IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 9, Issue 5 Ser. VI (Sep. – Oct. 2020), PP 46-52
www.iosrjournals.org

A study to assess the effect of physical exercise and nutritional counseling on symptoms of PCOD among women's at selected areas of Pune.

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Abstract:
Background*: PCOD/PCOS is a heterogeneous condition characterized by menstrual irregularity, hyperandrogenism, obesity and polycystic ovaries on ultrasound. [(1)] It is one of the most common lifestyle diseases due to lack of exercise & unhealthy dietary habits among women in reproductive age (15-45 Years).The proper weight management by regular physical exercise and dietary management play an important role in reducing the severity of PCOD symptoms among women's with PCOD. So the researcher selected this study to assess the effect of physical exercise and nutritional counseling on symptoms of PCOD.*
Materials and Methods: *The present study is an evaluative study with pre experimental one group pre-test post-test design. 100 samples were taken by using Non probability purposive sampling from selected setting. The data was collected by using demographic profile and PCOD symptom checklist. (10)*
Results: *The analysis was done by descriptive and inferential statistics. Researcher applied paired t-test for the effect of physical exercise in women with symptoms of PCOD. The average PCOD symptoms score in pre-test was 11.72 which were 6.08 in post-test. T-value for this test was 35.7 with 99 degrees of freedom. Fisher's exact test used to find the association between physical exercise and nutritional counseling with selected demographic variables. Corresponding p-value for the physical exercise and dietary pattern was small (0.000, 0.04, less than 0.05), the null hypothesis is rejected. It is evident that the PCOD symptoms improved significantly after physical exercises and nutritional counseling.*
Conclusion: *Regular exercise and healthy diet can prevent many of the lifestyle related diseases. Proper weight management and dietary modification can help to control and manage the PCOD symptoms. In present study physical exercise and nutritional counseling is found very effective in managing the PCOD symptoms among women diagnosed with PCOD.*
Key Word*: Physical exercise, Nutritional counseling, Symptoms, PCOD, PCOS*

Date of Submission: 02-10-2020 Date of Acceptance: 16-10-2020

I. Introduction

PCOS was first discovered in 1935 by Doctors stein and Leventhal. PCOS also called hyperandrogenic anovulation (HA), or steinleventhal syndrome, as it includes a set of symptoms due to hormone imbalance. The exact cause of PCOS is unknown.[(2)] The genes, insulin resistance and inflammation-all these factors linked to excess androgen production. The three main features of PCOD includes, -Cysts in the ovaries, High levels of male hormones, Irregular or skipped periods. **Polycystic ovarian morphology (PCOM)** as either an ovary with 12 or more follicles, ranging in size from 2 mm to 10 mm, in a single plane or an ovarian volume of more than 10 mL without a dominant follicle. Poly Cystic Ovaries are detected with the help of pelvic ultrasound, which estimated the prevalence of 20-33%.[(3)] The findings of recent research studies shows that the lifestyle changes might reduce the extent of impaired glucose tolerance and delay the development of metabolic disorders in the general population. Ultimately, PCOS is a disorder that has no definitive cure; many of its manifestations can be controlled with the right lifestyle modifications. So the researcher selected this study to assess the effect of physical exercise and nutritional counseling on symptoms of PCOD

II. Material And Methods

This evaluative study was carried out on patient of Gynaec OPD of Dr. D Y Patil Hospital, Pune, from December 2019- March 2020, to assess the effect of physical exercise and nutritional counseling on symptoms of PCOD among women. 100 samples using Non probability purposive sampling technique was used for the selection of samples from selected setting. The data collected using a demographic profile and a PCOD symptom check list.

Study Design: The study used an evaluative approach with Pre-experimental one group pre-test post-test design
Study Location: The setting for the present study was Gynaec OPD of Dr. D Y Patil Hospital, Pune.
Study Duration: December 2019 to March 2020.
Sample size: The sample size for the present study was 100.
Subjects & selection method: The population for the present study was drawn from the women's who diagnosed and present with the symptoms of PCOD with Non probability purposive sampling technique. The samples were divided into four groups (each group had 25 patients).

Inclusion criteria:

1. Women's in reproductive age (15-44 Years)
2. Women's who diagnosed and present with the symptoms of PCOD
3. Women are who are willing to participate in the study.

Exclusion criteria:

1. Women with BMI < 25
2. Women with other medical conditions

Procedure methodology

A formal permission was obtained from authorities of selected hospital for the study. Informed the samples regarding the objectives of the study and obtained their consent after assuring the confidentiality of the data. The investigator had conducted the pre-test with demographic profile and PCOD symptom checklist. The researcher demonstrated the nursing interventions of Range Of Motion exercise. The exercise session for the present study includes 10-15 minutes of warm up session, followed by nursing interventions of ROM exercise. The samples are instructed to perform the exercise for 15 repetition, 2 minutes gap, and 3 sets. The exercise session completed with cooling down the body with icing. The total duration of exercise session was 1hour. Information regarding PCOD diet (low glycemic, organic meat and fat) along with a sample menu was also given on the same day. The post-test has been done after one month to assess the effect of physical exercise and nutritional counseling on symptoms of PCOD among selected samples. The duration of data collection for each sample was 30-35 minutes.

Statistical analysis

The data analysis was planned to include descriptive and inferential statistics. Paired t-test was used for the effect of physical exercise and nutritional counseling in women with symptoms of PCOD. Fisher's exact test was used to find the association between physical exercise and nutritional counseling with selected demographic variable.

III. Findings

Section I: Description of samples (women with symptoms of PCOD) based on their personal characteristics

Table 1: Description of samples (women with symptoms of PCOD) based on their personal characteristics in terms of frequency and percentages

N=100

Demographic variable	Frequency	%
Age:		
15-21	30	30%
22-29	60	60%
30-37	10	10%
Age of Menarche:		
11- 13 Years	38	38%
14 – 16 Years	62	62%
Menstrual history:		
Regular	26	26%
Irregular	74	74%
Marital status:		
Married	44	44%
Unmarried	56	56%
Education:		
Primary education	23	23%
Secondary education	44	44%
Graduate	14	14%
Undergraduate	19	19%
Occupation:		
Housewife	54	54%
Private Sector	46	46%

No. of children:		
None	83	83%
One	17	17%
Use of contraceptive Pills:		
Yes	9	9%
No	91	91%
Presence of Medical Illness:		
No Illness	100	100%
History of bad habits:		
No	100	100%

Table No 1 shows, 30% of the women with symptoms of PCOD have age 15-21 years, 60% of them had 22-29 years and 10% of them had 30-37 years.38% of them had menarche at age 11-13 years and 62% of them had 14-16 years.26% of them had regular menstruation and 74% of them had irregular menstruation.44% of them were married and 56% of them were unmarried.23% of them had primary education, 44% of them had secondary education, 14% of them had graduation and 19% of them were under graduates.54% of them were housewives, 46% of them had private sector and 29% of them had government service.83% of them did not had children and 17% of them had one.9% of them were using contraceptive pills. None of them had medical illness and history of any bad habits.

Section II: Analysis of data related to the existing symptoms of PCOD.

Part 1:

Table 2: Changing categories of PCOD
N=100

PCOD symptoms	**Pre-test**	
	Frequency	**%**
BMI category:		
Underweight	0	0%
Normal	4	4%
Overweight	96	96%
Obese	0	0%
Dietary pattern:		
Vegetarian	35	35%
Non-vegetarian	37	37%
Eggetarian	28	28%
Exercise pattern:		
Routine	19	19%
Irregular	45	45%
No exercise	36	36%

Table No 2 shows, 4% of the women with PCOD symptoms in pretest were normal,96% of them were overweight.35% of them were vegetarian, 37% of them were eggetarian and 28% of them had mixed dietary pattern.19% of them had routine exercises, 45% of them had irregular exercises and 36% of them were not doing exercises at all.

Part II:

Table 3: Existing symptoms of PCOD
N=100

Symptoms	**Pre-test**	
	Frequency	**%**
No Symptom (0)	0	0%
Mild(1-5)	0	0%
Moderate (6-10)	35	35%
Severe (11-15)	57	57%

Extreme (16-20)	8	8%

Table No 3 Shows, 35% of the women with PCOD symptoms had moderate symptoms (score 6-10), 57% of them had severe symptoms (score 11-15) and 8% of them had extreme symptoms (score 16-20).

SECTION III: Analysis of data of related to the effect of physical exercise and nutritional counseling in women with symptoms PCOD.

Part I

Table 4: Effect of physical exercise and nutritional counseling in women with changing categories of PCOD

N=100

PCOD symptoms	**Pre-test**		**Post-test**	
	Frequency	**%**	**Frequency**	**%**
BMI category				
Underweight	0	0%	0	0%
Normal	4	4%	69	69%
Overweight	96	96%	30	30%
Obese	0	0%	1	1%
Dietary pattern				
Vegetarian	35	35%	35	35%
Non-vegetarian	37	37%	37	37%
Eggetarian	28	28%	28	28%
Exercise pattern				
Routine	19	19%	65	65%
Irregular	45	45%	35	35%
No exercise	36	36%	0	0%

Table No 4 shows, in pretest, 4% of the women with PCOD symptoms in pretest were normal and 96% of them were overweight. In post-test, 69% of them had normal BMI, 30% of them were overweight and 1% of them were obese.

In pre-test, 35% of them were vegetarian, 37% of them were eggetarian and 28% of them had mixed dietary pattern. In post-test, 35% of them were vegetarian, 37% of them were eggetarian and 28% of them had mixed dietary pattern.

In pre-test, 19% of them had routine exercises, 45% of them had irregular exercises and 36% of them were not doing exercises at all. In post-test, 65% of them had routine exercises and 35% of them had irregular exercises.

Part II

Table 5: Effect of physical exercise and nutritional counseling in women with symptoms of PCOD

N=100

Symptoms	Pre-test		Post-test	
	Frequency	%	Frequency	%
No Symptom (0)	0	0%	0	0%
Mild(1-5)	0	0%	37	37%
Moderate (6-10)	35	35%	63	63%
Severe (11-15)	57	57%	0	0%
Extreme (16-20)	8	8%	0	0%

Table No 5 shows that 35% of the women with PCOD symptoms had moderate symptoms (score 6-10), 57% of them had severe symptoms (score 11-15) and 8% of them had extreme symptoms (score 16-20) in Pre-test. In Post-test, 37% of them had mild symptoms (score 1-5) and 63% of them had moderate symptoms (score 6-10). This indicates that the PCOD symptoms among women improved remarkably after physical exercises.

Table 6: Paired t-test for the effect of physical exercise and nutritional counseling in women with symptoms of PCOD

N=100

	Mean	**SD**	**t**	**df**	**p-value**
Pre-test	11.72	2.4	35.7	99	0.000
Post-test	6.08	2.0			

In table No 6, Researcher applied paired t-test for the effect of physical exercise and nutritional counseling in women with symptoms of PCOD. Average PCOD symptoms score in pre-test was 11.72 which were 6.08 in post-test. T-value for this test was 35.7 with 99 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis is rejected. It is evident that the PCOD symptoms improved significantly after physical exercises.

SECTION IV: Analysis of data related to the association between physical exercise and nutritional counseling with selected demographic variable

Table 7: Fisher's exact test for the association between physical exercise and nutritional counseling with selected demographic variable

N=100

Demographic variable	**Severity of PCOD symptoms**			**p-value**
	Extreme	**Moderate**	**Severe**	
Age:				
15-21	1	9	20	0.134
22-29	5	25	30	
30-37	2	1	7	
Age of Menarche:				
11- 13 Years	2	9	27	0.094
14 – 16 Years	6	26	30	
Menstrual history:				
Regular	1	14	11	0.074
Irregular	7	21	46	
Marital status:				
Married	6	12	26	0.108
Unmarried	2	23	31	
Education:				
Primary education	1	7	15	0.706
Secondary education	6	15	23	
Graduate	1	5	8	
Undergraduate	0	8	11	
Occupation:				
Housewife	6	18	30	0.505
Private Sector	2	17	27	
No. of children:				
None	6	30	47	0.709
One	2	5	10	
Use of contraceptive Pills				
Yes	2	4	3	0.108
No	6	31	54	

BMI category:				
Normal	0	2	2	0.739
Overweight	8	33	55	
Dietary pattern:				
Vegetarian	7	15	13	0.004
Non-vegetarian	0	13	24	
Eggetarian	1	7	20	
Exercise pattern:				
Routine	1	8	10	0.330
Irregular	4	19	22	
No exercise	3	8	25	

Table no 7 shows, since p-value corresponding to dietary pattern is small (less than 0.05) and dietary pattern was found to have significant association with the PCOD symptoms.

IV. Discussion:

The findings of the study have been discussed with reference to the objectives, and findings of the similar studies. Discussion of the findings are presented as for demographic variables, effect of physical exercise & nutritional counseling on symptoms of PCOD and the association between physical exercise and nutritional counseling with selected demographic variable.

In pre- test, 35% of the women with PCOD symptoms had moderate symptoms (score 6-10), 57% of them had severe symptoms (score 11-15) and 8% of them had extreme symptoms (score 16-20). In posttest, 37% of them had mild symptoms (score 1-5) and 63% of them had moderate symptoms (score 6-10). This indicates that the PCOD symptoms among women improved remarkably after physical exercises and nutritional counseling. In pre-test mean score was 11.72 with a standard deviation of 2.4 in post- test the mean score was 6.08 with a standard deviation of 2.0. Paired t-test was applied to compare the severity of PCOD symptoms among women before and after the nursing interventions of ROM exercise and nutritional counseling. Since P-value was small (less than 0.05), the null hypothesis is rejected. It is evident that the PCOD symptoms improved significantly after physical exercises. Thus, the physical exercise is proved effective in reduction in the severity of PCOD symptoms among Women's.

The association between the physical exercise and nutritional counseling with selected demographic variable was assessed using Fisher's exact test. Since p-value corresponding to dietary pattern is small (less than 0.05), dietary pattern was found to have significant association with the PCOD symptoms. Thus, the null hypothesis was rejected.

A study was done by Brenda Bruner, to assess the effects of exercise and nutritional counseling on hormonal, menstrual, and reproductive function in women with polycystic ovary syndrome (PCOS). Twelve females with a clinical, biochemical, and ultrasonographic diagnosis of PCOS were randomly assigned to endurance and resistance exercise plus nutritional counseling (EN) or nutritional counseling only (N) for a period of 12 weeks. . Anthropometry, resting metabolic rate (RMR), selected hormones, and ovarian follicle population were measured pre and post-intervention. The findings of the study shows that there is greater decrease in sum of 2 skin folds ($p = 0.002$) and a greater increase in estimated VO2 max ($p = 0.017$) occurred in the exercise group. Significant decreases in waist girth ($p = 0.001$) and insulin levels ($p = 0.03$) occurred in both groups. In the present study, also it is observed that nursing interventions of Range Of Motion exercise and nutritional counseling is effective in reduction of PCOD symptoms among women's in reproductive age group.[4]

Similarly an evaluative study with quasi experimental design was conducted to assess the effect of lifestyle changes on symptoms of polycystic ovarian syndrome in obese girls. Multistage sampling technique used. The data's collected through self administrated questionnaire, includes demographic profile and clinical characteristics, menstrual patterns, lifestyle habits and knowledge about PCOS. They have also provided with record sheet for diet, exercise and changing symptoms. The result of the study revealed that there was a highly statistically significant difference regarding knowledge about PCOS and a highly significant improvement of menstrual frequency, menstrual problems and weight loss post intervention ($P < .001$). Also highly significant decreases in waist circumference ($P < .001$), hirsutism and acne total score. There was significant difference in

psychological status post intervention. Study concluded that lifestyle changes positively affect in reducing symptoms of PCOS.[5]

In present study evaluative approach with pre-experimental one group pre-test post – test design used. 100 samples were selected by non- probability purposive sampling technique. Existing symptoms of PCOD was assessed with PCOD symptom checklist. Pre –test was conducted and demonstrated the nursing interventions of Range Of Motion exercise along with information regarding PCOD diet was given on same day and the post test was taken after one month

The findings of the study shows that Average PCOD symptoms score in pre-test was 11.72 which was 6.08 in post-test. T-value for this test was 35.7 with 99 degrees of freedom. Corresponding p-value was small, 0.000 (less than 0.05), the null hypothesis is rejected. It is evident that the PCOD symptoms improved significantly after physical exercises. Fisher's exact test used to find the association between physical exercise and nutritional counseling with selected demographic variables. Since p-value corresponding to dietary pattern is small, 0.004 (less than 0.05), dietary pattern was found to have significant association with the PCOD symptoms.

V. Conclusions:

The main aim of the study was to assess the effect of physical exercise and nutritional counseling on symptoms of PCOD among women. In this study since the ($p<0.05$) H0 (null hypothesis) is rejected. It is evident that the physical exercise and nutritional counseling is very effective in managing the PCOD symptoms among women diagnosed with PCOD.

Conflict of Interest- Nil
Source of Funding- Dr. D Y Patil Vidyapeeth, Pimpri, Pune.

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Mrs. Jithya PM. "A study to assess the effect of physical exercise and nutritional counseling on symptoms of PCOD among women's at selected areas of Pune." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 9(5), 2020, pp. 46-52.