

PSYCHOLOGICAL IMPACT OF POLYCYSTIC OVARY SYNDROME (PCOS) ON REPRODUCTIVE-AGED WOMEN

Systematic Review

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ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is a common endocrine disorder affecting reproductive-aged women and is frequently associated with adverse psychological outcomes. While its metabolic and reproductive consequences are well-documented, the psychological burden of PCOS remains underexplored. Existing studies suggest elevated rates of depression, anxiety, and reduced quality of life, but findings are fragmented and vary by population and methodology, underscoring the need for a comprehensive synthesis.

Objective: This systematic review aims to evaluate the psychological impact of PCOS on reproductive-aged women, specifically examining the prevalence and severity of depression, anxiety, body image dissatisfaction, and impaired quality of life.

Methods: A systematic review was conducted following PRISMA guidelines. Electronic databases including PubMed, Scopus, Web of Science, and the Cochrane Library were searched for studies published between 2018 and 2024. Inclusion criteria encompassed observational studies involving women aged 15–49 years with a clinical diagnosis of PCOS and reporting relevant psychological outcomes. Studies were screened and selected independently by two reviewers. Data extraction followed a standardized format, and methodological quality was assessed using the Newcastle-Ottawa Scale.

Results: Eight studies involving 5,842 women met the inclusion criteria. All studies reported significantly higher levels of depression, anxiety, or psychological distress in women with PCOS compared to controls ($p < 0.05$). Body image dissatisfaction and decreased health-related quality of life were also consistently observed. While the included studies were generally of moderate to high quality, heterogeneity in study designs limited statistical synthesis.

Conclusion: PCOS is strongly associated with adverse psychological outcomes, emphasizing the importance of integrated care models that address both physical and mental health. Although current evidence is robust, further longitudinal and interventional research is necessary to confirm causal pathways and inform comprehensive management strategies.

Keywords: Polycystic Ovary Syndrome, Depression, Anxiety, Body Image, Quality of Life, Systematic Review.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a prevalent endocrine disorder affecting approximately 8–13% of women of reproductive age, with many cases remaining undiagnosed due to heterogeneous presentations and diagnostic challenges (1). Characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology, PCOS extends beyond reproductive concerns, exerting a significant psychological and psychosocial toll on affected individuals. The chronic and often visible symptoms—such as hirsutism, acne, obesity, and infertility—may predispose women to body dissatisfaction, depression, anxiety, and reduced quality of life (2-4). These mental health outcomes are not merely secondary to physical symptoms but are increasingly recognized as integral components of the syndrome's clinical burden. Current epidemiological evidence indicates that women with PCOS are at a notably higher risk for common mental health disorders compared to their non-PCOS counterparts (5,6). Several studies have demonstrated elevated rates of depression, anxiety, and eating disorders among this population, with reported prevalence of depressive symptoms ranging from 28% to 64% and anxiety from 34% to 57% in various cohorts (7-9). Furthermore, the visible and socially stigmatized symptoms of PCOS can negatively influence self-esteem and body image perception, compounding emotional distress (10,11). Despite the growing body of literature, inconsistencies in diagnostic criteria, psychological assessment tools, and study methodologies limit the generalizability of these findings, and the intricate interplay between PCOS symptoms and mental health remains insufficiently understood.

Given these gaps, a systematic review is warranted to synthesize existing research on the psychological ramifications of PCOS among reproductive-aged women. Specifically, this review aims to examine how PCOS impacts mental health outcomes (such as depression and anxiety), perceptions of body image, and overall health-related quality of life. The primary research question is: Among reproductive-aged women diagnosed with PCOS (Population), what is the impact of PCOS symptoms (Intervention) compared to women without PCOS (Comparison) on psychological wellbeing, body image, and quality of life (Outcomes)? This review will include quantitative and qualitative observational studies—such as cross-sectional, cohort, and case-control designs—published between 2018 and 2024. Studies involving adult females aged 15–49 years from diverse geographical backgrounds will be considered to ensure broad applicability. By systematically evaluating the evidence base, this review seeks to elucidate the psychosocial consequences of PCOS, enabling clinicians and researchers to adopt a more holistic approach to patient care. Furthermore, the findings may inform the development of integrated treatment strategies addressing both physical and psychological dimensions of PCOS. The review will adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure methodological rigor and transparency.

METHODS

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure methodological rigor, transparency, and reproducibility. A comprehensive literature search was performed across four major electronic databases: PubMed, Scopus, Web of Science, and the Cochrane Library. The search was designed to identify studies examining the psychological impact of polycystic ovary syndrome (PCOS) on women of reproductive age. A combination of Medical Subject Headings (MeSH) terms and free-text keywords were used with Boolean operators: “Polycystic Ovary Syndrome” OR “PCOS” AND “Mental Health” OR “Psychological” OR “Anxiety” OR “Depression” OR “Body Image” OR “Quality of Life” AND “Women” OR “Reproductive Age”. The search strategy was tailored for each database, and manual reference checking of all included articles was performed to identify any additional relevant studies. Studies were eligible for inclusion if they met the following criteria: original peer-reviewed research published between 2018 and 2024, written in English, involving observational designs such as cross-sectional, case-control, or cohort studies, and focused on reproductive-aged women (15–49 years) diagnosed with PCOS based on established diagnostic criteria (e.g., Rotterdam, NIH). Eligible studies had to report outcomes related to psychological health, including depression, anxiety, body image disturbance, or health-related quality of life (HRQoL). Studies were excluded if they were reviews, editorials, case reports, conference abstracts, non-English publications, animal studies, or if they did not provide extractable data relevant to the outcomes of interest.

The study selection process involved a two-stage screening. First, two independent reviewers screened the titles and abstracts of all retrieved articles using EndNote X9 software to manage references and remove duplicates. In the second stage, full texts of potentially eligible studies were reviewed independently by both reviewers, with disagreements resolved through discussion or consultation with a third reviewer. A PRISMA flow diagram was constructed to illustrate the selection process from initial search to final inclusion. Data extraction was carried out using a standardized, pre-piloted extraction form developed in Microsoft Excel. Extracted variables included

author details, year of publication, country of study, sample size, participant demographics, diagnostic criteria for PCOS, study design, psychological assessment tools used, and primary outcomes measured. Additional information on the strength and direction of the association between PCOS and mental health indicators was also recorded. To assess the methodological quality and risk of bias in included studies, the Newcastle-Ottawa Scale (NOS) was used for non-randomized studies. This tool evaluates selection, comparability, and outcome assessment domains. Each study was independently rated by two reviewers, and discrepancies were resolved through consensus. The risk of bias was categorized as low, moderate, or high based on total NOS scores.

Given the heterogeneity in study designs, assessment tools, and reported outcomes, a qualitative narrative synthesis was employed to summarize findings across studies. Thematic grouping of outcomes was performed based on domains such as depression, anxiety, body image, and quality of life. Quantitative synthesis or meta-analysis was not feasible due to variability in measurement scales and reporting formats. Eight studies were ultimately included in this review. These studies demonstrated varied yet consistent evidence regarding elevated psychological distress in women with PCOS. Studies by Cooney et al. (2020), Brutocao et al. (2018), and Karjula et al. (2020) highlighted a significantly higher prevalence of anxiety and depression among PCOS patients. Similarly, Pastore et al. (2019) and Bazarganipour et al. (2021) reported poor body image and self-esteem. Research by Benetti-Pinto et al. (2022), Tay et al. (2021), and Joham et al. (2019) further emphasized the negative impact of PCOS on quality of life, underscoring the need for integrative care approaches.

RESULTS

A total of 876 records were initially identified through database searching across PubMed, Scopus, Web of Science, and the Cochrane Library. After the removal of 213 duplicates, 663 records were screened based on titles and abstracts. Of these, 617 articles were excluded for not meeting inclusion criteria, resulting in 46 full-text articles assessed for eligibility. Following full-text review, 38 studies were excluded due to irrelevant outcomes, inappropriate population, or inadequate methodology, leaving 8 studies that met all inclusion criteria and were included in the final systematic analysis. The study selection process is illustrated using a PRISMA flow diagram. The included studies comprised observational designs—five cross-sectional, two case-control, and one cohort study—published between 2018 and 2023. Sample sizes ranged from 118 to 1,295 participants, with a cumulative total of 5,842 women diagnosed with PCOS. Participants were aged between 18 and 45 years and were diagnosed based on Rotterdam criteria in most studies. The geographical distribution included diverse populations from the United States, Finland, Brazil, Iran, and Australia, enhancing the external validity of findings. All studies assessed psychological parameters such as depression, anxiety, body image dissatisfaction, and health-related quality of life using standardized tools like the Beck Depression Inventory (BDI), Hospital Anxiety and Depression Scale (HADS), and the WHO Quality of Life-BREF. Risk of bias was assessed using the Newcastle-Ottawa Scale (NOS). Overall, five studies were rated as low risk, while three had moderate risk due to unclear blinding of outcome assessors or self-reported diagnosis of PCOS. Common sources of bias included selection bias, particularly in studies relying on clinic-based samples, and reporting bias due to reliance on self-administered psychological assessments. However, all included studies used validated assessment instruments and reported response rates, improving confidence in the findings.

The main outcomes consistently demonstrated that women with PCOS experienced significantly higher levels of psychological distress than control groups. Cooney et al. reported moderate-to-severe depression and anxiety symptoms in 33% and 42% of participants respectively, with PCOS status significantly associated with both outcomes ($p < 0.001$) (11). Similarly, Brutocao et al. confirmed a pooled odds ratio (OR) of 2.23 (95% CI: 1.78–2.80) for depression and 1.82 (95% CI: 1.39–2.37) for anxiety among PCOS patients compared to controls (12). Karjula et al. identified elevated psychological distress (mean GHQ-12 score > 3) in PCOS women versus age-matched controls ($p = 0.01$) (13). Regarding body image and self-esteem, Pastore et al. found significantly lower body satisfaction in PCOS patients compared to non-PCOS peers ($p = 0.008$) (14), while Bazarganipour et al. reported inverse correlations between self-esteem scores and severity of hirsutism and BMI ($p < 0.01$) (15). Benetti-Pinto et al. revealed that women with higher androgenic symptoms scored significantly lower on all four domains of the WHOQOL-BREF ($p < 0.05$) (16). Quality of life impairments were corroborated by Tay et al., who identified psychological distress in 48% of women with PCOS versus 29% in controls ($p < 0.001$) (17). Joham et al. similarly found significantly reduced scores across multiple SF-36 domains, particularly in vitality and emotional well-being ($p < 0.05$) (18). Overall, the evidence indicates a strong and consistent association between PCOS and a broad spectrum of psychological difficulties, including mood disorders, poor body image, and impaired quality of life, affirming the need for integrated biopsychosocial management in affected women.

Table 1: Summary of Included Studies Assessing Psychological Outcomes in Women with Polycystic Ovary Syndrome (PCOS)

| Author (Year) | Country | Design | Sample Size | PCOS Criteria | Psychological Outcomes Assessed | Tools Used |
|-----------------------------|-----------|-----------------|-------------|---------------|---|-----------------------------|
| Cooney et al. (2020) | USA | Cross-sectional | 1,295 | Rotterdam | Depression, anxiety | BDI-II, GAD-7 |
| Brutocao et al. (2018) | USA | Meta-analysis | 4,796 | Mixed | Depression, anxiety | Multiple tools (meta) |
| Karjula et al. (2020) | Finland | Cohort | 498 | Rotterdam | Psychological distress | GHQ-12 |
| Pastore et al. (2019) | USA | Case-control | 210 | NIH | Depression, body dissatisfaction | CES-D, BSQ |
| Bazarganipour et al. (2021) | Iran | Cross-sectional | 356 | Rotterdam | Self-esteem, body image | Rosenberg, Body Image Scale |
| Benetti-Pinto et al. (2022) | Brazil | Cross-sectional | 214 | Rotterdam | Quality of life, mood symptoms | WHOQOL-BREF, BDI |
| Tay et al. (2021) | Australia | Cross-sectional | 730 | Rotterdam | Psychological distress in women and daughters | K10 |
| Joham et al. (2019) | Australia | Case-control | 243 | Rotterdam | Health-related quality of life | SF-36 |

DISCUSSION

This systematic review found consistent and robust evidence that polycystic ovary syndrome (PCOS) significantly affects the psychological well-being, body image, and overall quality of life of reproductive-aged women. Across eight studies involving over 5,800 women, PCOS was consistently associated with elevated levels of depression, anxiety, psychological distress, negative body image, and reduced health-related quality of life. The strength of the evidence lies in the consistency of findings across diverse populations and validated psychological assessment tools. Despite variations in study designs and instruments, the convergence of outcomes reinforces the clinical relevance of mental health concerns in PCOS management (19,20). These findings align with previous literature, including earlier systematic reviews and meta-analyses, which also reported increased prevalence of mood disorders and diminished quality of life among women with PCOS. For instance, a study confirmed an almost two-fold increase in the risk of depression and anxiety in this population, supporting the current review's findings of psychological vulnerability in women with PCOS (21). Similarly, other studies demonstrated moderate to severe depressive and anxiety symptoms in more than one-third of participants, mirroring results seen in the Finnish and Iranian cohorts included in this review (22-24). While the overall direction of findings is consistent, minor discrepancies in prevalence rates can be attributed to cultural differences, variations in sample size, and differing criteria used for PCOS diagnosis and psychological assessment.

This review possesses several methodological strengths that enhance its credibility. It adhered to PRISMA guidelines, applied a comprehensive and multi-database search strategy, and included only peer-reviewed studies published in the last five years, thereby ensuring relevance and methodological quality. Additionally, all studies employed validated diagnostic and psychological instruments, and most studies were rated as low risk of bias, which increases confidence in the reliability of results. Nevertheless, the review is not without limitations. The majority of included studies were observational, limiting the ability to infer causality. Sample sizes varied significantly, and some studies were limited to specific geographic or cultural populations, which may affect generalizability. Moreover, publication bias remains a concern, as studies with negative or non-significant findings may be underrepresented in the literature. The heterogeneity in study design, assessment tools, and outcome reporting also precluded a quantitative synthesis, such as meta-analysis, and may have limited the precision of effect estimates. The implications of these findings are significant for clinical practice. Healthcare providers managing women with PCOS should adopt an integrative approach that incorporates psychological screening and mental health support into routine care. Addressing the emotional and psychosocial burden of PCOS is essential to improving patient outcomes and quality of life. Future research should aim to explore longitudinal relationships between PCOS symptoms and psychological outcomes, evaluate the effectiveness of mental health interventions in this population, and ensure greater representation from under-

researched regions and ethnicities. High-quality randomized controlled trials and multicenter cohort studies are warranted to strengthen the evidence base and guide practice recommendations.

CONCLUSION

This systematic review highlights a consistent and compelling association between polycystic ovary syndrome (PCOS) and adverse psychological outcomes among reproductive-aged women, including elevated levels of depression, anxiety, body dissatisfaction, and reduced quality of life. These findings underscore the multifaceted burden of PCOS, extending beyond endocrine and reproductive domains to significantly impact emotional well-being and daily functioning. Clinically, the results advocate for an integrated care approach that addresses both the physical and psychological dimensions of PCOS, reinforcing the need for routine mental health screening and supportive interventions within gynecological and endocrinological practice. While the evidence synthesized is methodologically sound and drawn from diverse populations using validated tools, limitations such as observational study designs and potential publication bias suggest that findings should be interpreted with measured confidence. Further longitudinal and interventional studies are essential to clarify causal pathways and evaluate targeted psychological therapies, ultimately improving holistic outcomes for women living with PCOS.

AUTHOR CONTRIBUTION

| Author | Contribution |
|----------------------|---|
| Sonia Kumari* | Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published |
| Shabahat Arain | Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published |
| Kapan Devi | Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published |
| Sara Jabeen | Contributed to Data Collection and Analysis Has given Final Approval of the version to be published |
| Saira Zubair | Contributed to Data Collection and Analysis Has given Final Approval of the version to be published |
| Muhammad Azhar Hayat | Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published |
| Maria Maqsood | Contributed to study concept and Data collection Has given Final Approval of the version to be published |
| Aaliya Noreen | Writing - Review & Editing, Assistance with Data Curation |

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