

Assess the Effectiveness of Life Style Modification Regimen on Polycystic Ovary Syndrome among Adolescent Girls in Selected Colleges, Puducherry - Pilot study

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Abstract

Background: Polycystic ovary syndrome is a common endocrinopathy affecting women of reproductive age. Commonly manifested by polycystic ovary, menstrual irregularities and hyperandrogenism even though the presentation could be heterogeneous. Insulin resistance (IR) is considered to be accountable for the associated hormonal and metabolic derangements. Polycystic ovary syndrome has two phenotypes, overweight/obese and lean.

Objectives & Methodology: Quasi experimental one group pre and posttest timeseries research design was adopted to assess the effect of Life Style Modification Regimen on Polycystic Ovary Syndrome among 16 Adolescent Girls in selected Arts and Science Colleges, Puducherry. Baseline screening was done for 112 adolescent girls by census method using modified PCOS risk assessment questionnaire and identified adolescent girls with PCOS. Adolescent girls at moderate risk of PCOS with BMI 23 and above were included in the study. PCOS risk and Lifestyle habits were assessed before and after implementation of Lifestyle Modification Regimen, whereas clinical features of PCOS were assessed at baseline, at 2months (Posttest-1), 4 months (Posttest-2) and at 5 months (Posttest-3).

Results: Study results shows that significant difference between Pre and posttest PCOS risk (17.507) and lifestyle habits (Dietary habits: -3.873 and Physical activity: -2.236) at $p < 0.05$ level. Improvement found in the clinical features of PCOS including weight, BMI, menstrual cycle, Hirsutism and Acne at $p < 0.05$ level. Similar percentage (50%) of them had unfavorable and moderately favorable dietary habits during pretest, whereas in posttest 81.3% and 18.7% had moderately favorable and fa-

vorable dietary habits and highest percentage (62.5%) of them had Moderately favorable physical activity in pretest, whereas 75.8 and 24.2% had Moderately favorable and favorable physical activity respectively in posttest. Significant association found between the pretest level of PCOS risk and lifestyle habits of adolescent girls (dietary habits: 12.444 & Physical activity: 6.661) at $p < 0.05$ level and also observed association between the pretest level of PCOS risk and selected demographic variables such as age in years and monthly family income in Rs at $p < 0.05$ level.

Conclusion: Lifestyle Modification brings positive change in lifestyle habits, risk of PCOS and clinical features of PCOS among adolescent girls at risk of PCOS. Study concludes that Healthy lifestyle practices prevents the development of PCOS by risk reduction. Primordial prevention involving early identification of Risk of PCOS promotes reproductive health of the adolescent girls.

Key words

Adolescent Girls and Risk of PCOS, lifestyle habits, lifestyle modification regimen.

Imprint

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BACKGROUND

Health is a fuel that runs a human body with the regular activities and functions. In women's, reproductive health plays an important role of general health which needs universal concern. It is very important to care themselves during their reproductive age in order to prevent reproductive health related problems. Improper reproductive life pose risk to the life of a woman. Many times, woman has the risk of infertility, contraception, and other reproductive infections caused by sexual practices. Irregular menstrual periods among women cause such ovulatory dysfunctions and polycystic ovarian syndrome. Women with PCOS have no regular periods, and are not able to ovulate and get pregnant. ⁽¹⁾

Polycystic ovary syndrome is a common endocrinopathy affecting women of reproductive age. Com-

monly manifested by polycystic ovary, menstrual irregularities and hyperandrogenism even though the presentation could be heterogeneous. Insulin resistance (IR) is considered to be accountable for the associated hormonal and metabolic derangements. Polycystic ovary syndrome has two phenotypes, overweight/obese and lean. The prevalence of lean PCOS is much less common comparatively overweight/obese PCOS. ⁽²⁾

Poly Cystic Ovarian Syndrome (PCOS) is the common endocrine disorder globally increased the prevalence of overweight and obesity among women and young women. It is a heterogeneous disorder involved with multiple etiology that has been made it difficult to define the syndrome by diagnostic test. It is very important for women to take care of their health during their reproductive years because much reproductive health related problems can arise during this period. Any failure in living a healthy reproductive life could cause a risk to the life of women and adds to the maternal mortality rate. Women bear the risk of infertility and many other reproductive infections. ⁽³⁾

NEED FOR THE STUDY

Polycystic ovary syndrome (PCOS) is a common endocrine disorder with a global prevalence of 5-10% and is an important cause of chronic an ovulation in young women. PCOS is characterized by menstrual irregularity, signs of hyperandrogenism such as acne, excess body hairs, male-pattern baldness and infertility. In addition, PCOS is linked to many long-term health problems such as cardiovascular diseases and diabetes. ⁽⁴⁾

Polycystic ovarian disease in teenager is characterized irregular or completely absent periods, heavier than normal menstrual bleeding, ovarian cysts, hirsutism and alopecia. Other symptoms range from acne, skin tags and brown skin patches to reduced sex drive, exhaustion or lack of mental alertness, depression anxiety, sleep apnea and thyroid problems. Teens with overweight are increasingly being linked with Polycystic Ovarian Disease. ⁽⁵⁾ Women diagnosed with Polycystic ovary syndrome (PCOS) experienced poor quality of life, greater anxiety and depression than women without PCOS related to BMI status. ⁽⁶⁾

A community based cross sectional study conducted on prevalence of PCOS among 778 young girls and adolescents aged between 15-24 years in Mumbai. Clinical, USG and biochemical investigations were completed by 600 adolescent girls. Results reveals that,

prevalence of PCOS was 22.5% by Rotterdam criteria and 10.7% by Androgen Excess Society criteria. Prevalence of PCOS among nonobese comprised of 71.8% diagnosed by Rotterdam criteria. Mild PCOS comprised of 52.6%. ⁽⁷⁾

A cross sectional study was conducted to assess the dietary habits and life style among 384 pre-university college students, Raichur, India. Results reveals that 45.6 % were male and 54.4% were females. The mean age was 16.75 yrs. 184 (48%) students were predominantly vegetarians. 176 (45.8%) reported consumption of junk food more than once in a week and 338 (88%) reported to use fruits and vegetables occasionally in their diet. Only 147 (38.3%) students walked at least for 30 minutes and did exercise daily. The study concludes that prevalence of unhealthy dietary habits and life style are more also with obesity. ⁽⁸⁾

Cross-sectional study was carried out among 420 girls residing in the social welfare hostels in urban area of Vizianagaram District, Andhra Pradesh, India. The result shows that 56.4 % girls were undernourished. 2.9% was found to be overweight and none of the girls was found to be obese. According to the new guidelines by the Government of India 56.4 % was found to be undernourished while 5.8 % was found to be Overweight. ⁽⁹⁾

METHODOLOGY

Quasi experimental one group pre and posttest study was conducted to investigate the effect of Life-style modification Regimen on the risk of PCOS among Adolescent Girls in selected Arts and Science College, Puducherry.

Tool for data collection

Section -I: Modified PCOS risk assessment questionnaire consist of 09 items

Section -II: Demographic variable consist of 13 items

Section - III: Five-point rating scale on lifestyle habits consist of 30 items in two sections for dietary habits and physical activity

Section -IV: Tool to assess the clinical features of PCOS

Description of Intervention

Duration: Four months

1. Group Counseling Session
2. Aerobic exercise for weekly three days for 30 minutes

3. Structured dietary guidelines for PCOS

Ethical consideration

Forma permission taken from Institutional Review Board, Directorate of Technical & Higher Education and Principal of the College, Puducherry. Informed consent was taken after explaining the study purpose and assent and parent consent taken for the minors.

Data collection procedure

Data collection was carried out from four months in 2021. Baseline screening was done for 112 adolescent girls by census method using modified PCOS risk assessment questionnaire and identified adolescent girls with PCOS. Adolescent girls at moderate risk of PCOS with BMI 23 and above (16) were included in the study. SAQ used to collect data on demographic variable, PCOS risk and Lifestyle habits were assessed before and after implementation of Life Style Modification Regimen, whereas clinical features of PCOS were assessed at baseline, at 2months (Posttest-1), 4 months (Posttest-2) and at 5 months (Posttest-3).

RESULTS

Demographic characteristics shows that 62.5% of them were in 19 yaers, 62.5% belongs science background, 43.7% of them attained menarche at 14-15 years of age, similar percentage (87.5%) were non-vegetarian and Hindus, 31.3% had monthly family income of Rs.10,110 – 15,159, 81.2% of them were belongs to nuclear family, 56.3% from rural, similar percentage (37.5%) of the mother and father studied Higher secondary education, 31.3% and 6.3% had family history DM and PCOS respectively and 25.0% got previous information about PCOS. (Table no.1)

Table 1

Frequency and percentage distribution of Adolescent Girls according to socio demographic variables n = 16

Sl.No	Socio demographic variables	Frequency (f)	Percentage (%)
1.	Age in year		
	17	3	18.8
	18	3	18.8
	19	10	62.5
2.	Education		
	B.Sc	10	62.5
	B.Com	3	18.8
	BCA	3	18.8

3.	Age at Menarche in years		
	10-11	2	12.5
	12-13	6	37.5
	14-15	7	43.7
4.	Dietary Pattern		
	Vegetarian	2	12.5
	Non-vegetarian	14	87.5
5.	Religion		
	Hindu	14	87.5
	Christian	2	12.5
6.	Monthly family Income in Rupees		
	≥ 40,430	1	6.3
	20,210 – 40,429	3	18.8
	15,160 – 20,209	3	18.8
7.	Type of family		
	Joint	3	18.8
	Nuclear	13	81.2
8.	Place of residence		
	Urban	7	43.8
	Rural	9	56.3
9.	Father's Education		
	Secondary	3	18.8
	Higher secondary	6	37.5
	Diploma	5	31.3
10.	Mother's Education		
	Primary	2	12.5
	Secondary	4	25.0
	Higher secondary	6	37.5
11.	Family history of DM		
	Yes	5	31.3
	No	11	68.8
12.	Family history of PCOS		
	Yes	1	6.3
	No	15	93.7
13.	Previous source of information		
	Yes	4	25.0
	No	12	75.0

Similar percentage (50%) of them had unfavorable and moderately favorable and none had favorable dietary habits whereas, 81.3% had moderately favorable and 18.7% had favorable dietary habits in posttest. (Table no.2)

Table: 2

Distribution of Adolescent Girls according to Dietary Habits
n = 16

Dietary Habits	Pretest		Post test	
	f	%	f	%
Unfavorable	8	50.0	0	0
Moderately favorable	8	50.0	13	81.3
Favorable	0	0	3	18.7

Highest percentage (62.5%) of them had Moderately favorable and none had favorable physical activity whereas, 75.8% had moderately favorable and 24.2% had favorable physical activity in posttest. (Table no.3)

Table 3

Distribution of Adolescent Girls according to Habit of Physical activity
n = 16

Habit of Physical activity	Pretest		Posttest	
	f	%	f	%
Unfavorable	6	37.5	0	0
Moderately favorable	10	62.5	13	75.8
Favorable	0	0	3	24.2

Frequency of menstrual cycle shows that in pretest highest percentage (50.00%) had frequency of menstrual cycle 36-41 days whereas in Posttest 71.42% had their menstrual cycle at 21 – 35, Duration of menstrual blood flow depicts that during pretest similar percentage (35.72%) of them had duration of 3-5 days and < 3days, whereas in posttest highest percentage (71.42%) had duration of 3-5 days and Perceived blood loss shows that 64.28% of them perceived moderate blood loss in pretest, whereas in posttest 78.57% of them perceived moderate blood loss (Table no.4)

Significant difference in the Pre and posttest PCOS risk among adolescent girls and calculated t- value was 17.507 at $p < 0.01$ level. It concludes that there was positive improvement in PCOS risk after implementation of lifestyle modification regimen (Table no.5)

Significant difference in the Pre and posttest Lifestyle habits among adolescent girls and calculated t- value was -3.873 and -2.236 at $p < 0.01$ level respectively for dietary habits and physical activity. It concludes that there was positive improvement in lifestyle habits after implementation of lifestyle modification regimen. (Table no.6)

Significant difference in the Pre and posttest clinical features of the adolescent girls that during pretest mean weight score was 61.38 ± 4.90 whereas in posttest-3 the

Table 4

Percentage wise comparison of pre and Posttest menstrual pattern of Adolescent Girls
(N = 14)

Menstrual Pattern	Pretest		Posttest-3	
	f	%	F	%
Frequency				
< 21 Days	1	7.14	1	7.15
21-35 Days	5	35.72	10	71.42
36 – 41 Days	7	50.00	3	21.43
42 – 60 Days	1	7.14	-	-
Duration				
< 3 days	5	35.72	2	14.29
3 - 5 days	5	35.72	10	71.42
> 5days	4	28.56	2	14.29
Perceived blood loss				
Light	3	21.43	2	14.29
Moderate	9	64.28	11	78.57
Heavy	2	14.29	1	7.14

Table 5

Compare the effect of lifestyle modification regimen on PCOS risk
(n = 16)

Level of PCOS risk	MD	SD	t - value	P
Pretest and Posttest PCOS risk	3.563	0.814	17.507	.000

$p < 0.01$ - significant

Table 6

compare the effect of lifestyle modification regimen on lifestyle habits
(n = 16)

Lifestyle habits		Mean	SD	t – value	p-value
Dietary habit	Pretest	1.94	.250	-3.873	.002
	Posttest	2.44	512		
Physical activity and Sleep	Pretest	1.94	.250	-2.236	.041
	Posttest	2.19	403		

$p < 0.05$ significant

mean weight score was 57.45 ± 4.190 and calculated t-value was 11.135 at $p < 0.01$ level, mean BMI score was 25.10 ± 1.805 during pretest, whereas in posttest-3 the mean BMI score was 23.48 ± 1.333 and calculated t-value was 10.767 at $p < 0.01$ level, pretest mean hirsutism score 10.91 ± 2.948 whereas in posttest-3 the mean hirsutism score was 9.09 ± 3.986 and calculated t-value was 4.303 at $p < 0.05$ level and pretest mean acne score 21.92 ± 5.760 whereas in posttest-3 the mean acne score was 11.33 ± 2.015 and calculated t-value was 8.474 at $p < 0.01$ level (Table no.7)

Table 7

Effect of lifestyle modification regimen on clinical features of PCOS

Clinical features of PCOS		Mean	SD	Mean Diff.	t-value	p-value
Weight (N = 16)	Pretest	61.38	4.9055	-	-	-
	Posttest-1	60.28	4.6780	1.10	8.375	.000
	Posttest-2	58.80	4.2531	2.58	9.045	.000
	Posttest-3	57.45	4.1901	3.93	11.135	.000
BMI (N = 16)	Pretest	25.10	1.8054	-	-	-
	Posttest-1	24.65	1.6729	0.45	8.332	.000
	Posttest-2	24.05	1.5060	1.05	9.206	.000
	Posttest-3	23.48	1.3336	1.62	10.767	.000
Hirsutism (N = 11)	Pretest	10.91	2.948	-	-	-
	Posttest-1	10.27	3.101	.636	2.609	.026
	Posttest-2	10.27	2.867	.636	3.130	.011
	Posttest-3	9.09	3.986	1.818	4.303	.002
Acne (N = 12)	Pretest	21.92	5.760	-	-	-
	Posttest-1	18.75	5.207	3.18	13.385	.000
	Posttest-2	14.67	3.284	7.25	7.864	.000
	Posttest-3	11.33	2.015	10.58	8.474	.000

p < 0.01 highly significant & p < 0.05 significant

Significant association found between the pretest level of PCOS risk and lifestyle habits of adolescent girls (dietary habits: 12.444 & Physical activity: 6.661) at p < 0.05 level (Table no.8) and also observed association between the pretest level of PCOS risk and selected demographic variables such as age in years and monthly family income in Rs at p < 0.05 level. (Table no.9).

Table 8

Association between the Pretest PCOS risk and lifestyle habits of adolescent girls (N = 16)

Parameter	χ^2	p-value
Pretest PCOS risk and dietary habits	12.444a	.002
Pretest PCOS risk and Physical activity	6.661a	.036

p < 0.05 significant.

Table 9

Association between Pretest PCOS risk with selected Demographic variables of the adolescent girls (N = 16)

S Sl.no	Demographic variable	Pretest PCOS risk	
		χ^2	p-value
1	Age in years	9.813a	.044
4	Diet	1.778a	.411
8	Monthly family income in Rs	18.560a	.017
9	Type of family	4.622a	.099
10	Residence	.062a	.969
11	Family history of PCOS	2.216a	.330

p < 0.05 significant.

DISCUSSION

Study results suggests that significant reduction in posttest PCOS risk (17.507) and improvement in lifestyle habits (Dietary habits: -3.873 and Physical activity: -2.236) at p < 0.05 level, and also improvement found in the clinical features of PCOS including weight, BMI, menstrual cycle, Hirsutism and Acne at p < 0.05 level. Anju Krishnan Nair et.al⁽¹⁰⁾ also observed similar findings after implementation of lifestyle modification package among adolescent girls that 66.4% and 15.2% had weight loss and weight stabilization respectively. Lass et.al⁽¹¹⁾ also reported that weight loss after lifestyle intervention was significantly associated with positive change in the menstrual pattern.

Similar percentage (50%) of them had unfavorable and moderately favorable dietary habits during pretest, whereas in posttest 81.3% and 18.7% had moderately favorable and favorable dietary habits and highest percentage (62.5%) of them had Moderately favorable physical activity in pretest, whereas 75.8 and 24.2% had Moderately favorable and favorable physical activity respectively in posttest. Manijeh Alavi et.al⁽¹²⁾ also reported that 54.4% of the adolescent girls had moderate nutrition behavior and Binati Behera et.al⁽¹³⁾ reported that 52.3% and 46.4% of the adolescents and young adult students had slow and moderate physical activity respectively.

Significant association found between the pretest level of PCOS risk and lifestyle habits of adolescent girls (dietary habits: 12.444 & Physical activity: 6.661) at p < 0.05 level and also observed association between the pretest level of PCOS risk and selected demographic variables such as age in years and monthly family income in Rs at p < 0.05 level.

CONCLUSION

Lifestyle Modification brings positive change in lifestyle habits, risk of PCOS and clinical features of PCOS among adolescent girls at risk of PCOS. Study concludes that Healthy lifestyle practices prevents the development of PCOS by risk reduction. Primordial prevention involving early identification of Risk of PCOS promotes reproductive health of the adolescent girls.

Conflict of interest

nil

Source of funding

nil

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