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

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ABSTRACT

Background: *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 mental health status of infertile and fertile females and its association with certain parameters.*

Methodology: *A cross sectional study was conducted in Punjab and Chandigarh using two staged sampling technique among 18-50 years old females. 100 infertile females from randomly selected Assisted Reproductive Clinics and 100 fertile females from general population were enrolled by purposive sampling. Their mental health status was assessed using Beck's Depression Inventory (BDI) tool.*

Results: *Majority of the infertile couples were in the age group 31- 40 years and 75% of infertile females were unemployed. Depression was significantly higher in infertile females (69%) than fertile females (10%) and also among secondary infertile (41%) than primary infertile (28%) ($p < .05$). Duration of infertility had a significant and positive corelation with the BDI scores ($\rho = 0.271$, p-value = .006), but age showed insignificant negative corelation with depression ($\rho = 0.009$, p-value = .900).*

Conclusions: *Prevalence of depression among the infertile women is high, especially among age group 31- 40 years. It is crucial to bring forward the interventions to decrease and prevent the development of severe depression among the 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). It can further be classified as primary and secondary infertility. Infertility can be primary, if the couple has never conceived despite cohabitation and exposure to pregnancy (not contracepting) for a period of two years. Infertility can be secondary, if a couple fails to conceive following a previous pregnancy, despite cohabitation and exposure to pregnancy (Jejeebhoy, 1998).

Worldwide, around 17.5% of the adult population, which is roughly 1 in 6, experience infertility, implying on 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 this is a major health challenge globally. In India, as per NFHS-5, the prevalence of infertility in India during 2019-20 was 18.7 per 1,000 among women who have been married for at least five years and who are currently in union (Agiwal et al., 2023).

The ability to become pregnant and bear children is seen as central to a woman's identity in many societies. In our society, to have a child means living a fulfilled life. Thus, couples who cannot do so feel barren and incomplete. Therefore, infertility is more than just a medical problem. It affects all aspects of life, the most important being mental health (Sharma and Shrivastava, 2022). The lives of infertile couples, especially women, are significantly impacted negatively by infertility on a social level. Women are more likely to endure social shame, violence, divorce, emotional stress, sadness, anxiety and low self-esteem (WHO, 2024). Depression and anxiety are highly prevalent among infertile women. Modern reproductive technology in developed countries makes it possible to diagnose and treat infertility, but it also obscures its psychological factors by keeping them in the background (Cousineau and Domar, 2007). In gender comparison, women reported about more depressive symptoms and poorer quality of life than men (Cserepes et al, 2014). Even though infertility can affect both men and women, women in a relationship with a man are often perceived to suffer from infertility, regardless of whether or not they actually are infertile (WHO, 2024). The woman is frequently blamed for the infertility, especially where fertility testing is not an option (Inhorn and Patrizio, 2015).

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 and Connolly, 1986). Some authors have paid attention to the fact that health problems, loss of self-esteem, feeling akin to mourning, threat, sexual distress, depression, guilt, anxiety, frustration, emotional distress, inferiority complex, rejected feeling and marital problems are all associated with infertility (Wallach and Mahlstedt, 1985; Edelmann and Connolly, 1986; 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.

Hypotheses

Based on the reviewed literature, following hypotheses were formulated:-

1. There will be a significant difference in the mental health status of infertile females and fertile females.
2. There will be a significant difference in the mental health status of primary and secondary infertile females.
3. There will be a significant association between the mental health status and the background characteristics of the infertile females.

METHODS

A cross sectional study was conducted and a two-staged sampling method was adopted. In the first stage, through random sampling, 25 Assisted Reproductive Technology (ART) clinics were selected in Punjab (Jalandhar, Ludhiana, Patiala, Moga and Barnala) and Union territory of Chandigarh. In the second stage 100 infertile females were selected by purposive sampling from these 25 ART clinics. Similarly, 100 fertile females were enrolled from general population and those visiting health facilities for reasons other than infertility. Age group chosen was 18-50 years. The infertile and fertile females were interviewed for background information

using a structured schedule. Mental health status was assessed using Beck's Depression Inventory (BDI) tool.

Beck's Depression Inventory tool

Beck Depression Inventory (BDI) is one of the most widely used tools for depression screening that has been developed (Beck et al., 1961).

The Beck Depression Inventory tool is used to measure negative, emotional, cognitive, and motivational symptoms encountered in a state of depression. The instrument comprises 21 self-reported items devised as a four-point Likert scale. Each of the inventory items provides a four-option self-evaluation phrase and identifies the behavioural pattern typical of depression. Based on the severity of depression described by the subject, the option corresponds to the points 0, 1, 2, 3. The inventory's maximum score is 63, and the recognized cut off value for diagnosing clinical depression is 17. With an accuracy rate of over 90%, points above 17 are recommended to diagnose depression that requires therapy (Kamışlı, 2020).

Statistical Analysis

The data were evaluated using the IBM SPSS 21 software program. Frequency and percentages were used for the descriptive data. The statistical analysis carried out to determine whether there is a relationship between the depression scores and participant's descriptive characteristics, the non-parametric Spearman correlation analysis and Chi-square test were carried out since the data obtained from BDI scores was not normally distributed.

Ethical Considerations

The ethical approval was obtained from Institutional Ethical Committee, Panjab University, Chandigarh. Participant information sheet was provided to each subject and written consent was taken in language best understood by the subject (English, Hindi or Punjabi).

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 females suffered from primary infertility and 61 from secondary infertility. One female from each group was married for the second time. Females were divided into five different age groups. The mean age ± standard deviation (SD) of the subjects was 33.86 ± 6.23 with range 20-45 years of age. Whereas, mean age of infertile and fertile groups was 32.92 ± 5.78 and 34.80 ± 6.55 respectively and was significantly different ($p< .05$). Age groups 31-35 years had the highest prevalence among both the groups. 1 % and 6% of females were illiterate among infertile and fertile groups respectively. 75.0% of infertile females and 38% of fertile females were housewives or unemployed. Overall, majority of the subjects were Sikhs (62.5%) followed by Hindus (32.5%). Most of the females belonged to upper middle class, in term of socio-economic status, in both the groups. (Table 1)

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

Socio-demographic characteristic	Infertile females n= 100	Fertile females n= 100	Total n= 200 (%)
Age groups (years)			
<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 ± SD*	32.92 ± 5.78	34.80 ± 6.55	33.86 ± 6.23
Qualification			
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)
Profession/ honours	19	35	54 (27)
Occupation			
Unemployed	75	38	113 (56.5)
Employed	25	62	87 (43.5)
Religion			
Sikh	69	56	125 (62.5)
Hindu	24	41	65 (32.5)
Muslim	7	1	8 (4.0)
Christian	0	2	2 (1.0)
Socio economic status			
Upper (I)	18	35	53 (26.5)
Upper middle (II)	62	41	103 (51.5)
Lower middle (III)	18	15	33 (16.5)
Upper lower (IV)	2	7	9 (4.5)
Lower (V)	0	2	2 (1.0)

*Mean age difference is significant at the < .05 level (*p*- value= .03); [Confidence Interval (CI) 95%: 3.602 to 0.158]

In next step, we compared the prevalence of depression in the two groups. Mean score of depression was 22.72 ± 11.36 in infertile females and 6.63 ± 6.87 in fertile females, whereas, the difference in mean BDI scores was highly significant (*p*< .001) between the two groups at 95% CI: 13.47 to 18.71. As per the scoring system, scores were classified into six categories: Scores more than or equal to 17, i.e. scores added for borderline clinical depression, moderate depression, severe depression and extreme depression, were considered as cut off for depression. Accordingly, depression was observed to be more in infertile group (69%) than fertile group (10%). Furthermore, depression was significantly higher among females suffering from secondary infertility (41%) than primary infertility (28%) (*p*< .05). (Table 2)

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

Level of Depression	Infertile (n=100)			Fertile (n=100)	Total (n=200)	*p*- value
	Primary n (%)	Secondary n (%)	Total			
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 (39)	61(61)	100	100	200 (100)	

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

Few of the items from the BDI tool have been presented in comparison with both the groups. Suicidal tendency, crying tendency, loss of sleep, irritation, guilt and loss of interest in intercourse was significantly higher among infertile females. (Table 3)

Table 3: Assessment of major issues faced by the infertile 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****

**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 (ρ= 0.271, *p*– value= .006). On the other hand, age of the female had non-significant and negative relation with BDI scores (ρ= -0.006, *p*- value= .949). (Table 4)

Table 4: Correlation between BDI score with 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 the 0.01 level.

Based on duration of infertility 15 (48.4%), 28 (75.7%), 13 (72.2%) and 13 (92.8%) infertile females had depression in different groups, but there was no significant relationship between duration of infertility and depression (*p*- value= .054). (Table 5)

Table 5: Frequency and rate of depression best on duration of infertility.

BDI classification	1-3 yrs n (%)	4-6 yrs n (%)	7-9 yrs n (%)	>10 yrs n (%)	Total n= 100 *p*- value= .054*
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

DISCUSSION

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

The mean age of the females was 32.92 and 34.80 in infertile and fertile groups respectively and both groups were significantly comparable. 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 women (39.3%) belonged to 25–29 years of age group (Katole and Saoji, 2019). Overall, 26-35 years age group has been noted to be most affected by infertility (Singh et al., 2020).

The study showed that 39% females suffered from primary infertility and 61% from secondary infertility. Prevalence of secondary infertility is higher than primary infertility in present study. It should be noted that secondary infertility also includes females who experienced miscarriage. 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, 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 showed higher prevalence of primary infertility (78.7%) than secondary infertility (21.3%) (Singh et al., 2020).

According to present study, depression was higher in infertile females (69%) than fertile females (10%). This finding is in consistence with the work of Guerra et al (1988) which reported 67% depression rate among infertile females. Depression rate among infertile women was 53.8% in a study conducted in Saudi Arabia (Homaidan, 2011). A study conducted in Ghana reported 62.0% depression rate among infertile females (Alhassan et al., 2014). Also, females with secondary infertility reported higher depression symptoms than those with primary infertility. Furthermore, depression was significantly higher among females suffering from secondary infertility (41%) than primary infertility (28%). The higher prevalence of depression among secondary infertile females could be attributed to sadness due to miscarriages, pressure of having a male child, burden of raising previous child, peer pressure to have more children, or grief from failure to conceive again. 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). In contradiction, a study showed that depression level was comparatively more in primary infertile patients (29.5%) than in secondary infertile patients (4.9%) (Singh et al., 2020).

It is worth to mention 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 the age increases, depression decreases. This could be a result of the resilience that develops with age and helps to adjust with the prevailing situation.

In our study, depression scores significantly had a positive correlation with duration of infertility. According to some studies, long lasting infertility accompanied with failed treatment cycles intensifies stress and causes depression (Berg and Wilson, 1991; Lok et al., 2002). Social and family pressures play an important role. This finding in our study was contradictory to some other studies, also. A Turkish study concluded that depression was improved in infertile women as the duration of infertility increased (Guz et al., 2004) which was not the case in our study. Another study showed that those who had 2–3 years 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 situation, willingness to adopt or live without a child, that may happen after 6 years of duration of infertility (Domar et al., 1992). Studies have also reported to show that there is no relation between duration of infertility and depression or psychological factors (Hunt and Monach, 1997).

Psychological interventions that emphasize on stress management and coping-skills training have proven beneficial for infertility patients (Cousineau and Domar, 2007). Further research is needed to understand the association between depression and fertility outcome, as well as effective psychosocial interventions.

Limitations

The study included a small sample size. Also, the partners of the females were not included.

Recommendations

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

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