



Physical Exercise Among Obese Infertile Women: Educational Program Implication

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Abstract

Background: Physical exercise includes recreational activities, mobility modes like walking or cycling, employment, domestic tasks, games, sports, or organized exercise, depending on the situation.

Aim: Evaluate the effect of exercise regime on women BMI and infertility among women with polycystic ovary syndrome.

Subjects and Methods: A purposive sample of 116 overweight, obesity and infertile women was selected. An Arabic structured interview questionnaire was used to collect basic data. Anthropometric measure's formulas used to measure Body mass index.

Results: Anthropometric measures improved for infertile overweight and obese women with polycystic ovary syndrome after intervention, with a higher percentage of overweight and obese women. 72.4%, 69.0% of the study and control groups did not regularly engage in one or more physical activities (running, walking, or going to gyms) before the intervention, compared to 100.0% of the study group regularly engaging in one or more physical activities, and 69.0% of the control group do not regularly engage in one or more physical activities after the intervention, respectively. 98.3% and 93.1% of the study and control groups spent less than 15 minutes on each exercise or activity before the intervention, compared to 70.7% of the study group spending 46 to 60 minutes on each exercise or activity and 86.2% of the control group spending less than 15 minutes on each exercise or activity after the intervention, respectively.

Conclusion: Infertile overweight and obese women who will receive physical activity regime program experience better dietary habit and improvement in obesity.

Recommendations: Physical activity regime modification for infertile obese women should be disseminated.

Keywords: Obesity; Infertility; Educational Program; Physical Exercise

Introduction

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 [1]. By 2035, if major action is not taken, more than half of the world's population will be overweight or obese [2]. According to the World Obesity Federation's 2023 Atlas, more than 4 billion people, or 51% of the world's population, will be fat or overweight in the following 12 years. According to the study, rates of obesity are rising particularly swiftly among children and in low-income nations. The World Health Organization [3] ranks Egypt as having the greatest prevalence of obesity in the world, coming in at position 18th worldwide.

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 [4-11]. Physical activity and exercise have well-documented mechanistic effects on the cardiometabolic and reproductive characteristics of PCOS. Additionally, insulin resistance is improved in populations where exercise lowers DM2 risk and CVD risk factors [12-21].

Health professionals should encourage and advise the following for the prevention of weight gain and maintenance of health: A minimum of 150 minutes of moderate-intensity physical activity

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per week for adults between the ages of 18 and 64, or 75 minutes of intense intensity per week for teenagers, and daily intensive physical exertion. Physical exercise includes recreational activities, mobility modes like walking or cycling, employment, domestic tasks, games, sports, or organized exercise, depending on the situation. The optimal number of steps per day is 10,000, which may be broken down into everyday activities, 30 minutes of organized physical activity per day, or roughly 3,000 steps per day. Be active for at least 10 minutes at a time, or roughly 1000 steps per bout, to get at least 30 minutes a day on most days. Self-monitoring techniques, such as fitness trackers, are possible [22-25]. Therefore, reducing body fat, especially abdominal fat, directly and favorably affects all of the PCOS women's key problems. Additionally, research shows that exercise not only reduces fat but also supports healthy endocrine and adrenal function. Complete remission from PCOS's clinical features can be achieved with physical activity and weight loss efforts [26-29].

Aim of the Study

This study aims to evaluate the impact of exercise regime on women BMI and infertility among women with poly cystic ovary syndrome.

Study Hypotheses

Infertile overweight and obese women who will receive exercise regime program will experience physical activity modification and improvement in obesity.

Subjects and Methods

This study used a quasi-experimental design at Beni-Suef University Hospital's gynecological and infertility clinics. A purposive sample of 116 women with polycystic ovary syndrome, overweight, and obesity, was selected.

Tools of data collection

Tool I: Personal data: The Arabic structured interview questionnaire to collect basic data.

Tool II: the Block Adult Physical Activity (PA) Screener was the predictor for physical activity. The tool evaluates job-related, daily life, and leisure activities. It measures responses on nine items, with women's responses measured on five points [30]. The total score is categorized into mild, moderate, and vigorous physical activity.

Study Field Work

Teaching sessions: The researcher started to explain the physical activity modification intervention for the women.

Session Objectives: The researcher started to explain the physical activity modification intervention for the women.

Intended Learning Outcomes (ILOS)

- Knowledge and Understanding Skills: Describe the physical activity pattern.
- Professional and practical skills: Demonstrate how to practice physical activity exercise and demonstrate how to replace the food with a healthy alternative.
- General and transferable skills: Communicate effectively with the women with polycystic ovary syndrome to practice different physical activities and exercises.

Teaching Methods: Individual discussion, demonstration and re-demonstration.

Teaching Aids: A guide booklet, and Illustrative pictures and explanation videos about physical activity and exercise. The researcher provided instructions to women with polycystic ovary syndrome about the lifestyle modification program intervention for the women and the importance of weight reduction, diet regimen, physical activity pattern, and exercise.

Exercise regimen: Every participant was given instructions to follow worldwide guidelines based on evidence for PCOS, which recommend: Engage in moderate-intense physical activity for at least 150 minutes per week (30 minutes per day) or vigorous physical activity for at least 75 minutes per week (15 minutes per day). If physical activity cannot be done continuously, it can be done in bursts of at least ten minutes or around a thousand steps.

Note

- Moderate intensity physical activity is defined as an aerobic exercise that raises the heart rate (HR) by 55 to 70% from HR max ($208 - (0.7 \times \text{AGE} [\text{years}])$) and may be done while carrying on an uninterrupted conversation; for example, running.
- Vigorous intensities Physical activity is an aerobic activity where an uninterrupted conversation can't be maintained and increases the heart rate (HR) by 70–90% from HRmax, e.g. Race walking.
- Leaflets containing examples of moderate- and vigorous-intensity physical activity were given to the patients.
- Sedentary or sitting time should be minimized as possible.

Statistical Analysis

Data was entered and analyzed using SPSS (Statistical Package for Social Science, version 25). Graphics were done using the Excel program as well as the SPSS package. The level of significance was set at a P value of <0.05 for all significant tests.

Results

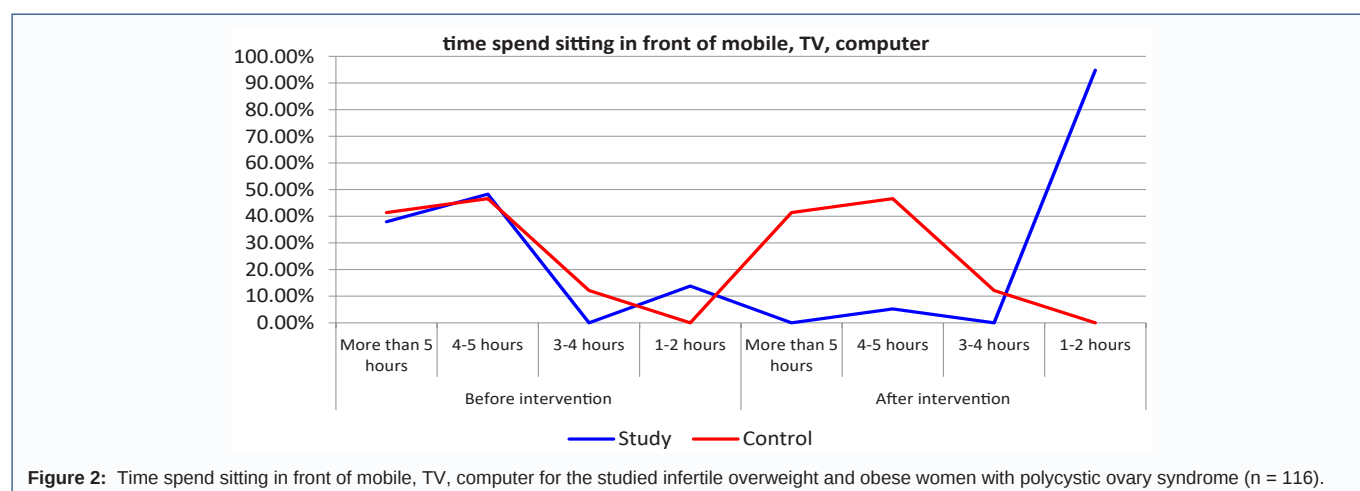
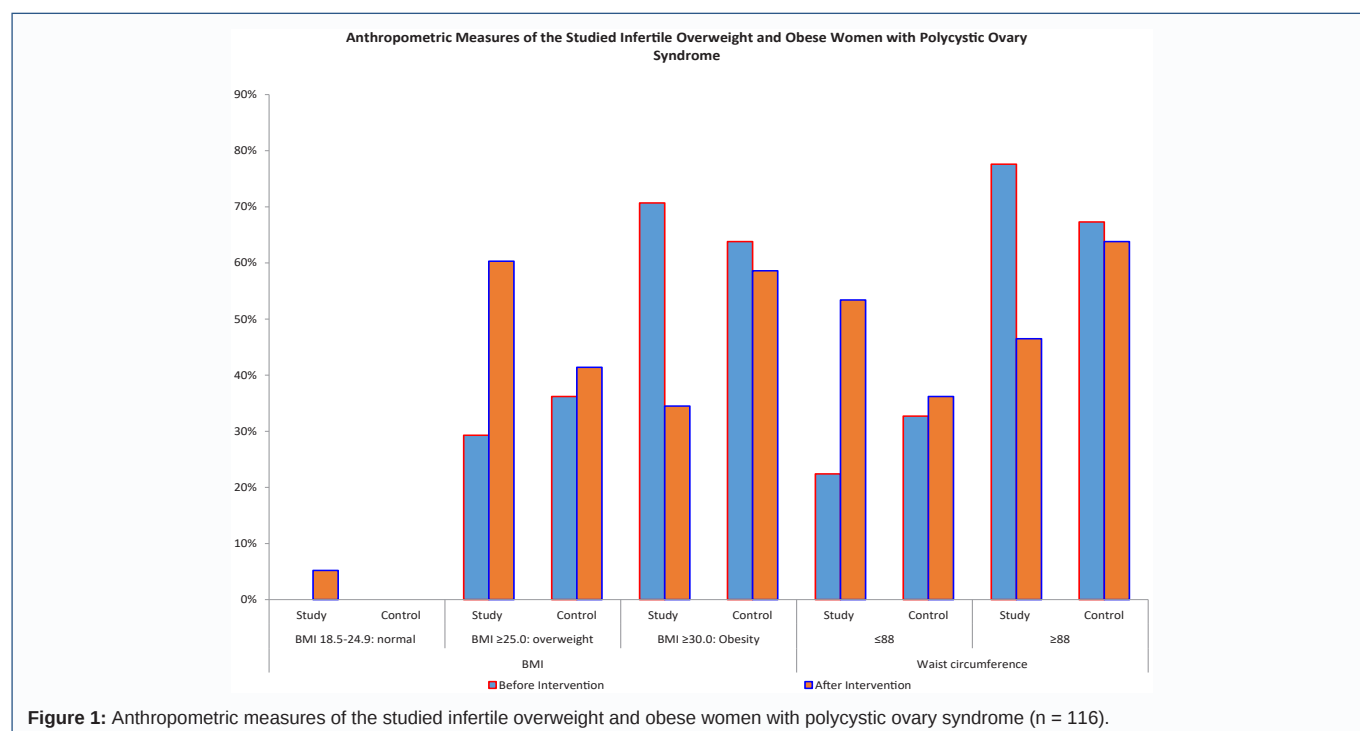
Figure 1 portrays that anthropometric measures improved for infertile overweight and obese women with polycystic ovary syndrome after intervention, with a higher percentage of overweight and obese women.

Figure 2 shows the weekly physical activity self-assessment questionnaire among the studied infertile overweight and obese women with polycystic ovary syndrome. It reveals that 48.3% and 46.6% of the study and control groups spent 4-5 hours sitting in front of a mobile, TV, or computer before the intervention, compared to 94.8% of the study group spending 1-2 hours and 46.6% of the control group spending 4-5 hours after the intervention, respectively.

Figure 3 presents 72.4%, 69.0% of the study and control groups did not regularly engage in one or more physical activities (running, walking, or going to gyms) before the intervention, compared to 100.0% of the study group regularly engaging in one or more physical activities, and 69.0% of the control group do not regularly engage in one or more physical activities after the intervention, respectively.

Figure 4 shows that 60.3% and 58.6% of the study and control groups did all these activities once or twice a month before the intervention, compared to 51.7% of the study group doing all these activities twice a week and 62.1% of the control group doing all these activities once or twice a month, respectively.

Figure 5 presents that 98.3% and 93.1% of the study and control groups spent less than 15 minutes on each exercise or activity before



the intervention, compared to 70.7% of the study group spending less than 15 minutes on each exercise or activity and 86.2% of the control group spending less than 15 minutes on each exercise or activity after the intervention, respectively.

Figure 6 & 7 show that 46.6% and 48.3% of the study and control groups felt medium-voltage effort when exercising before the intervention, compared to 60.3% and 48.3% of them after the intervention, respectively. However, 58.6% and 60.3% of the study and control groups said their job required some physical activity before and after the intervention, respectively.

Figure 8 & 9 present that 84.5% of the study and control groups spent 3–4 hours outside of work activity a week on household chores (cleaning, washing, tidying up the House) before and after the intervention, respectively. In addition, 98.3% of the study and control groups spent less than 15 minutes walking daily before the intervention, compared to 72.4% of the study group spending 46–60

minutes walking daily and 100.0% of the control group spending less than 15 minutes walking daily after the intervention, respectively.

Figure 10 presents that 55.2% and 51.7% of the study and control groups climbed the ladder less than twice daily before the intervention, compared to 60.3% and 46.6% of them climbed the ladder 3–5 times daily after the intervention, respectively.

Discussion

Regular exercise is the first-line treatments for obese women with PCOS. Extreme weight, insulin resistance, glucose intolerance, irregular menstruation, and infertility all have strong correlations. Even small lifestyle adjustments can make a big difference, and in obese an ovulatory woman, losing just 2% to 5% of body weight has been demonstrated to boost insulin sensitivity and restore ovulation [31].

Numerous research studies have shown that obesity is not a

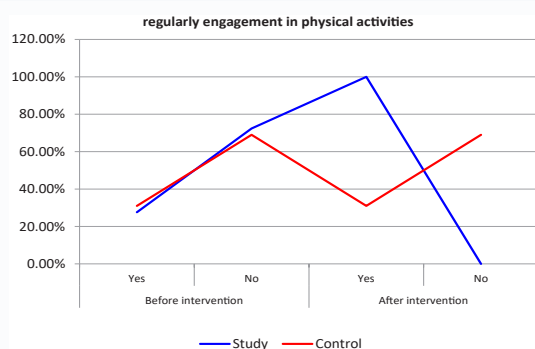


Figure 3: Regularity engagement in physical activities for the studied infertile overweight and obese women with polycystic ovary syndrome (n = 116).

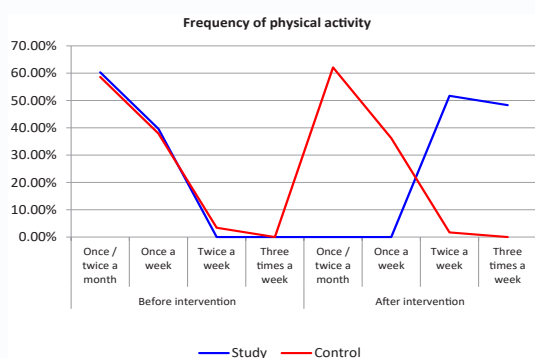


Figure 4: Frequency of physical activities for the studied infertile overweight and obese women with polycystic ovary syndrome (n = 116).

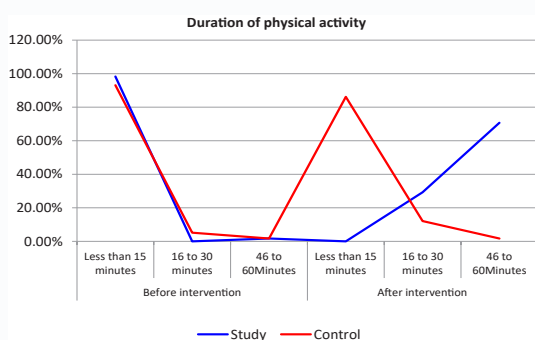


Figure 5: Duration of physical activities for the studied infertile overweight and obese women with polycystic ovary syndrome (n = 116).

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) [32].

Obesity and infertility have a complex relationship. The knowledge that is now available supports the idea that androgen changes and their interaction with estrogen are the primary mechanism causing subfertility or infertility in obese women [33]. Maternity nurses play a crucial role in woman's health improvement, which provides woman education and support. At the same time, the nurse can provide health promotion & psychosocial services include assessment, health education, counseling & appropriate referral [34-44]. So, this study aims to evaluate the impact of lifestyle modifications on women BMI and infertility among women with polycystic ovary syndrome.

In brief, the results of the current study declare that the

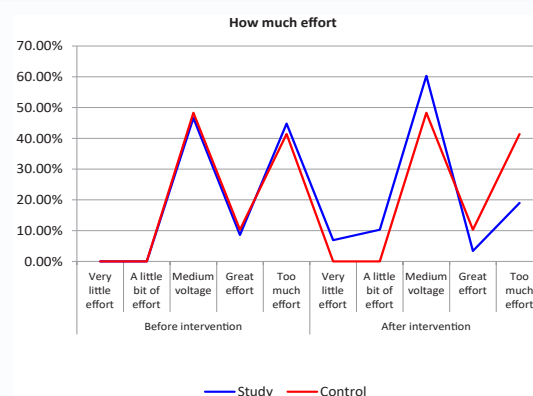


Figure 6: Effort for the studied infertile overweight and obese women with polycystic ovary syndrome (n = 116).

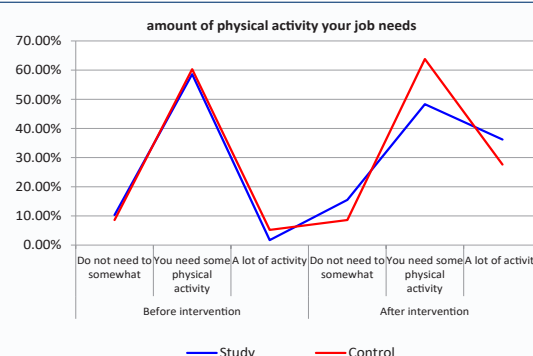


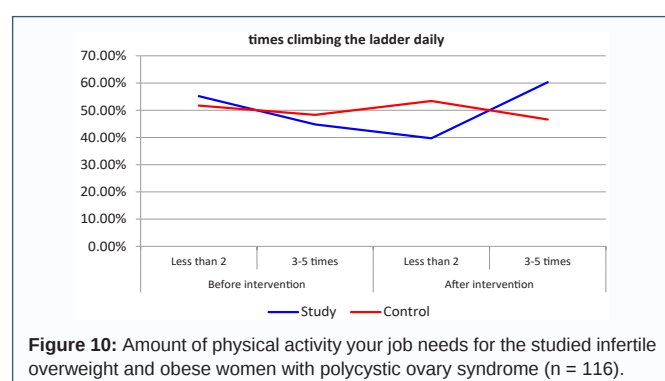
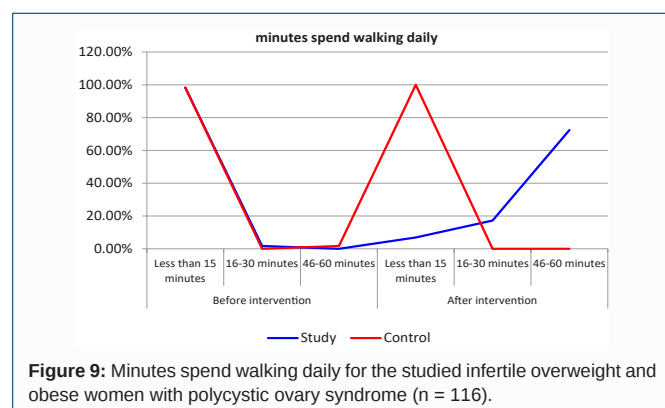
Figure 7: Amount of physical activity your job needs for the studied infertile overweight and obese women with polycystic ovary syndrome (n = 116).



Figure 8: Hours spend a week on household chores for the studied infertile overweight and obese women with polycystic ovary syndrome (n = 116).

infertile overweight and obese women who received the physical activity regime program experienced better dietary habits and improvement in obesity after program implementation, generally. The improvement involved anthropometric measures, time spent sitting in front of a mobile, TV, or computer, regularity, frequency, duration of the engagement in physical activities, effort, hours spent a week on household chores, and minutes spent walking daily. This improvement could be attributed to the attendance of the educational sessions, as well as a wide variety of educational methods used [45-56].

Additionally, the distributed Arabic booklets also played a crucial role in attaining and retaining knowledge about physical



activity. Booklets are best used when they are brief, written in plain language, full of good pictures, and used to back up other forms of education. This is in accordance with Edgar Dale's or the NTL's Pyramid of Learning as cited by Masters, as the pyramid illustrates that individuals can retain 10.0% of what they read and 20.0% of what they see and hear (audiovisual). The same author added that one can retain 50.0% of what he learned by a discussion [57-76].

Regarding BMI, the findings of the current study revealed improvement after the intervention compared to before. These results agreed with Haqq, *et al.*, (2014), who pointed to the positive effects to the positive effects of lifestyle modification interventions on the reduction of weight in patients with obesity and PCO [77]. On the contrary, these findings were incongruous with those of Serrao, (2013), who revealed that the lifestyle interventions did not affect waist circumference [78]. This incongruence between the current and previous studies may be related to the patient's residence rural area and not having adequate access to adherence to sports and adequate exercise. Regarding Weekly physical activity Self-assessment, the current study findings revealed that about half of the study and control groups spent 4-5 hours sitting in front of a mobile, TV, or computer before the intervention, compared to the majority of the study group spending 1-2 hours, respectively.

These results came in agreement with These findings came in agreement with Morrow-Baez, (2018), who study "Thriving with PCOS: lifestyle strategies to successfully manage polycystic ovary syndrome", and found out lack of physical activity among PCOS patients spent more time in front of their phones and sitting watching TV [79].

In addition, the current study findings supported by Eleftheriadou *et al.* (2012) showed that girls with PCOS participated in physical activities much less than did controls [80]. Also, the current study

findings revealed that there is improvement in physical activity engagement, about three-quarters of the study and control groups did not regularly engage in one or more physical activities (running, walking, or going to gyms) before the intervention, compared to all of the study group regularly engaging in one or more physical activities after the intervention, respectively. These results came in agreement with these findings came in agreement with Banting, *et al.*, (2014) who study "Physical activity and mental health in women with polycystic ovary syndrome", and found out fewer women with PCOS reported being physically active compared to women without PCOS [81]. According to the researcher's point of view, this reflected not only the fact that they were less likely to take up physical activity but also that when they did, it was less frequent and less intense than controls.

Meanwhile, the current study findings revealed that times of physical activity increased for the study group. About two-thirds of the study and control groups did all these activities once or twice a month before the intervention, compared to more than half of the study group doing all these activities twice a week with no change in the control group, respectively. Another investigation was carried out in Stockholm, Sweden's Karolinska University Hospital [82]. It was determined that dietary control and exercise, either alone or in combination, are equally beneficial in enhancing ovarian function in women with PCOS. This study compared the effects of three months of food management and/or physical exercise (three interventions) on ovarian function in women with PCOS.

Moreover, the current study findings revealed that the majority of the study group increased the time of exercise after the intervention. The majority of the study and control groups spent less than 15 minutes on each exercise or activity before the intervention, which increased to nearly three-quarters of the study group spending 46 to 60 minutes on each exercise or activity after the intervention, respectively. These results came in agreement with these findings came in agreement with Eleftheriadou, *et al.*, (2015) who studied "Dietary habits in adolescent girls with polycystic ovarian syndrome". They found out majority of PCOS patients spent less time exercising [83]. Furthermore, the current study findings revealed that about half of the study and control groups felt medium-voltage effort when exercising before the intervention, compared to two-thirds of them after the intervention, respectively. However, two-thirds of the study and control groups said their job required some physical activity before and after the intervention, respectively.

In addition, the current study findings revealed that the time of activity increased in the study group after intervention. About nearly all of the study and control groups spent less than 15 minutes walking daily before the intervention, compared to nearly three-quarters of the study group spending 46-60 minutes walking daily and all of the control group spending less than 15 minutes walking daily after the intervention, respectively. Additionally, half of the study and control groups climbed the ladder less than twice daily before the intervention, compared to two-thirds of them climbing the ladder 3-5 times daily after the intervention, respectively.

These results came in agreement with Woodward, *et al.*, (2022), who study "Supervised aerobic exercise training and increased lifestyle physical activity to reduce cardiovascular disease risk for women with polycystic ovary", and found that times of physical activity increased for the study group than the control group [84]. Moreover, these findings were in concordance with Stepto *et al.*,

(2019), who studied "Exercise recommendations for women with polycystic ovary syndrome: is the evidence enough", which revealed that women must exercise at least 150 minutes of moderate to intense exercise per week [85].

According to the researcher's point of view, this may be justified as increased efforts in quantifying and developing strategies to reduce sedentary behaviors in this inactive group should be considered due to significant current and future health problems. Also exercising 30-60 minutes three times a week to three total hours per week can improve metabolic and reproductive symptoms associated with PCO.

Conclusion

Infertile overweight and obese women who will receive physical activity regime program experience better dietary habit and improvement in obesity.

Recommendations

Physical activity regime modification for infertile obese women should be disseminated.

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