

Psychosocial Aspects of Fertility and Assisted Reproductive Technology



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KEYWORDS

- Psychosocial • Fertility • Infertility • Assisted reproductive technology (ART)
- Anxiety • Depression • Stress • Mood disorder

KEY POINTS

- Literature evaluating the impact of stress, symptoms of depression and anxiety, and mood disorders on fertility and infertility is limited and inconsistent.
- Stress, symptoms of depression, and antidepressant use may reduce the probability of conceiving for both fertile and infertile women.
- Infertility and miscarriage are associated with considerable psychological burden.
- It is important to screen for stress, depression, and anxiety among infertility patients.

INTRODUCTION

The psychosocial aspects of fertility and assisted reproductive technology (ART) are complex. The extent to which stress, symptoms of anxiety and depression, mood disorders, and psychotropic medication use impact fertility remains unclear. The impact of infertility and ART treatment on psychological well-being, marital and sexual relationships, and the quality of life of couples continues to be researched. The psychosocial implications of ART on our society are considerable and include a shift toward older maternal age, complexities of third-party reproduction, and psychological and socioeconomic barriers to receiving care.

Mood Disorders and Natural Fertility

Stress, anxiety, and depression have significant effects on energy, mood, interests, and self-esteem, all of which may contribute to decreased reproductive efficiency. Depressive symptoms are associated with a 25% to 75% incidence of sexual

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dysfunction, including loss of libido, erectile dysfunction, and reduced vaginal lubrication.^{1–3} The underlying pathophysiology of the mood disorder may also impact fertility, including disruptions of the hypothalamic–pituitary–adrenal axis, thyroid dysfunction, or hyperprolactinemia.⁴ These etiologies can lead to anovulation and reduced fecundity. However, a prospective cohort of 248 ovulatory women enrolled in the Biocycle study failed to find an association between depressive symptoms and reproductive hormone levels or the odds of sporadic anovulation (odds ratio [OR], 1.1; 95% confidence interval [CI], 0.02–5.00).⁵ The study was unable to assess the impact of clinical depression on ovulation, because women with history of clinical depression were excluded.

Literature evaluating the impact of psychosocial factors including stress, symptoms of depression and anxiety, and mood disorders on natural fertility is limited and inconsistent. In a prospective, time-to-pregnancy cohort study of 2146 women enrolled in the PRESTO study, Nilni and colleagues⁶ found that severe depressive symptoms were associated with decreased fecundability (the probability of conceiving naturally within a given menstrual cycle) compared with no or low depressive symptoms (OR, 0.62; 95% CI, 0.43–0.91). Every 10-unit increase in Major Depression Inventory score was associated with a 10% decrease in fecundability (fecundability ratio, 0.90; 95% CI, 0.83–0.97). In contrast, Lynch and colleagues⁷ prospectively analyzed a cohort of 339 women trying to conceive and found no association between self-reported psychosocial stress, anxiety, or depression and fecundability. Interestingly, the authors did find significantly increased fecundability in women reporting higher versus lower social support levels.

The literature on the impact of psychotropic medications on fecundity is also inconclusive. In the PRESTO study, use of psychotropic medications did not seem to decrease fecundability, although a nonsignificant negative trend was noted in current users. Time to Conceive, a prospective, time-to-pregnancy cohort study of 957 women, recently demonstrated a trend toward reduced fecundability with antidepressant use (fecundability ratio, 0.86; 95% CI, 0.63–1.20), which became statistically significant after controlling for history of depression (fecundability ratio, 0.66; 95% CI, 0.45–0.97).⁸ These studies suggest that antidepressant use may reduce the probability of conceiving naturally.

Stress and Natural Fertility

The literature suggests that stress and reproduction are interrelated. Psychosocial stress activates the sympathetic nervous system, which may impact the hypothalamic–pituitary–adrenal axis. In the Biocycle study, Schliep and colleagues⁹ demonstrated that daily perceived stress interferes with menstrual function. Women with higher daily perceived stress had an increased risk of anovulation and lower luteal phase progesterone levels. Interestingly, baseline stress levels did not predict anovulation, suggesting that it is not chronic stress, but instead daily short-term stressors that affect ovulation.

Biomarkers of stress include corticotrophin-releasing hormone, cortisol, and alpha-amylase.^{10,11} Salivary alpha-amylase levels correlate with chronic stress scores and dispositional stress reactivity scores, which measure how a person responds to stressors.¹⁰ Two large prospective studies on preconception stress (the Oxford Conception Study and LIFE Study) found that women in the highest tertile of alpha-amylase experienced a 15% to 29% decrease in fecundability compared with women with levels in the lowest tertile.^{12,13} This finding corresponded with a greater than 2-fold increase in the risk of infertility for women in the highest tertile. There was no association with salivary cortisol. Although biomarker levels seem to be associated with

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