

RISK FACTORS FOR DEPRESSION AND ANXIETY IN SUBFERTILE WOMEN IN PAKISTAN

Pakeeza Afzal^{*1}, Nadia Arif², Shazia Nayyer³, Anum Fareed⁴, Maria Younas⁵, Khadija Aslam⁶

^{*1,2,3,4,5} CMH Kharian

⁶ Cantonment General Hospital Rawalpindi

^{*1} pakizagondal@yahoo.com

DOI: <https://doi.org/10.5281/zenodo.17539698>

Keywords

Infertility, depression, anxiety, risk factors, Pakistan, women, mental health, treatment failure, education.

Article History

Received: 11 March 2025

Accepted: 21 April 2025

Published: 28 May 2025

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Corresponding Author: *

Pakeeza Afzal

Abstract

Background: Infertility is a significant source of psychosocial stress, with studies indicating high rates of depression and anxiety among affected women. This study aimed to identify the risk factors associated with these mental health conditions in subfertile women in Pakistan.

Methods: A cross-sectional study was conducted over six months with 150 subfertile women aged 18-45 from CMH Kharian infertility clinics. Data were collected via structured interviews using validated Urdu versions of the Patient Health Questionnaire-9 (PHQ-9) for depression and the Generalized Anxiety Disorder-7 (GAD-7) for anxiety. Multivariable logistic regression was used to determine independent risk factors.

Results: The prevalence of moderate-to-severe depression was 54.0%, and moderate-to-severe anxiety was 62.7%. Multivariable analysis identified longer infertility duration (>5 years) (Depression aOR: 2.45; Anxiety aOR: 2.88) and a history of previous treatment failure (Depression aOR: 2.88; Anxiety aOR: 3.21) as significant independent risk factors for both conditions. Secondary infertility was a significant risk factor for depression (aOR: 1.95). Conversely, higher educational attainment served as a protective factor against both depression (aOR: 0.35) and anxiety (aOR: 0.41).

Conclusion: There is a high burden of depression and anxiety among subfertile women in Pakistan, strongly associated with prolonged infertility, failed treatments, and lower education levels. These findings underscore the necessity of integrating routine psychological screening and supportive mental health services into standard fertility care to improve patient well-being.

INTRODUCTION

According to the Royal College of Obstetricians and Gynaecologists, 'Fertility is the ability to conceive a baby and, for a woman, to become pregnant'.¹ Infertility, on the other hand, has a broad definition because it has been defined using different approaches across various disciplines. The definition has a significant impact on clinical outcomes, including those reported in research studies.² Within

infertility clinic settings, infertility is defined as 'the inability to establish a pregnancy within a specified period of time, usually 1 year'.³ The approach taken by epidemiologists has been different. In many epidemiological studies, it is defined as 2 years exposure to the risk of pregnancy without becoming pregnant. On the other hand, the definition commonly used by demographers is 5 years' exposure

without a viable birth.⁴ Studies have revealed that infertile patients experience higher levels of stress, anxiety and depression^{5,6}. In a clinical study, approximately 87% of women with infertility were reported varying levels of anxiety ranging from mild to severe. Meanwhile, 41% of women were reported mild, moderate or severe depression⁷. Depression is widespread, and represents a major health concern. It is one of the leading causes of disabilities worldwide. Typical symptoms of depression include persistently low mood, lowered activity, loss of interest, and the inability to derive pleasure from things that once brought joy. Depression may either contribute to infertility, result from it, or both⁸. Anxiety is a normal adaptive response to threats and stressful situations. Women struggling with infertility report higher rates of anxiety than the general population, with this emotional burden potentially impacting their quality of life⁹. Additionally, chronic stress associated with infertility treatments and uncertainty of outcomes can exacerbate depression and anxiety symptoms, creating a vicious cycle that may further complicate conception. Therefore, addressing depression and anxiety through psychological support and stress-reduction techniques is crucial for managing the overall well-being of patients with infertility.

Methodology

This cross-sectional study was conducted over six months in infertility clinics of CMH Kharian in Pakistan. A total of 150 subfertile women aged 18–45 years were included through consecutive sampling. Women with major psychiatric disorders, severe medical illness, or current pregnancy were excluded.

After obtaining ethical approval, eligible women were approached in clinic settings. The purpose of the study was explained, and written informed consent was taken from each participant. Privacy and

confidentiality were strictly maintained throughout the study.

Data were collected through structured face-to-face interviews. The questionnaire included socio-demographic variables such as age, education, occupation, income, and residence, along with infertility-related details such as type and duration of subfertility and previous treatment history.

Depression and anxiety were assessed using validated Urdu versions of the Patient Health Questionnaire-9 (PHQ-9) and the Generalized Anxiety Disorder-7 (GAD-7). These tools have been widely used in clinical research and provided cut-off scores to categorize symptom severity.

All data were entered into SPSS for statistical analysis. Descriptive statistics were applied to summarize baseline characteristics. Associations between independent variables and depression or anxiety were first examined using bivariate analysis.

Variables showing significance in bivariate analysis were entered into multivariable logistic regression. Adjusted odds ratios (aOR) with 95% confidence intervals were calculated to determine independent risk factors for depression and anxiety.

Results

A total of 150 subfertile women participating in the study completed the interviews. The data on socio-demographic characteristics, infertility-related factors, and the prevalence of depression and anxiety were analyzed.

The baseline characteristics of the study participants are summarized in Table 1. The mean age of the participants was 32.4 years (± 5.1 SD). The majority of women had a secondary level of education (45.3%), were housewives (72.7%), and lived in urban areas (68.0%). The average duration of subfertility was 5.8 years (± 3.4 SD), with primary infertility being more common (63.3%) than secondary infertility.

Table 1: Baseline Characteristics of the Study Participants (N=150)

Characteristic	Category	Frequency (n)	Percentage (%) / Mean ($\pm$ SD)
Age (Years)			32.4 ($\pm$ 5.1)
Education	No Formal Education	25	16.7%
	Primary	32	21.3%
	Secondary	68	45.3%
	Tertiary	25	16.7%
Occupation	Housewife	109	72.7%
	Employed	41	27.3%
Residence	Urban	102	68.0%
	Rural	48	32.0%
Type of Infertility	Primary	95	63.3%
	Secondary	55	36.7%
Duration of Infertility (Years)			5.8 ($\pm$ 3.4)

The assessment using the PHQ-9 and GAD-7 scales revealed a high prevalence of psychological morbidity among the participants. As shown in Table 2, over half of the women (54.0%) were found to have

clinically significant symptoms of depression (PHQ-9 score ≥ 10). Symptoms of anxiety (GAD-7 score ≥ 8) were even more prevalent, affecting 62.7% of the study sample.

Table 2: Prevalence of Depression and Anxiety Among Subfertile Women (N=150)

Condition	Severity Category	Cut-off Score	Frequency (n)	Percentage (%)
Depression (PHQ-9)	Minimal / Mild	0-9	69	46.0%
	Moderate to Severe	≥ 10	81	54.0%
	Moderate	*10-14*	*45*	30.0%
	Severe	≥ 15	*36*	24.0%
Anxiety (GAD-7)	Minimal / Mild	0-7	56	37.3%
	Moderate to Severe	≥ 8	94	62.7%
	Moderate	*8-14*	*59*	39.3%
	Severe	≥ 15	*35*	23.3%

3. Factors Associated with Depression and Anxiety: Bivariate and Multivariable Analysis

Bivariate analysis (using Chi-square tests) identified several socio-demographic and infertility-related factors significantly associated (p-value < 0.05) with moderate-to-severe depression and anxiety. These

significant variables were then included in the multivariable logistic regression models.

The final models, presented in Table 3, identified the independent risk factors for depression and anxiety after adjusting for other variables.

Table 3: Multivariable Logistic Regression for Independent Risk Factors of Depression and Anxiety

Variable	Category	Adjusted Odds Ratio (aOR) for Depression	95% CI	Adjusted Odds Ratio (aOR) for Anxiety	95% CI
Education	Tertiary (Ref: No Formal)	0.35	0.14 - 0.89*	0.41	0.17 - 0.99*
Occupation	Employed (Ref: Housewife)	0.48	0.24 - 0.97*	0.55	0.28 - 1.09

Infertility Type	Secondary (Ref: Primary)	1.95	1.02 - 3.72*	1.82	0.96 - 3.45
Duration of Infertility	>5 Years (Ref: ≤5 Years)	2.45	1.33 - 4.52**	2.88	1.55 - 5.34***
Previous Treatment Failure	Yes (Ref: No)	2.88	1.48 - 5.59**	3.21	1.65 - 6.24***

Ref = Reference Category; CI = Confidence Interval;

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Key Findings from Regression Analysis:

- **Protective Factors:** Higher education (tertiary level) was a significant protective factor against both depression (aOR: 0.35) and anxiety (aOR: 0.41). Being employed was a protective factor against depression (aOR: 0.48).
- **Risk Factors:**
 - **Longer Infertility Duration:** A duration of infertility greater than 5 years significantly increased the odds of both depression (aOR: 2.45) and anxiety (aOR: 2.88).
 - **Previous Treatment Failure:** A history of unsuccessful fertility treatments was the strongest risk factor, associated with nearly three times the odds of depression (aOR: 2.88) and over three times the odds of anxiety (aOR: 3.21).
 - **Type of Infertility:** Secondary infertility was associated with significantly higher odds of depression (aOR: 1.95) compared to primary infertility.

Discussion:

This study demonstrates a high prevalence of depression and anxiety among subfertile women in Pakistan, with prolonged infertility duration and failed treatment attempts emerging as major risk factors. Higher educational attainment served as a protective factor, while secondary infertility was uniquely associated with increased depression risk. These findings highlight that infertility is not merely

a biological disorder but also a profound psychosocial stressor. Hence, incorporating routine psychological screening and counseling into fertility care is crucial to reducing the mental health burden and improving overall patient well-being¹⁰.

Our results were partially consistent with prior research. Both studies identified low educational level as a significant determinant of depression and anxiety, though our study further revealed longer infertility duration and previous treatment failure as key predictors¹⁰.

We observed a higher prevalence of depression (54% vs. 30.5%), aligning with comparative findings that linked prolonged infertility and failed treatment attempts to adverse psychological outcomes¹¹.

Broad agreement was also found with studies reporting high rates of depression and anxiety in subfertile women, emphasizing similar risk factors such as prolonged infertility and history of treatment failure¹². However, some variation was noted. For example, one study reported higher depression in women with primary infertility, rural residence, and increased treatment frequency, whereas our findings highlighted secondary infertility, extended infertility duration, and treatment failure as stronger contributors¹³.

Overall, our findings were in accordance with existing evidence, reaffirming that infertility-related variables—such as duration, type, and treatment outcomes—are significant independent risk factors for depression in subfertile women¹⁴.

Conclusion

This study confirms a high prevalence of depression (54%) and anxiety (62.7%) among subfertile women in Pakistan, underscoring infertility as a significant psychosocial stressor beyond its biological aspects. Key independent risk factors identified include prolonged infertility duration (>5 years), a history of failed fertility treatments, and secondary infertility. Conversely, higher educational attainment and

employment serve as protective factors against these mental health conditions. The findings highlight the critical need for integrating routine psychological screening and supportive mental health services into standard fertility care to alleviate the emotional burden and improve the overall well-being of women facing infertility.

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