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Original Research Article

Frequency of depression and anxiety in infertile women with and without polycystic ovary syndrome referring to Ardabil infertility center

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ABSTRACT

Background: In spite of the serious consequences that polycystic ovary syndrome (PCOS) can have on the mental health aspects of sufferers, most of the researches conducted in this field have dealt with the medical aspects of this disease, and its effects and psychological aspects have received far less attention in the literature. The aim of this study was to determine the frequency of depression and anxiety in infertile women with and without PCO referred to Ardabil infertility center.

Methods: This case-control study was conducted on 99 women with polycystic ovary syndrome and 96 infertile women for other reasons who referred to the infertility center of Ardabil city in 2022. The diagnosis of polycystic ovary syndrome in this study was based on the Rotterdam criteria. Mood disorders including depression and anxiety were determined based on the Beck standard test. After collecting the data, it was analyzed using descriptive and analytical statistics by statistical package for the social sciences (SPSS) software version 26.

Results: Most of the underlying diseases among them were related to bleeding with 71 cases (36.6%) and then related to hair growth with 43 cases (22.2%). Among the studied women, the rate of depression was 53 (27.3%) and 184 (94.8%) had a low level of anxiety. Among women with PCOS, 38 (38.4%) and among women without PCOS, 15 (15.8%) had depression. Statistically, there was a significant relationship between depression and PCOS.

Conclusion: The rate and severity of depression in PCOS patients was significantly higher than non-PCOS infertile patients.

Keywords: Polycystic ovary syndrome, Anxiety, Depression

INTRODUCTION

Polycystic ovary syndrome (PCOS) is the most common clinical endocrine disorder of the reproductive system in women of reproductive age and the most common cause of infertility due to lack of ovulation.¹ The prevalence of PCOS in different countries has been reported between 2

and 30% and it is estimated that 105 million women of reproductive age in the world have PCOS.² In a review and meta-analysis study, the prevalence of PCOS in Iranian women aged 10 to 54 was reported as 19.5% based on the Rotterdam criteria, 41% based on ultrasound methods, and 1.7% according to the research of the National Institute of Health in Iran.^{3,4} This disease is a heterogeneous disorder

that affects women with hyperandrogenic symptoms, increased metabolic risks, and infertility. It is estimated that approximately 75% of women suffering from this disease suffer from infertility due to lack of ovulation.⁵ Infertile women with PCOS are candidates for ovulation stimulation in the first step, and in case of no pregnancy, they are candidates for in vitro fertilization (IVF).⁶

Infertility exposes sufferers to many emotional and psychological problems such as loss of self-confidence, feeling alone and rejected, obsession about getting pregnant, stress, depression, despair and feeling ashamed of infertility, costs, risks, and the side effects of treatments affect different aspects of their lives.⁷ Infertile women with PCOS are exposed to other problems related to PCOS in addition to the above problems. For example, women with PCOS have a significantly increased risk of overweight and obesity, high blood pressure, dyslipidaemia, glucose tolerance disorder, hyperinsulinemia and insulin resistance, type 2 diabetes, metabolic syndrome, endothelial dysfunction, and diseases. cardiovascular problems.^{8,9} Hyperandrogenism in women with PCOS manifests clinically with hirsutism, acne, and androgenic alopecia.¹⁰ In fact, many of the symptoms of PCOS are painful, unpleasant and unpredictable and are associated with features that are culturally considered unfeminine and undesirable.¹¹ This volume of problems may have side effects on the mental health of PCOS sufferers and expose them to various mood and psychological disorders. The results of the study by Almeshari et al showed that all women with PCOS experience some degree of anxiety, the intensity of which is moderate to severe in a quarter of the sufferers, and more than 60% of women with PCOS also experience some degree of depression. are affected, the severity of which is severe or very severe in more than 10% of cases.¹² The aim of this study was to investigate the frequency of depression and anxiety in infertile women with and without PCO referring to Ardabil infertility center.

METHODS

This case-control study was conducted in 1401 on women referring to Ardabil infertility center with infertility problem (with and without PCOS). 99 women with PCOS and 95 women without PCOS participated in the study. Sampling was done in a non-random and available manner among the patients who met the entry and exit criteria. The control group was matched with the case group in terms of age. Patients who for any reason used any type of drug with antidepressant properties such as tricyclic antidepressants or one of the anti-anxiety drugs, people with a history of smoking, hookah and alcohol consumption, conflicts and severe family conflicts, accidents and Recent accidents that may be involved in the occurrence of depression and anxiety (such as the death of a close relative), addiction, threats of divorce, and illiteracy were excluded from both groups. Also, people who did not cooperate in giving a history and completing the relevant questionnaires (for example, having a hearing,

speech or mental disorder) were excluded from both groups.

Other possible confounding variables such as education level, employment status, and economic status of the family were controlled through the regression model. The diagnosis of polycystic ovary syndrome in this study was based on the Rotterdam criteria. According to this criterion, suffering from PCOS includes having three of the following criteria: oligomenorrhea or amenorrhea, having evidence of PCO in ultrasound, having clinical symptoms (acne, and hirsutism) or laboratory findings of hyperandrogenism. For all participants in the study, demographic information (including age, height, weight, education level, employment status, economic status of the family) and other clinical information (including drug use, smoking, clinical symptoms) are determined and collected in forms and information were registered Mood disorders including depression and anxiety were determined based on Beck depression inventory (BDI) and Beck anxiety inventory (BAI), respectively.

Beck depression questionnaire

The BDI consists of a total of 21 questions related to various symptoms of depression, which subjects must answer on a four-point scale from zero to three. These substances are in areas such as sadness, pessimism, feelings of helplessness and failure, guilt, sleep disturbances, loss of appetite, and self-loathing. This scale determines different degrees of depression from mild to very severe and its scores range from a minimum of 0 to a maximum of 63. A person's total score is obtained by adding up the scores in each subject. Determining the degree of depression based on the Beck depression questionnaire is as follows: score 0 to 13 is no or minimal depression, score 14 to 19 is mild depression, score 20 to 28 is moderate depression, score 29 to 63 is severe depression. The desired validity and reliability of this tool has been determined many times inside and outside of Iran.

Beck's anxiety questionnaire

Beck anxiety inventory (BAI) is designed to measure the level of anxiety and includes 21 statements. Each phrase reflects one of the symptoms of anxiety commonly experienced by people who are clinically anxious, or who are in an anxiety-provoking situation. In each subject, the subject chooses one of the four options that indicate the intensity of his anxiety in the form of a four-point Likert scale from not at all (score 0) to severe (score 3). The total score ranges from 0 to 63. Determining the degree of anxiety based on Beck's anxiety questionnaire is as follows: score 0 to 7 is no or minimal anxiety, score 8 to 15 is mild anxiety, score 16 to 25 is moderate anxiety, score 26 to 63 is severe anxiety. The desired validity and reliability of this tool has been determined many times inside and outside of Iran. After coding the data from the checklists, they were entered into the statistical package for the social sciences (SPSS) version 21 program, and the

quantitative variables were displayed as mean±standard deviation. T-test was used to compare the results of quantitative variables between two groups and chi-square test was used for the relationship between qualitative variables. Also, one-way analysis of variance was used for the relationship between quantitative variables (age, height and weight) based on the intensity of anxiety. The significance level in all tests (p value) was considered less than 0.05.

RESULTS

In this study, 194 infertile women were included in the study based on the objectives of the study. Of these, 99 (51%) had PCOS and 95 (49%) had no PCOS. 100% of women with PCOS had primary infertility. The education of most of the samples with 162 people (83.5%) was below diploma. 13 people (6.7%) were employed. The economic status of most women with 63.4% was poor and very poor (Table 1).

Table 1: Demographic characteristics of the studied samples.

Variables	Number	Percent
Education		
Sub-diploma and diploma	162	83.5
Bachelor's degree	27	13.9
Master's degree	5	2.6
Total	194	100
Job		
Employed	13	6.7
Housewife	181	93.3
Total	194	100
The economic situation		
Very weak	41	21.1
Weak	82	42.3
Medium	66	34
Top	5	2.6
Total	194	100

Among women, the most symptom was related to bleeding with 64 cases (64.6%) and then increased hair loss with 41 cases (41.4%) (Figure 1).

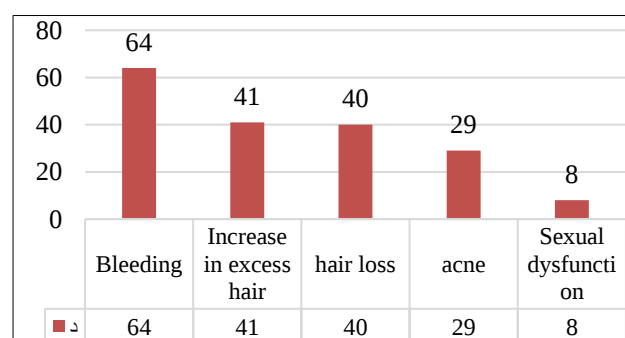


Figure 1: Frequency of symptoms among women with PCOS studied.

As shown in Table 2, among the studied women, the frequency (percentage) of depression was 53 (27.3%) and 184 (94.8%) had a very low level of anxiety.

Table 2: Frequency distribution of depression and anxiety level in the studied samples.

Variables	Frequency	Percent
Depression		
Have	53	72.7
Not have	141	27.3
Total	194	100
Anxiety level		
Very little	184	94.8
Low	9	4.6
Medium	1	0.5
Intense	0	0
Total	194	100

Table 3: Frequency distribution of depression and anxiety level in women with PCOS and without PCOS.

Variables	With PCOS		Without PCOS		P value
	Freq- uency	%	Freq- uency	%	
Depression					
Have	38	38.4	15	15.8	0.003
Not have	61	61.6	80	84.2	
Total	99	100	95	100	
Anxiety					
Very little	95	96	89	93.7	0.35
Low	3	3	6	6.3	
Medium	1	1	0	0	
Intense	0	0	0	0	
Total	99	100	95	100	

Among women with PCOS, 38 (38.4%) and among women without PCOS, 15 (15.8%) had depression. According to Chi-square test, there was a significant relationship between depression and the presence of PCOS. Also, the anxiety level of women with PCOS was very low with 96% and women without PCOS with 93.7%. According to the chi-square test, there was no statistically significant relationship between the level of anxiety and the presence of PCOS (p=0.35).

The rate of depression in women with PCOS was about 2.4 times that of women without PCOS (Figure 2).

Among women with PCOS, who had education below diploma, 35.3% had depression and 97.6% anxiety level was very low. In terms of Chi-square test, there was no statistically significant relationship between depression and anxiety in women with and without PCOS and education.

Among working women with PCOS, 57.1% had depression and the anxiety level was low. Also, among working women without PCOS, 16.7% had depression and 83.3% anxiety level was low. Statistically, there was no statistically significant relationship between depression and anxiety in women with and without PCOS and occupation. Among women with poor and very poor economic status with PCOS, 36.8% had depression and 97% had very low anxiety levels. Also, among women with poor and very poor economic status without PCOS, 16.4% had depression and 92.7% anxiety level was very low. Statistically, there was no statistically significant relationship between depression and anxiety in women with and without PCOS with poor and very poor economic status.

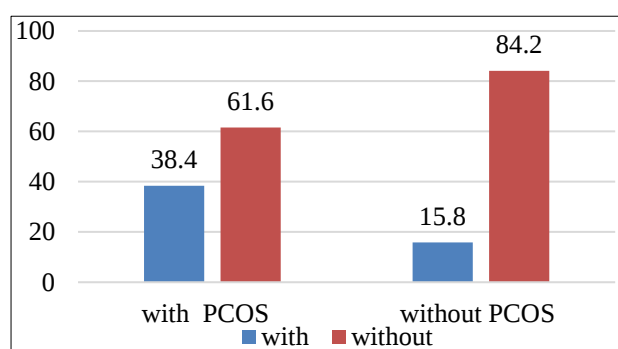


Figure 2: Comparison of depression rates among women with and without PCOS.

Table 4: The relationship between the presence of depression and anxiety with the duration of PCOS in women with PCOS.

Duration of infection group with PCOS	Average	SD	P value
Depression			
Have	4.9	3.4	0.12
Not have	5.7	2.5	
Anxiety			
Very little	5.3	3.1	0.19
Low	1.7	1.1	
Medium	4	1	
Intense	-	-	

There was no significant difference between the duration of depression in terms of presence of depression based on independent t-test and anxiety level based on analysis of variance among women with PCOS. Among women with PCOS with irregular bleeding, 43.8% had depression and 95.3% had very low anxiety levels. Statistically, there was no statistically significant relationship between depression and anxiety in women with PCOS with irregular bleeding.

Among women with PCOS hair loss, 40% had depression and 97.5% anxiety level was very low. Statistically, there was no statistically significant relationship between depression and anxiety in PCOS women with hair loss.

Among women with excessive hair growth with PCOS, 48.8% had depression and 92.7% had very low anxiety levels. Statistically, there was no statistically significant relationship between depression and anxiety in women with PCOS and increased hair loss. Among women with PCOS with acne, 44.8% had depression and 96.6% of anxiety levels were very low. Statistically, there was no statistically significant relationship between depression and anxiety in women with PCOS with acne.

Among women with sexual dysfunction with PCOS, 25% had depression and all had very low anxiety levels. Statistically, there was no statistically significant relationship between depression and anxiety in women with PCOS and sexual dysfunction. There was no significant difference between age, height and weight among women with PCOS in terms of depression based on independent t test and anxiety level based on variance analysis. There was no significant difference between age, height and weight among women without PCOS in terms of depression and anxiety level based on independent t test. Among women with PCOS, 23 (23.2%) had mild depression and among women without PCOS, 8.4% had mild depression. There was a statistically significant relationship between the severity of depression in women with PCOS (Figure 3).

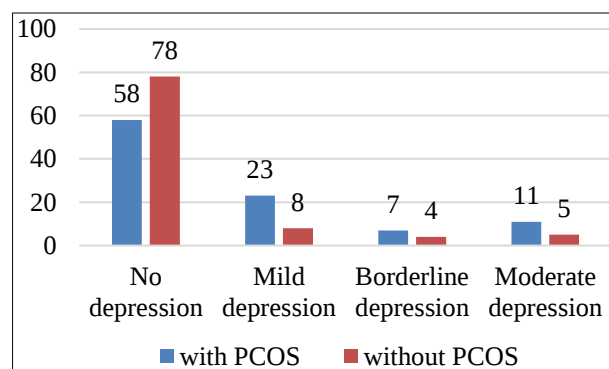


Figure 3: The relationship between the severity of depression and PCOS in the studied women.

DISCUSSION

It has been observed that mental health disorders are often the result of the following three things; hormonal disorders associated with polycystic ovary syndrome, the appearance changes that occur after suffering from it, as well as the need to deal with a number of problems caused by this chronic and incurable disease. Two of the most important complications of PCOS that have been widely confirmed in previous scientific studies are anxiety and depression.¹³

Various studies have not determined what factors influence the level of anxiety and depression in women with PCOS. For this reason, the purpose of our study was not only to determine the frequency of these disorders in PCOS patients, but also to try to answer the question of

which of the socio-demographic variables and disease symptoms (such as acne) affect the level of anxiety and depression. It is effective in women with PCOS. This study included 99 women with PCOS and 95 non-PCOS women as a control group, all of whom were in the reproductive age group. The rate of depression in women with PCOS was 38.4% and in women without PCOS it was 15.8%. The level of depression in the group of women with PCOS was significantly higher; Thus, the rate of depression in women with PCOS was about 2.4 times that of women without PCOS. In a case-control study by Alvar et al, the level of depression in women with PCOS was higher than in the control group, which was consistent with our study. In Almeshari et al study, depression was present in 49% of women with PCOS, which may be due to the larger sample size of their study. Also, high levels of anxiety were not confirmed in the present study. Anxiety was present in only 4% of surveyed women with PCOS, while 96% of affected women had no anxiety symptoms. In the control group, anxiety was present in 6.3% of examined women. Therefore, the relationship between PCOS and anxiety was not confirmed in our study. A recent study is also in line with the current study, so that in this study only 6% of women with PCOS had severe symptoms of anxiety. The rest had mild or moderate symptoms.¹² Another study conducted by Alur et al showed a higher frequency of anxiety in PCOS sufferers compared to the control group (76.5% versus 56.5%), which is significantly higher than the present study, which may be due to the sample size. almost double in their study.¹⁴

In our study, it was found that in women with polycystic ovary syndrome, depression and anxiety are not related to the patient's age, height, and weight. In the study of Kogure et al which was conducted in India, no direct relationship was found between obesity and depression and anxiety in women with PCOS, which is consistent with this study. It shows cystic among overweight and obese women.¹⁵ The study by Dybczak et al which was conducted in 2021, showed that age over 30 years and obesity increase the level of depression in women with PCOS.¹⁶ The study by Stapinska-Syniec et al also showed a significant relationship between depression and the index. Body mass was higher.¹⁷ This difference can be caused by differences in cultures. Chaudhari and colleagues believe that, unlike Western countries where obesity is considered unattractive, it may not be seen as negative in Asian countries.

In this study, there was no statistically significant relationship between depression and anxiety with education, occupation and economic status in women with and without PCOS. In Kaviani et al study, anxiety had a direct relationship with low income ($p=0.03$) and being unemployed ($p=0.03$).¹⁸ Dybczak et al study showed that a lower level of education is associated with more depression and anxiety.¹⁶ Considering the low presence of working people with high education and good economic status in this study, this difference can be justified. According to the results of this research, there was no

statistically significant relationship between depression and anxiety levels in infertile women with PCOS and hair loss. The study conducted by Kogure et al in 2018 showed that anxiety has a significant relationship with hair loss. In this study, there was no difference between the case and control groups in terms of sexual dysfunction in women.¹⁵ In Altuntaş's study in 2022, there was no significant difference in the female sexual performance index scores between the PCOS group and the healthy control group. Which is consistent with the results of the present study.¹⁹

In this study, no statistical relationship was found between irregular menstrual bleeding and frequency of depression and anxiety in women with PCOS. The study by Kogure et al in 2018 also shows the same result as the present study. In our study, it was found that in women with polycystic ovary syndrome, excessive hair growth and depression and anxiety are not statistically related. In Kogure et al study, a direct relationship between excessive hair growth and anxiety and depression was not confirmed statistically, which is similar to this study. Also, the relationship between depression, anxiety and acne in women with PCOS was not confirmed in our study, while in the study of Kogure et al, depression had a significant relationship with acne. This difference can be due to the method of data collection in their study (direct interview and clinical evaluation).¹⁵

Limitations

There were limitations in our study, the use of self-report questionnaires that could lead to biased responses. A complete assessment of anxiety and depression was not possible due to the exclusive use of screening tools. Most of the people present in the study were at a low level in terms of education and society, which can lead to wrong answers and results that are contrary to reality.

CONCLUSION

The group of women with PCOS was significantly more likely to suffer from depression; Thus, the rate of depression in women with PCOS was about 2.4 times that of women without PCOS. The severity of depression in PCOS patients was significantly higher than non-PCOS infertile patients. Among women with polycystic ovary syndrome, there was a direct relationship between taking medications for this disease and suffering from anxiety.

Recommendations

Future research in this field should be focused on evaluating the possibility of applying therapeutic interventions, both in the field of anxiety and depression, in the context of flexible coping with the stress of a chronic disease. Clinical trials with interventions to improve patients' depression with drug therapy. In our study and similar studies, there was no evidence of the effect of place of residence or education level on the anxiety and depression of PCOS women, which will require further

investigation due to the following reason: women who live in rural areas may have less access or opportunity to get help to solve their health problems. In addition, they may be more exposed to pressure and negative judgments in a small community, which has a negative impact on their mental health. In turn, evidence shows that people with higher education are more effective in finding help and coping with stress, and education has been shown to be protective against anxiety symptoms. Other methods of data collection should be used to check the prevalence of depression, such as direct interviews and clinical examinations.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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