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Research Article

Effect Of Life Style Modification Implemented Program Among Infertile Women with Poly Cystic Ovary Syndrome on Obesity and Menstrual Regulation

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Abstract

Background: Obesity raises the risk of sub-fecundity and infertility, which is mostly attributed to hypothalamic-pituitary-ovarian (HPO) axis dysfunction, low oocyte quality, and reduced endometrial receptivity. Another side effect of obesity is infertility, which is manifested by irregular menstrual cycles, lower spontaneous and aided pregnancy rates, and higher miscarriage rates. The risk of normal-gonadotrophic anovulation is increased by the distribution of body fat in the center and general obesity. Aim: evaluate the effect of life style modification implemented program among infertile women with poly cystic ovary syndrome on obesity and menstrual regulation. Subjects and Methods: A purposive sample of 116 women with polycystic ovary syndrome, overweight, and obesity, was selected. Results: It shows that 58.6% of the study and control groups had a 3–5-day duration of the menstrual cycle before the intervention, compared to 86.2% and 55.2% after the intervention. Also, 98.3% and 94.8%of the study group and control groups had irregular menstrual cycles before the intervention, compared to 60.3%of the study group having regular menstrual cycles and 51.7% of the control group having irregular menstrual cycles after the intervention. A significant association between the ovulatory function and physical activity level in the study group of infertile overweight and obese women with polycystic ovary. Conclusion and Recommendations: Life style modification implemented program positively affect menstrual cycle regularity and normal body mass index for infertile overweight and obese women. Disseminate results of the study to health care centers

Key words: life style modification; poly cystic ovary syndrome; obesity; menstrual regulation

Introduction

Adult body fat can be calculated using a variety of techniques, such as total body weight, waist circumference, and hip circumference. These measures have led to the development of several obesity indicators, including the body mass index (BMI), which is the most often used indicator of body fat for height and weight. The BMI is calculated by dividing the weight in kilograms by the square of the height in meters [1-7]. Worldwide over 1.9 billion people were overweight in 2016; more than 650 million of them were obese, representing a nearly tripling of the prevalence of obesity since 1975 [8]. Obesity raises the risk of sub-fecundity and infertility, which is mostly attributed to hypothalamic-pituitary-ovarian (HPO) axis dysfunction, low oocyte quality, and reduced endometrial receptivity [9-14]. Another side effect of obesity is infertility, which is manifested by irregular menstrual cycles, lower spontaneous and aided pregnancy rates, and higher miscarriage rates. The risk of normal-gonadotrophic anovulation is increased by the distribution of body fat in the center and general obesity [15-20]. Even a 5% weight loss may help a woman respond better to ovulation induction or

restore her ovulation [21]. A higher body mass index (BMI) is linked to a worse fertility prognosis, and obese women exhibit lower reproductive outcomes regardless of the method of conception [9-24]. As the most prevalent endocrine illness among women of reproductive age, polycystic ovarian syndrome (PCOS) is one of the major causes of infertility [25]. In case-control research, 52 women between the ages of 20 and 38 were divided into two groups (fertile-cases and infertile-controls), and it was discovered that obesity has a substantial detrimental impact on women's fertility ($p = 0.017$). Those who were infertile had a 7.5-fold higher likelihood of being fat than those who were fertile [26]. Women's body fat affects the hypothalamus-pituitary-ovarian (HPO) axis's functionality through both central and peripheral pathways. Clinical studies show that excessive leanness causes puberty to come on later than it should, whereas obesity causes puberty to come on earlier [27]. Obesity also affects the endometrium. These findings were supported by human investigations conducted in vitro and in vivo, where it was found that obese women had less stromal decidualization [27-30]. The pathophysiology of this phenomenon may be attributable to proinflammatory cytokines and ROS that cause endothelial dysfunction; endometrial levels of expression of this inflammatory marker were shown to be higher in obese women who experienced recurrent miscarriages [31]. Around the world, obesity has emerged as a serious health issue. One-fifth of women in the UK suffer from obesity, with 18.3% of women in the reproductive age range (16-44 years) being classified as obese [32]. It is well-known that many PCOS patients are overweight, but not all of them. Since adipose tissue is regarded to be an endocrine organ that produces androgens, there is growing evidence that PCOS in some women develops as a result of obesity [33]. A higher risk of infertility is linked to oligo anovulation, and PCOS is the most common cause of ovulatory problems. Primary infertility was observed in 50% of cases and secondary infertility in 25% of instances in a large group of 1,741 women with PCOS [34].

Aim of the study:

This study aims to evaluate the effect of life style modification implemented program among infertile women with poly cystic ovary syndrome on obesity and menstrual regulation

Study hypotheses:

Infertile overweight and obese women who will receive life style modification implemented program will experience regular menstrual cycle and normal body mass index.

Subjects And Methods

A purposive sample of 116 women with polycystic ovary syndrome, overweight, and obesity, was selected.

Tool I: Personal data: The Arabic structured interview questionnaire collects basic data and women's menstrual cycle data. BMI categories: Underweight: < 18.5 kg/m², Normal: 18.5- 24.9 kg/m², Overweight: 25 -29.9 kg/m², Obese: 30- 39.9 kg/m

Tool iii diet habits characteristics:

Part I nutritional habit: The study measures women's nutrition habits, including food and soft drinks, using a five-point scale. Poor habits are scored below 60% of total scores, while good habits are scored ≥ 60%

Results

Table (1) revealed a statistically significant relationship between the intervention and modified quality of life program for overweight and obese infertile women's anthropometric measures.

Figure (1): Portrays ovulatory function and anthropometric measures of the studied infertile overweight and obese women with polycystic ovary syndrome. It shows that 58.6% of the study and control groups had a 3–5-day duration of the menstrual cycle before the intervention, compared to 86.2% and 55.2% after the intervention, respectively. Meanwhile, 81.1% and 77.6% of the study and control groups had irregular cycles before the intervention, compared to 31.0% and 67.2% after the intervention, respectively. Also, 51.7% of the study group had an average menstrual cycle of 35–90 days, and 60.3% of the control group had more than 90 days before the intervention, compared to 41.4% of the study group having 21–34 days and 50.0% of the control group having more than 90 days after the intervention, respectively.

Figure (2) shows the symptoms experienced by the studied infertile overweight and obese women with polycystic ovary syndrome. It reveals that 98.3% and 94.8%of the study group and control groups had irregular menstrual cycles before the intervention, compared to 60.3%of the study group having regular menstrual cycles and 51.7% of the control group having irregular menstrual cycles after the intervention. Moreover, 53.4% and 51.7% of the study and control groups had an absence of the menstrual cycle before the intervention, compared to 84.5% of the study group having no absence of the menstrual cycle and 43% of the control group having an absence of the menstrual cycle after the intervention, respectively.

Figure (3) showed that there was a significant association between ovulation and lifestyle in the study group of infertile overweight and obese women with polycystic ovary syndrome (n = 58). About 87.5%, 83%, and 77.7% of poor nutrition Habits of the study group women are Duration of the menstrual cycle less than days (hypomenorrhea), irregular cycle, and a long average menstrual cycle is more than 90 days (oligo amenorrhea) before intervention. Compared to 78%, 75.6%, and 83.3% of good habits, the duration of the menstrual cycle is 3-5 days, the regular cycle, and the long average of the menstrual cycle is 21-34 days after intervention.

Figure 4 showed that there was a significant association between the ovulatory function and physical activity level in the study group of infertile overweight and obese women with polycystic ovary syndrome (n = 58). About 87.5%, 93.6%, and 77.7% of Mild Physical Activity (sedentary lifestyle) of the study group women have a duration of menstrual cycle of less than 3 days (hypomenorrhea), an irregular cycle, and a long average menstrual cycle of more than 90 days (oligo amenorrhea) before intervention. Compared to 68%, 80%, and 83.3% of moderate physical activity had a normal duration of the menstrual cycle of 3-5 days, a regular cycle, and the long average of the menstrual cycle is 21-34 days after the intervention.

Variables	Before the intervention		χ^2 P –value	After the intervention		χ^2 P –value
	Study(n=58)	Control (n=58)		Study(n=58)	Control (n=58)	
BMI						
BMI 18.5-24.9: normal	0.00%	0.00%	t 0.18 > 0.05 ns	5.2%	0.00%	t 4.45 ≤ 0.001**
BMI ≥25.0: overweight	29.3%	36.2%		60.3%	41.4%	
BMI ≥30.0: Obesity	70.7%	63.8%		34.5%	58.6%	
Waist circumference						
≤88	22.4%	32.7%	t 1.92 > 0.05 ns	53.4%	36.2%	t 1.96 ≤ 0.05
≥88	77.6%	67.3%		46.5%	63.8	

Table 1: Anthropometric Measures of the Studied Infertile Overweight and Obese Women with Polycystic Ovary Syndrome (n = 116).

NB: ns non-statistically significant (p≥0.05) **highly statistically significant (p≤0.001)

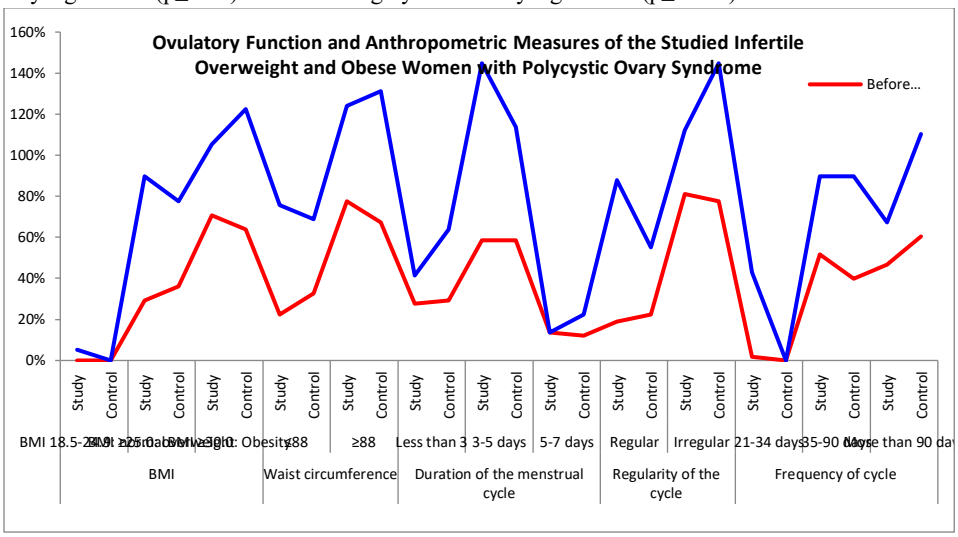

Figure 1: Ovulatory Function and Anthropometric Measures of the Studied Infertile Overweight and Obese Women with Polycystic Ovary Syndrome (n = 116).

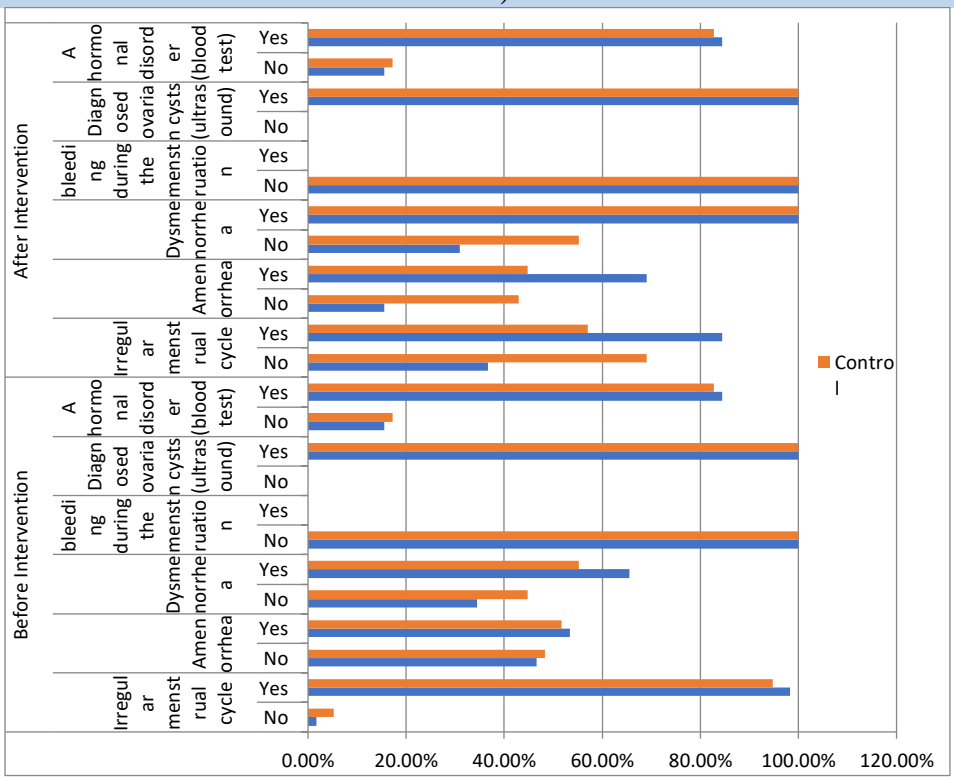

Figure 2: Symptoms Experienced among Studied Infertile Overweight and Obese Women with Polycystic Ovary Syndrome (n = 116).

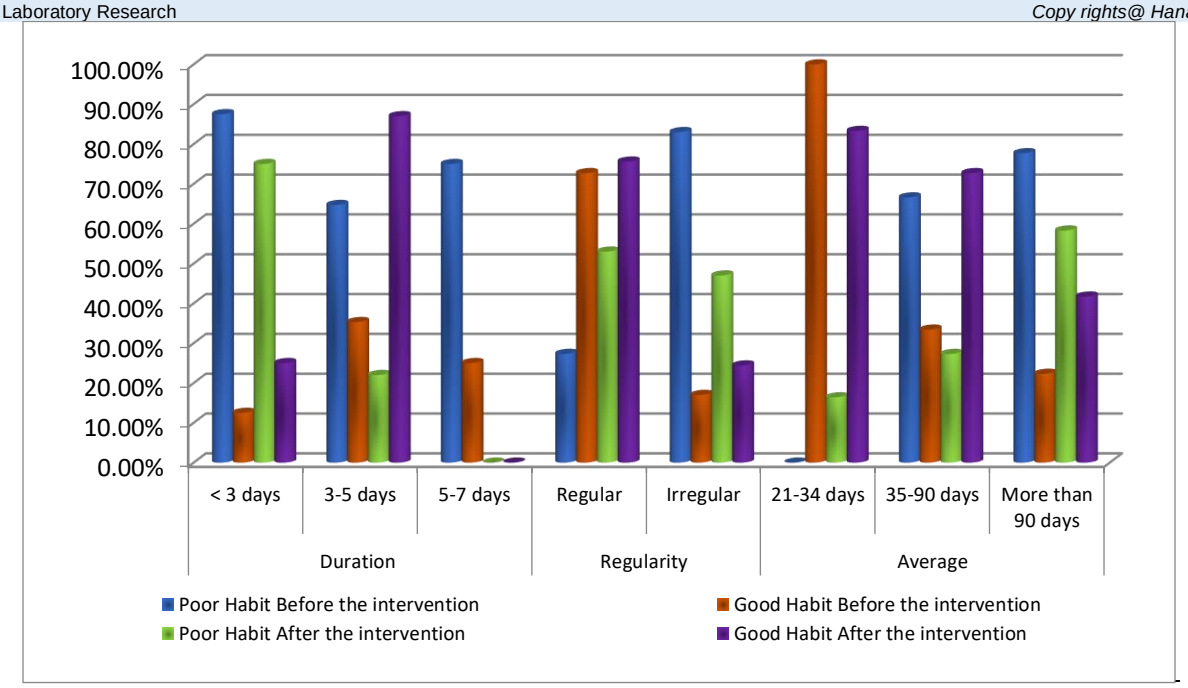

Figure 3: Relationship between Ovulatory function and lifestyle dietary habits in the Study group of Infertile Overweight and Obese Women with Polycystic Ovary Syndrome (n = 58).

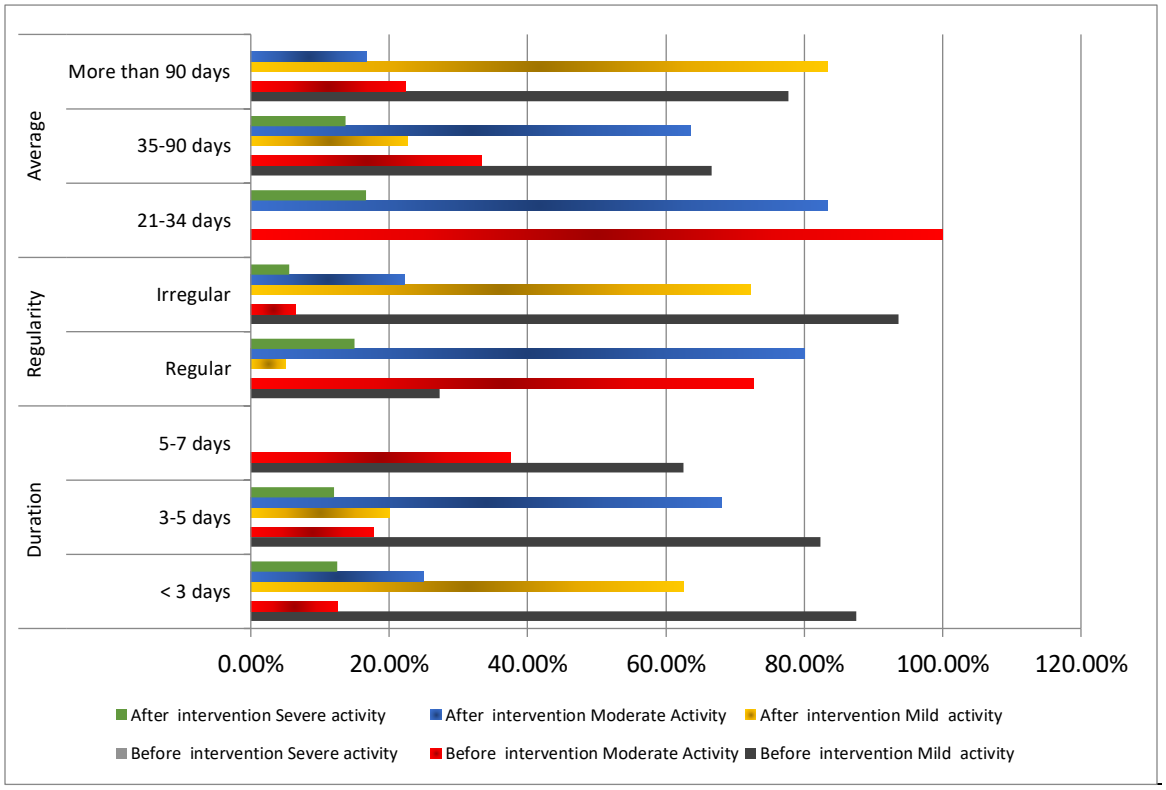

Figure 4: Relationship between Ovulatory function and physical activity level among the Study group of Infertile Overweight and Obese Women with Polycystic Ovary Syndrome (n = 58).

Discussion

Numerous research studies have shown that obesity is not a simple issue but rather a complicated health issue caused by a mix of individual elements (genetics, learned behaviors) and significant causes (unhealthy societal or cultural eating habits, food deserts) [35]. Regarding the duration of the menstrual cycle, the findings of the current study showed that the present study revealed that, there were highly statistically significant improvements in menstrual cycle irregularities in the study, more than half of the study and control groups had a 3–5-day duration of the menstrual cycle before the intervention compared to the majority of the study group had had a 3-5 day

duration of the menstrual cycle after the intervention. These findings are similar to the study done by Öberg, (2022). They studied "Effects of Lifestyle Intervention in Overweight Women with Polycystic Ovary Syndrome. From the researcher's point of view, lifestyle interventions have been shown to have positive effects in terms of improved menstrual cycle irregularities [36]. Regarding relationship between anthropometric measures and menstrual cycle regularity among the study group infertile overweight and obese women with polycystic ovary syndrome; the current study findings revealed that there is a positive correlation between anthropometric measures and menstrual cycle regularity about majority obese of the study group had irregular menstrual cycles before intervention. Compared to major of the study group overweight and normal weight the study group had regular cycles after intervention. These findings came in agreement with Marzouk, et al., (2015(who studied "Effect of dietary weight loss on menstrual regularity in obese young adult women with polycystic ovary syndrome" and showed that menstrual regularity was recorded with weight reduction. According to the researcher's point of view, this may be justified as Obesity is associated with much comorbidity and obese women frequently suffer from reproductive disorders, including menstrual irregularity [37]. In contrast, Neubronner, et al.,)2021), a study on healthy women between the ages of 21 and 45 who were selected from participants in an annual health screen at Singapore's National University Hospital (NUH) found that women with normal or high BMIs were equally at risk for oligomenorrhea [38]. Regarding the symptoms experienced, the current study findings revealed that all of the study group and control groups suffered from obesity before and after the intervention. These findings came in agreement with Alwahab, et al., (2018), who studied "A ketogenic diet may restore fertility in women with polycystic ovary syndrome", and revealed that all groups suffered from obesity before the intervention [39].These findings were incongruous with those of Aldossary et al. (2020), who studied the "Prevalence of polycystic ovary syndrome, and relationship with obesity/overweight", who revealed that most of the groups suffered from obesity before and after the intervention [40]. Regarding menstrual irregularity, the current study findings revealed that there is a significant improvement in menstrual regularity after intervention. About major of the study group and control groups had irregular menstrual cycles before the intervention, compared to two-thirds of the study group having regular menstrual cycles and 51.7% of the control group having irregular menstrual cycles after the intervention. On the contrary, these findings were incongruous with those of Li, et al., (2022), who studied "The degree of menstrual disturbance is associated with the severity of insulin resistance in PCOS", who showed that the incidence of IR is as high as the major of obese PCOS subjects [41]. Another study conducted by Abdolahian et al., (2020), who studied "Lifestyle modifications on anthropometric, clinical, and biochemical parameters in adolescent girls with polycystic ovary syndrome." revealed that after three–to 12 months of intervention and documented improvement in menstrual cycle irregularities after the program [42]. Regarding lifestyle and daily dietary habits, in the present study, there was a highly statistically significant difference between data for habits and lifestyle modification of the pre and post-intervention after 6 months. The present study revealed that about half of the study group and control groups rarely had 2 to 3 times breakfast outside the house before the intervention, compared to two-thirds of the study group rarely had breakfast outside the house after the intervention. These findings came in agreement with Eleftheriadou, et al., (2015), who studied "Dietary habits in adolescent girls with polycystic ovarian syndrome", which revealed that more than half of adolescents with PCOS ate high sugar content items and fast food for breakfast, such as cakes, croissants, toast with honey or jam [43]. According to the researcher's point of view, this may be justified as that kind of food is due to their favorable taste, color, shape, easy accessibility, and advertisements.

Conclusion And Recommendation

Life style modification implemented program positively affect menstrual cycle regularity and normal body mass index for infertile overweight and obese women. Disseminate results of the study to health care centers.

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