

Direct Costs of Mental Health Disorders in PCOS: Systematic Review and Meta-Analysis

Adam Bonner. *University of Alabama School of Medicine*

Adam Bonner¹, Surabhi Yadav², Olivia Delau², Daniela Markovic³, William Patterson⁴, Sasha Ottey⁴, Ricardo Azziz⁵

¹University of Alabama School of Medicine, Birmingham, Ala., ²New York University School of Global Public Health, New York, N.Y., ³UCLA School of Medicine, Los Angeles, Calif., ⁴PCOS Challenge: The National Polycystic Ovary Syndrome Association in Atlanta, Ga., ⁵University of Alabama at Birmingham, Birmingham, Ala.

BACKGROUND: Polycystic ovary syndrome (PCOS) is the most prevalent endocrine abnormality of reproductive-aged women today, affecting one in seven reproductive-aged women worldwide, and represents a significant financial burden to our health care. Women with PCOS have an increased risk for developing mental health (MH) disorders, in part due to biochemical changes, constant concerns regarding physical appearance, and social stigma from hirsutism, obesity, and infertility.

OBJECTIVE: To determine the excess economic burden associated with MH disorders in women with PCOS.

METHOD: Followed PRISMA reporting guidelines for systematic review, we searched PubMed, Web of Science, EBSCO, Medline, Scopus, and PsycINFO through July 16, 2021, for studies on MH disorders in PCOS. Excluded were studies not in humans, without controls, without original data, or not peer reviewed. As anxiety, depression, and eating disorders were by far the most common MH disorders assessed by the studies, we performed our meta-analysis on these disorders. Meta-analyses were performed using the DerSimonian-Laird random-effects model (DerSimonian and Laird 1986) to compute pooled estimates of odds ratios (OR) for the associations between PCOS and anxiety, depression, and eating disorders. Study-specific and overall estimates using the log-odds scale were presented using forest plots. Between-study heterogeneity was evaluated using the I² statistic. We then calculated the excess direct costs of these MH in U.S. dollars (USD) for women suffering from PCOS.

RESULT: We screened 72 articles by title/abstract, assessed 37 articles in full-text, and included 24 articles. Pooled ORs were 1.65 (95% CI: 1.15-2.38) for anxiety, 2.20 (95% CI: 1.69-2.86) for depression, and 2.53 (95% CI: 1.14-2.07) for eating disorders, for PCOS relative to controls. In the U.S., the additional direct healthcare costs associated with MH disorders in PCOS were estimated to be \$3.075 billion/yr., \$2.280 billion/yr., and \$0.714 billion/yr. in 2021 USD for depression, anxiety, and eating disorders, respectively. Taken together, the additional direct healthcare costs associated with these MH disorders in PCOS was estimated to be \$6.069 billion/yr. in 2021 USD.

CONCLUSION: This work is the first to estimate the excess direct healthcare costs of MH disorders associated with PCOS. Overall, the direct healthcare costs for the most common MH disorders in PCOS, namely depression, anxiety, and eating disorders, exceeded \$6 billion in 2021 USD for the U.S. population alone. Taken together with our prior work, these data suggest that the healthcare-related economic burden of PCOS exceeds \$14 billion yearly, considering the costs of diagnosis, and MH, reproductive, vascular, and metabolic disorders (but not indirect and intangible costs). As PCOS is a global disorder with much the same prevalence across the world, the excess economic burden

attributable to PCOS globally is enormous, mandating that the scientific and policy community increase its focus on this important disorder.

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