Comparison of Body Image Perception and Depression in Polycystic Ovarian Syndrome (PCOS) and Non-PCOS Women

Sassi Kanwal (1)
Syeda Sadia Fatima (2)
Fatima Abid (3)
Aliya Jafri (4)
Fatima Hasan Kazmi (5)
Nargis Fatima (6)

(1) MBBS, M.Phil. Assistant Professor, Physiology Department, Jinnah Medical and Dental College, Karachi
(2) MBBS, M.Phil., PhD., Assistant Professor, Department of Biological and Biomedical Sciences
Aga Khan University, Karachi
(3) MBBS, M.Phil., MBA (HHCM), CMED., Assistant Professor, Physiology Department, Jinnah Sindh Medical University, Karachi
(4) MBBS, MCPS, M.Phil., Assistant Professor, Biochemistry Department,Jinnah Sindh Medical University, Karachi
(5) MBBS. , Liaquat National Hospital and Medical College, Karachi.
(6) MBBS, M.Phil., Assistant Professor, Physiology Department, Shaheed Mohtarma Benazir Bhutto Medical College, Lyari.

Corresponding author:
Dr. Aliya Jafri
Assistant Professor Biochemistry Department, Sindh Medical College, Jinnah Sindh Medical University, HJ Rafiqui Shaheed Road, Karachi, Pakistan.
Phone numbers office: 021- 99205185 Ext: 1003 Mobile: +92 3002365984
Email address: dr.ajafri@gmail.com, aliya.jafri@jsmu.edu.pk

Abstract

Objectives: The aim of the current study was to appraise the relationship between women's body image perception and depression in case and controls.

Methods: In this case-control study 60 polycystic ovarian syndrome patients established agreeing to the Rotterdam criteria and 60 healthy controls of reproductive age group were enrolled.

The PCOS patients and healthy controls were evaluated on questionnaire for physical appearance and depression. Body image perception was accessed using the validated Body Esteem Scale. The symptoms of Depression were evaluated with the Quick Inventory of Depressive Symptomatology-Self Report.

Results: 55% of PCOS patients had depression while 36.7% were found with depression in the control group. In the PCOS group 65% of patients were found with positive body image while 98.3% of patients were found with positive body image. Significant association of study cases group was found with

BMI group (p=0.049), diet habit (p=0.013), depression (p=0.044) and body image (p=0.000). Patients with depression are also more likely to have PCOS in comparison with those who haven't (OR=2.111).

Conclusion: There was a significant association of study group with body image perception and depression. Therefore, health of the patients with this set of symptoms is essential to be acknowledged more fully, predominantly in relation to the despair and poor body image. The outcomes of this study foster implications for clinical practice and propose that a multidisciplinary team should be involved in treatment of PCOS.

Key words: Polycystic Ovary Syndrome (PCOS), Quick Inventory of Depressive Symptomatology (QIDS), Depression.

Introduction

Polycystic ovarian disorder is very recurrent endocrine condition in child bearing age with occurrence of around 6–8% in the reproductive years (1). Worldwide the total prevalence and phenotypic highlights of polycystic ovary syndrome (PCOS) is the utmost widely renowned endocrine disorder among reproductive age women (2). This alteration in occurrence of PCOS around the world is generally due to diverse diagnostic criteria and because of racial antithetic groups. And so, to overcome these major investigative dissimilarities it is essential to consider for racial and cultural specific approaches for PCOS (3). PCOS is a set of symptoms characterized and labelled by irregular menstrual cycle, barrenness, androgen superfluous and insulin resistance(4). Polycystic ovarian syndrome has long-term risks such as cardiovascular illnesses, Type-2 Diabetes Mellitus, dyslipidemia and endometrial carcinoma (5).

Body image is perception of one's appearance, and disappointment with one's bodily outlook. It is the psychosomatic involvement of the look and function of her body which influences on PCOS females very badly and may lead to miserable, stressed and low quality of life (6). PCOS patients also experience higher rates of depression and disquiet than normal healthy females in the concurrence on ladies' health features of polycystic ovary syndrome (PCOS). Emotional aspects must also be considered in all women with PCOS so they must be evaluated for psychological disorder (7) Many studies have shown negative body image perception in PCOS compared to non PCOS even with no difference in body mass index (BMI) (8). It is seen that one's personality perception is the psychological depiction of one's body image appearance, state of well-being, and completeness of life (9). PCOS is also linked by psychological complications, comprising chronic stress, dejection, anxiety and low self-confidence that may affect an individual's personality consciousness (10). It is shown from past research that PCOS patients are more prone to have depression as compared to healthy women (11).

Obesity and negative self-esteem have shown association with depression in PCOS compared to normal persons. Also, PCOS with Hyperandrogenism symptoms including excessive body hairs and acne have more chances of negative personality perceptions than non PCOS (12). Displeased physical appearance perceptions of PCOS include disappointment with general body look, loss of femininity and sense of less sexually appeal (13). Feelings of self-confidence may help in managing new and chronic illness, whereas lack of confidence is associated with anxiety, depression and general psychiatric symptoms (14).

The World Health Organization (WHO) has assessed that by the end of year 2020, depressive disorders will be recognized as the leading mental disability in women (15). In some published data prevalence of depression globally is about 40% in women with PCOS (16). The PCOS patients are at high risk of negative body image perception and low self-esteem as compared to the general population which may cause serious damage to social, professional and intimate affiliations (17). PCOS women were associated with possibility for higher body discontent at age 31 and 46 (Odds ratio, OR 2.39,) was found by one study (18).

Rationale:
Body image perception is a key factor which may predict the development of depressed mood. Also, body image in PCOS patients may upset the worth of life of a sufferer. Low self-confidence due to body image and associated depression may lead to a negative impact on her emotional attitude and psychiatric illness. So, in order to avoid major psychological and social upset of PCOS patient these factors should be considered and treated well as a top priority along with other comorbidities of PCOS.

Aim
In the present study we intended to determine association of body image perception, and depressive symptomatology in women with polycystic ovary syndrome (PCOS) in association with healthy controls.

Objectives
1. To assess and compare the body image perception between PCO positive and PCO negative study subjects.
2. To evaluate and compare frequency of depression between PCO positive and PCO negative study subjects.

Material and Methods

This case control study was conducted at Jinnah postgraduate medical center in alliance with Aga Khan University, Karachi. Ethical clearance was taken from the institutional review committee (NO.F.2-81-IRB/2017-GENL/418/JPMC). The study period was one year after ethical clearance from 2017 to 2018. A minimum sample size of 80 women was mandatory to achieve a power of 90 and an alpha of 5%, with a prevalence of PCOS as 15% in local population. We included 120 patients (60 in each group). 120 subjects gave permission and participated in this study. The inclusion criteria for cases were females of reproductive age group established as PCO per Rotterdam criteria. Rotterdam criteria for PCOS diagnosis states that a woman may present with any 2 out of 3 conditions: Anovulation, hirsutism or less commonly male pattern alopecia or raised free testosterone, or polycystic ovaries on ultrasound (when 10 small antral follicles are seen in each ovary) (4). Absence of the aforementioned states was deliberated to be inclusion for the normal control subjects.

Study partakers were divided into two groups:
i) Group A: PCO group included individuals with diagnosed polycystic phenotypes n=60
ii) Group B: Control group included individuals without any PCO phenotypes n=60.

The PCOS patients and healthy controls were evaluated on questionnaire for body image perception and depression. Body dissatisfaction was measured using the validated Body Esteem Scale (19). Depression symptoms

were measured with the Quick Inventory of Depressive Symptomatology-Self Report 16 (20)

Subjects with any systemic diseases like atherosclerosis, diabetes mellitus, hypertension, and any other reproductive disorders such as congenital adrenal hyperplasia, androgen secreting tumors, Cushing syndrome, thyroid dysfunction and hyper prolactinaemia were excluded from this study. After obtaining written and informed consent from the subjects, their biophysical parameters were measured.

Data were analyzed by using SPSS version 26. Mean and standard deviation were computed for quantitative variable. Frequency and percentage was calculated for qualitative variables. Stratification was done with regards to qualitative variables to see the effect of these modifiers on study group by using chi square and Fisher exact test as appropriate. Odds ratios were calculated by univariate and multivariate binary logistic regression. P-value ≤0.05 was considered as significant.

Results

A total 120 patients (60 in PCOS and 60 in Control group) were included in the study. Overall mean age was 27.86±6.62 years while mean age in PCOS and Control group was 26.61±6.68 years and 29.11±6.37 respectively. Mean disease duration in PCOS group was 18.81±10.27 months while mean Body mass index in PCOS and Control group was 28.56±5.54 kg/m2 and 28.41±4.11 kg/m2 respectively as presented in Table 1.

Among 60 patients in the PCOS group, 21(35%) have regular and 39(65%) have irregular menstrual cycle while in the control group all patients have regular menstrual cycle as presented in Figure 1. 40% of patients in the PCOS group have past medical history of diabetes; 23.3% have drug history while only 3.3% do exercise. Ultrasound was done for the PCOS group in which 19 (31.7%) were found with right ovary cyst, 20 (33.3%) with left ovary cyst and 21 (35%) with both ovary cyst. We found 55% of PCOS patients with depression while 36.7% were found with depression in the general group. In the PCOS group 65% of patients were found with positive body image while 98.3% of patients were found with positive body image in the control group as presented to Table 2.

We found significant mean difference of age (p=0.038) and number of children (p=0.000) according to study groups as presented in Table 1. We found significant association of study group with BMI group (p=0.049), diet habit (p=0.013), depression (p=0.044) and body image (p=0.000) as presented in Table 2.

By univariate logistic regression we found that married patients were more likely to have PCOS in comparison to unmarried patients (OR=2.471). Patients with Normal BMI (OR=1.328) and Overweight (OR=3.701) are more likely to have PCOS in comparison with obese patients. Those who have family history of hypertension are also more likely to have PCOS in comparison with those who haven't (OR=1.429). Patients with depression are also more likely to have PCOS in comparison with those who haven't (OR=2.111). Detailed results of odds ratios are presented in Table 3.

Table-1: Mean Comparison of study group with quantitative variables

	Mean±SD			P-Value
	Overall	PCOS	Control	
Age(years)	27.86±6.62	26.61±6.68	29.11±6.37	0.038
No of Children (n=107)	2.07±1.97	1.08±1.51	3.15±1.85	0.000
Height(m)	1.54±0.05	1.54±0.05	1.54±0.06	0.828
Weight(kg)	63.13±11.14	63.56±13.12	62.70±8.82	0.672
Body Mass Index	28.49±4.86	28.56±5.54	28.41±4.11	0.872
BGL(mg/dl)	108.90±28.31	113.63±34.45	104.16±19.59	0.067

Independent t-test was applied.
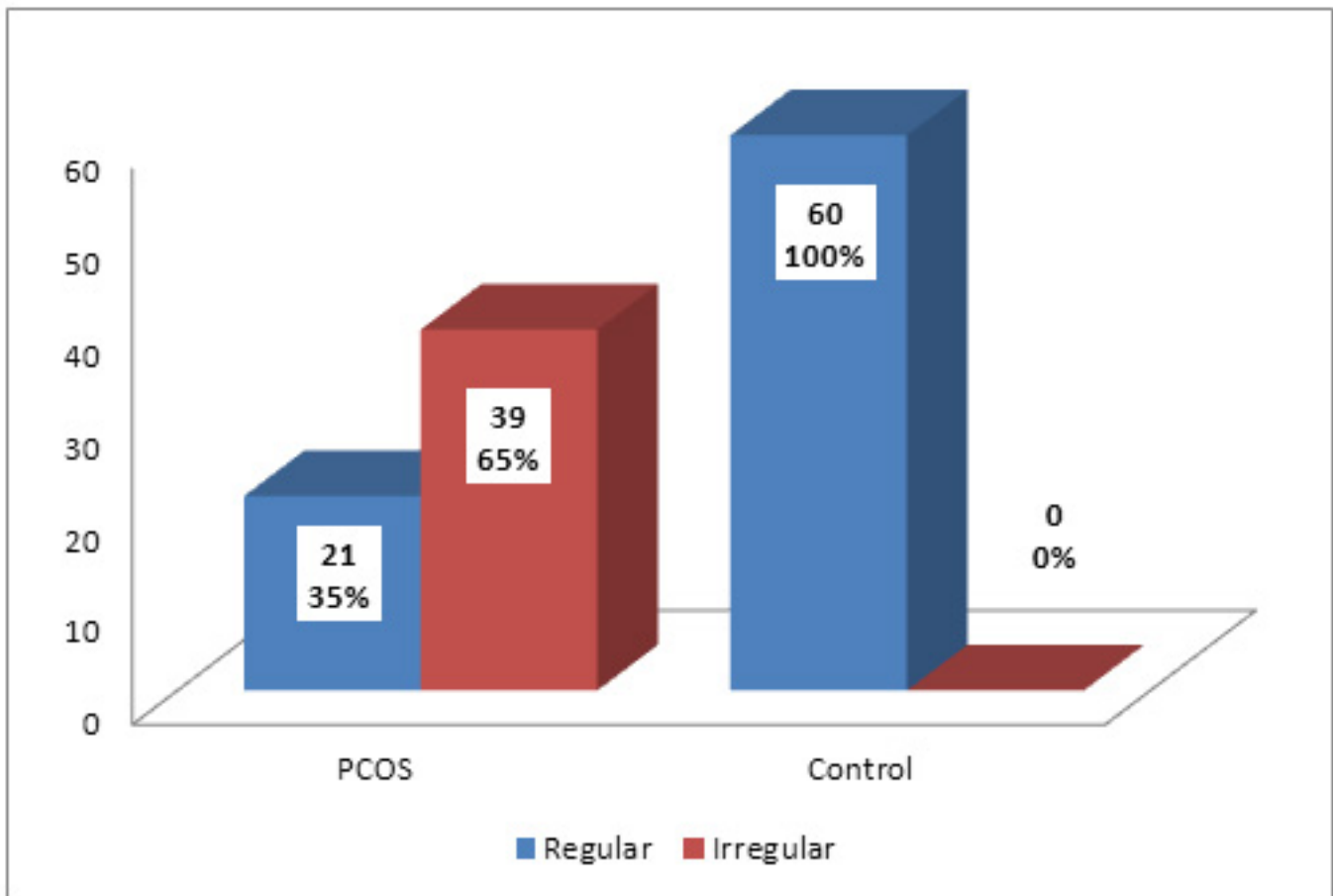P-Value ≤0.05 considered as significant

Figure 1: Frequency distribution of menstrual cycle among study groups

Table 2: Comparison and association of study group with qualitative variables

	N (%)			P-Value
	PCOS (n=60)	Control (n=60)	Total (n=120)	
Marital Status				0.142
Married	56(93.3)	51(85)	107(89.2)	
Unmarried	4(6.7)	9(15)	13(10.8)	
BMI Group				0.049
Normal	21(35)	22(36.7)	43(35.8)	
Overweight	16(26.7)	6(10)	22(18.3)	
Obese	23(38.3)	32(53.3)	55(45.8)	
Diabetes Family History				0.066
Yes	12(20)	21(35)	33(27.5)	
No	48(80)	39(65)	87(72.5)	
Hypertension Family History				0.346
Yes	25(41.7)	20(33.3)	45(37.5)	
No	35(58.3)	40(66.7)	75(62.5)	
CAD Family History				1.000
Yes	2(3.3)	3(5)	5(4.2)	
No	58(96.7)	57(95)	115(95.8)	
Surgical History				1.000*
Yes	4(6.7)	3(5)	7(5.8)	
No	56(93.3)	57(95)	113(94.2)	
Diet Habit				0.013
Healthy	42(70)	53(88.3)	95(79.2)	
Unhealthy	18(30)	7(11.7)	18(30)	
Depression				0.044
Yes	33(55)	22(36.7)	55(45.8)	
No	27(45)	38(63.3)	65(54.2)	
Body Image				0.000
Positive	39(65)	59(98.3)	98(81.7)	
Negative	21(35)	1(1.7)	22(18.3)	

Chi-square test was applied.
*Fisher Exact test was applied.
P-Value ≤0.05 considered as significant.

Table 3: Odds ratio for PCOS cases

	Un-Adjusted*		Adjusted**	
	P-Value	Odds Ratio(95% CI)	P-Value	Odds Ratio(95% CI)
Marital Status				
Married	0.152	2.471(0.717-8.515)	--	--
Unmarried[®]		1		
BMI Group				
Normal	0.489	1.328(0.595-2.964)	--	--
Overweight	0.017	3.710(1.259-10.930)	--	--
Obese[®]		1		
Diabetes Family History				
Yes	0.069	0.464(0.203-1.060)	--	--
No[®]		1		
Hypertension Family History				
Yes	0.347	1.429(0.680-3.002)	--	--
No[®]		1		
CAD Family History				
Yes	0.650	0.655(0.106-4.069)	--	--
No[®]		1		
Surgical History				
Yes	0.698	1.357(0.290-6.341)	--	--
No[®]		1		
Diet Habit				
Healthy	0.017	0.308(0.118-0.807)	0.05	0.350(0.123-0.999)
Unhealthy[®]		1		
Depression				
Yes	0.045	2.111(1.016-4.385)	0.260	1.606(0.704-3.664)
No[®]		1		
Body Image				
Positive	0.001	0.031(0.004-0.244)	0.001	0.035(0.005-0.278)
Negative[®]		1		

*Univariate binary logistic regression was applied.
**Multivariate logistic regression was applied.
®Reference group
P-Value≤0.05 considered as significant

Discussion

Body image is a very important aspect among PCOS patients. In the current study, 98.3% of patients in the control group were showing positive body image while 65% of patients showed positive body image in the PCOS group which reflects a healthy state of mind. There is a significant association found between the study group with body image perception. Also more than over half of PCOS (55%), females had depression due to Body image perception. However, there is a significant association found between depression and study group. Various literary studies show antithetic findings regarding body image perception. Along with these PCOS (cases) have 2.11 times more odds to develop depression as compared to those without PCOS.

One of the studies showed the same results as the current study of increased risk of Body-image perception in women with polycystic ovary syndrome, which is the cause of lifetime distress (21). Similar to our results, one of the published research showed that there was a difference of body perception between PCOS and non-PCOS. PCOS women had a lower score of body image as compared to healthy females (22). Another finding from one study is in accordance with our results showing bad impact exerted by self-pride, increased risk of body image perception, unhealthy and unhappy sexual life of PCOS, in contrast to healthy subjects (23).

Another study found that body excess weight is the primary cause of low self-esteem, unhealthy mind state and depression. Further these patients are more willing to go for a weight loss plan of action (24). Similar to this study result published data showed body image dissatisfaction odds ratio higher (OR 2.39) than non PCOS subjects (25).

One of the studies showed high prevalence of depression among young PCOS patients, which is considered a very important health, issue commonly seen in PCOS. It may be because of some underline pathophysiology of PCOS like metabolic dysfunctions and different reproductive pathologies (26). One of the researchers published data found increased odds of depression and poor body image perception in PCOS females same as seen in this study (27).

Similar to our result one of the research studies showed the increased incidence of depressive symptoms in PCOS females in comparison to healthy individual (28). A systematic review on depression in PCOS females found increased odds of depression as OR 3.78; to OR 4.18; in different studies which are similar to this study (29).

Like this current study some other research found an insignificant relationship between depression and PCOS (30). Besides these promising findings, some of the limitations of this study were its sample size and inability to perform invasive investigations. Another limitation of this study is that the newly diagnosed subject could not show that long-lasting hormonal imbalance effect in PCOS women.

Conclusion

There is a profound significant difference of body image found between cases and controls with significant association regarding depression in cases and controls. Likelihood of negative body image perception and depressive symptomatology was shown higher in cases as compared to controls. However, some PCOS subjects also experienced depression due to body image so this may be a sign for psychiatric illness in PCOS, which needs to be treated as a high priority to improve quality of life of PCOS patients.

References

1.   Leon LIR, Mayrin JV. Polycystic Ovarian Disease (Stein-Leventhal Syndrome). StatPearls [Internet]: StatPearls Publishing; 2018.
2.   Bahri Khomami M, Joham AE, Boyle JA, Piltonen T, Arora C, Silagy M, et al. The role of maternal obesity in infant outcomes in polycystic ovary syndrome -A systematic review, meta-analysis, and meta-regression. Obesity Reviews. 2019.
3.   Ding T, Hardiman PJ, Petersen I, Wang F-F, Qu F, Baio G. The prevalence of polycystic ovary syndrome in reproductive-aged women of different ethnicity: a systematic review and meta-analysis. Oncotarget. 2017; 8:96351.
4.   Witchel SF, Oberfield S, Rosenfield RL, Codner E, Bonny A, Ibáñez L, et al. The diagnosis of polycystic ovary syndrome during adolescence. Hormone research in paediatrics. 2015;83:376-89.
5.   Condorelli R, Calogero A, Di Mauro M, Cannarella R, Rosta G, La Vignera S. Androgen excess and metabolic disorders in women with PCOS: beyond the body mass index. Journal of endocrinological investigation. 2018;41:383-8.
6.   Yildiz BO, Yarali H, Oguz H, Bayraktar M. Glucose intolerance, insulin resistance, and hyperandrogenemia in first degree relatives of women with polycystic ovary syndrome. The Journal of Clinical Endocrinology & Metabolism. 2003;88:2031-6.
7.   Polak K, Czyzyk A, Simoncini T, Meczekalski B. New markers of insulin resistance in polycystic ovary syndrome. Journal of endocrinological investigation. 2017;40:1-8.
8.   Norman RJ, Dewailly D, Legro RS, Hickey TE. Polycystic ovary syndrome. Lancet. 2007;370:685-97.
9.   Livadas S, Diamanti-Kandarakis E. Polycystic ovary syndrome: definitions, phenotypes and diagnostic approach. Front Horm Res. 2013;40:1-21.
10.   Kiyak Caglayan E, Engin-Ustun Y, Sari N, Gocmen AY, Seckin L, Kara M, et al. Is there association between vitamin D levels, apelin 36, and visfatin in PCOS? Gynecol Endocrinol. 2016;32:386-9.

11.   Ibrahim MKS, Mostafa MI, Abdella RM, Marzouk SA, El-attar S. Relation of serum apelin levels to ultrasound images and Doppler indices in diagnosed Polycystic ovary syndrome in overweight and obese women. Middle East Fertility Society Journal. 2018;23:377-83.

12.   Sun X, Wu X, Zhou Y, Yu X, Zhang W. Evaluation of apelin and insulin resistance in patients with PCOS and therapeutic effect of drospirenone-ethinylestradiol plus metformin. Medical science monitor: international medical journal of experimental and clinical research. 2015;21:2547.

13.   Olszanecka-Glinianowicz M, Madej P, Nylec M, Owczarek A, Szanecki W, Skałba P, et al. Circulating apelin level in relation to nutritional status in polycystic ovary syndrome and its association with metabolic and hormonal disturbances. Clinical Endocrinology. 2013;79:238-42.

14.   Amruth H. Study of serum lipid profile and fasting blood sugar in polycystic ovarian syndrome. 2016.

15.   Kuehner C. Why is depression more common among women than among men?. Lancet Psychiatry, 2016; 30(9):677-85.

16.   Sadeeqa S, Mustafa T and Latif S. Polycystic Ovarian Syndrome–Related Depression in Adolescent Girls: A Review. J Pharm Bioallied Sci., 2018; 10(2):55–59.

17.   Fia Sundelin, Emilia Koivuaho, Marjo-Riitta Järvelin, Jaana Laitinen, Juha S Tapanainen, Stephen Franks, Laure Morin-Papunen & Terhi T Piltonen. Polycystic ovary syndrome (PCOS) associates with dissatisfied body image and weight loss attempts at age 31 and 46 - A prospective, population-based Cohort study, Endocrine Abstracts (2018) 56 P939

18.   Elisabetta Scaruffi, Isabella Giulia Franzoi, Cristina Civilotti, Fanny Guglielmucci, Luana La Marca, Michela Tomelini, Fabio Veglia, Antonella Granieri. Body image, personality profiles and alexithymia in patients with polycystic ovary syndrome (PCOS), Journal of Psychosomatic Obstetrics & Gynecology Volume 40, 2019 - Issue 4)

19.   Franzoi SL, Shields SA. The Body Esteem Scale: multidimensional structure and sex differences in a college population. J Pers Assess. 1984; 48(2):173-8.)

20.   Rush AJ, Trivedi MH, Ibrahim HM, Carmody TJ, Arnow B, Klein DN, Markowitz JC, Ninan PT, Kornstein S, Manber R, Thase ME. The 16-Item Quick Inventory of Depressive Symptomatology (QIDS), clinician rating (QIDS-C), and self-report (QIDS-SR): a psychometric evaluation in patients with chronic major depression. Biological psychiatry. 2003 Sep 1;54(5):573-83.

21.   Snigdha Alur-GuptaM. Anat Chemerinski, Chang Liu B.A. JennaLipson, KellyAllison, Mary D. Sammel, Anuja Dokras.   Body-image distress is increased in women with polycystic ovary syndrome and mediates depression and anxiety. Fertility and Sterility Volume 112, Issue 5, November 2019, Pages 930-938.1

22.   Karacan E, Caglar GS, Gürsoy AY, Yilmaz MB. Body satisfaction and eating attitudes among girls and young women with and without polycystic ovary syndrome. J Pediatr Adolesc Gynecol. 27(2):72-7, 2014.

23.   Bazarganipour F, Ziaei S, Montazeri A, Foroozanfard F, Kazemnejad A, Faghihzadeh S. Health-related quality of life in patients with polycystic ovary syndrome (PCOS): a model-based study of predictive factors. J Sex Med. 2014 Apr; 11(4):1023-1032, 2014

24.   Fia Sundelin, Emilia Koivuaho, Marjo-Riitta Järvelin, Jaana Laitinen, Juha S Tapanainen, Stephen Franks, Laure Morin-Papunen and Terhi T Piltonen. Polycystic ovary syndrome (PCOS) associates with dissatisfied body image and weight loss attempts at age 31 and 46 - A prospective, population-based Cohort study. Endocrine Abstracts. 56 P939, 2018.

25.   (Fia Sundelin1), Polycystic ovary syndrome (PCOS) associates with dissatisfied body image and weight loss attempts at age 31 and 46 - A prospective, population-based Cohort study: Endocrine Abstracts (2018) 56 P939

26.   Jing Tan, Qiu-Yi Wang, Gui-Mei Feng, Xue-Ying Li, and Wei Huang. Increased Risk of Psychiatric Disorders in Women with Polycystic Ovary Syndrome in Southwest China.   Chin Med J (Engl). 2017 Feb 5; 130(3): 262–266.

27.   Laura G. Cooney & Anuja Dokras. Depression and Anxiety in Polycystic Ovary Syndrome: Etiology and Treatment. Reproductive Psychiatry and Women's Health (CN Epperson, Section Editor), Published: 20 September 2017.

28.   Aditi P. Chaudhari, Kaustubh Mazumdar, and Pooja Deepak Mehta. Anxiety, Depression, and Quality of Life in Women with Polycystic Ovarian Syndrome. Indian J Psychol Med. 2018 May-Jun; 40(3): 239–46.

29.   Laura G. Cooney, Iris Lee, Mary D. Sammel, Anuja Dokras. High prevalence of moderate and severe depressive and anxiety symptoms in polycystic ovary syndrome: a systematic review and meta-analysis Human Reproduction, Volume 32, Issue 5, May 2017, Pages 1075–1091.

30.   Zahra Basirat , Mahbobeh Faramarzi, Seddigheh Esmaelzadeh, Sharareh Abedi Firoozjai, Theresa Mahouti, and Zahra Geraili. Stress, Depression, Sexual Function, and Alexithymia in Infertile Females with and without Polycystic Ovary Syndrome: A Case-Control Study Int J Fertil Steril. 2019 Oct-Dec; 13(3): 203–208.