Dr. R Venkatesan
Associate Professor, Tamil Nadu
Physical Education and Sports
University, Chennai, Tamil
Nadu, India

Effect of different intensities of combined training with seed cycling on body weight body mass index and resting metabolic rate among PCOD affected women

Dr. R Venkatesan

Abstract
The purpose of the study is to find out the Effect of different intensities of combined training with seed cycling on body weight body mass index and resting metabolic rate among PCOD affected women.
Researches Design: To achieve this purpose, 45 subjects were selected for the study. The selected group consists of home makers women between the age group of 25-35 years. They were divided into three groups where each group with 15 members were given combined training with seed cycling and the other group acted as a control group.
Selection of variables: The selection of variables was done based on the literature available and with consultation with the experts. The availability of techniques for the purpose of analysis, feasibility, reliability procedure and the outcome were extensively taken care before finalizing the variables. The selected independent and dependent variables are as follows.
Dependent variables: 1. Weight 2.Body Mass Index 3. Resting Metabolic Rate
Independent variable: Training with seed cycling.
Conclusions: Within the above mentioned scope of this study, the following conclusions were arrived as: 1.Experimental groups showed significant reduction in the physiological variable such as body weight, Body Mass Index and improvement in Resting Metabolic Rate than the control group. 2. The Experimental group II showed greater reduction on physiological variable such as body weight, Body Mass Index and greater improvement in Resting Metabolic Rate. All these changes were due to the 12 weeks of different intensities of combined training with seed cycling.

Keywords: PCOD, polycystic ovary syndrome, seed cycling

Introduction
Polycystic Ovary Syndrome: is a condition in which the ovaries produce an abnormal amount of androgens, male sex hormones that are usually present in women in small amounts. The name polycystic ovary syndrome describes the numerous small cysts (fluid-filled sacs) that form in the ovaries. However, some women with this disorder do not have cysts, while some women without the disorder do develop cysts.

Ovulation occurs when a mature egg is released from an ovary. This happens so it can be fertilized by a male sperm. If the egg is not fertilized, it is sent out of the body during your period. In some cases, a woman doesn't make enough of the hormones needed to ovulate. When ovulation doesn't happen, the ovaries can develop many small cysts. These cysts make hormones called androgens. Women with PCOS often have high levels of androgens. This can cause more problems with a woman's menstrual cycle. And it can cause many of the symptoms of PCOS.

Treatment for PCOD
1. A change in diet and activity. A healthy diet and more physical activity can help you lose weight and reduce your symptoms. They can also help your body use insulin more efficiently, lower blood glucose levels, and may help you ovulate.
2. Exercise to improve your PCOS doesn't have to take hours a week. Studies have found exercise sessions ranging from 30 minutes a day, three times a week, to three total hours per week improved metabolic and reproductive symptoms associated with PCOS.

Corresponding Author:
Dr. R Venkatesan
Associate Professor, Tamil Nadu
Physical Education and Sports
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Nadu, India

The follicular phase of seed cycling

1. Estrogen secretion is high during this period. Hence, it is recommended to eat a combination of pumpkin, flax, and seeds. Phytoestrogens or lignans in flax seeds bind to the excess estrogen and then remove it from the women's body. Thus, seed cycling benefits women with PCOS by keeping estrogen levels under control.
2. Zinc in pumpkin seeds promotes progesterone production in the body. Flax seeds and pumpkin seeds maintain estrogen and progesterone levels of the body during the follicular phase. This supports a healthy reproductive system and thus, in turn, helps in the treatment of PCOS by seed cycling.

The luteal phase of seed cycling

1. This is the phase when a woman is most fertile. The follicle releases the egg and awaits sperm for fertilization. Estrogen and progesterone are secreted in high quantities to support the fertilized egg. Consume sesame seeds and sunflower seeds during this luteal phase.
2. Sesame seeds block excess estrogen as they are a rich source of Zinc and Selenium. On the other hand, sunflower seeds are rich in Vitamin E and Gamma-Linolenic Acid (GLA). Both of them boost progesterone production. Thus, the level of estrogen and progesterone is maintained in the body.

Statement of the problem

The purpose of the study is to find out the purpose of the study is to find out the Effect of Different Intensities of Combined Training with Seed Cycling on Selected Physiological and Psychological Variables among PCOD Affected Women.

Hypothesis

It is hypothesized that there will be significant improvement on selected physiological and psychological variables among Polycystic Ovary Disorder women due to Different Intensities of Combined Training with Seed Cycling.

Selection of subjects

To achieve this purpose, 45 subjects were selected for the study. The selected group consists of home makers women between the age group of 25-40 years. They were divided into three equal groups where each group with 15 members were given combined training with seed cycling and the other group acted as a control group.

Selection of variables- dependent variables: Physiological variables -1.Body Mass Index 2. Resting Metabolic Rate 3. Body weight

Independent variable: combined training with seed cycling.

Experimental design

To achieve the purpose of our study, 45 subjects with evidence like ultrasound imaging, or gynecologist reports are selected. They are divided into three groups as Group I with Different Intensities of Combined Training with Seed Cycling and Group II Different Intensities of Combined Training with Seed Cycling, the control group without any training. The pretest was taken for all the groups at the beginning. After eight weeks, the post test was taken for both the groups. The pretest and post test scores will be subjected to statistical analysis to find out the significance among the mean differences.

Training schedules: The treatment durations lasts for 16 weeks of different intensities of combined training and seed cycling was monitored Experimental Group – I – moderate intensities with seed cycling, Experimental Group – II received high intensities with seed cycling and Control Group did not receive any treatment.

Statistical Techniques: Analysis of covariance statistical technique was used, to test the significant difference among the treatment groups. Scheffes Post Hoc Test used to find out the significance of intergroup variables.

Statistical analysis: The recorded data was verified by Analysis of Covariance (ANCOVA) to make sure of the significant difference among the two groups between the pretest and posttest on physiological and psychological factors in polycystic ovary disordered adults.

Results of BMI: The results on physiological parameter of BMI were measured and the results on the effect of different intensities of combined training with seed cycling among polycystic ovary affected female were presented in table.

Table 1: Calculation of analysis of covariance on BMI of experimental group and control group

TEST	EXP-1	EXP-2	Cont Group	SV	SS	DF	MS	OF	TF
Pre Test	32.51	32.51	32.80	B	0.84	2	0.42	0.40	2.7
				W	44.90	42	1.06		
Post Test	31.17	29.39	32.51	B	73.47	2	36.73	3.90	2.7
				W	395.61	42	9.41		
Adjusted	31.28	29.50	32.28	B	59.079	2	29.53	3.59	2.72
				W	337.00	41	8.21		

Table shows analyzed data on BMI. The pretest means of BMI were 32.51, 32.51 and 32.80 for the Experimental Group- I, Experimental Group- II and the Control Group. The obtained 'F' ratio 0.40 was lesser than the table 'F' ratio 2.7. Hence, the pre test was not significant at .05 level of confidence for degrees of freedom 2 and 28.

The post test means were 31.17 for Experimental Group - I, 29.39 for Experimental Group - II and 32.51 for Control Group. The obtained 'F' ratio 3.90 was higher than the table 'F' ratio 2.7. Hence, post test was significant at .05 level of confidence for the degrees of freedom 2 and 28.

The adjusted posttest means were 31.28 for Experimental Group - I, 29.50 for Experimental Group - II and 32.28 for Control Group. The obtained 'F' ratio 3.59 was higher than the table 'F' ratio 2.7. Hence, the adjusted post test was significant at .05 level for the degrees of freedom 1 and 27.

4.5.1. Discussion on the findings of BMI

In this work, the analysis of covariance of BMI was carried out in Experimental groups with the inclusion of seed cycling

with different intensities of combined training. The same analysis was carried out in another group called the Control Group without inclusion of seed cycling with different intensities of combined training. From these analyses, it was found that the results obtained from the Experimental Groups had significant decreases in the BMI from higher level to moderate when compared with one from the Control Group. Its interestingly noted that experimental group II had greater reduction on body mass index when compared with experimental I. This was due to the influence of 16 weeks of seed cycling with different intensities of combined training.

These results were found to be in a good agreement with the earlier work of P Ravn, *et al*., (2013) who analyzed the overweight in polycystic ovary syndrome. An update on evidence based advice on diet, exercises and met for

minimum use for weight loss. They concluded that Weight loss through life style changes, preferably a low calorie diet, should be the first line treatment in overweight/obese women with PCOS. Since the results obtained from the analysis of covariance in very good agreement with the earlier results, it was worthwhile to mention that seed cycling with specific diet prescription reduces the BMI. This, in turn, helps to be healthy, lifestyle changing to the women with PCOD.

4.6. Results of RMR
The results on physiological parameter of RMR were measured and the results on the effect of seed cycling with different intensities of combined training among polycystic ovary disordered adults were presented in table.

Table 2: Analysis of covariance on RMR of experimental group and control group

| TEST	EXP-1	EXP-2	CONT GROUP	SV	SS	DF	MS	OF	TF
Pre Test	1445.44	1445.44	1445.44	B	0.0	2	0.0	0.00	2.7
				W	598812.18	42	14257.43289		
Post Test	1567.51	1605.92	1445.44	B	210664.29	2	105332.14	7.24	2.7
				W	610953.588	42	14546.514		
Adjusted	1567.51	1605.92	1445.44	B	210664.290	2	105332.1452	8.86	2.72
				W	487608.573	41	11892.89203		

Table XI shows analyzed data on RMR. The pretest means of BMI were 1445.44, 1445.44 and 1445.44 for the Experimental Group- I, Experimental Group- II and the Control Group. The obtained 'F' ratio 0.00 was lesser than the table 'F' ratio 2.7. Hence, the pre test was not significant at .05 level of confidence for degrees of freedom 2 and 28.

The post test means were 1567.51for Experimental Group - I, 1605.92for Experimental Group - II and 1445.44 for Control Group. The obtained 'F' ratio 7.24 was higher than the table 'F' ratio 2.7. Hence, post test was significant at .05 level of confidence for the degrees of freedom 2 and 28.

The adjusted post test means were 1567.51 for Experimental Group - I, 1605.92 for Experimental Group - II and 1445.44 for Control Group. The obtained 'F' ratio 8.86 was higher than the table 'F' ratio 2.7. Hence, the adjusted post test was significant at .05 level for the degrees of freedom 1 and 27.

4.6.1. Discussion on the findings of RMR
In this work, the analysis of covariance of RMR was carried out in Experimental groups with the inclusion of seed cycling with different intensities of combined training. The same analysis was carried out in another group called the Control Group without inclusion of seed cycling with specific diet prescription.
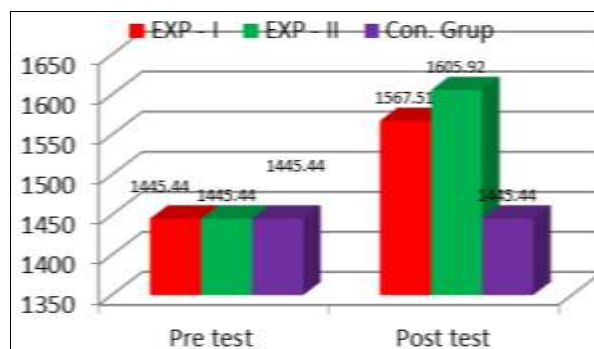
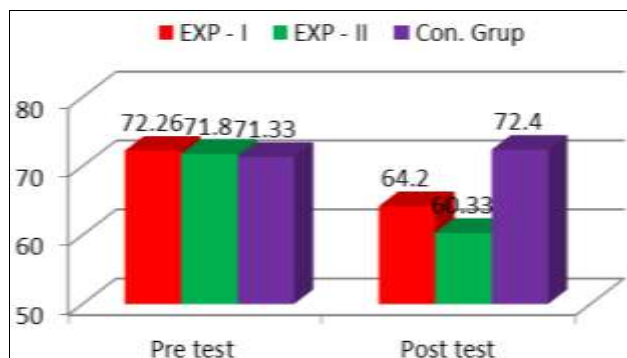**Fig 1:** Analysis of covariance on RMR of experimental group and control group

From these analyses, it was found that the results obtained from the Experimental Groups had significant improvement in the RMR from moderate to higher level when compared with one from the Control Group. . Its interestingly noted that experimental group II had greater increase on resting metabolic rate when compared with experimental I This was due to the influence of diet intervention and it has made significant impact on the RMR levels of the women with PCOD.

Table 3: Analysis of covariance on weight of experimental groups and control group

TEST	EXP-1	EXP-2	Cont group	SV	SS	DF	MS	OF	TF
Pre Test	72.26	71.8	71.33	B	6.53	2	3.26	0.10	2.7
				W	1390.66	42	33.11		
Post Test	64.2	60.33	72.4	B	1138.97	2	569.48	25.04	2.7
				W	955.33	42	22.74		
Adjusted	63.98	60.33	72.61	B	1191.44	2	595.73	37.50	2.72
				W	651.33	41	15.88		

Table XI shows analyzed data on Weight. The pretest means of BMI were 72.26, 71.8 and 71.33 for the Experimental Group- I, Experimental Group- II and the Control Group. The

obtained 'F' ratio 0.00 was lesser than the table 'F' ratio 2.7. Hence, the pre test was not significant at .05 level of confidence for degrees of freedom 2 and 28.

Fig 2: Analysis of covariance on weight of experimental groups and control group

The posttest means were 64.2 for Experimental Group - I, 60.33 for Experimental Group - II and 72.4 for Control Group. The obtained 'F' ratio 25.04 was higher than the table 'F' ratio 2.7. Hence, posttest was significant at .05 level of confidence for the degrees of freedom 2 and 28.

The adjusted posttest means were 63.98 for Experimental Group - I, 60.33 for Experimental Group - II and 72.61 for Control Group. The obtained 'F' ratio 37.50 was higher than the table 'F' ratio 2.7. Hence, the adjusted posttest was significant at .05 levels for the degrees of freedom 1 and 27.

Discussion on the findings of weight
In this work, the analysis of covariance of body weight was carried out in Experimental groups with the inclusion of seed cycling with different intensities of combined training. The same analysis was carried out in another group called the Control Group without inclusion of seed cycling with specific diet prescription.

From these analyses, it was found that the results obtained from the Experimental Groups had significant improvement in the Weight from moderate to higher level when compared with one from the Control Group. This was due to the influence of diet intervention and it has made significant impact on the RMR levels of the women with PCOD.

Conclusions
Within the limitation of the study, the following conclusions were drawn:
1. Experimental groups showed significant reduction in the physiological variable such as body weight, Body Mass Index and improvement in Resting Metabolic Rate than the control group.
2. The Experimental group II showed greater reduction on physiological variable such as body weight, Body Mass Index and greater improvement in Resting Metabolic Rate. All these changes were due to the 12 weeks of different intensities of combined training with seed cycling.

References
1. King TL, Brucker MC, Kriebs JM, Fahey JO. Varney's Midwifery. Burlington: Jones & Bartlett Learning; 2013. 145, 347, 355, 356, 365
2. Legro RS, Arslanian SA, Ehrmann DA, Hoeger KM, Murad MH, Pasquali R, *et al*. Diagnosis and Treatment of Polycystic Ovary Syndrome: An Endocrine Society Clinical Practice Guideline. The Journal of Clinical Endocrinology & Metabolism. 2013;98(12):4565-92.
3. Kristensen M, Jensen MG, Aarestrup J, Petersen KE, Søndergaard L, Mikkelsen MS, *et al*. Flaxseed dietary fibers lower cholesterol and increase fecal fat excretion, but magnitude of effect depend on food type. Nutrition & Metabolism. 2012;9(1):8.
4. Harvard Health Publishing. Quick-start guide to nuts and seeds [Internet]. Harvard Health Letter. 2019. Available from: https://www.health.harvard.edu/staying-healthy/quick-start-guide-to-nuts-and-seeds
5. Linus Pauling Institute. Lignans [Internet]. Micronutrient Information Center. 2020 [cited 2020Jan21]. Available from: https://lpi.oregonstate.edu/mic/dietary-factors/phytochemicals/lignans
6. Phipps WR, Martini MC, Lampe JW, Slavin JL, Kurzer MS. Effect of flax seed ingestion on the menstrual cycle. The Journal of Clinical Endocrinology & Metabolism. 1993;77(5):1215-1219. doi:10.1210/jcem.77.5.8077314
7. Practice Committee of the American Society for Reproductive Medicine. Current clinical irrelevance of luteal phase deficiency: A committee opinion. Fertil Steril. 2015Apr, 103(4).