table 14). These foods contain lots of fibers, in addition to its high content of vitamins and minerals (Schipper, 2009), it is low in carbohydrates, as two cups of green salad contain only about 5 grams of carbohydrates (Li, 2009), so, they contribute positively to weight loss, and considered good habit.

Nearly all the respondents (95.8%) consume beverages (Table 14). They are famous for their high caloric values (McFerland, 1987), which contributes negatively to weight loss. Moreover, 62.5% of the respondents consume hot drinks (mainly tea and coffee) (Table 14). Tea and coffee contain caffeine substance which proved in some studies to be a risk factor for infertility. Some fertility specialists have advised couples trying to conceive to reduce caffeine so as to increase their chance of conception (Burton et al, 1988). A study conducted in 1989 at USA, indicated an association between caffeine consumption and infertility in women.

Table (15): Frequency of Use of Herbal Extracts

Responses	Frequency	Percent
Often	33	51.6
Occasionally	10	15.6
With menses	15	23.4
Rarely	6	9.4
Total	64	100%

It was found that 51.6% of the respondents drink herbal extracts often (green tea, Maharaib, Miramia and Harjal) to reduce weight, with 23.4% drink it during menses (Tables 15). There is also general belief among the studied group that Maharaib, Miramia, and Harjal are good herbs in (cleaning) the uterus, hence facilitating conception.

Table (16): Frequency of Exercise Practiced in the Past

Responses	Frequency	Percent
Once/day	47	57.3
Twice/day	13	15.9
Day after day	8	9.8
3-4 times/week	11	13.3
Once/week	3	3.7
Total	82	100

Table (17): Duration of Exercise Practiced in the Past

Responses	Frequency	Percent
10-20 minutes	17	20.7
21-30 minutes	24	29.3
31-40 minutes	2	2.4
> 40 minutes	39	47.6
Total	82	100

Regarding the frequency of exercise, 73.2% of those who performed exercise before, did it on daily basis (once and twice/day) (Table 16), but 50% of them performed it for less than 30 minutes (Table 17). This reflects that the time needed to facilitate burning of fats (more than 30 minutes), is not insured. So, weight loss will not be achieved.

Obstacles to Practicing Successful Weight Reduction Strategies:

Table (18): Obstacles to Practicing Weight Reduction Strategies in the Past

Responses	Frequency	Percent
Lack of information	3	7.1

Do not know its benefits	15	35.7
Have no time	3	7.1
Do not like weight reduction	4	9.5
No reason	8	19.1
No need	8	19.1
Have fluctuating weight	1	2.4
Total	42	100%

One third of the respondents (35.7%) did not practice any strategy for weight reduction in the past because they do not know its benefits, while 19.1% had no reason, and another 19.1% said that there is no need for practicing weight reduction (table 18). Moreover, 40.2% of the respondents had no reason for not practicing weight reduction at the time of the study, while 20.7% said that there is no need for practicing weight reduction (Table 19).

Table (19): Current Reasons for not practicing any Strategy for Weight Reduction

Responses	Frequency	Percent
No time	16	19.5
Sick	8	9.8
It cost a lot	2	2.4
Don't know about it	3	3.7
Don't like it	3	3.7
No reason	33	40.2
No need	17	20.7
Total	82	100%

All these results revealed that the respondent's motivation and desire to perform weight reduction may not be strong enough to enable them lose weight. Also, they may not have the needed information which assists them to choose the proper option for weight reduction that enhances weight loss.

Conclusion and Recommendations:

Conclusion:

Obesity is high (63.6%) among the study group, and secondary infertility is more common among them (53.3%), and so for the inactivity (42.6%). Results also show that most of the respondents were sedentary (70%), and very few (17.9%) used (exercise alone) to reduce weight. The majority (55.1%) was not following (diet and exercise) as the most effective strategy for weight loss. Those who used diet restriction, none of them performed the right combinations that enable them to lose weight. Results also showed the low motivation of the obese women to perform weight reduction.

Recommendations:

This study recommended integration of weight reduction strategies in Gynecologist and Obstetric Clinics by including nutrition specialists or dietetics in their teams to perform the task of educating women to lose weight in the proper way before they start infertility treatments. Parents should take more care about children's nutrition to prevent childhood and adulthood obesity, through following proper ways of child feeding practices (e.g: breast feeding). Women should take more care about their nutrition after delivery, to improve their chance of success in next pregnancies.

Practicing weight reduction strategy should be performed under scientific advices (especially dieticians).

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