

Prevalence of Depression in Polycystic Ovarian Syndrome Patients: A Cross Sectional Study

Rohini N Chavan¹, Dr. Neha Deshpande (PT)²

¹Intern, LSFPEF'S College of Physiotherapy

Email Id: rohiichavan[at]gmail.com

²Associate Professor, Department of Community Physiotherapy, LSFPEF's College of Physiotherapy

Email Id: dr.kulkarni.neha[at]gmail.com

Abstract: PCOD - polycystic ovarian syndrome is one of the most common endocrine disorders in women. The present study was conducted in a cross-sectional study type with a convenient sampling of diagnosed PCOD patients to see the depression levels in the PCOD. The main purpose of this study was to find out the depression levels in PCOD patients. An online survey was conducted with participants chosen according to the inclusion and exclusion criteria. Patient Health Questionnaire (PHQ-9) was used to evaluate the prevalence of depression levels in PCOD patients. The results showed mild levels of depression in PCOD patients by using the PHQ-9 questionnaire with the diagnosed PCOD patients within 1 year showed mild level of depression and PCOD since 2 years showed moderate level of depression. Since a large part of the treatment is mainly focused on the physical aspect- mental health should also be taken into consideration during the course of the treatment. Regular screening of PCOD patients for mental health along with dietary changes and exercises could lead to reduced stress levels in the PCOD patients. The results showed that the patients face different levels of depression along with a significant increase in stress levels in their day to day activities.

Keywords: PCOD, PCOD patients, mental-health, depression, stress levels

1.Introduction

The endocrine disorders encountered most frequently in gynecologist patients are those related to disturbances in regular occurrence in ovulation & accompanying menstruation. It occurs in 6% -10 % of women of reproductive age with a higher prevalence in obese women [2].

The most prevalent problems are those characterized by androgen excess often with insulin resistance, including what is arguably the most common endocrinopathy in women- polycystic ovary syndrome (PCOS). Genetic and environmental contributors combine with obesity, ovarian dysfunction and hormonal drivers contribute to the aetiology of PCOS. The symptoms in PCOS patients are hirsutism, menstrual dysfunction, acne, abnormal menses from puberty, obesity, insulin resistance, abnormal lipoproteins and depression.

The increased prevalence of PCOS among general population throughout the world is found to be 5%–10% in the women of reproductive age, and about 40% women with PCOS experience depression, particularly young girls. The cause of PCOS is unknown. Early diagnosis and rehabilitation with weight loss may reduce the risk of long-term complications. Depression and anxiety are common in women with PCOS but are often overlooked & left untreated.

Obesity increased reproductive features - hyperandrogenism, hirsutism, infertility and pregnancy complications- both independently and by exacerbating PCOS.

Risk factors include sedentary lifestyle, BMI and long-term risks like chronic anovulation, persistent elevated estrogen levels, increased risk of breast cancer & ovarian

cancer.

PCOS is a chronic condition that manifests across the life course. Women with PCOS present with psychological. [5][23] reproductive and metabolic implications.

Psychological problems arise in patients with PCOS [4] particularly like challenged to feminine identity, body image due to obesity, acne, excessive body hairs infertility, changes in physical appearance.

Studies reveal the increased prevalence of PCOS among the general population throughout the world, which ranges from 5%-10% [6] in women of reproductive age, about 40 % women with PCOS experience depression [7] particularly young girls.

As per the National Institute of Health, the rate of PCOS increases from 6.5% to 6.8% in adult reproductive-aged women worldwide [9].

Moreover, the pathophysiology of depression and mental stress during PCOS is linked to various changes that include psychological changes such as high activity of pro-inflammatory markers and immune system during stress [15].

International research has shown that PCOS has an adverse effect on patient's quality of life (QOL) [4].

PCOS negatively impacts quality of life yet McCOOK et al. (2005) suggest that the psychological implications of PCOS are underestimated and have been largely ignored.

The recently published international guidelines on PCOS & the Androgen excess (AE-PCOS) society position statement therefore recommend screening all women with PCOS for anxiety & depression at their initial visit. [1,13]

We need to gain information as to which symptoms are likely to cause the maximum impact, so that the novel therapies can be targeted toward improving the overall outcome in each patient. [4]

International research has shown that PCOS has an adverse effect on patient's quality of life (QOL). The Indian perspective on the quality of life is totally unexplored.

The Indian literature on psychological aspect on PCOS is inconsistent.

PCOS is a lifestyle disease like DIABETES. Diabetes is a well known disease, but don't you think its high time for people of India (both men and women) should be aware about PCOS as a disease considering every 1 in 5 girl in India is affected with PCOS/PCOD.

PHQ-9 depression scale has high internal consistency at baseline and end of treatment alpha = 0.83 and 0.92 and also has 42% variance.

Diagnosis – Ultrasonography

Common tests for PCOS-ULTRASOUND, HORMONAL PANEL, FASTING GLUCOSE, BMI

Less talked about lab tests for PCOS- WAIST/HIP RATIO, VITAMIN DEFICIENCIES, LIPID PROFILE.

2.Objective

- To find the prevalence of depression in PCOS patients using the PHQ-9 questionnaire

3.Literature Survey

J.A BARRY et al. conducted a study in 2011 on ANXIETY AND DEPRESSION IN POLYCYSTIC OVARY SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS.

These researchers conducted a study for 1 year and included patients who come under government health scheme and government professionals. They found out that prevalence of depressive disorder was 25.7 % and anxiety disorder was 38.6%.

L BARNARD et al. conducted a study in 2007 on QUALITY OF LIFE AND PSYCHOLOGICAL WELL BEING IN POLYCYSTIC OVARY SYNDROME.

The researchers conducted a study for quality of life and depression in women with PCOS using a questionnaire which was modified and concluded that there should be regular screening for psychological wellbeing of the PCOS patients.

A A DEEKS et al. conducted a study in 2011 on IS HAVING POLYCYSTIC OVARY SYNDROME A PREDICTOR OF POOR PSYCHOLOGICAL FUNCTION INCLUDING ANXIETY AND

DEPRESSION?

The researchers conducted a study the factors causing negative impact on the psychological wellbeing causing increase in depression and anxiety and concluded that women with PCOS have depression, negative body image and anxiety compared to women without PCOS,

FATEMEH BAZARGANIPOUR et al. conducted a study in 2013 on PSYCHOLOGICAL INVESTIGATIONS IN PATIENTS WITH POLYCYSTIC OVARY SYNDROME.

The researchers conducted a study to aim of to calculate the prevalence of mood disorders and factors causing psychological distress in Iranian women having PCOS and concluded that a necessary pre evaluation for mental disorders should be done primarily.

ANGELA KERCHNER et al. conducted a study in 2009 on RISK OF DEPRESSION AND OTHER MENTAL HEALTH DISORDERS IN WOMEN WITH POLYCYSTIC OVARY SYNDROME; A LONGITUDINAL STUDY.

These researchers conducted a study with the aim of studying the risk factors in women with PCOS and concluded that there should be regular screening for mental health disorders in women with PCOS.

NUJA DOKRAS et al. conducted a study in 2011 on INCREASED RISK FOR ABNORMAL DEPRESSION SCORES IN WOMEN WITH POLYCYSTIC OVARY SYNDROME; A SYSTEMATIC REVIEW AND META-ANALYSIS.

The researchers conducted a study on women with PCOS and women without PCOS with the aim to study abnormal depression scores and concluded that the assessment of depression on women with PCOS should be done with validated screening tools.

JUDY GRIFFIN MCCOOK, NANCY E REAME, SAMUEL S THATCHER et al. conducted a study in 2005 on HEALTH RELATED QUALITY OF LIFE ISSUES IN WOMEN WITH POLYCYSTIC OVARY SYNDROME.

The researchers conducted the study with the aim of evaluating women with PCOS having symptoms like fertility status, obesity, high level of androgens on women with PCOS and concluded that psychological factors in PCOS are given less importance and a modified rehabilitative approach with psychological education and support should be included to improve the quality of life status.

Samrat Ganguly¹, Moumita Samanta, Prithwish Roy, Sukanta Chatterjee, David W Kaplan, Basu conducted a study in 2013 on PATIENT HEALTH QUESTIONNAIRE-9 AS AN EFFECTIVE TOOL FOR SCREENING OF DEPRESSION AMONG INDIAN ADOLSCENTS.

The researchers conducted the study on depression in teenagers among health centres in India using patient health questionnaire-9 (PHQ-9) and concluded that the questionnaire is an easy and successful tool and gives indented result for assessing depression in adults.

4.Methods

Study type: Cross-sectional study
 Sampling method: Convenient sampling
 Study subject: PCOS/ PCOD patients
 Sample size 100
 Study duration: 6 months
 Study area: Pune

Inclusion criteria

Diagnosed PCOS/PCOS patients (upto3 years)
 Age group - 20 to 30 years (married, unmarried, trying to conceive)
 PCOS patients on medications (Homeopathy, Ayurvedic, Metformin and other PCOS medications)

A. Exclusion criteria

Patients who are known cases of psychiatric illness other medical conditions (DM, HTN)
 Patients who are unable to read English

B. Outcome measures

Evaluation of depression using PHQ-9 questionnaire

C. Procedure

The study was conducted from the month of June to September 2021 using a convenient sampling method. A google form containing the PHQ-9 depression scale was made.

The google form was verified by the guide. The subjects were selected on the basis of the inclusion & exclusion criteria. Ethical approval/ online consent was taken from the participants.

The scale was submitted using Google forms and was shared by gynaecologist via their social media platforms & to their respective contacts.

The questionnaire was then sent to the participants through the various virtual platforms. The responses were noted and analysed further. The data was further presented in a statistical format.

5.Results

Table 1: shows the number of participants belonging to different age groups who participated in the study

Age group	Number of participants
20-25	60
25-30	24

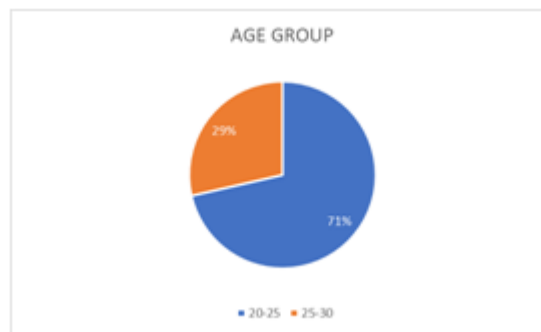


Figure 1: Representation of number of individuals who participated in the study belonging to different age groups.

Interpretation: The above pie chart shows that 71% of the participants were of 20-25 years age group and 29% participants were of 25-30 years age group.

Table 2: Shows the classification of responses to the patient health questionnaire (PHQ-9)

Depression Severity	Percentage of responses
Minimal depression	13.44%
Mild depression	20.16%
Moderate depression	15.12%
Moderately severe depression	10.08%
Severe depression	4.2%
No depression	7.56%

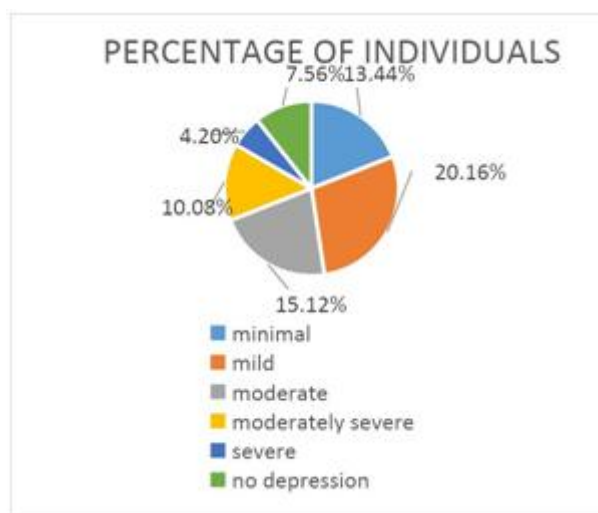


Figure 2: Shows the responses of the patient health questionnaire (PHQ-9) by the participants.

Interpretation: The pie chart showing the responses of the Patient health questionnaire which is suggestive of the mild depression (20.16%) moderate depression (15.12%) moderately severe depression (10.08%), severe depression (4.20%) and no depression (7.56%).

Table 3: Shows the responses of the participants if they are on medications or not

Participants taking medications	Number of participants taking medications
YES	49
NO	51

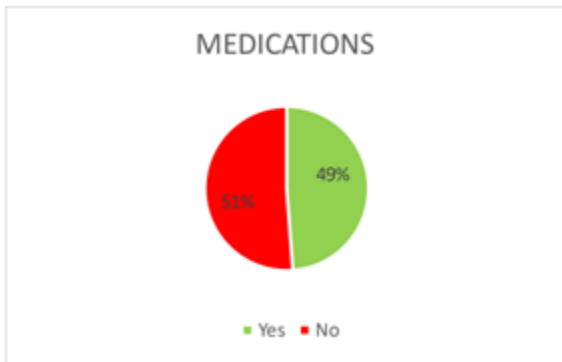


Figure 3: Shows the classification of responses of participants if they are on medications or not

Interpretation: The bar graph showing the classification of the participants if they are on medications or not and is suggestive of more (51%) of the participants are not on any kind of medications and (49%) are taking medications for the treatment of PCOS.

Table 4: Shows classification of the responses of participants who are under medications for depression severity

Depression severity	Percentage of participants
Minimal depression	3.24%
Mild depression	4.68%
Moderate depression	2.16%
Moderately severe depression	1.08%
Severe depression	0.72%
No depression	1.08%

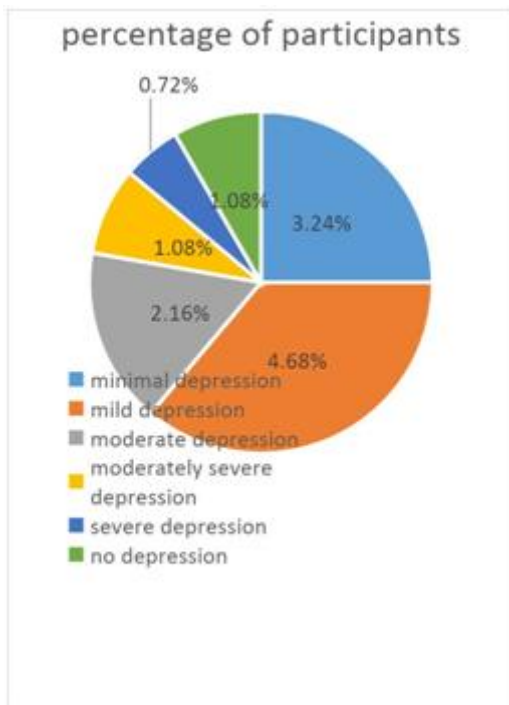


Figure 4: Shows classification of the responses of participants if they are on medications or not

Interpretation: The pie chart showing the classification of responses under medications with accordance to the patient health questionnaire (PHQ-9) is suggestive of depression severity of about – minimal depression (3.24%)

mild depression, (4.68%) mild depression, (2.16%) moderately depression, (1.08%) moderately severe depression, (0.72%) severe depression and (1.08%) no depression.

Table 5: Shows the responses of the participants who are not on medications for depression severity

Depression Severity of the Participants Not On Medications	Percentage of the Participants
Minimal depression	3.75%
Mild depression	5.61%
Moderate depression	6.12%
Moderately Severe depression	4.59%
Severe depression	1.53%
No depression	3.06%

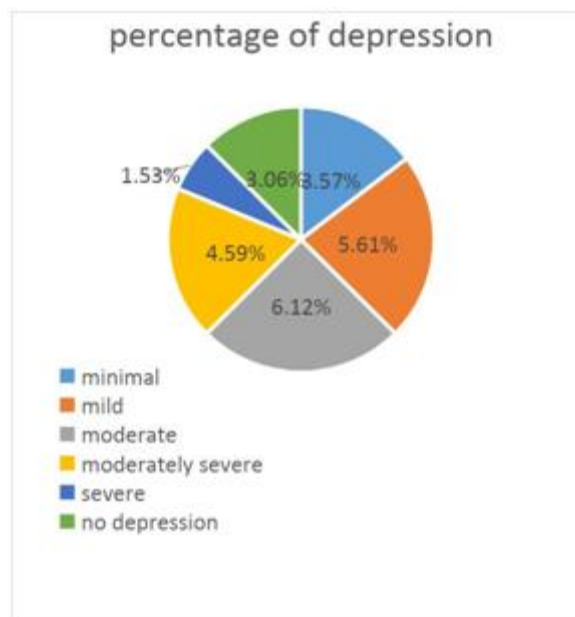


Figure 5: shows the number of participants not taking medications for PCOS and are suffering from depression according to the PHQ-9 questionnaire

Interpretation: The above pie-chart is suggestive of the participants are not taking medications for PCOS and are suffering from depression according to the PHQ-9 questionnaire are- (3.75%) minimal depression, (5.61%) mild depression, (6.12%) moderate depression, (4.59%) moderately severe depression, (1.53%) severe depression and (3.06%) no depression.

Table 6: Shows the classification according to the marital status of the participants

Classification of the Participants According to their Marital Status	Number of the Participants
MARRIED	11
UNMARRIED	74
TRYING TO CONCEIVE	1

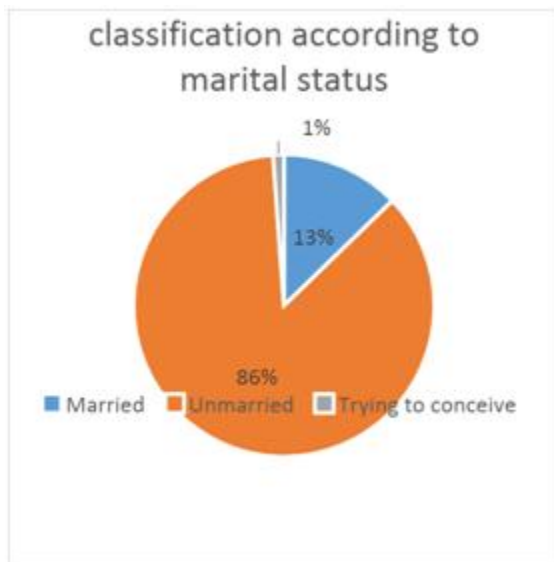


Figure 6: shows the classification of the participants according to the marital status

Interpretation: The above chart is suggestive of the participants according to their marital status- (13%) married, (86%) unmarried and (1%) trying to conceive.

Table 7: Shows the response of the participants for PCOS for since how many years they have been diagnosed with PCOS

Diagnosed with PCOS Since	Number of Participants
1 YEAR	29
2 YEARS	39
3 YEARS	32

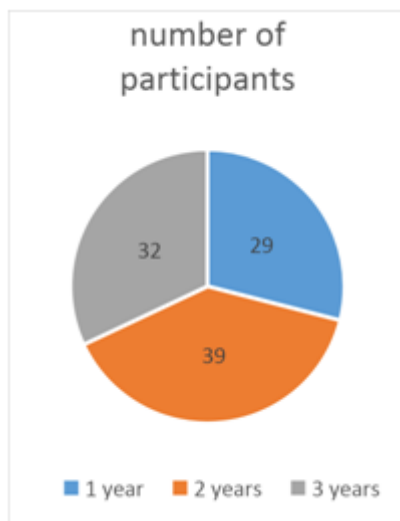


Figure 7: shows the response of the participants for since how many years they have been diagnosed with PCOS

Interpretation: The above pie-chart is suggestive of the number of the participants for since how many years they have been diagnosed with PCOS- (29) since 1 year, (39) since 2 years and (32) since 3 years.

Table 8: Shows the percentage of participants suffering from PCOS since their diagnosis

Severity of Depression	PCOS SINCE 1 YEAR	PCOS SINCE 2 YEARS	PCOS SINCE 3 YEARS
MINIMAL DEPRESSION	0.48%	2.97%	1.35%
MILD DEPRESSION	1.92%	3.63%	1.35%
MODERATE DEPRESSION	1.2%	2.64%	1.35%
MODERATELY SEVERE DEPRESSION	0.96%	1.65%	0.81%
SEVERE DEPRESSION	0.48%	0	0.81%
NO DEPRESSION	0.72%	0	1.62%

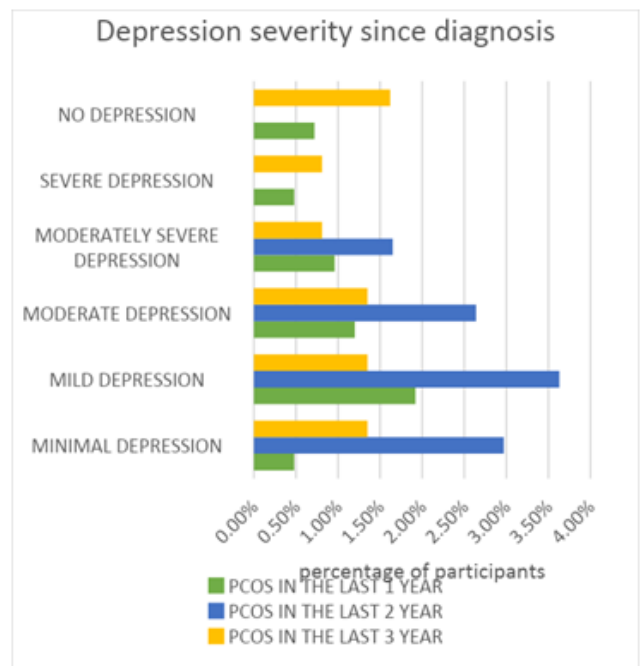


Figure 8: shows the response of the percentage of participants for PCOS since their diagnosis

Interpretation: The above chart is suggestive of percentage of participants since their diagnosis of PCOS suggest that PCOS since 1 year- (0.48%) minimal depression, (1.92%) mild depression, (1.2%) moderate depression, (0.96%) moderately severe depression, (0.48%) severe depression and (0.72%) no depression. PCOS since 2 years – (2.97%) minimal depression, (3.63%) mild depression, (2.64%) moderate depression, (1.65%) moderately severe depression, (0%) for severe depression and no depression. PCOS since 3 years- (1.35%) minimal depression, (1.35%) mild depression, (1.35%) moderate depression, (0.81%) moderately severe depression, (0.81%) severe depression and (1.62%) no depression.

6. Discussion

In women with PCOS, emotional distress could have a psychological impact owing to various visible features such as acne, hirsutism, obesity, and infertility. As there is currently no cure, the main management of PCOS is

currently more focused on the hormonal imbalance levels, infertility.

Patients with a history or known cases of any psychiatric illness, mental retardation, chronic illness were excluded from the study as it could lead to different results. Other medical conditions, recent surgeries like abdominal hernia were excluded as it may cause emotional distress. Also, subjects who were unable to read English were excluded because it may have caused a language barrier between the subject and the therapist.

Farideh ZZ, Mina J, Mohammad MN, Nasrine A, Fedyeh H. conducted a study on the psychological distress in women with PCOS from a hospital in Tehran suggested a list of common symptoms of PCOS that are likely to be told are: nothing to worry about, normal, not as bad as you're saying, or not a big deal. Going months without menses, painful period symptoms, constant bleeding/spotting, constant tiredness and fatigue, intense cravings, sleep troubles, mental health, weight loss struggles, acne, excess hair growth or even hair loss, acanthosis nigricans [1]

These are the symptoms that can be treated. Mental health is the most underrated symptom of PCOS and is as important as physical health. [1]

As women with PCOS tend to suffer from body related issues and are at increased risk of mood and depressive disorders. [1]

The 4 golden principles for PCOS lifestyle changes are – sleep & wake cycle, daily movements, healthy eating habits, emotional wellbeing. If all these elements are worked upon together then PCOS can be overcome. It's a viscous cycle and all the symptoms are inter-connected. [1]

PCOS management isn't about just going on a diet plan- it starts with- body literacy, understanding & educating about the symptoms, getting the right diagnosis, following sustainable eating habits, self care & right supplements. No amount of diet plans can heal the hormones that are troubled by lack of sleep, anxiety & unresolved emotional stress. Our mental health greatly influences our hormones & is equally important to address while working on our health. [1]

Since, **Dennett CC, Simon J.** conducted a study on the role of PCOS in reproductive and metabolic health suggest that the under-lying pathophysiology of PCOS has not been fully understood the treatment focus is on the known symptoms and not the lesser-known symptoms. [2]

McCook JG, Reame NE, Thatcher SS. conducted a study on health-related quality of life issues in women with PCOS suggest that PCOS is of a complex nature and hence the correct treatment is not in a straight-forward manner.

Although, it's been few years since PCOS has got diagnostic criteria but till today the condition has been

ignored, over-looked in the general public on a large scale. [3]

The lack of knowledge about the most common endocrine disorder or the most causes of fertility issues among women its high time we speak or get to know about the condition. [3]

Kerchner A, Lester W, Stuart SP, Dokras A. conducted a study on the risk of depression and other mental health disorders in women with PCOS which was a longitudinal study and suggest that the goal in PCOS patients should be to assess for depression over a period of 1-2 years in PCOS patients is of utmost importance with regular screening for the depressive disorders. [4]

Malik S, Jain K, Talwar P, Prasad S, Dhorepatil B, Gouri Devi. Conducted a study on the management of PCOS in India. The treatment of PCOS needs a multi-disciplinary approach. [5]

Benson S, Hahn S, Tan S, Mann K, Janssen OE, Schedlowski M, et al. conducted a study on the prevalence and implications of anxiety in PCOS which was internet based and conducted in Germany suggest that women with PCOS tend to suffer from anxiety and depression particularly more than women without PCOS. [21] Anxiety and depression contribute not only contribute to increase the severity of the symptoms but also impair the quality of life in PCOS patients. [6]

The study observed the prevalence for high rate of mild depression in PCOS.

7. Conclusion

- It's not easy to deal with it every day. Some of the days are difficult, overwhelming to deal with hence mental health should be given importance as well. Screening of depression in PCOS along with exercises and dietary changes could lead to reduced stress levels, anxiety in PCOS patients.
- The prevalence of depression using PHQ-9 questionnaire in the individuals is about (20.16%) mild depression.
- The prevalence of depression using the PHQ-9 questionnaire in individuals with 1-year PCOS was (1.92%) mild depression and individuals with PCOS in the last 2 years (3.63%) moderate depression and individuals with PCOS in the last 3 years (1.62%) no depression.
- The prevalence of depression in individuals with medications and who are not on medications is statistically not significant and did not get any significant results.
- With this study we found out that there is prevalence of depression in PCOS patients.

8. Future Scope of Study

- The study will be very useful in creating awareness about PCOS.
- PCOS patients have higher rates of depression and

anxiety than general population, therefore, international as well as Indian guidelines suggest that psychological factors must be considered in all women with PCOS, and they must be screened for depression and anxiety on regular basis.

- A larger age group can be taken into consideration for further study.
- If assessment of each symptom of PCOS could be done, then we could get to know about the major symptom/ factor causing depression in PCOS patients.

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