

Investigating the Consumption of Steroid Contraceptives and Causing Depression and Anxiety in Women and Girls with Polycystic Ovary Syndrome in Tehran

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Abstract

The aim of the present study was to investigate the relationship between the use of steroid contraceptive pills and the development of depression and anxiety in women and girls. A descriptive-correlational design was used in this research. The statistical population of the research included 110 women of Tehran city in 2024, who were selected in an accessible way. For this purpose, the scale of depression, anxiety, stress (Lavibond, 1995) was used. Data analysis was done using Pearson's correlation coefficient, descriptive (mean and standard deviation) and inferential (Pearson's correlation coefficient) using SPSS26 software. The results of this research showed that there is a significant positive relationship between the use of contraceptive pills and the occurrence of 3 psychological variables: anxiety, $r=0.461$, depression $r=0.817$, and stress, $r=0.782$. And it became significant, this means that with the use of contraceptive pills, the level of depression and anxiety increases. These results have been confirmed at a significant level at the $p<0.01$ level, which indicates the importance and strength of the relationship between the variables. These findings can help counselors and doctors to provide more accurate information about the side effects of these drugs to their patients and, if needed, suggest appropriate solutions to reduce these effects.

Conclusion: Based on the findings, it is concluded that as a result of taking contraceptive pills, women are exposed to psychiatric side effects of these types of pills. That the 3 variables of depression, anxiety and stress are at a medium and higher level, which is a worrying statistic. Various methods can be used to reduce and treat these psychiatric complications, including: counseling and psychotherapy, lifestyle changes, and contraceptive drugs.

Keywords: Anxiety, Polycystic, Depression

Introduction

Oral contraceptives (OCP) refer to a group of oral medications in the form of pills that are used to prevent pregnancy. It is estimated that contraceptive pills are used daily by more than 151 million women worldwide. Generally, hormonal pills are very effective in preventing pregnancy (Haakenstad & Angelino, 2022). Hormonal contraceptive pills are known to accelerate or sustain depression in some patients. The relationship between the use of pills and depression may be attributed to the amount and type of progesterone present in the pills. The hormonal compounds in these types of pills have been one of the most common methods of contraception and have been extensively studied since 1960 (Robinson, 2004). Older oral contraceptive pills containing ethinyl estradiol are associated with severe mood problems.

There are several different forms of contraceptive pills available for women. Some contain only progesterone, while others contain both estrogen and progesterone. Estrogen and progesterone affect the chemical nervous system, brain function, and the activity of neurotransmitters such as gamma-amino butyric acid, serotonin, and dopamine (Green, 2017). Progesterone and estrogen in these pills exert their primary effect by inhibiting the function of gonadotropins. This mechanism involves suppressing the secretion of luteinizing hormone (LH) and follicle-stimulating hormone (FSH) in the blood and preventing the mid-cycle surge of luteinizing hormone. Estrogen receptors (ER)-alpha and ER-beta are widely distributed in the brain, with ER-alpha mainly found in the hypothalamus, hippocampus, amygdala, and brainstem.

Progesterone receptors alpha and beta are most abundant in the amygdala, cerebellum, cerebral cortex, hippocampus, and hypothalamus (Kulkarni, 2011). Functional brain imaging studies have shown that estrogen regulates the activation of brain regions involved in emotional and cognitive processing, such as the amygdala and dorsolateral prefrontal cortex (Toffoletto & Lanzenberger, 2014). Unlike estrogen, progesterone is not neuroprotective. Progesterone can worsen mood symptoms (Skovlund & Mørch, 2016). Possible links include the increase of progesterone in inhibiting GABA-induced glutamate transmission (Smith, 1987). Progesterone increases the concentration of monoamine oxidase, thereby reducing the concentration of serotonin (Klaiber, 1996). There is evidence suggesting that both estrogen and progesterone affect brain function, which may be responsible for the negative mood changes and depression commonly reported by women who use oral contraceptive pills (Civic, 2000; Sanders, 2001). The mechanism by which oral contraceptive pills affect mood is controversial. However, there is increasing evidence suggesting a

significant association between pill use and the reduction of mood disorders such as depression (Herzberg, 1987).

Many reports indicate that despite their numerous benefits, these pills can cause negative issues and side effects such as increased appetite, weight gain, weakness, vomiting, nausea, headaches, dizziness, fainting, bloating, premenstrual syndrome, cardiovascular diseases, cancer, and mood and psychological changes like irritability, anxiety, fatigue, depression, and anxiety (Oddens, 1999).

Additionally, contraceptive pills can have benefits beyond pregnancy prevention for individuals and society. These pills can reduce PMS symptoms, decrease uterine fibroids, lower the incidence of rheumatoid arthritis, and reduce symptoms of polycystic ovary syndrome and pituitary adenomas (Anderl, 2020).

Numerous clinical studies have identified a link between the use of contraceptive pills during youth and an increased risk of depression. A large Danish study involving more than one million women found that the risk of first-time use of an antidepressant and the first diagnosis of depression increases among users of various types of oral contraceptive pills, with the highest rates among adolescents (De Wit, 2020; Skovlund, 2016). A comprehensive review published in 2002, which includes 13 controlled studies, examines the relationship between mood and pill use. One study showed differences in the impact between users of oral contraceptive pills and non-users. Another experimental study involving 58 women found that current or recent users of contraceptive pills had higher levels of subjective and objective depression compared to non-users (Oinonen, 2002). The general belief in medicine is that the compounds in these pills can cause mood disorders, even to the extent of major depression. Robinson and colleagues also stated that higher levels of anxiety, depression, fatigue, nervous symptoms, and sexual dysfunction are observed in users (Carson, 2006). The general belief in medicine is that the compounds in these pills can cause mood disorders, even to the extent of major depression. Robinson and colleagues also stated that higher levels of anxiety, depression, fatigue, nervous symptoms, and sexual dysfunction are observed in users (Carson, 2006). Depressive disorder is one of the most common mental disorders, imposing a considerable emotional, social, and economic burden on individuals and society (Alijani & Ranjbar-Kohan, 2022).

A common feature of all psychological disorders is the presence of sadness, feelings of emptiness, or an irritable state of apathy and aversion to activity or disinterest and lack of motivation, which can affect a person's thoughts, behavior, feelings, and overall

well-being. Depression leads to significant disability in personal and social aspects of an individual's life and employment (Wanjan, 2014). The prevalence of anxiety in Iranian society is similar to that of depression. Additionally, some studies indicate that the comorbidity of depression and anxiety in Iranian society is about 60%, and the overlap of these symptoms is very high (Kavyani, 2003).

The central feature of depression is mood disturbance. A decrease in serotonin and the resulting low mood cause depression. Depression creates severe symptoms that affect feelings, thoughts, and daily activities such as sleeping, eating, or working. Almost all depressed patients (about 97% of them) complain of decreased energy, which makes it difficult for them to perform their tasks easily. Depression causes academic and occupational disruptions and reduces individuals' motivation to undertake new projects. About 80% of patients complain of sleep difficulties, especially early morning awakening (i.e., terminal insomnia) and frequent waking during the night, during which they constantly think about their problems. Many patients experience weight loss or gain. Individuals with depressive disorder feel sadness, worthlessness, lack of interest and pleasure, sadness, and hopelessness (Kaplan & Sadock, 2021). According to the American Psychiatric Association, anxiety is a negative mood characterized by physical symptoms such as bodily tension and fear about the future. Anxiety is a normal and adaptive response that helps preserve life by warning about various dangers and prompting individuals to take action to prevent or mitigate the consequences of these threats. This preparation is accompanied by the activity of the autonomic nervous system.

According to the Yerkes-Dodson theory, a certain amount of anxiety improves performance. Anxiety becomes neurotic when it lasts too long or occurs too frequently, disrupts functioning, is disproportionate to the level of threat, and is beyond the individual's control. An anxiety disorder is a state of severe psychological arousal characterized by excessive fear, doubt, and worry (Khajavi, 2022; American Psychological Association, 2013). In this context, the present study was conducted with the general aim of determining the relationship between the use of contraceptives and symptoms of depression and anxiety. This research, utilizing scientific methods and precise analyses, seeks to find answers to important questions in this field. Can the use of these drugs lead to mood changes? Is there a relationship between the use of these drugs and increased levels of anxiety and depression? Is there a connection between depressive symptoms and the use of contraceptive pills? The results of this research can help clarify this issue and provide strategies for better management of women's mental health. It is hoped

that this study will be an effective step towards improving the quality of life and mental health of the community.

Research Method

In this descriptive-correlational study, the relationship between the use of contraceptive drugs and the development of depression and anxiety in women and girls with polycystic ovary syndrome in Tehran was examined. The statistical population of this study consisted of women residing in Tehran. 110 women were selected through convenience sampling. After obtaining the participants' consent and ensuring they met the inclusion criteria, the Depression, Anxiety, and Stress Scale was administered. For data collection, the Depression, Anxiety, and Stress Scale (DASS, Lovibond, 1995) was used (Ashtiani, 1958). This scale consists of three self-report scales designed to assess negative emotional states of depression, anxiety, and stress. The primary application of this scale is to measure the severity of the core symptoms of depression, anxiety, and stress. Antonio and colleagues conducted a factor analysis on the mentioned scale, and their research results again indicated the presence of three factors: depression, anxiety, and stress. The results of this study showed that 68% of the total variance of the scale is accounted for by these three factors, with Cronbach's alpha coefficients of 0.95, 0.92, and 0.97 for these factors, respectively. Additionally, the correlation calculations among the factors studied by Antony and colleagues (1998) indicated a correlation coefficient of 0.48 between the depression and stress factors, 0.53 between anxiety and stress, and 0.28 between anxiety and depression.

The validity and reliability of this questionnaire in Iran were examined by Samani and Jokar (2007), who reported test-retest reliability coefficients of 0.77, 0.76, and 0.80 for the depression, anxiety, and stress scales, respectively. They also reported Cronbach's alpha coefficients of 0.81, 0.74, and 0.78 for the depression, anxiety, and stress scales, respectively (Samani & Jokar, 2007).

Inclusion criteria for the study:

- 1) Age between 18 and 45 years.
- 2) Female gender (single or married).
- 3) No history of mental disorders.
- 4) Not taking psychiatric medications or any other drugs that reduce symptoms of depression and anxiety.
- 5) At least 3 months of OCP use (as it takes 1-3 months for the pill to establish stable hormonal changes) (Gray & Johnson, 1976).

Findings

In this study, 110 women from Tehran were examined. The maximum age was 45 years and the minimum age was 18 years. The age distribution was divided into four categories as shown in the table below. For

data analysis, descriptive and inferential statistics were used. In the descriptive section, the mean and standard deviation of the data were calculated, and in the inferential section, Pearson's correlation coefficient was used. The data were analyzed using SPSS 26 software.

Table1- Statistical Comparison of Age Variable in the Investigated Group

Age Category	Frequency	Percent	Valid Percent	Cumulative Percent
18 -25	29	26.4	26.4	100.0
25-33	33	30.0	30.0	73.6
33-40	27	24.5	24.5	43.6
40-45	21	19.1	19.1	19.1
Total	110	100.0	100.0	

According to Table 1, in the first age group (18-25 years), there were 29 individuals (26.6%), in the age group 25-33 years, there were 33 individuals (30%), in the age group 33-40 years, there were 27 individuals (24.5%), and in the last age group (40-45 years), there were 21 individuals (19.1%). The highest frequency was in the age group 25-33 years (30%).

Table2- Descriptive Findings Related to Gender Variable

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Woman (Married)	66	60	60	60
Woman (Single)	44	40	40	100
Total	110	100	100	

According to Table 2, out of the 110 participants in this study, 66 were married women, making up 60% of the total, while 44 were single women, comprising 40% of the total participants.

Table3- Descriptive Findings Related to the Variables of Indications.

Indications	Frequency	Percent	Valid Percent	Cumulative Percent
Birth Control	46	41.8	41.8	100
Treat (PCOS)	34	30.9	30.9	58.2
Use for Hair Loss and etc.	24	21.8	21.8	21.8
Treat Pituitary Adenoma	6	5.5	5.5	27.3
Total	100	100	100	

According to Table 3, among the population of women, 46 individuals (41.8%) use contraceptive pills for birth control. On the other hand, 34 individuals (30.9%) use these pills to treat polycystic ovary syndrome (PCOS). This condition, which is

associated with symptoms such as irregular menstruation, excessive hair growth, and fertility issues, can be managed with these medications. Additionally, 24 individuals (21.8%) use these medications for other purposes, which may include regulating menstruation, severe hair loss, acne, and more. Finally, 6 individuals (5.5%) use contraceptive pills to treat pituitary adenoma.

Table4- Descriptive Findings Related to Research Variable.

variables	Number	Deviation	Mean
Anxiety	110	5.17330	8.4455
Dep	110	6.03839	12.2455
Stress	110	6.04089	14.9455

According to Table 4, the anxiety variable, with a standard deviation of 5.17330 and a mean of 8.4455, indicates a variety of anxiety levels among the participants. The mean of 8.4455 shows that the overall anxiety level among the participants is moderate. The depression variable, with a standard deviation of 6.03839 and a mean of 12.2455, was also examined. The mean of 12.2455 indicates that the depression level is slightly above average. The stress variable, with a standard deviation of 6.04089 and a mean of 14.9455, shows that the overall stress level among the participants is above average. These numbers provide a general picture of the participants' mental state and help us better understand their psychological condition. They also indicate that the use of contraceptive pills can have a significant impact on the levels of anxiety, depression, and stress in individuals.

Table5- Findings from Pearsons Correlation of Variables.

Variables	Anxiety	Dep	Stress
Taking pills	0.461	0.817	0.782

In Table 5, of this study, the findings from the Pearson correlation between contraceptive use and the three psychological variables of anxiety, depression, and stress were examined. The correlation between contraceptive use and anxiety, with a correlation coefficient of 0.461, indicates a strong relationship between these two variables. This number suggests that the use of these pills has a significant impact on the participants' anxiety levels, and these two variables are highly correlated. The correlation between contraceptive use and depression, with a coefficient of 0.817, also indicates a very strong relationship between these two variables. Finally, the correlation between contraceptive pill use and stress, with a coefficient of 0.782, indicates that the use of these pills has a significant impact on the participants' stress levels. According to Table 5, there is a significant positive relationship between pill use and

the three psychological variables at the 0.01 level: anxiety { $r=0.461$, $P<0.01$ }, depression { $r=0.817$, $P<0.01$ }, and stress { $r=0.782$, $P<0.01$ }. These findings show that pill use greatly affects the levels of anxiety, depression, and stress among participants. Each participant, with their unique experiences, has enriched this study and helped us gain a better understanding of the effects of contraceptive pill use on mental health. This strong correlation highlights the importance of considering the psychological impacts of pill use and the need for appropriate counseling, support, and treatment for women.

Discussion and Conclusion

Women's mental health is a crucial part of their overall well-being. Mental health issues are more prevalent in women than in men, highlighting the importance of maintaining mental health in women. Women's mental health affects their emotional, psychological, and social interactions with others. Therefore, all women need to strive to maintain their mental health. Women's mental health is not only recognized as a human right but also has significant implications for the health of families and communities. Women's health encompasses their physical, psychological, social, and emotional well-being and is influenced by physiological and social factors. Due to their multiple roles in the family and society, and the various physiological stages they go through such as puberty, menstruation, pregnancy, and menopause, women are at greater physical and psychological risk. Therefore, paying attention to women's mental health and providing necessary support is of special importance. Based on the findings, it is concluded that the use of contraceptive pills exposes women to acute psychiatric side effects such as depression, anxiety, stress, and negative mood. So, in response to the questions: Can the use of these medications lead to mood changes? Is there a connection between the use of these medications and increased levels of anxiety and depression? The answer is yes. These effects may be due to changes in dopamine and serotonin signaling in the brain. These neurotransmitters play a crucial role in regulating mood and emotions, and changes in their levels can lead to depression and anxiety. Depression and stress reduce energy and create a sense of despair, hopelessness, fatigue, and frustration. Therefore, to cope with and mitigate these effects and improve the quality of life, various methods can be used. Here are some of these methods:

1) Counseling and Psychotherapy: One of the most effective methods for managing anxiety and depression is counseling and psychotherapy. Cognitive-behavioral therapy (CBT) and acceptance and commitment therapy (ACT) are effective methods in this field (Abdolghaderi, 2014).

2) Changing Medication: In some cases, changing the type of contraceptive pill can help reduce symptoms of anxiety and depression.

3) Antidepressant and Anti-Anxiety Medications: In severe cases, a doctor may prescribe antidepressant or anti-anxiety medications. These can include selective serotonin and norepinephrine reuptake inhibitors (SSNRIs), monoamine oxidase inhibitors (MAOIs), and selective serotonin reuptake inhibitors (SSRIs) (Kaplan & Sadock, 2021).

4) Lifestyle Changes: Regular physical activity, healthy eating, adequate sleep, and stress management techniques such as meditation and yoga can help improve mental health.

5) Social Support: Having support from family and friends and participating in support groups can help reduce negative feelings and increase positive emotions (Epstein, 1991).

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