

Mental health status of infertile females visiting Assisted Reproductive Technology clinics in North India

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ABSTRACT

The inability to bear children is a tragedy for a female which affects her mental health. The aim of the study was primarily to assess the difference between the mental health status of infertile and fertile females and its association with certain parameters. A cross-sectional study was conducted in Punjab and Chandigarh using a two-stage sampling technique among 20-50-year-old females. 100 infertile females from randomly selected assisted reproductive technology clinics and 100 fertile females from the general population were enrolled by purposive sampling. Their mental health status was assessed using Beck's Depression Inventory (BDI) tool. Majority of the infertile couples were in the age group 31- 35 years and 75% of infertile females were unemployed. Depression was significantly higher among infertile females (69%) than fertile females (10%) and also among primary infertile females (71.8%) than secondary infertile females (67.2%) ($p < .001$). Duration of infertility had a significant and positive correlation with the BDI scores ($\rho = 0.271, p = .006$), but age showed insignificant negative correlation with depression ($\rho = - 0.006, p = .949$). Prevalence of depression among infertile women is higher. It is crucial to bring forward the interventions to decrease and prevent the development of severe depression among females going through infertility.

Keywords: *Infertile, Beck's Depression Inventory, Depression, Duration of infertility.*

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INTRODUCTION

Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse (World Health Organization: WHO, 2024). A 'primary infertile' female is a woman who has never been diagnosed with a clinical pregnancy and meets the criteria of being classified as having infertility. The term 'secondary infertile' female applies to a woman who is unable to establish a clinical pregnancy but has been previously diagnosed with a clinical pregnancy (Zegers-Hochschild et al., 2017).

Worldwide, around 17.5% of the adult population, roughly 1 in 6, experience infertility, implying the urgent need to increase access to affordable, high-quality fertility care. The new estimates by WHO (2023) show limited variation in the

prevalence of infertility between high, middle and low-income countries, indicating that it is a major health challenge globally. In India, as per NFHS-5 data analysis from representative sample, the estimated prevalence of infertility during 2019-20 was 18.7 per 1,000 among females who had been married for at least five years and were currently in union (Agiwal et al., 2023).

The ability to become pregnant and bear children is viewed as an essential aspect of a woman's identity in our society. Females who are unable to accomplish this feel barren and unfulfilled. Infertility is more than just a medical problem because it impacts all facets of life, the most important being mental health. Stress can negatively impact a person's relationships with friends, family and their partner. Detachment from the family and a decline in social engagement could arise from this. Stress

may also have a detrimental effect on the outcome of the treatment (Sharma & Shrivastava, 2022). Despite the fact that both men and women can experience infertility, women are frequently believed to be infertile, even if they are not, especially where fertility testing is not a possibility (WHO, 2024; Inhorn & Patrizio, 2015). Women are more prone to suffer social shame, violence, divorce, emotional stress, sadness, depression, anxiety and low self-esteem (WHO, 2024). In developed nations, modern reproductive technology helps to diagnose and treat the problem of infertility, but it also ignores its psychological components by keeping them in the background (Cousineau & Domar, 2007).

While some authors contend that psychological factors may be a primary cause of infertility, others contend that psychological symptoms may be triggered by the state of infertility itself (Edelmann & Connolly, 1986). Other impacts associated with infertility include feelings akin to mourning, threat, sexual distress, guilt, frustration and rejected feelings (Edelmann & Connolly, 1986; Wallach & Mahlstedt, 1985; Ramezanzadeh et al., 2004)

Objectives

1. To compare the mental health status of infertile females and fertile females.
2. To compare the mental health status of primary infertile females and secondary infertile females.
3. To assess the association of mental health status with the background characteristics of the infertile females.

METHODS

A cross-sectional study was conducted and a two-stage sampling method was adopted. In the first stage, through random sampling, 25 Assisted Reproductive Technology (ART) clinics were selected in Punjab (districts Jalandhar, Ludhiana, Patiala, Moga and Barnala) and the union territory of Chandigarh. In the second stage, 100 infertile females who failed to establish a

clinical pregnancy after 12 months of regular, unprotected sexual intercourse (Zegers-Hochschild et al., 2017) were selected by purposive sampling from these 25 ART clinics. On the other hand, 100 fertile females confirmed to have conceived without assisted reproductive techniques and having delivered at least one child were enrolled from the general population, hospital staff and females visiting health facilities for reasons other than infertility. The age group chosen for both infertile and fertile females was 20-50 years. The infertile and fertile females were interviewed for background information using a structured schedule. Mental health status of the females was assessed using Beck's Depression Inventory (BDI) tool.

Beck's Depression Inventory tool

The 21-item Beck Depression Inventory is a self-report rating inventory that measures characteristic attitudes and symptoms of depression. This scale is widely used to gauge the intensity of depression. Each item describes a distinct behavioural manifestation of depression. Scores on each item are rated on a 4-point Likert scale and can range from 0, indicating no depressive symptomatology, to 3, indicating a severe level of symptomatology. Total scale scores for 21 items can thus range from 0 to 63 (Beck, 1961).

For this study, scores were classified into six categories and females with BDI score of 17 or more i.e. females falling into the categories of borderline clinical depression, moderate depression, severe depression or extreme depression were considered as having depression.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics 21. Descriptive statistics were expressed as frequencies and percentages. As the Beck Depression Inventory (BDI) scores were not normally distributed, non-parametric tests were applied. The association between depression scores and participants' characteristics was assessed using Spearman's rank correlation and the Chi-square test.

RESULTS

The study included 200 females in total and 100 females in each of the two groups: Infertile and Fertile. Out of 100 infertile females, 39 had primary infertility and 61 had secondary infertility. One female from each group was married for the second time. Females were divided into five different age groups. The mean age \pm standard deviation (SD) of the total study participants was 33.86 ± 6.23 , with a range of 20-45 years of age. Whereas, the mean ages of the infertile and fertile groups were 32.92 ± 5.78 and 34.80 ± 6.55 respectively.

The majority of the females were in the 31-35 years age group among both groups. Qualification-wise, 1% and 6% of the females were illiterate among the infertile and fertile groups respectively. 75% of infertile females and 38% of fertile females were housewives or unemployed. Overall, the majority of the subjects were Sikhs (62.5%) followed by Hindus (32.5%). Most infertile females were from the lower middle socioeconomic class (48%), while the majority of fertile females belonged to the upper middle socioeconomic class (37%). (Table 1)

Table 1: Socio-demographic characteristics of the study participants.

Socio-demographic characteristic	Infertile females n= 100	Fertile females n= 100	Total females= 200 n (%)
<u>Age groups (years)</u>			
<25	11	8	19 (9.5)
26-30	22	19	41 (20.5)
31-35	33	31	64 (32)
36-40	26	21	47 (23.5)
41-45	8	21	29 (14.5)
Mean age \pm standard deviation (SD)	32.92 ± 5.78	34.80 ± 6.55	33.86 ± 6.23
<u>Qualification</u>			
Illiterate	1	6	7 (3.5)
Primary	2	8	10 (5.0)
Middle	8	5	13 (6.5)
High	13	6	19 (9.5)
Intermediate/Diploma	25	15	40 (20)
Graduate	32	25	57 (28.5)
Professional/Honours	19	35	54 (27)
<u>Occupation</u>			
Unemployed	75	38	113 (56.5)
Employed	25	62	87 (43.5)
<u>Religion</u>			
Sikh	69	56	125 (62.5)
Hindu	24	41	65 (32.5)
Muslim	7	1	8 (4.0)
Christian	0	2	2 (1.0)
<u>Socio economic status</u>			
Upper (I)	13	30	43 (21.5)
Upper middle (II)	35	37	72 (36)
Lower middle (III)	48	16	64 (32)
Upper lower (IV)	4	15	19 (9.5)
Lower (V)	0	2	2 (1)

Next, the prevalence of depression was compared between the two groups as shown in table 2. Mean score was 22.72 ± 11.36 in the infertile group and 6.63 ± 6.87 in the fertile group, and the difference in mean BDI scores was highly significant ($p < .001$) between the two groups at 95% CI: 13.47 to 18.71. Depression was observed to be more prevalent in the infertile group

(69%) than in the fertile group (10%). Furthermore, overall depression was significantly higher among females suffering from primary infertility (71.8%) than secondary infertility (67.2%) ($p < .001$). Majority of the primary infertile (33.3%) and secondary infertile females (36.1%) suffered from moderate depression.

Table 2: Beck’s Depression Inventory (BDI) scores among infertile and fertile female groups.

Level of Depression	Infertile females			Fertile females n	Total females n (%)	p-value
	Primary n (%)	Secondary n (%)	Total n			
Normal (1-10)	4 (10.3)	11 (18.0)	15	78	93 (46.5)	.000**
Mild mood disturbance (11-16)	7 (17.9)	9 (14.7)	16	12	28 (14.0)	
Borderline clinical depression (17-20)	6 (15.4)	6 (9.8)	12	3	15 (7.5)	
Moderate depression (21-30)	13 (33.3)	22 (36.1)	35	6	41 (20.5)	
Severe depression (31-40)	8 (20.5)	9 (14.7)	17	1	18 (9.0)	
Extreme depression (Over 40)	1 (2.6)	4 (6.6)	5	0	5 (2.5)	
Total	39	61	100	100	200 (100)	

** $p < 0.001$ is highly significant for Chi square association

A few of the items from the BDI tool have been presented in comparison between the two groups in table 3. Feeling of guilt, suicidal tendency, crying tendency, irritation, loss of sleep, and loss of interest in intercourse were significantly higher among infertile females.

Table 3: Assessment of major issues faced by the infertile and fertile females.

Issue	Infertile females	Fertile females	p-value
Guilt	67%	15%	.000**
Suicidal tendency	26%	7%	.001*
Crying tendency	92%	39%	.000**
Irritation	89%	42%	.000**
Loss of sleep	44%	29%	.000**
Loss of appetite	24%	18%	.255
Loss of weight	23%	12%	.111

Loss of interest in intercourse	78%	51%	.000**
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* $p < .05$ is significant for Chi square association

** $p < .001$ is highly significant for Chi square association

Duration of infertility had a significant and positive relation with the BDI scores ($\rho = 0.271$, $p = .006$) as shown in table 4. As the duration of infertility increased, depression worsened. On the other hand, the age of the female had a non-significant and negative relation with BDI scores ($\rho = -0.006$, $p = .949$).

Table 4: Correlation between BDI score and age of infertile females & duration of infertility.

Background characteristic	Spearman's Rho (ρ)	p -value
Age of female (years)	-0.006	.949
Duration of infertility (years)	0.271	.006*

*Correlation is significant at $p < .05$.

Based on the duration of infertility, 15 (48.3%), 28 (75.6%), 13 (72.2%) and 13 (92.7%) infertile females had borderline to extreme depression in different groups of duration of infertility. A higher proportion of infertile females suffered from moderate depression, with a duration of infertility of more than 3 years ($p = .054$). (Table 5)

Table 5: Relationship between duration of infertility and depression among infertile females.

BDI classification	Duration of infertility				Total n
	1-3 years n (%)	4-6 years n (%)	7-9 years n (%)	>10 years n (%)	
Normal	8 (25.8)	5 (13.5)	1 (5.5)	1 (7.1)	15
Mild mood disturbance	8 (25.8)	4 (10.8)	4 (22.2)	0 (0)	16
Borderline clinical depression	5 (16.1)	3 (8.1)	2 (11.1)	2 (14.2)	12
Moderate depression	5 (16.1)	17 (45.9)	8 (44.4)	5 (35.7)	35
Severe depression	4 (12.9)	7 (18.9)	3 (16.7)	3 (21.4)	17
Extreme depression	1 (3.2)	1 (2.7)	0 (0)	3 (21.4)	5
Total	31	37	18	14	100
* $p = .054$					

DISCUSSION

The findings of this study provide information about the frequency and severity of depression in females while making a comparison between infertile and fertile females.

The mean ages of the infertile and fertile groups were comparable. The majority of the infertile females were in the age group of 30-35 years of age. In a study conducted by Bhadkaria et al. (2023), in Gorakhpur city of Uttar Pradesh, most cases (41.33%) were observed in the 26-30 years of age group. In another study, the majority of the infertile women (39.3%) belonged to the

25–29 years age group (Katole & Saoji, 2019). Overall, the 26-35 years age group has been noted to be most affected by infertility (Singh et al., 2020).

The prevalence of secondary infertility was higher than primary infertility in this study. A recent study conducted in Ahmedabad also showed that the secondary type of infertility was more common (Sharma et al., 2024). In some of the other studies conducted in India, prevalence of primary infertility was higher than secondary. A study showed that 57.33% of women experienced primary infertility, while 42.66% had secondary infertility

(Bhadkaria et al., 2023). Another study also showed a higher prevalence of primary infertility (78.7%) than secondary infertility (21.3%) (Singh et al., 2020).

Our study showed that depression was significantly higher in infertile females (69%) than in fertile females (10%). This finding is consistent with the work of Guerra et al (1988) which reported a 67% depression rate among infertile females. The depression rate among infertile women was 53.8% in a study conducted in Saudi Arabia (Al-Homaidan, 2011). A study conducted in Ghana reported a 62% depression rate among infertile females (Alhassan et al., 2014). Consistent with our findings, another study reported an overall higher prevalence of depression among primary infertile patients compared to secondary infertile patients (Singh et al., 2020). Category-wise, severe depression was higher in primary infertile whereas extreme depression was more in secondary infertile females. Extreme depression among secondary infertile females was attributed to miscarriage-related sadness, pressure to have a male child, the burden of raising an existing child, peer pressure to have more children, and failure to conceive again. Similar to our findings, another study reported that mild depression was found to be higher in the primary infertile females and moderate depression was higher in the females of the control group (Yoldemir et al., 2020).

Depression scores significantly had a positive correlation with the duration of infertility. According to some studies, long-term infertility accompanied by unsuccessful treatment cycles intensifies stress and sadness (Berg & Wilson, 1991; Lok et al., 2002). Social and family pressures play an important role. This finding in our study was contradictory to a Turkish study which concluded that the problem of depression improved in infertile women as the duration of infertility increased (Guz et al., 2003). Another study showed that those who had 2–3 years of infertility had more depression than those

who had this problem for a year or more than 6 years. This was attributed to the emotional adjustments, which can result from a sense of acceptance of the situation, willingness to adopt or live without a child, that may happen after 6 years of duration of infertility (Domar et al., 1993). Studies have also reported to show that there is no relation between duration of infertility and depression or psychological factors (Hunt & Monach, 1997). It is worth mentioning that although the result was not significant, a negative correlation was observed between the age of the infertile females and the depression scores. It means that as age increases, depression decreases. This could be a result of the resilience that develops with age and helps to adjust to the prevailing situation.

Patients with infertility have shown benefit from psychological interventions that prioritize stress management and coping-skills training (Cousineau & Domar, 2007). Further research is needed to understand the association between depression and fertility outcomes, as well as effective psychosocial interventions.

Limitations

The study included a small sample size. A cross-sectional study could not establish a causal relationship.

Recommendations

Mandatory counselling by qualified professionals is essential for infertile females before, during and after fertility treatments. Couples therapy could be even more helpful. Awareness programs regarding assistance in coping with infertility and exploring fertility treatments should be incorporated.

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