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Review

Comorbid Anxiety Risk and Mental Health Management Pathways in Patients with Polycystic Ovary Syndrome

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Abstract: Polycystic ovary syndrome (PCOS) is a highly prevalent reproductive endocrine and metabolic disorder affecting a significant proportion of women of reproductive age worldwide. In addition to classic clinical presentations—such as menstrual irregularity, hyperandrogenic symptoms, ovulatory dysfunction, obesity, and insulin resistance—PCOS profoundly impacts patients' body image, emotional well-being, overall quality of life, and long-term disease management trajectories. Anxiety represents one of the most critical yet frequently overlooked psychological comorbidities associated with PCOS, often remaining insufficiently recognized in routine clinical care settings. This comprehensive review adopts a rigorous literature-based and theoretical analytical approach to systematically examine the clinical manifestations, underlying influencing factors, and optimal management pathways concerning comorbid anxiety risk in patients diagnosed with PCOS. The synthesized analysis indicates that PCOS-related anxiety is intricately shaped by a multitude of interacting variables. These include underlying endocrine and metabolic abnormalities, distressing visible clinical symptoms, chronic menstrual irregularity, intense fertility pressure, the exhausting burden of long-term self-management, insufficient social support networks, and pervasive disease misconceptions. Consequently, contemporary PCOS management paradigms must urgently evolve beyond a narrow, traditional reproductive and metabolic treatment model. A holistic, patient-centered mental health management pathway should be systematically established. This framework must incorporate routine psychological screening, precise anxiety risk stratification, targeted health education, integrated therapeutic interventions, robust multidisciplinary collaboration, and structured long-term follow-up protocols. Implementing such a comprehensive approach will significantly reduce anxiety risk, enhance treatment adherence, and ultimately promote the holistic physical and mental well-being of patients living with PCOS.

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1. Introduction

Polycystic ovary syndrome (PCOS) is a common reproductive endocrine and metabolic disorder among women of reproductive age. It is typically characterized by menstrual irregularity, hyperandrogenic manifestations, ovulatory dysfunction, obesity, insulin resistance, and related metabolic disturbances. Because of its chronic and recurrent nature, PCOS affects not only reproductive function and metabolic health but also patients' daily lives, body image, emotional well-being, and long-term self-management [1]. With the shift from a disease-centered biomedical model to a more holistic model of health care, increasing attention has been paid to the psychological burden experienced by patients with PCOS. Among these psychological concerns, anxiety represents a particularly important comorbidity because it may influence patients' quality of life, treatment adherence, and confidence in disease management.

The risk of anxiety in patients with PCOS does not arise from a single psychological factor. Rather, it is shaped by the interaction of biological abnormalities, visible clinical symptoms, fertility-related concerns, and long-term management pressure. Menstrual irregularity, acne, hirsutism, hair loss, and weight gain may negatively affect patients' body image and self-esteem, leading to embarrassment, social avoidance, and persistent worry. In addition, ovulatory dysfunction and potential infertility may increase reproductive anxiety, especially among patients who are preparing for pregnancy or experiencing repeated difficulties in conception. The long-term nature of PCOS management also places a considerable burden on patients. Dietary control, physical activity, medication use, weight management, and regular follow-up require sustained effort. When symptoms fluctuate or treatment effects are not immediately visible, patients may experience frustration, uncertainty, and reduced confidence in managing their condition [2].

However, current clinical management of PCOS still tends to focus primarily on menstrual regulation, ovulation induction, hormonal control, weight reduction, and metabolic risk management [3]. Psychological symptoms, sleep disturbances, body image concerns, and emotional support needs are often insufficiently assessed in routine care. Some patients may not actively report anxiety because they lack appropriate channels for communication, worry about being misunderstood, or regard psychological distress as a personal weakness rather than a health issue requiring support. If anxiety is not identified and managed in a timely manner, it may further reduce quality of life, weaken adherence to lifestyle interventions, increase avoidance of follow-up, and undermine long-term disease management outcomes. Therefore, integrating mental health assessment and support into PCOS care is of practical significance.

Based on this background, this paper adopts a literature-based and theoretical analytical approach, without involving participant recruitment or individual clinical data collection [4]. It aims to examine the manifestations and influencing factors of comorbid anxiety risk in patients with PCOS and to explore a feasible pathway for mental health management. The discussion focuses on the need to move beyond a narrow reproductive and metabolic treatment model toward a patient-centered, biopsychosocial approach. By emphasizing psychological screening, risk stratification, integrated intervention, multidisciplinary collaboration, and long-term follow-up, this paper seeks to provide a practical reference for improving comprehensive care and promoting the overall physical and mental well-being of patients with PCOS.

2. Manifestations of Comorbid Anxiety Risk in Patients with Polycystic Ovary Syndrome

2.1. Increased Anxiety Symptoms and Psychological Burden

Patients with PCOS may experience anxiety related to both physical symptoms and uncertainty about long-term outcomes. Menstrual irregularity often causes concern about endocrine imbalance, reproductive health, and disease progression. Visible symptoms such as acne, hirsutism, hair loss, and weight gain may further increase psychological pressure because they directly affect appearance and self-perception [5]. For many patients, these symptoms are not only medical problems but also continuous reminders of the disease.

Uncertainty about fertility is another important source of anxiety. Because PCOS is associated with ovulatory dysfunction and possible difficulty in conception, some patients may worry excessively about future reproductive ability, especially those preparing for pregnancy or experiencing repeated conception failure [6]. Anxiety may appear as persistent nervousness, sleep disturbance, excessive attention to bodily changes, repeated online searching for disease information, and frequent medical consultations. These manifestations show that anxiety in PCOS is closely linked to symptom perception, treatment expectations, and concerns about future health.

2.2. Impact of Anxiety on Quality of Life

Anxiety may reduce the quality of life of patients with PCOS. The disease affects areas closely related to personal identity, including appearance, menstruation, body weight, sexuality, and fertility. When anxiety develops around these issues, patients may experience lower life satisfaction, reduced self-confidence, and a weakened sense of control over their bodies [7]. They may become more sensitive to physical changes and more worried about others' judgments.

The impact of anxiety may extend to study, work, intimate relationships, and family life. Younger patients may be affected by worries about appearance, menstruation, and peer evaluation. Adult patients may experience anxiety related to fertility, marital communication, and family planning [8]. Some patients may avoid social situations because of acne, hirsutism, obesity, or fear of negative evaluation. Therefore, anxiety can amplify the overall disease burden and reduce well-being beyond the direct effects of physical symptoms.

2.3. Impact of Anxiety on Treatment Adherence

Anxiety can also affect treatment adherence and long-term disease management. PCOS management usually requires lifestyle modification, medication use, weight control, and regular follow-up. However, anxious patients may become overly concerned about treatment effectiveness, symptom improvement, or future fertility [9]. When treatment effects are slow or unstable, anxiety may lead to disappointment, distrust, or frequent changes in treatment plans.

Some patients may also respond to anxiety through avoidance. They may delay follow-up, discontinue medication without medical advice, or avoid discussing fertility and weight-related issues. Lifestyle interventions may become difficult to maintain, as diet control and exercise require long-term persistence. Anxiety, low confidence, and frustration may weaken motivation, leading either to extreme short-term self-management or complete withdrawal from management. Thus, anxiety is not only a psychological consequence of PCOS but also a factor that may interfere with treatment continuity [10].

2.4. Coexistence of Anxiety with Other Psychological Problems

Anxiety in patients with PCOS often does not occur alone. It may coexist with depression, sleep disturbance, body image dissatisfaction, disordered eating, low self-esteem, and reduced health-related quality of life [5]. These problems may interact and form a reinforcing cycle. For example, body image concerns caused by weight gain, acne, or hirsutism may increase social anxiety and reduce self-esteem. Low self-esteem may further contribute to depressive mood, while anxiety and depression may worsen sleep quality and reduce motivation for healthy behaviors.

Disordered eating is also relevant. Since weight control is often emphasized in PCOS management, some patients may develop excessive concern about diet, body shape, and weight change. Without proper guidance, this may increase guilt, emotional eating, restrictive eating, or dissatisfaction with treatment outcomes [11]. Therefore, assessment of comorbid anxiety risk should not be limited to anxiety symptoms alone, but should also include emotional, behavioral, and quality-of-life dimensions.

3. Influencing Factors of Comorbid Anxiety Risk in Patients with Polycystic Ovary Syndrome

The anxiety risk of patients with PCOS is not caused by a single factor. It is shaped by the interaction of biological, clinical, reproductive, behavioral, and social factors [12]. From a biopsychosocial perspective, PCOS-related anxiety can be understood as a cumulative response to endocrine-metabolic abnormalities, visible symptoms, fertility uncertainty, chronic self-management demands, and insufficient support. As shown in Table 1, these factors are closely connected with subsequent mental health management strategies.

Table 1. Major Influencing Factors of Comorbid Anxiety Risk in Patients with PCOS

Influencing factor	Main anxiety pathway	Management implication
Endocrine and metabolic abnormalities	Hormonal imbalance, obesity, insulin resistance, sleep disturbance, and inflammatory burden may affect emotional stability	Integrate psychological screening into endocrine and metabolic assessment
Visible clinical symptoms	Acne, hirsutism, hair loss, and weight gain may impair body image and self-esteem	Assess body image distress and provide supportive counseling
Menstrual irregularity	Unpredictable cycles and recurrent symptoms may increase uncertainty	Provide clear disease explanation and realistic treatment expectations
Fertility pressure	Ovulatory dysfunction, infertility risk, and assisted reproduction may increase reproductive anxiety	Offer fertility counseling and emotional support
Long-term management burden	Diet, exercise, medication, and follow-up may cause frustration and fatigue	Use individualized goals and continuous follow-up
Limited social support and misconceptions	Family misunderstanding, stigma, and misinformation may increase insecurity	Strengthen patient education and family support

3.1. Biological Endocrine and Metabolic Factors

Biological and metabolic abnormalities provide an important basis for anxiety risk in patients with PCOS. Hyperandrogenism, insulin resistance, obesity, chronic low-grade inflammation, and sleep problems are commonly associated with PCOS and may influence emotional stability through direct and indirect pathways. Although anxiety should not be explained solely by biological mechanisms, endocrine and metabolic features can increase patients' vulnerability to distress [13].

Hyperandrogenism is associated with acne, hirsutism, and hair loss, which may contribute to anxiety by affecting appearance and self-image [4]. Insulin resistance and obesity may also increase pressure, particularly when patients are repeatedly advised to lose weight but experience slow progress. Obesity and metabolic dysfunction may be linked to fatigue, poor sleep, and reduced physical activity, which can weaken emotional regulation. Therefore, biological factors should be understood not only as medical indicators but also as conditions that shape psychological experiences.

3.2. Clinical Symptoms and Body Image Pressure

Visible clinical symptoms are among the most direct sources of anxiety in PCOS. Acne, hirsutism, hair loss, and weight gain can significantly influence how patients perceive their bodies and how they believe others view them [12]. These symptoms are often difficult to conceal and may serve as constant reminders of their condition, leading to feelings of embarrassment, diminished self-confidence, and social withdrawal.

Body image pressure is particularly pronounced among adolescents and young women. During these life stages, appearance, peer evaluation, intimate relationships, and self-identity are highly sensitive concerns. When PCOS symptoms affect facial skin, hair distribution, body shape, or weight, patients may experience heightened social anxiety or reduced self-esteem. Consequently, the psychological impact of PCOS symptoms is closely tied to self-identity, social confidence, and overall quality of life [1].

3.3. Menstrual Irregularity and Disease Uncertainty

Menstrual irregularity is a common manifestation of PCOS and a significant source of disease uncertainty. For many patients, irregular menstruation is not only a physical symptom but also an indication that the body may not be functioning optimally. When menstrual cycles are unpredictable, patients often worry about endocrine imbalances, disease progression, future fertility, and potential long-term health risks.

Disease uncertainty tends to increase when patients do not receive clear explanations from healthcare professionals. A lack of understanding regarding symptom fluctuations or the necessity of long-term treatment adjustments may lead patients to perceive these changes as signs of worsening illness. This uncertainty can result in excessive self-monitoring, repeated medical consultations, and frequent online searches. Therefore, effective communication is essential to alleviate anxiety and improve PCOS management.

3.4. Fertility Pressure and Family-Social Expectations

Fertility-related concerns are a significant contributor to anxiety in patients with PCOS. Due to the association of PCOS with ovulatory dysfunction and potential infertility, many patients worry about their ability to conceive [7, 9]. This concern may arise even before planning for pregnancy, particularly when patients receive incomplete or alarming information about PCOS and infertility.

Family expectations and societal norms can further exacerbate psychological stress. In certain contexts, women may face pressure to conceive within a specific timeframe after marriage. Delayed conception may lead to feelings of guilt, shame, or fear of disappointing family members. The process of ovulation induction, repeated pregnancy attempts, and assisted reproductive treatments can also heighten stress, as each cycle carries the weight of expectations and the possibility of disappointment.

3.5. Long-Term Health Management Burden

PCOS typically requires long-term management rather than short-term treatment. Patients may need to focus on dietary control, regular physical activity, weight management, medication adherence, and periodic follow-up. These efforts demand consistent commitment, yet the results may not be immediately visible. When patients do not observe clear improvements in weight, menstrual regularity, skin conditions, or fertility outcomes, they may experience frustration and a loss of confidence [10].

The management burden can also lead to psychological fatigue. Some patients may become excessively strict with their diet and exercise routines, resulting in stress and feelings of guilt when they fail to meet their goals. Others might disengage from management altogether, believing their efforts to be futile. Therefore, PCOS care should emphasize realistic goal-setting, emotional support, and gradual behavior-change strategies, rather than solely focusing on lifestyle modifications.

3.6. Insufficient Social Support and Disease Misconceptions

Social support significantly influences the anxiety experienced by patients with PCOS. When family members, partners, or peers lack understanding of the condition, patients may feel isolated or misunderstood. Weight gain is often misinterpreted as poor self-control, menstrual irregularities may be dismissed, and fertility challenges may be unfairly attributed to the patient. These misconceptions can exacerbate feelings of shame, self-blame, and hesitation to seek professional help.

Misunderstandings about the disease further contribute to anxiety. Fragmented or inaccurate information from online sources and social media may amplify fears regarding infertility, obesity, or lifelong health consequences. Simplistic advice such as "just lose weight" can lead to feelings of blame when progress is slow. Health professionals should prioritize providing clear, evidence-based, and patient-centered explanations. Educating family members can also alleviate pressure and foster stronger support networks. Overall, anxiety related to PCOS should be understood within the broader clinical, reproductive, behavioral, and social contexts in which it arises [4].

4. Mental Health Management Pathways for Patients with Polycystic Ovary Syndrome

Effective mental health management for patients with PCOS should be integrated into routine clinical care [1]. Since anxiety risk is closely related to endocrine symptoms, body image concerns, fertility uncertainty, lifestyle burden, and social support, psychological management should cover the entire process of PCOS care. As shown in Figure 1, a feasible pathway includes initial screening, risk assessment, health education, integrated intervention, multidisciplinary collaboration, and long-term follow-up. Table 2 summarizes the key management priorities for different anxiety risk levels.

Table 2. Stratified Management of Anxiety Risk in Patients with PCOS

Risk level	Main characteristics	Management focus
Low risk	Mild worry, no clear functional impairment, stable disease understanding	Health education, lifestyle guidance, routine follow-up
Medium risk	Persistent anxiety, sleep problems, reduced quality of life, poor confidence in management	Stress management, sleep support, counseling, closer follow-up
High risk	Severe anxiety, significant functional impairment, depressive symptoms, self-harm risk, poor disease control	Referral to psychology or psychiatry, intensive support, safety assessment

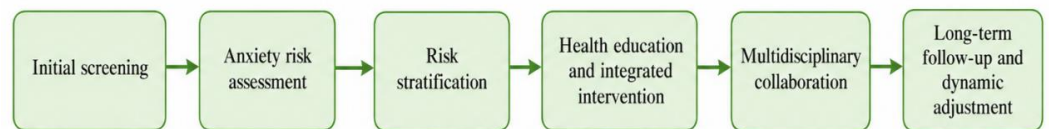


Figure 1. Proposed Mental Health Management Pathway for Patients with PCOS

4.1. Initial Screening: Establishing a Psychological Risk Identification Mechanism

Initial screening is the first step in identifying anxiety risk among patients with PCOS. During first visits and follow-up consultations, clinicians should evaluate menstrual patterns, androgen-related symptoms, metabolic indicators, ovulation status, and fertility needs, while also paying attention to emotional state, sleep quality, body image concerns, and quality of life. Many patients may not actively report psychological distress unless approached in a supportive and non-judgmental manner.

Psychological screening does not need to be complex. Brief questions can help identify persistent worry, sleep disturbances, excessive concern about appearance, fear of infertility, or difficulty maintaining daily activities. Standardized anxiety and depression screening tools may also be utilized when conditions allow. However, screening should not rely solely on scale scores [12]. Clinicians should consider the patient's disease stage, reproductive plans, symptom severity, and social context, ensuring psychological risk identification becomes an integral part of comprehensive PCOS assessment.

4.2. Risk Assessment: Implementing Stratified Anxiety Management

After screening, patients should be stratified according to anxiety severity, functional impairment, disease stage, and social support [13]. A stratified approach ensures that the intensity of support aligns with patients' actual needs.

Low-risk patients may experience mild worry without significant impairment in daily life, work, study, or relationships. Basic health education, reassurance, and routine

follow-up are typically sufficient. Medium-risk patients may exhibit persistent anxiety, sleep disturbances, reduced quality of life, or challenges adhering to interventions. These individuals may benefit from structured psychological support, stress management techniques, sleep guidance, and closer follow-up. High-risk patients may suffer from severe anxiety, pronounced functional impairment, depressive symptoms, panic episodes, self-harm thoughts, or an inability to continue disease management. Such patients should be promptly referred to mental health professionals.

4.3. Health Education: Improving Patients' Understanding of PCOS

Health education is essential for anxiety management. Many anxiety symptoms in PCOS are intensified by uncertainty, fragmented information, and unrealistic expectations. Clinicians should provide clear and continuous education to help patients understand the chronic but manageable nature of PCOS. Patients should also understand that treatment goals vary across life stages. Adolescents may prioritize menstrual regulation, acne, hirsutism, and body image; reproductive-age patients may focus on ovulation, fertility planning, and metabolic health; patients with obesity or insulin resistance may require long-term lifestyle and metabolic management.

Health education should address common misconceptions. PCOS does not equate to inevitable infertility, and slow weight reduction does not signify treatment failure. Menstrual improvement, metabolic control, and lifestyle changes often require time. When patients understand the realistic course of management, they are less likely to perceive temporary fluctuations as failure. Education should use patient-friendly language and may be reinforced through written materials, follow-up consultations, and digital platforms. Family members or partners may also be included when fertility pressure, weight stigma, or misunderstanding contributes to anxiety.

4.4. Integrated Intervention: Combining Medical Treatment, Psychological Support, and Lifestyle Management

Integrated intervention should address both anxiety symptoms and their sources. For low-risk patients, the primary focus should be on explaining the disease, providing lifestyle guidance, and offering positive reinforcement. Clinicians should assist patients in setting realistic goals, such as gradual weight management, regular physical activity, and improved sleep patterns [1, 13].

For medium-risk patients, psychological support should follow a more structured approach. Stress management, sleep improvement strategies, relaxation training, cognitive-behavioral techniques, and supportive counseling can help reduce excessive worry and enhance coping abilities. Patients concerned about infertility may benefit from balanced fertility counseling. Those distressed by body image issues require support in dissociating self-worth from appearance-related symptoms. Patients struggling with lifestyle changes may find small-step goals and constructive, non-punitive feedback beneficial.

For high-risk patients, timely referral is essential. When anxiety is severe, persistent, or accompanied by depression, panic symptoms, self-harm ideation, or significant functional impairment, mental health professionals should be involved. Psychological therapy, psychiatric evaluation, and medication may be considered based on clinical needs. Psychological intervention should complement, rather than replace, endocrine, reproductive, or metabolic treatments, ensuring a comprehensive approach to care.

4.5. Multidisciplinary Collaboration: Building a Continuous Support System

PCOS-related anxiety involves multiple dimensions, so management should not rely on a single department. Gynecologists and reproductive specialists may focus on menstrual regulation, ovulation, fertility planning, and symptom treatment [1, 10]. Endocrinologists may address insulin resistance, obesity, and metabolic risks. Nutritionists can provide dietary guidance, while nurses can support follow-up, education, and self-management. Psychologists and psychiatrists can assess and treat anxiety, depression, sleep disturbances, and other mental health concerns.

The key to multidisciplinary collaboration is continuity. Patients should not simply be told to "see another department" without guidance. Referral criteria, communication channels, and follow-up responsibilities should be clear. For example, a patient with moderate anxiety and poor lifestyle adherence may receive counseling and nursing follow-up, while a patient with severe anxiety and depressive symptoms should be referred to mental health services while continuing PCOS treatment. This coordinated model can reduce fragmented care and improve patients' sense of security.

4.6. Long-Term Follow-Up: Promoting Dynamic Mental Health Management

PCOS is a long-term condition, and psychological risks may evolve over time. Consequently, mental health management should be dynamic rather than a one-time intervention [6]. Follow-up efforts should be intensified during sensitive periods, such as adolescent diagnosis, preparation for pregnancy, infertility treatment, postpartum recovery, significant weight fluctuations, symptom recurrence, and treatment failure.

Long-term follow-up may integrate face-to-face visits, telephone consultations, online health platforms, patient education materials, and repeated screenings when necessary. These follow-ups should address not only menstrual and metabolic indicators but also anxiety symptoms, sleep quality, body image, treatment adherence, and overall quality of life. If psychological risks increase, the management plan should be promptly adjusted. Through continuous follow-up, clinicians can assist patients in maintaining realistic expectations, enhancing self-management confidence, and preventing anxiety from hindering treatment progress.

5. Practical Challenges, Optimization Strategies, and Conclusion

5.1. Current Challenges in PCOS Mental Health Management

At present, mental health management for patients with PCOS still faces several practical challenges. Clinical care often prioritizes physiological treatment while providing insufficient attention to psychological assessment. Menstrual regulation, ovulation induction, androgen control, weight management, and metabolic indicators are typically regarded as primary treatment targets, whereas anxiety, sleep disturbances, body image distress, and quality of life are not routinely evaluated. Additionally, the use of psychological screening tools remains limited in many clinical settings. Although brief scales can help identify anxiety risk, they are not consistently integrated into routine PCOS consultations. Referral mechanisms between gynecology, endocrinology, reproductive medicine, and mental health services are frequently incomplete. Even when psychological distress is identified, patients may not receive timely or continuous support. Furthermore, patients themselves may hesitate to disclose psychological problems due to stigma, lack of awareness, or concerns that their emotional distress will not be taken seriously [9, 10].

5.2. Optimization Strategies for Mental Health Management Pathways

To enhance the management of mental health issues related to PCOS, anxiety screening should be integrated into routine consultations and follow-ups. Clinicians can utilize brief questions or standardized tools to evaluate anxiety, sleep quality, body image concerns, treatment-related stress, and overall quality of life [8]. A standardized psychological risk assessment form may improve consistency and minimize missed diagnoses. Additionally, medical staff should undergo training to identify psychological comorbidities and communicate with patients in a supportive and empathetic manner. Strengthening multidisciplinary collaboration is also essential. Gynecologists, endocrinologists, reproductive specialists, psychologists, psychiatrists, nutritionists, and nurses should establish clear referral pathways and share follow-up responsibilities. Moreover, online follow-up platforms can facilitate health education, symptom monitoring, lifestyle guidance, and psychological support between clinic visits, particularly for patients requiring long-term management.

5.3. Conclusion

The risk of comorbid anxiety in patients with PCOS is influenced by biological, psychological, and social factors. Endocrine and metabolic abnormalities, visible symptoms, menstrual irregularity, fertility pressure, long-term self-management burden, and insufficient social support may jointly increase anxiety risk. Therefore, PCOS care should move beyond a narrow reproductive endocrine treatment model and adopt a comprehensive health management approach. Psychological screening, risk stratification, integrated intervention, multidisciplinary collaboration, and long-term follow-up should be included in routine PCOS management. Such a patient-centered pathway can help reduce anxiety risk, improve treatment adherence, and promote the overall physical and mental well-being of patients with PCOS.

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