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# Anxiety and Depression in Women Undergoing Fertility Treatment: A Prospective Study

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**Abstract**
**Background and Objective:** Infertility and its treatment present considerable emotional challenges for women, often leading to elevated levels of anxiety and depression. The physical invasiveness and uncertain outcomes associated with assisted reproductive technologies (ART) can exacerbate psychological distress. This prospective study aimed to evaluate the prevalence and progression of anxiety and depression in women undergoing fertility treatment and to identify key psychosocial predictors of emotional burden.
**Material and Methods:** A prospective observational study was conducted over 12 months at a tertiary fertility center. This study was conducted at the department of Psychiatry, Mayo Institute of Medical Sciences, Lucknow-Ayodhya Road, Gadia, Uttar Pradesh, India from July 2017 to June 2018. 60 women aged 22–40 years undergoing fertility treatment—including ovulation induction, intrauterine insemination (IUI), and in vitro fertilization (IVF)—were enrolled. Psychological assessment was conducted using the Hospital Anxiety and Depression Scale (HADS) and the State-Trait Anxiety Inventory (STAI) at three time points: Sociodemographic details, infertility duration, prior treatment attempts, and partner support levels were documented and analyzed for association with psychological outcomes.
**Results:** At T1, 33.3% of women (n=20) exhibited moderate to severe anxiety, and 26.7% (n=16) showed depressive symptoms. During T2, anxiety peaked, affecting 48.3% (n=29) of patients, particularly those undergoing IVF cycles. Depression also rose to 31.7% (n=19). By T3, women with a successful pregnancy outcome showed a significant decline in anxiety and depression (mean HADS-A score dropped from 10.4 to 6.2; HADS-D from 9.8 to 5.7), while those with unsuccessful outcomes had persistently elevated scores (HADS-A: 11.3; HADS-D: 10.6). Multivariate analysis indicated that previous treatment failure, infertility duration >3 years, and lack of partner/emotional support were significant predictors of high anxiety and depression ($p < 0.05$).
**Conclusion:** Anxiety and depression are highly prevalent among women undergoing fertility treatment, particularly during active intervention and after unsuccessful outcomes. These findings highlight the importance of incorporating routine mental health screening, patient education, and counseling into fertility treatment protocols to improve overall patient care and treatment success.

**Keywords:** Fertility treatment, Anxiety, Depression, Infertility, IVF, Psychological impact, assisted reproduction, HADS, STAI, Women's mental health

## Introduction
Infertility is a growing global health issue that affects approximately 10–15% of reproductive-aged couples, with an increasing number seeking medical intervention through assisted reproductive technologies (ART) such as ovulation induction, intrauterine insemination (IUI), and in vitro fertilization (IVF). While these treatments offer hope for conception, they are often accompanied by significant psychological stressors. The uncertainty of outcomes, repeated hormonal stimulation, invasive procedures, financial burdens, and societal pressures collectively contribute to emotional distress in women undergoing fertility treatments [1-3].
Women undergoing fertility treatment often experience heightened levels of anxiety and depression, which can vary throughout the treatment cycle. Studies have shown that the emotional toll is not only linked to the medical complexity and invasiveness of the procedures but also to the psychosocial factors such as marital satisfaction, social support, cultural expectations, and personal coping strategies. The psychological effects may peak at different stages—during treatment initiation, after oocyte retrieval, or upon disclosure of treatment outcomes—and are often more pronounced in those with repeated treatment failures or longer durations of infertility [4-6].
Research indicates that up to 40–50% of women undergoing IVF report clinical levels of anxiety, and 25–30% experience depressive symptoms during the treatment period. Furthermore, persistent emotional disturbances may impair not only the individual's quality of life but also

treatment adherence and potentially affect treatment success rates through biological and behavioral pathways [7, 8]. Despite the known psychological burden, mental health support remains under-addressed in many fertility programs. Most treatment protocols focus on physical outcomes, with minimal emphasis on emotional well-being. There is a critical need to integrate psychological evaluation and support into routine fertility care to provide comprehensive, patient-centered treatment. This study aims to prospectively evaluate the prevalence and trajectory of anxiety and depression in women undergoing fertility treatment and to identify predictive factors that contribute to heightened psychological vulnerability. By understanding these patterns and risk factors, the findings of this study can guide the implementation of targeted mental health interventions to support women throughout their fertility journey [9, 10].

**Material and Methods:**

This was a prospective observational study conducted over a 12-month period in the fertility outpatient department of a tertiary care center. This study was conducted at the department of Psychiatry, Mayo Institute of Medical Sciences, Lucknow-Ayodhya Road, Gadia, Uttar Pradesh, India from July 2017 to June 2018. Ethical clearance was obtained from the Institutional Ethics Committee, and written informed consent was collected from all participants. A total of 60 women, aged 22 to 40 years, undergoing fertility treatment were enrolled. Participants were selected using a purposive sampling method.

**Inclusion Criteria:**

- Women aged 22–40 years.
- Diagnosed with primary or secondary infertility.
- Scheduled to undergo ovulation induction, IUI, or IVF during the study period.
- Willing to provide written informed consent.
- Able to understand and complete the psychological assessment tools.

**Exclusion Criteria:**

- Women with a pre-existing psychiatric diagnosis (e.g., major depressive disorder, generalized anxiety disorder).
- Currently receiving psychotropic medication or psychotherapy.
- Women with known neurological disorders or cognitive impairment.
- Women with major medical illnesses (e.g., uncontrolled diabetes, chronic renal disease) that could influence psychological outcomes.
- Inability to comprehend or complete the questionnaire due to language barrier or illiteracy.

**Data Collection Tools and Procedure:**

Sociodemographic data (age, education, occupation, marital duration, socioeconomic status), clinical characteristics (duration and type of infertility, prior treatment attempts, treatment type), and psychosocial variables (perceived partner support, family pressure) were recorded using a structured proforma.

**Statistical Analysis:**

Data were entered and analyzed using SPSS version 26.0. Descriptive statistics (mean, standard deviation, frequency, percentage) were used for demographic data. Comparative analysis was done using paired t-tests, ANOVA, and chi-square tests to evaluate changes in anxiety and depression scores over time and their association with clinical variables. A p-value $< 0.05$ was considered statistically significant.

**Results:**

A total of 60 women undergoing fertility treatment were enrolled and followed at three stages: T1 (pre-treatment), T2 (mid-treatment), and T3 (post-treatment outcome). The mean age of participants was 30.2 ± 4.5 years. Most participants had primary infertility (75%), and 41.7% had a history of previous unsuccessful treatment attempts.

**Table 1:** Sociodemographic and Clinical Characteristics of Participants

| Variable | Category | Frequency (%) |
|---|---|---|
| Age (years) | 22–30 | 34 (56.7%) |
| | 31–40 | 26 (43.3%) |
| Type of Infertility | Primary | 45 (75%) |
| | Secondary | 15 (25%) |
| Duration of Infertility | <3 years | 24 (40%) |
| | ≥3 years | 36 (60%) |
| Previous Treatment Attempts | None | 19 (31.7%) |
| | 1–2 | 26 (43.3%) |
| | >2 | 15 (25%) |
| Type of Current Treatment | Ovulation Induction | 12 (20%) |
| | Intrauterine Insemination (IUI) | 20 (33.3%) |
| | In Vitro Fertilization (IVF) | 28 (46.7%) |

This table 1 shows the baseline characteristics of the participants. A majority had primary infertility and had been trying to conceive for over 3 years. Nearly half of them were undergoing IVF, the most intensive form of ART.

**Table 2:** Prevalence of Anxiety and Depression across Time Points

| Time Point | Anxiety (HADS-A ≥ 11) | Depression (HADS-D ≥ 11) |
|---|---|---|
| T1 | 20 (33.3%) | 16 (26.7%) |
| T2 | 29 (48.3%) | 19 (31.7%) |
| T3 | 15 (25.0%) | 18 (30.0%) |

At baseline (T1), 33.3% of women showed clinically significant anxiety, which peaked at mid-treatment (T2) to 48.3%. Depression also showed a slight increase at T2. By T3, anxiety declined in women with positive outcomes, but depression persisted in some, especially after failed treatment cycles.

**Table 3:** HADS Mean Scores across Time Points (Mean ± SD)

| Domain | T1 (Pre-treatment) | T2 (Mid-treatment) | T3 (Post-treatment) |
|---|---|---|---|
| HADS – Anxiety | 9.4 ± 3.1 | 11.6 ± 3.5 | 8.2 ± 3.6 |
| HADS – Depression | 8.7 ± 2.9 | 9.8 ± 3.1 | 8.9 ± 3.4 |

There was a statistically significant increase in anxiety scores at T2 ($p < 0.01$), followed by a decrease at T3. Depression scores showed a modest but not statistically significant change across the three phases.

**Table 4:** Anxiety and Depression at T3 Based on Treatment Outcome

| Outcome | Anxiety (n, %) | Depression (n, %) |
|---|---|---|
| Positive (n=22) | 3 (13.6%) | 2 (9.1%) |
| Negative (n=38) | 12 (31.6%) | 16 (42.1%) |

Women with positive treatment outcomes had significantly lower anxiety and depression levels compared to those with failed treatments, highlighting the emotional sensitivity of outcome disclosure.

**Table 5:** Predictors of High Anxiety and Depression (Multivariate Analysis)

| Predictor Variable | Odds Ratio (95% CI) | p-value |
|---|---|---|
| Infertility duration ≥3 years | 2.8 (1.1–7.2) | 0.03* |
| >2 previous treatment failures | 3.5 (1.4–8.5) | 0.01* |
| Low partner support | 4.2 (1.6–10.9) | 0.002* |

Multivariate analysis identified longer infertility duration, multiple prior failures, and low partner support as independent predictors of high anxiety and depression. All associations were statistically significant.

**Discussion:**

The present study highlights the significant psychological burden faced by women undergoing fertility treatments, revealing elevated levels of both anxiety and depression throughout different treatment phases. These findings are consistent with previous studies suggesting that infertility and its management can lead to profound emotional distress due to uncertainty, procedural stress, and societal pressures reported by the Greil et al., 2010; Gourounti et al., 2012 [11, 12].

Our results showed that anxiety was highest during the mid-treatment phase (48.3%), which corresponds with periods of hormonal stimulation, invasive procedures (e.g., oocyte retrieval), and waiting for fertilization outcomes. This is in agreement with studies by Lakatos et al. (2017) and Volgsten et al. (2008), who reported heightened psychological stress during critical points of the ART cycle. Depression also peaked slightly at T2 but remained notably persistent in those who experienced unsuccessful treatment outcomes, reinforcing the emotional impact of repeated failure given by the Chen et al., 2004 [13-15].

The emotional state of participants significantly improved following a positive pregnancy test, as shown by reduced HADS scores at T3. This confirms findings by Verhaak et al. (2007), who noted that psychological distress declines after successful treatment. Conversely, those with negative outcomes continued to display high anxiety and depression scores, highlighting the need for post-cycle psychological support [16].

A notable finding in our study was the significant association between psychological distress and certain clinical and social variables. Women with infertility durations ≥3 years and those with more than two previous treatment failures had a higher likelihood of experiencing anxiety and depression. These findings are consistent with reports by El Kissi et al. (2013) and Chachamovich et al. (2010), suggesting that prolonged infertility can amplify emotional exhaustion and hopelessness [17, 18].

Furthermore, women who reported low partner support were four times more likely to suffer from psychological distress. Emotional support from partners has been shown to act as a protective factor against stress, helping women better cope with treatment pressures reported as Peterson et al., 2006; and Ying et al., 2015. The absence of such support, especially in cultures where fertility is strongly linked to a woman's social identity, can intensify feelings of inadequacy and failure by Greil, 1997 [19, 21].

Despite the high levels of emotional suffering, few patients had access to counseling services or psychological support during their treatment journey. This reflects a gap in holistic infertility care in many settings, as observed by Pasch and Holley (2011), who advocated for the integration of psychosocial services within fertility clinics [22, 23].

The current findings underscore the importance of psychological screening as an essential component of ART protocols. Mental health professionals should be routinely involved in counseling infertile women, particularly during emotionally taxing phases of treatment. Early intervention strategies such as cognitive-behavioral therapy (CBT), support groups, and stress-reduction workshops can improve not only mental well-being but also treatment adherence and potentially outcomes given by the Domar et al., 2011 [24].

**Conclusion:**

This prospective study demonstrates that women undergoing fertility treatment experience significant psychological distress, with elevated levels of anxiety and depression particularly during mid-treatment phases. The emotional burden is notably greater in women with longer infertility duration, prior treatment failures, and limited partner support. These findings underscore the importance of routine psychological assessment and the integration of mental health services into fertility care protocols. Providing timely psychosocial support—especially at emotionally vulnerable treatment stages—may not only improve mental well-being but also enhance patient engagement and potentially optimize treatment outcomes. A multidisciplinary approach that addresses both reproductive and emotional health should be considered essential in modern infertility management.

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