



Effect of lifestyle changes intervention on quality of life and self-esteem of adolescent female with polycystic ovary syndrome

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ABSTRACT

Background: Polycystic ovary syndrome is most common female endocrine disorder which cause distress in both physical and emotional well-being and leads to long life suffering of the affected female, so the aim of this study is to assess impact of lifestyle changes intervention on quality of life and self -esteem of adolescent female with polycystic ovary syndrome. **Methods:** Predictive correlation research design was used. A purposive sample of 50 females with PCOS were included. Pre/post intervention subject's assessment was done. The intervention was administered in five sessions. Quality of life, self f-esteem were measured pre and post intervention. **Results:** Subjects' knowledge regarding poly cystic ovary was improved significantly post the intervention, also incidence of obesity among subjects' decreased by 16% compared with 66% pre intervention. Regarding subjects' self-esteem 96% of the subjects had low self-esteem before the intervention, compared to 30 percent after 6 months and just 20% after 12 months. There were also significant variations in physical, psychological, and social domains of quality of life pre and post the intervention. **Conclusion:** The lifestyle modifications have a positive effect on the quality of life and self-esteem of the study participants. **Recommendation:** Lifestyle changes are the starting point for PCOS adolescent females to enhance their awareness, quality of life, and self-esteem, as well as sustain their therapeutic plan compliance, and they need long-term follow-up, as well as their ability to cope with PCOS and overall life satisfaction.

Key words: Lifestyle changes, Quality of life, Self esteem, Adolescent female, Polycystic ovary syndrome.

Introduction:

Polycystic ovarian syndrome (PCOS) is one of the most common metabolic and reproductive disorders among women in reproductive age. Women with PCOS experience several of symptoms related to menstrual dysfunction and androgen excess, all of which have a negative effect on their quality of life. They may also be at an elevated risk of various morbidities, such as

obesity, insulin resistance, and thyroid disease.¹ PCOS is a hormonal, metabolic, and psychosocial disease that has a negative impact on the quality of life of patients. It's especially crucial to treat polycystic ovaries patients holistically and early on in order to cope with emotional stress.² Chronic anovulation, hyperandrogenism, and polycystic ovaries are all symptoms of this condition, which has an uncertain

etiology and is characterized by reproductive disturbances.³ PCOS is a congenital condition with symptoms that appear during puberty. The predominant cause of the high levels of androgen (male hormones) associated with PCOS is unclear, but it tends to run in families. Many of these clinical symptoms arise during adolescence and have a long-term effect on an adolescent's or women daily wellbeing and activities of daily living.⁴

The prevalence of PCOS in fertile women is estimated to be between 15% and 20%.⁵ While adolescent girls' menstrual abnormalities are frequently attributed to an immature uterus, axis of the hypothalamus, pituitary, and gonadal glands.⁶ Many girls with chronic menstrual irregularities could have PCOS.³ PCOS affects 6.6% of Egyptian teenage girls, and 12.6% of those who are at high risk.⁷

Disordered neuroendocrine gonadotropin secretion, hyperandrogenism, insulin resistance, and hyperinsulinemia, or a mixture of these, are all accepted etiologic hypotheses. Around half to seventy percent of women with the disease go undiagnosed. Nurse practitioners and dermatology nurses play an important part in early diagnosis.⁸ To record hyperandrogenemia, measurements of total and/or free testosterone hormones are taken. Additional laboratory investigations can be ordered if needed to rule out other causes.⁹ PCOS signs have an effect on teenage girls' body image and self-esteem. Young women need support to deal with the physical and psychological effects of polycystic ovary syndrome. Polycystic ovary syndrome may have long-term consequences.¹⁰ It is linked to a lot of metabolic and psychological problems. Insulin resistance, hyperinsulinemia, overweight, obesity, metabolic syndrome, decreased glucose tolerance, and type 2 diabetes are all more common in PCOS-affected adolescents. Adolescents

with PCOS have a higher incidence of depression, anxiety, and psychiatric and subclinical eating disorders. It can be easily healed if treated during the early adolescent phase.⁸

Patients' treatment plans should be adapted to their specific needs; combined oral contraceptives are the first line of defense. Anti-androgens are used in pharmacotherapy to control the growth of terminal hair. Metformin can be used for women with PCOS who have type 2 diabetes or compromised glucose tolerance and have not changed with lifestyle changes.⁹ The first line of treatment for PCOS is lifestyle change, which includes diet, exercise (150 minutes a week), and weight control. This reduces women's body weight, central obesity, testosterone levels, hirsutism, and insulin resistance.¹⁰ Alternative treatments are useful because they treat without causing side effects, and yogic practices for the treatment of PCOS-like syndromes have been found to be particularly effective.¹¹ Nurses may be able to support women with PCOS by offering counseling and education. Assist the patient in overcoming negative self-image caused by PCOS's physical manifestations. Which assist the patient in making positive lifestyle changes and improving coping abilities.¹²

2. Significance of the study:

Polycystic ovary syndrome constitute a stressful point for the affected female & their family members and its manifestation effect life style aspect of the affected female so this investigate impacts of lifestyle changes intervention on quality of life and self-esteem of female with polycystic ovary syndrome.

3. Materials and Methods

3.1. Study aim:

- 3.1.1. To investigate the impact of polycystic ovary syndrome on psychological and quality of life of girls

3.1.2. Design a plan for lifestyle changes intervention used to overcome this problem through:

- Improvement of women's knowledge and increase their awareness regarding PCOS.
- Diet and physical exercise program to overcome obesity and improve body image

3.2. Hypothesis:

3.2.1. Subjects' weight & BMI will improved significantly post the intervention.

3.2.2. Subjects' knowledge will improved significantly post intervention.

3.2.3. Subjects' self-esteem will improved significantly post intervention.

3.2.4. Subjects' life quality domains will improved significantly post intervention.

3.3. Research design: Predictive correlation research design was used for current study

3.4. Setting of the study: It was conducted at ant natal clinic unit women health hospital, Assiut University, Egypt.

3.5. Sample of study: a purposive sample of 50 women in reproductive age admitted with PCOS from April 2018 till April 2019 was included. All females attending the study setting under certain criteria was included in the study sample: still menstruating, have intact uterus & ovaries, not taking any hormonal medical treatment and include two out of three of the following: Polycystic-ovaries, oligo/anovulation and signs of hyperandrogenism to be included in the study.

3.6. Tools of this study:

(A) A structured interviewing schedule that includes Socio-demographic and clinical characteristics of the studied sample as (age, marital status, family

income level of education, body mass index, weight and menstruation

(B) **Rosenberg Self-Esteem Scale (RSE)¹³:** This scale attempt to achieve a one-dimensional measure of global self-esteem. It contains 14 questions, including the RSE elements that were designed to reflect a spectrum of self-worth statements ranging from statements supported by subjects with low self-esteem to statements endorsed only by subjects with high self-esteem. Developed by RSE; Rosenberg, translated by psychologist; Dr/Sayed Yusuf and modified by the researcher. All items are answered using a 4-point Likert scale format ranging from strongly agree to strongly disagree

(C) **The Short Form Health Survey (SF-36)¹⁴:** The Short Form Health Survey (SF-to assess the QOL is a well-generic-validated-instrument that measures 9 subscales: physical functioning, role limitations related to physical problems, energy and vitality, bodily pain, general health perception, change in health, social functioning, role limitations related to emotional problems, and mental health. The score for each subscale ranges from 0-100 where higher scores indicate better conditions.

3.7. Validity and reliability of the tools:

The questionnaire was developed in consultation with two gynecologists, two maternity & gynecological nursing professors, and an expert in questionnaire validation. The validity of the used tools was evaluated by a health-care specialists and modifications were done accordingly based on their judgment, while its reliability assessed by piloting & measuring the related Cronbach Alpha value (Alpha = 0.88).

3.8. Pilot study:

Pilot study was conducted on 10 female with PCOS to test the feasibility and applicability of the tools, and to estimate the time needed for data

collection. Necessary modification/omission/addition was followed as needed according to the results of the conducted pilot study.

3.9. Ethical considerations :

Ethical approval was obtained from research ethics committee at the institutional review board at Faculty of nursing, Minia University. Written informed consent was obtained from all participants before the study. They will; be also informed that each participant has the right to withdraw from the study at any time without any consequences. Anonymity, privacy safety and confidentiality will absolutely be assured throughout the study.

3.10. Intervention sessions:

Intervention demonstrated in 5 sessions: 50 minutes each, on one day. In the opening ceremony session, the researchers introduce their self to participants and get their expectations, then distribute pre-test to assess participants' baseline-knowledge regarding PCOS. **The 1st session** covers an introduction and overview regarding PCOS. **The 2nd session** illustrates etiology, clinical features and complications of PCOS. **The 3rd session** discussed the therapeutic measures for PCOS and its associated manifestation as acne, hirsutism, etc. **The 4th session** covers all points regarding the healthy instructions and QOL for a patient with PCOS as mentioned healthy diet. The Prescribed Low Calorie Diet: All patients were given an interview-based food survey to determine their previous eating patterns and any dietary abnormalities. The low-calorie diet recommended was healthy, with 15 percent protein, 30 to 35 % fat, and 50 to 55 % carbohydrate on average, to provide around 1000 calories per day for a year. Along with the Low Calorie Diet, the participants were told to eat 4-5 servings of fresh vegetables and fruits, whole grains, and fiber-rich foods. A multivitamin, as well as 8 to 10 glasses of

water or clear fluids, are recommended to help fill in nutritional deficiencies and encourage optimal organ function. On the other side, they were told to consume less foods high in saturated fats, such as meats, cheeses, and fried foods, and to eat more fiber and polyunsaturated fat. Participants were also told to change their eating habits (e.g., avoid eating while watching television or soon before bedtime; avoid drinking through/immediately after meals; rather drink before meals). **The 5th session** includes all facets of physical activity to illustrate physical activities such as brisk walking, treadmill, or exercise bicycle to regulate body weight and be exercised at least 5 days a week, starting at 10 minutes a day and progressively rising to 30 to 35 minutes a day for 5 days a week over a one-year period. List methods for reducing obesity and maintain ideal body weight. The 6th session was closed by distribution of the post-test to evaluate the effect of the intervention on participants' knowledge. Researchers adopted a problem-solving approach in sessions which allowed participants to participate and discuss their concerns. During the sessions, short films, presentations, illustrated pictures, and group discussion were held. At the end of each session, the researcher summarized the important points and the participants were encouraged to ask and show their personal experience.

3.11. Statistical analysis:

Data entry done using the statistical package for Social Sciences (SPSS version 20). Data were presented using descriptive statistics in the form of numbers and percentages. Qualitative variables were compared by Chi-square test. Level of significance (p-value) was measured at .05; $p > .05$ = Non-significant and $p < .05$ = Significant.

4. Results

4.1. Personal data

Table 1 show personal characteristics of the sample

Items	No. (50)	%
Age: (years)		
Less than 20	16	32%
20 – 30	34	68%
Marital status:		
Married	20	40%
Single	30	60%
Family income:		
Enough	31	62%
Not enough	19	38%
Education level:		
Secondary	24	48%
University	26	52%
Body Mass Index (BMI)		
Normal body weight (BMI: 18.5-24.9 kg/m ²).	20	40%
Over weight (BMI: 25-29.9 kg/m ²).	13	26%
Obese (BMI; of 30 or greater kg/m ²).	17	34%
Menstruation:		
Regular	20	40%
Irregular	30	60%

Table (1): Personal data

4.2. Subjects knowledge

Subjects' knowledge about poly cystic ovary was improved significantly post the intervention as presented in table 2.

Table (2): Subjects’ knowledge about Poly Cystic Ovary (pre and post the intervention).

Correct answer	Correct answer						X ¹	X ²	
	Pre intervention		post 6 months intervention		post 12 months intervention				
	No	%	No	%	No	%			
1. Definition	9	1	31	62	33	66	6.4	5.64	0.003
2. Causes.	1	2	34	64	41	82	5.33	6.23	0.044
3. Signs and symptoms	4	8	37	74	35	70	4.33	5.24	0.032
4. Required diet.	3	6	39	78	40	80	5.64	3.20	0.023
5. Management.	6		36	72	35	70	3.86	3.54	0.032
6. Complications	5	10	45	90	44	88	4.53	7.37	0.032

4.3. Body mass index

Table (3) revealed that number of women complaining from obesity decreased post intervention compared pre intervention.

Table (3) Body mass index of the studied women (pre and post the intervention).

Item	Pre intervention		post 6 months		post 12 months		X ¹	X ²	P
	No	%	No	%	No	%			
BMI	33	66	31	62	9	16	6.4	5.64	0.003

4.4. Self-esteem

Figure 1 shows that self-esteem of studied subjects was improved post the intervention where more than two thirds of them have high self-esteem post the intervention 70% post 6 months of the intervention and 80% post 12 months compared with only 4 % pre the intervention.

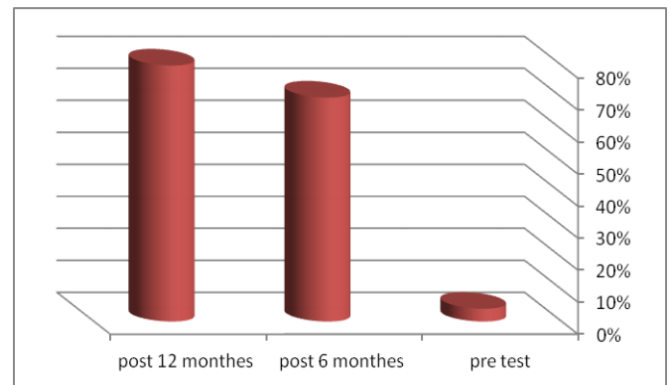


Figure (1): Subjects self-esteem (pre and post the intervention).

4.5. Quality of life

Table (4) show that significant differences in physical, psychological and social domains of quality of life pre and post the intervention among studied subjects.

Table (4) studied subjects quality of life (pre and post the intervention).

Items	Pre test		Post 6 months		post 12 months		X ¹	X ²	P
	No	%	No	%	No	%			
Physical	8	16	28	56	30	60	6.325	5.632	0.013
Psychological	2	4	30	60	35	70	5.326	6.230	0.044
Social	3	6	35	70	33	66	4.326	5.214	0.032

5. Discussion

Women with PCOS experience several of the symptoms related to menstrual dysfunction and androgen overload, both of which have a negative

effect on their quality of life.¹ Young women with PCOS continue to be concerned about lifestyle changes. The first-line therapy remains lifestyle changes aimed at preventing long-term problems. Obese and overweight PCOS patients with metabolic and reproductive abnormalities tend to benefit from lifestyle modifications such as diet, exercise, and behavioral modification.¹⁵ Many of the health issues associated with PCOS, such as high blood pressure and diabetes, can be alleviated by losing weight. Weight loss alone will also normalize hormone levels, allowing many symptoms to go away or become less intense. Healthy eating habits and exercise are excellent ways to reduce weight gain. Talking with other PCOS-affected teens and women is a great place to learn about recovery options and get help.¹⁶

The current research found that two-thirds of the subjects were between the ages of 20 and 30, which is consistent with findings of Witchel et al., 2015¹⁷ whom mentioned that diagnosing PCOS in children and adolescence is difficult due to the fact that typical pubertal physiological activities appear to resemble PCOS signs and symptoms. Because of the overlap between normal puberty and the diagnostic pathological requirements for PCOS, teenage girls may be over diagnosed with PCOS, resulting in inappropriate care and psychological disability.¹⁸ Our study is not consistent with Nivetha.M, 2016¹⁹ who discovered that 7.14 % of people between the ages of 18 and 31 have PCOS. Also, about a third of the women in the study were obese, which is consistent with Abd Elmenim & Emam, 2016¹² who found that women with a higher BMI, were overweight or obese (48.1 %) were more likely to have PCOS. Also Glueck et al., 2005²⁰ who discovered that PCOS prevalence ranges from 61 to 76 %.

About more than half of the studied sample (57%) complaining from irregular menstruation this finding is consistent with Amer et al., 2002 & Hahen et al., 2005^{21, 22} who revealed that nearly 75% of PCOS patients have clinically noticeable menstrual dysfunction. Also study finding in accordance with Eichenfield, et al., 2013²³ who reported that PCOS in adolescent girls may cause irregular menstrual cycles, hirsutism, and/or acne. Main amenorrhea (absence of menarche by 15 years of age or 2–3 years after breast budding), secondary amenorrhea (more than 90 days without a period with a background of previous menstrual periods), oligomenorrhea, and sever uterine bleeding.¹⁷ Menstrual dysfunction affects 50 to 90 percent of women with PCOS, and signs include oligomenorrhea (irregular menstrual cycles) or amenorrhea (absence of menstruation).^{24, 25}

The current study's findings showed a highly statistically significant difference was found in the weight and BMI of the studied sample post intervention compared to pre intervention so 1st research hypothesis was accepted. This result is consistent with Ahmed, et al., 2013²⁶ who discovered a substantial reduction in their anthropometric measures/weight loss; more than three-quarters of the studied sample were obese, but the intervention lowered this percentage to less than one-half, suggesting that the intervention was effective in lowering the obesity percentage by more than one-third. Also Bruner B, et al. 2006²⁷ who tried to find out what role exercise played in the treatment of obese PCOS patients. This could be explained by the fact that the majority of girls wanted a healthy body image and planned to conceive in the future, so they were more motivated to change their lifestyle.

The present study revealed that, there was a statistical significant differences in knowledge regarding definition, causes, and signs & symptoms,

required diet and management of PCOS post intervention (p 0.003, 0.044, 0.032.) so the 2nd research hypothesis was accepted and Subjects' knowledge about poly cystic ovary was improved significantly post the intervention. These findings are in agreement with Sowmya, et al.2013¹⁶ Who believed that after a comprehensive teaching program on polycystic ovarian syndrome knowledge among adolescent girls, there was a marked difference in knowledge scores about PCOS. Also these findings are in accordance with Colwell, et al. 2013²⁸ who reported that after participating in a clinical research study, girls with PCOS felt they had more awareness and incentive to adopt preventive health strategies. Girls with PCOS were able to experience physical and psychological benefits and interact more with their health care providers after learning about how PCOS impacts their immediate and long-term health. Also our finding in agreement with Hassan, 2019²⁹ who found that women's awareness has improved across the board (definition, prevalence, etiology, risk factors, diagnosis & clinical features , complications, laboratory investigation, management, instructions & recommendations for balanced and healthy food) with a highly significant relation ($p < .001$). Moreover, the total mean score (Mean \pm SD) of women's knowledge was improved from 9.01 ± 4.69 to 36.31 ± 3.89 , a high statistical difference was observed ($p < .001$).

As regards self-esteem of the studied girls, the present study findings revealed a significant differences in self-esteem pre and post intervention so the intervention improve the studied subjects self-esteem so the 3rd research hypothesis was accepted also regarding quality of life domain post intervention significant differences in physical, psychological and social domains of quality of life pre and post the intervention among studied subjects so the 4th research

hypothesis was accepted. The above mentioned findings are in the same line with Abd Elmenim & Emam, 2016¹² who found that changing one's lifestyle enhanced the self-esteem of girls with PCOS, and that there were substantial variations in self-esteem before and after the intervention. In addition, the current research supports Mc Farland's 2012³⁰ findings that psychological support is beneficial in the treatment of PCOS. Also supported by Thomson & Brinkworth 2011³¹ who reported that Changes in a woman's lifestyle have an effect not just on her physical health but also on her mental well-being. Various lifestyle improvements have been shown to have a positive impact on a variety of psychological factors, including mood and psychological well-being. In addition, the current research showed that there were substantial variations in physical, psychological, and social domains of quality of life before and after the intervention. These findings also in agreement with Liao, et.al 2008³² who studied The effect of exercises on body image distress in overweight and obese women with POS, and it was observed that women who completed the program had lower body image distress despite improvements in BMI, lower levels of depression and anxiety, and higher self-esteem and HRQOL scores for women with PCOS. PCOS can have a negative impact on a woman's quality of life, negatively affecting her social functioning and relationships with her partner/family. Providers of health care should consider the intensity of women's symptoms in relation to their quality of life and social condition.³³ Other practitioners, such as a gynecologist, nurse, or dietician/nutritionist, may be needed to support women with PCOS. Nurses are the backbone of the health-care system, making up the bulk of the workforce. They are in responsibility of the standard of care given to women during their lives. As researchers associated with the maternity nursing division, they

were instrumental in providing women with simple and reliable knowledge about PCOS in gynecologic clinics. They allow them to ask questions in order to receive the knowledge they need to improve their quality of life. Nurses play an important role in educating clients in all health care settings; the nurse is also the primary source of knowledge about health promotion, which is why they are included in the existing educational guidelines.^{34,35,29,33} In summary, our results indicate that lifestyle change through exercise, stress management and sensible eating patterns can lead to improved reproductive/hormonal features in PCOS girls.

6. Conclusion:

In conclusion, adolescents' female's quality of life affected by polycystic ovary syndrome which negatively affecting their self-esteem, psychological state and consequently has a great impact on their social adjustment and relation even inside their families. The study's findings show that participants' one-year compliance with a lifestyle change intervention improved their quality of life and increased their self-esteem.

7. Recommendations:

- Planned counseling is required to women with PCOS to reduce the physical and psychological problems of these women and ultimately improve their health.
- Upgrading women's knowledge concerning PCOS with a periodic screening of women for early detection and management of PCOS.
- Nurses in gynecologic and obstetrics clinics should organize educational sessions for adolescents regarding PCOS concerning the causes, symptoms and signs and the management, with the development of teaching materials in the form of posters and booklets.
- Health promotion programs through different media to improve QOL for women with PCOS.

Authors' contributions:

All authors were included in the study designing, data collection and analysis, interpretation of results and manuscript preparation and they read and approved the final manuscript.

Conflicts of interest

There are no conflicts of interest.

References

1. El Hayek S, Bitar L, Hamdar LH, Mirza FG, Daoud G. Poly Cystic Ovarian Syndrome: An Updated Overview. *Front Physiol* 2016; Apr 5;7:124. doi: 10.3389/fphys.2016.00124. PMID: 27092084; PMCID: PMC4820451.
2. John, S. The effectiveness of structured teaching programme regarding polycystic ovarian syndrome among adolescent girls, Master degree in obstetrics and gynecological nursing, VARALAKSHMI collage of nursing, Bangalore 2009;1-14.
3. Zangeneh F, Naghizadeh M, Abdollahi A, & Bagheri M. Synchrony between Ovarian Function & Sleep in Polycystic Ovary Syndrome Patients. *Open Journal of Obstetrics and Gynecology*, 2014; Vol.4 No.12. Article ID:49274,7 pages [DOI:10.4236/ojog.2014.412101](https://doi.org/10.4236/ojog.2014.412101)).
4. Buggs C, Rosenfield R.L. Polycystic ovary syndrome in adolescence. *Endocrinology and Metabolism Clinics of North America*. 2005; 34: 667-705.
5. Norman J, Dewailly D, Legro S, Hickey E. Polycystic Ovary Syndrome. *The Lancet*, 2007; 370, 685-697. [http://dx.doi.org/10.1016/S0140-6736\(07\)61345-2](http://dx.doi.org/10.1016/S0140-6736(07)61345-2)
6. Badawy A, Elnashar A. Treatment Options for Polycystic Ovary Syndrome. *International Journal of Women's Health*, 2011; 3, 25-35. <http://dx.doi.org/10.2147/IJWH.S11304>
7. Ibrahim s, Elsayed y, Reyad R, Azzam H. SCREENING OF POLYCYSTIC OVARIAN SYNDROME AMONG ADOLESCENT GIRLS AT CAIRO UNIVERSITY. 2017; 9 (1) July :16-20.

8. Kamboj M, [Bonny A](#). Polycystic ovary syndrome in adolescence: diagnostic and therapeutic strategies, [Transl Pediatr](#). 2017 Oct; 6(4): 248–255, doi [10.21037/tp.2017.09.11](#)
9. Carron, R. Update on Polycystic Ovary Syndrome: What Dermatology Nurses and Nurse Practitioners Need to Know, *Journal of the Dermatology Nurses' Association* 2016; 8(6):380-385.
10. Rose M. A study to assess the effectiveness of structured teaching programme on knowledge regarding polycystic ovarian syndrome among couples in selected hospitals at Bangalore nightingale collage of nursing, M.Sc. Nursing Dissertation Protocol Submitted to Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore: 2012; 1-21.
11. Seema M. *International Journal of Yoga, Physiotherapy and Physical Education*, 2018; Volume 3; Issue 2; March: 196-200.
12. Abd Elmenim S, Emam A. Effect of Lifestyle Changes on Symptoms of Polycystic Ovarian Syndrome in Obese Girls ;IOSR Journal of Nursing and Health Science (IOSR-JNHS) e-ISSN: 2320–1959.p- ISSN: 2320–1940. 2016; Volume 5, Issue 3 Ver. II (Mar. - Apr.), PP 01-10 [www.iosrjournals.org](#).
13. Rosenberg M. *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press, 1965.
14. Ware J. SF-36 Health Survey Update. *Spine*. 2000. 25; 24: 3130-3139.
15. Panidis D, Tziomalos K, Papadakis E, Vosnakis C, Chatzis P, Katsikis I. Lifestyle intervention and anti-obesity therapies in the polycystic ovary syndrome: impact on metabolism and fertility, *Epub*, 2013;44(3):583-90. <http://www.ncbi.nlm.nih.gov/pubmed/23625194>
16. Sowmya M.A, Fernandes p. Effectiveness of structured teaching programme on knowledge of polycystic ovarian syndrome among adolescent girls, *NUJHS (Nitte University Journal of Health Science)* 2013;Vol. 3, No.3,p54-58.
17. Witchel S F, Oberfield S, Rosenfield R L, Codner E, Bonny A, Ibáñez L, et al. The diagnosis of polycystic ovary syndrome during adolescence. *Horm. Res. Paediatr*. 2015. doi: 10.1159/000375530. [Epub ahead of print].
18. Powers S E, Uliassi N W, Sullivan S D, Tuchman L K, Mehra R, Gomez-Lobo V. Trends in standard workup performed by pediatric subspecialists for the diagnosis of adolescent polycystic ovary syndrome. *J. Pediatr. Adolesc. Gynecol*. 2015; 28, 43–46. doi: 10.1016/j.jpag.2014.03.002
19. Nivetha M, Susan G Suganya. Survey of Poly Cystic Ovarian Disease (PCOD) Among The Girl Students of Bishop Heber College, Trichirapalli, Tamil Nadu, India. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 5, Issue 4 Ver. I (Jul. - Aug. 2016), PP 44-52 [www.iosrjournals.org](#)
20. Glueck C J, Dharashivkar S, Wang P, Zhu B, Gartside P S, Tracy T, et al. Obesity and extreme obesity, manifest by ages 20-24 years, continuing through 32-41 years in women, should alert physicians to the diagnostic likelihood of polycystic ovary syndrome as a reversible underlying endocrinopathy. *Eur. J. Obstet. Gynecol. Reprod. Biol*. 2005;122, 206–212. doi: 10.1016/j.ejogrb.2005.03.010
21. Amer SA, Li TC, Bygrave C, Sprigg A, Saravelos H, Cooke ID. An evaluation of the inter-observer and intra-observer variability of the ultrasound diagnosis of polycystic ovaries. *Hum Reprod* 2002; 17:1616–1622
22. Hahn S, Tan S, Elsenbruch S, Quadbeck B, Herrmann BL, Mann K, Janssen OE. Clinical and biochemical characterization of women with polycystic ovary syndrome in North Rhine-Westphalia. *Horm Metab Res* 2005 ;37:438–444
23. Eichenfield LF, Krakowski AC, Piggott C, et al. Evidence-based recommendations for the diagnosis and treatment of pediatric acne. *Pediatrics* 2013;131 Suppl 3:S163-86. 10.1542/peds.2013-0490B[PubMed] [Cross Ref]
24. Azziz, R. Polycystic ovary syndrome: What's in a name? *The Journal of Clinical Endocrinology and Metabolism*, 2014;99(4), 1142Y1145. doi:10.1210/jc.2013-3996
25. Practice Committee of the American Society for Reproductive Medicine. The evaluation and treatment of androgen excess. *Fertility and Sterility*, 86(5, Suppl. 4), S241YS247. doi:10.1016/j.fertnstert. 2006.08.042

26. Ahmed E M, Salem M E, EidSweed M S. Effect of Lifestyle Modifications on Polycystic Ovarian Syndrome Symptoms ,Journal of American Science2012; 8(8), 535-544.
27. Bruner B, Chad K, Chizen D. Effects of exercise and nutritional counseling in women with polycystic ovary syndrome. *Appl Physiol Nutr Metab* 2006; 31:384-391
28. Colwell K, Lujan M E, Lawson K L, Pierson R A, Chizen D R. Women’s Perceptions of Polycystic Ovary Syndrome Following Participation in a Clinical Research Study: Implications for Knowledge, Feelings, and Daily Health Practices, *J Obstet Gynaecol* 2010;32(5):453–459
29. Hassan H E. The impact of polycystic ovary syndrome on women’s quality of life: Nursing guidelines for its management. *Clinical Nursing Studies* 2019, Vol. 7, No. 3
DOI: 10.5430/cns.v7n3p42
30. Mc Farland C. Treating polycystic ovarian syndrome & infertility, *MCN. The American journal of maternal child nursing.* 2012;37(2), 116-121
31. Thomson R L, Buckley J D, Brinkworth G D. Exercise for the treatment and management of overweight women with polycystic ovary syndrome: a review of the literature. *obesity reviews*, 2011;12(5), e 202-e 210.
32. Liao L M, Nestic J, Chadwick P M, Brooke-Wavell K, Prelevic G M. Exercise and body image distress in overweight and obese women with polycystic ovary syndrome: A pilot investigation. *Gynecological Endocrinology* 2008;24(10), 555-56
33. Farg D, Hassan H. Risk Factors for Hyperemesis Gravidarum Requiring Hospital Admission during Pregnancy and Nursing Implication. *American Journal of Nursing Research.* 2019; 7(3).
34. Nasr E, Hassan H. Association between quality of family planning services and client’s satisfaction level in maternal and child health centers in Port Said city. *Journal of Nursing Education and Practice.* 2016; 6(1): 85-99.
<https://doi.org/10.5430/jnep.v6n1p85>
35. Abd-Allah N, Nasr E, Hassan H. Impact of a Breast-Feeding Educational Program for Mothers Having Pre-Term Infants in General Hospitals in Port Said. *International Journal of Novel Research in Healthcare and Nursing.* 2017; 4(3): 215-225.