Original Article

Study of Anxiety and Depression in Couples receiving Infertility Treatment at a Tertiary Care Centre in North India

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Abstract

Background: Psychological distress during infertility is a common entity which may present differently in males and females. The objective is to investigate the frequency of anxiety and despair in infertile couples receiving infertility therapy. **Material and Methods:** This cross-sectional observational cohort study was carried out in a tertiary care hospital after taking Hospital Ethics committee approval. With their written and informed agreement, 160 consecutive infertile couples (cases) who met the inclusion and exclusion criteria and were either newly registered for treatment or receiving treatment through assisted reproductive technology (ART) were recruited for the study. The data collection was carried out during a period of 18 months from Feb 2024 to July 2025. **Results:** The study investigated the prevalence and severity of psychiatric co-morbidities in couples undergoing ART for infertility. Psychological distress during infertility is a common entity which may present differently in males and females. This cross-sectional study specifically compared prevalence of 02 crucial manifestations i.e. anxiety and depression in both the genders. **Conclusion:** This study draws attention to clinically significant levels of psychological distress (anxiety and depression) among infertile couples while undergoing infertility treatment via ART, which is an important factor for discontinuation of treatment or its failure rate.

Keywords: Anxiety disorders, Depression, Infertility.

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Introduction

Though the degree of sensitivity may differ based on the cultural and individual environment, having children is a universal ambition. Regardless of the family's economic, educational, or religious background, failing to do so can cause significant psychological, emotional, and social hardship. Norms may be difficult for those who prefer to live according to them, but they are even more difficult for those who have no choice. Infertility issues affect 50 to 80 million couples worldwide at some point in their reproductive life.[1] An estimated 13–19 million Indian couples are thought to be infertile at any given time.[2] The World Population Prospects 2017 Revision report states that the fertility rate of Indian couples has decreased by around 50%. The fertility rate has been projected to drop from 4.97 in 1975-80 to 2.3 in period of 2015-203. The rising number of infertility cases, which are mostly caused by changing lifestyles and have an impact on physiological and psychological health as well as an increase in mental disease among infertile couples, is a cause for serious concern and alarm.[3,4]

Despite that infertility occurs without physical symptoms and that it does not cause functional limitations in those who suffer from it, the problems to have a child naturally can generate changes in different areas of the lives of the people (intense emotional reactions, strained relationships, decline in self-esteem and self-concept, changes in plans and life expectations, etc.).[5]

Association of psychological distress with infertility is evident in multiple studies which may present with myriads of symptoms. The most tangible manifestations being that of depression and anxiety. They with most certainty go hand in hand with the roller coaster ride of hope and despair associated with dreary and tedious regimens of infertility treatment. The probable detrimental effect of distress associated with prolonged infertility treatment procedures themselves, on reproductive capacity of people, which they claim to treat should also be considered.

Even though men are also responsible, the negative social and economic consequences due to infertility mainly affect women 6. A degree of rejection, or the couple's perception of rejection, can lead to significant anxiety and disappointment in closed social

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groupings. Middle-class males are more likely than women to react in this fashion; some may purposefully avoid the problem entirely, while others may strive to discover a potential solution.[6,7]

In order to determine the prevalence of anxiety and depression among infertile couples receiving treatment, the current study was conducted at our tertiary care facility.

Materials and Methods

This cross-sectional observational cohort study was carried out in a tertiary care hospital, which is also a teaching institute, after taking Hospital Ethics committee approval. With their written and informed agreement, 160 consecutive infertile couples (cases) who met the inclusion and exclusion criteria and were either newly registered for treatment or receiving treatment through assisted reproductive technology (ART) were recruited for the study. The data collection was carried out during a period of 18 months from Feb 2024 to July 2025.

Inclusion Criteria

1. Married infertile couples freshly registered as well as couples already undergoing treatment at ART (Assisted Reproductive Techniques) center at Rajshree Medical Research Institute.
2. Aged between 18 - 49 yrs.
3. Couples consenting to participate in the study.

Exclusion Criteria

1. Couples where consent is not forthcoming to participate in the study.
2. Those under treatment, for any other illness except infertility at the time of study, so as to mitigate the possible confounding effects of this variable on symptoms of anxiety and depression in sample population. *
3. Past history of any psychiatric disorder.

*For e.g if an individual is also under treatment for a diagnosed and chronic disease like Tuberculosis, Cancer etc, it will possibly be a confounding variable having effect on the study population.

Scales Used: Hospital Anxiety and Depression Scale

Hospital anxiety and depression scale: Since Zigmond et al.8 first published the HADS test in 1983, it has been used all across the world. It was created as a screening method to find instances of depression and anxiety problems in patients in hospital clinics that are not psychiatric173. The self-administered HADS test consists of 14 survey questions. Seven of the questions relate to anxiety and the remaining seven questions relate to depression. Each item is rated on a four-point scale ranging from 0 to 3. Anxiety and depression scores are obtained by summing up the scores of the seven items, yielding values between 0 and 21. A score of 8 over a maximum of 21 is considered as a cut off mark for anxiety and depression. Additionally, the HAD-S offers a three-level categorical breakdown: 0–7 for non-cases, 8–10 for dubious cases, and 11–21 for cases. It is pertinent to note that a score of ≥ 11 has been given specific significance of case identification in HADS. The HADS-A and HADS-D Cronbach's alphas ranged from.68 to.93 (mean.83) and.67 to.90 (mean.82), respectively.174. A screening tool in form of HADS was used to have a lower threshold of identification of couples having psychological distress even though their symptoms may not amount to a syndromic diagnosis.

The HADS minimises the confounding influence of physical symptoms in identifying anxiety and sadness in individuals with somatic illness by concentrating on psychological symptoms. Both the overall score and the answers to each question are assessed. The test is appropriate for assessing the anxiety and sadness of patients with physical conditions and in an outpatient setting, and because it just has a few questions, it is not too taxing on patients.

Methodology: 160 infertile couples were included. The goal of the interview and the specifics of the study were explained to each participant. There was assurance of confidentiality. All the subjects co-operated adequately with interest and informed consent. Baseline demographic data of subjects were entered in semi structured Performa on registration to OPD.

They were then evaluated for the frequency and intensity of depression and anxiety using Hospital Anxiety & Depression Scale (HADS). All the patients who were found to have Anxiety & Depression score above 7 were then interviewed by psychiatrist for Anxiety & Depression, diagnosis was then confirmed by ICD -11 criteria for research. After diagnosis patients were given appropriate therapy.

Statistical Analysis: In this work, statistical analyses were both descriptive and inferential. Results were displayed as Mean SD for continuous measurements and as a percentage for categorical measurements. Level of significance was fixed at p=0.05 and any value less than or equal to 0.05 was considered to be statistically significant.

The importance of the study parameters on a categorical scale was determined using chi square analysis. The significance of study parameters on a continuous scale between two groups was determined using student t tests (two-tailed, unpaired). The Mann Whitney U test was utilised to determine whether study parameters on a continuous scale between two groups were significant. To determine the importance of the research parameters between the groups (intergroup analysis), analysis of variance (ANOVA) was employed. If the results of the ANOVA test were significant, additional post hoc analysis was done.

Results

Females were between 20-39 years of age and males were between 20-44 years of age. Majority of females belonged to age group of 25-34 years (83.8%) and majority of males belonged to age group of 25-39 year (92.5%). Majority of female and male were educated up to higher secondary or graduate level (84.5 and 82.5 respectively). Majority of participants had rural origins (75.6%). Majority of the couples had been married for 1-9 years (75.8 %).

About 85% couples had not conceived before and 97.5% of participants had no living children. 51.2 % of participants had not received any prior treatment.

In our study population female cause of infertility was commonest (48.8%), male cause was attributed in 11.3 %, both male and female factor were found in 5 % and no cause was evident in 35 %

The mean anxiety of females pt was 10.76 with SD of 2.686 and that of males pt was 10.07 with SD of 2.711. The difference between mean anxiety of females and males pts was statistically significant (p= 0.022).

The mean depression of female pts was 9.86 with SD of 2.060 and that of male pts was 9.81 with SD of 2.722. The difference between mean depression of female pts and male pts was not statistically significant (p= 0.853).

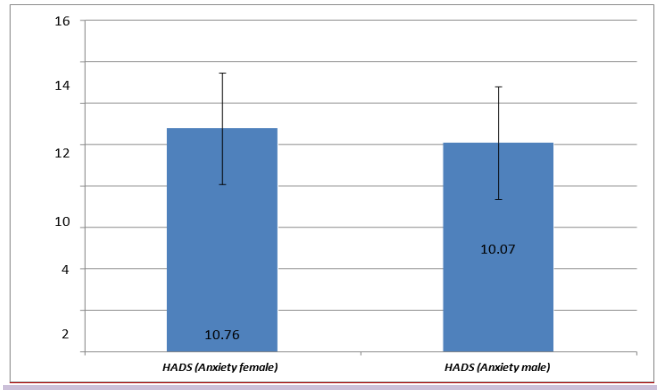

Figure 1: Comparison of severity of Anxiety in terms of {Mean HADS Anxiety score (SD)} among males and females using unpaired t test

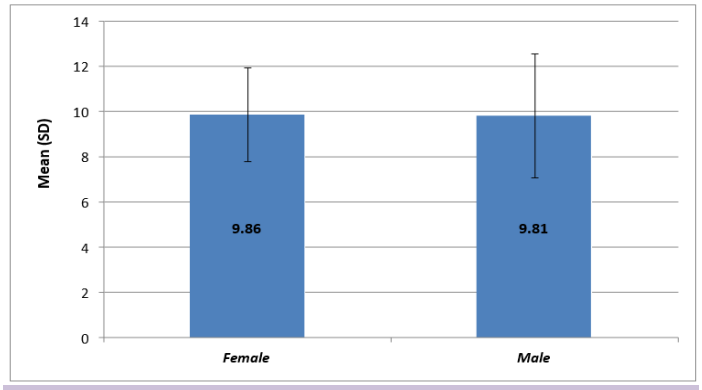

Figure 2: Comparison of the severity of depression in terms of {Mean HADS Depression score (SD)} among males and females using unpaired t test

The majority of Females had scores suggestive presence of anxiety, however for Male, the majority of participants had scores in range of doubtful anxiety. The difference in severity of anxiety of male and female participants when evaluated categorically was not statistically significant (p= 0.130).

The majority of Female and Male participants had scores in range of doubtful or presence of syndromic depression. The difference in severity of depression in males as compared to female participants, when evaluated categorically, was statistically significant (p= 0.032*).

Table 1: Relationship of the HADS Anxiety score in terms of {Mean (SD)} among different age groups in Females using ANOVA test

Age group	N	Mean	Std. Deviation	F value	P value
20-24 years	13	11.77	3.270	0.962	0.412
25-29 years	71	10.59	2.708		
30-34 years	63	10.87	2.446		
35-39 years	13	10.15	3.078		
Total	160	10.76	2.686		

Among females level of anxiety showed no statically significant relationship with age of participants (p=0.412).

Table 2: Relationship of the HADS Anxiety score in terms of {Mean (SD)} among different age groups in males using ANOVA test

Age group	N	Mean	Std. Deviation	F value	P value
20-24 years	5	13.00	3.082	3.807	0.006*
25-29 years	31	10.77	3.432		
30-34 years	75	10.07	2.075		
35-39 years	42	9.07	2.908		
40-44 years	7	10.86	1.069		
Total	160	10.07	2.711		

Among Males, mean level of anxiety showed bimodal distribution with age of participants and was statistically significant (p= 0.006*). The Tukey honestly significant difference (HSD) post hoc analysis showed that the only age groups with statistically significant differences in anxiety means were 35–39 years old and 20–24 years old.

Table 3: Relationship of the HADS Depression score in terms of {Mean (SD)} among different age groups in Females using ANOVA test

Age group	N	Mean	Std. Deviation	F value	P value
20-24 years	13	11.62	1.981	9.076	<0.001**
25-29 years	71	9.61	1.960		
30-34 years	63	10.19	1.916		
35-39 years	13	7.92	1.605		
Total	160	9.86	2.060		

Among Females, mean level of depression showed a progressive decline with increasing age and was statistically significant (p= 0.001*). According to post hoc analysis using Tukey honestly significant difference (HSD), there is a statistically significant difference between the age group of 35–39 years old and the other three age groups (20–24 years

old, 25–29 years old, and 30–34 years old), as well as between the age group of 20–24 years old and 25–29 years old.

Table 4: Relationship of the HADS Depression score in terms of {Mean (SD)} among different age groups in males using ANOVA test

Age group	N	Mean	Std. Deviation	F value	P value
20-24 years	5	13.40	0.894	3.033	0.019*
25-29 years	31	10.35	2.984		
30-34 years	75	9.43	2.308		
35-39 years	42	9.67	3.018		
40-44 years	7	9.86	3.024		
Total	160	9.81	2.722		

Among Males, mean level of depression showed a progressive decline with increasing age and was statistically significant (p= 0.019*). According to post hoc analysis using Tukey honestly significant difference (HSD), there is a statistically significant difference in the means of depression between the age groups of 20–24 years, 30–34 years, and 35–39 years.

Table 5: Relationship of the HADS Anxiety score in terms of {Mean (SD)} among different duration of treatments in Females using ANOVA test

Duration of treatment	N	Mean	Std. Deviation	F value	P value
<1 year	54	12.28	2.445	18.977	<0.001**
1-4 years	89	9.72	2.316		
5-9 years	6	8.50	1.643		
≥10 years	11	13.00	1.949		
Total	160	10.76	2.686		

Among Females, mean level of anxiety was highest at initial one year of treatment and when 10 years had lapsed, this was statistically significant (p= 0.001*). According to post hoc analysis using Tukey honestly significant difference (HSD), there is a statistically significant difference in the means of anxiety with treatment duration between 1 year, 1-4 years, and 5-9 years. Additionally, there is a 10-year treatment period between 1-4 and 5-9 years.

Among Males, mean level of anxiety was highest at initial one year of treatment and when 10 years had lapsed, this was statistically significant (p= 0.027*). According to post hoc analysis using Tukey honestly significant difference (HSD), there is only a statistically significant difference between the means of anxiety with treatment duration of one year and that of one to four years.

Table 6: Relationship of the HADS Depression score in terms of {Mean (SD)} among different duration of treatments in Females using ANOVA test

Duration of treatment	N	Mean	Std. Deviation	F value	P value
<1 year	54	9.54	2.161	2.060	0.108
1-4 years	89	10.07	2.049		
5-9 years	6	8.50	1.761		
≥10 years	11	10.55	1.293		
Total	160	9.86	2.060		

Among Females, variance of mean level of depression with different duration of treatment was not statistically significant (p= 0.108).

Among Males, mean level of depression was highest at initial one year of treatment and when 10 years had lapsed, this was statistically significant (p= 0.001*). There is a statistically significant difference between the means of depression and treatment length of 1 year, 1-4 years, and 5-9 years, according to post hoc analysis using Tukey honestly significant difference (HSD). Additionally, between a 10-year treatment period and a 5-9-year period.

Among Females, mean level of anxiety was highest when both male and females were identified to have infertility and, this was statistically significant (p= 0.001*)

Among Males, mean level of anxiety was highest when male infertility was present either alone or along with female, and this was statistically significant (p= 0.001*).

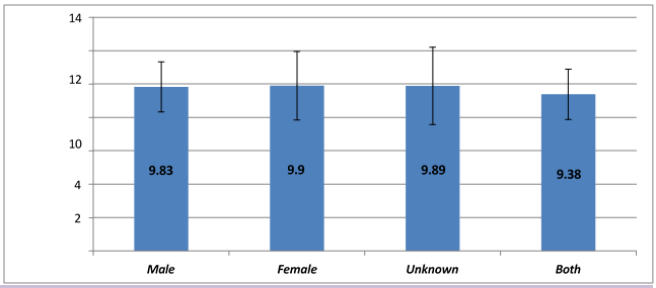

Figure 3: Comparison of the HADS Depression score in terms of {Mean (SD)} among different causes of infertility in Females using ANOVA test

Among Females, mean level of depression when compared with and gender based attribution of infertility, showed no statistically significant difference (p= 0.923*).

Among Males, mean level of depression was lowest when

cause of infertility was related to female, this was statistically significant (p= 0.005*).

Table 7: Relationship of the HADS Anxiety & Depression score in terms of {Mean (SD)} of both males & females among those who have taken the treatment earlier and those who haven't using unpaired t test.

	Treatment earlier	N	Mean	Std. Deviation	t value	P value
HADS Anxiety females	Yes	78	10.85	2.745	0.383	0.702
	No	82	10.68	2.643		
HADS Anxiety males	Yes	78	9.62	2.764	2.085	0.039*
	No	82	10.50	2.602		
HADS Depression females	Yes	78	9.76	1.955	0.634	0.527
	No	82	9.96	2.163		
HADS Depression males	Yes	78	9.22	2.577	2.749	0.007*
	No	82	10.38	2.752		

Among Males, there was statistically significantly higher level of anxiety (p=0.039*) and depression (p=0.007*) when the couple had not received treatment earlier. Females showed no such correlation.

Discussion

In our study mean anxiety score of female patients was 10.76 with SD of 2.686 and that of male patients was 10.07 with SD of 2.711. The unpaired t test was used to compare the mean anxiety scores of male and female patients, and the results showed a statistically significant difference (p=0.022). Suggesting that females experienced more severe anxiety than men. Similar results were seen by Yousri El Kissi et al, Wischmann et al.[10,11]

According to meta-analyses of Indian epidemiological research on mental illnesses, the prevalence of anxiety is from 16.5 to 20.7%12, while that of depression is between 7.9 and 15.1%.184. 51.9% of Females and 40.6 % Males had HADS scores suggestive of syndromic level of anxiety (score> 11). 43.1% of Females and 38.8% % Males had HADS scores suggestive of syndromic level of depression (score > 11). This amply reveals that infertile couples are significantly more distressed than the normal population, however age-sex matched comparison with general population was not conducted as it was beyond the scope of this study.

The majority of Females had HADS scores suggestive of anxiety 51.9%, however 37.5 % had doubtful scores for anxiety and 10.6% had no syndromic level anxiety. For Male, the majority of participants had scores in range of doubtful anxiety 46.2 %, with 40.6 % had scores suggestive of anxiety and 13.1% had no syndromic level anxiety. More females than men had scores in range suggestive of anxiety, however difference was not statistically significant (p= 0.130). Similar to our study Yousri El Kissi et al10, found more women were in the ranges of doubtful cases and cases, 32% and 38% respectively. However contrary to our finding he had significantly more number of males having scores of anxiety in range of non-cases or doubtful cases 72% and 16% respectively. This may be attributed to variation in sociodemographic factor, cultural issues and vulnerability to social pressure in both study population. Similar results were seen by Wischmann et al,[11] however case meeting syndromic level were lesser than that our study. The majority of Females had scores suggestive presence of anxiety, however for Male, the majority of participants had scores in range of doubtful anxiety. The difference in severity of anxiety of male and female participants when evaluated categorically was not statistically significant (p= 0.130).

The mean depression score of female patients was 9.86 with an SD of 2.060, whereas the mean depression score of male patients was 9.81 with an SD of 2.722, according to an unpaired t test comparison of the HADS depression scores for males and females. The female patient's mean depression score was not statistically significant (p=0.853) and was just marginally higher than the male patients. However when we compared HADS depression score in a categorical manner, using Chi square test we found that about similar number of females had HADS scores suggestive of doubt full presence of depression (44.4%) and syndromic depression (43.1%), and in rest depression was not present (12.5%). Similarly, for Male, 37.5% participants had scores suggestive of doubtful presence of syndromic depression while 38.8% had scores suggestive of syndromic depression and 23.8% had no syndromic level depression. Females had higher incidence of depression than male participants and it was statistically significant (p= 0.032). Similar results were seen by Yousri El Kissi et al,[10] Wischmann et al,[11] who also found infertile females to be having higher incidence of depressive symptoms as compared to males.

Among females mean level of anxiety showed progressive decline with age however it was not statically significant (p=0.412). Among males, mean level of anxiety showed bimodal distribution with age of participants and was statistically significant (p= 0.006*). Males had progressive decline in anxiety till 35-39 years and rise in age group of 40-44 years. Tukey HSD post hoc analysis showed a statistically significant difference between the age groups of 20–24 and 35–39 years, suggesting higher anxiety in younger age group of males.

Among females, mean level of depression showed a progressive decline with increasing age and was statistically significant (p= 0.001*). According to post hoc analysis using Tukey HSD, there is a statistically significant difference in the means of depression between the 35–39 age group and the other three age groups (20–24, 25–29, and 30–34) as well as between the 20–24 and 25–29 age groups. As among females, males' mean level of depression also showed a progressive decline with increasing age and was statistically significant (p= 0.019*). According to post hoc analysis using Tukey HSD, there is a statistically significant difference in the means of depression between the age groups of 20–24 years, 30–34 years, and 35–39 years, indicating that

younger age groups had higher levels of depression. Contrary to our study, study by Mariko Ogawa et al (2011) on infertile females and that of Aaron Bernie et al 2014 on males having Non-Obstructive Azoospermia, found increase in level of anxiety and depression with age in infertile patients. However similar to our study Beutel M et al 1998 and F. Chiaffarino et al 2011 noted that younger age patients were more likely to have depressive and anxious symptoms.[12-14]

Results similar to our study of having higher anxiety and depression in initial phase of treatment was also seen by Domar AD et al,[15] who found anxiety and depression being highest in 2-3 years duration of infertility and progressively reducing after 06 years of treatment. Our results should also be seen in light of study by Terzioglu F,[16] who were able to discover higher level of anxiety during intial phases of each ART cycle which decreased after ovum pick up. So this phasic anxiety can be understood to be higher in initial phases of treatment and to which patient progressively become accustomed. However with persistent unsuccessful results patients may develop higher psychological distress.

Among males, there was statistically significantly higher level of anxiety (p=0.039*) and depression (p=0.007*) when the couple had not received treatment earlier. Females showed no such correlation. Mariko Ogawa et al,[13] in there study had noted that infertile women are more likely to experience depression after receiving therapy, which is contrary to our finding, which may be due the fact that only three fourth of participants in study by Mariko Ogawa were treatment naïve as compared to our study where they were similar in number. Despite our best of efforts we could not find any other study comparing males anxiety or depression with prior treatment.

Mean level of anxiety and depression in both males and females showed an inverse correlation with hardiness and same was highly significant (p=0.001*). It is on expected lines as numerus studies have shown that higher resilience would lead to lessening of perceived psychological distress (Peterson, B. D et al 2006).[17]

Conclusion

This study draws attention to clinically significant levels of psychological distress (anxiety and depression) among infertile couples while undergoing infertility treatment via ART, which is an important factor for discontinuation of treatment or its failure rate. Hence this study highlights the need to integrate psychological support into treatment plan of during ART to deal with evident psychological emotional turmoil. Application of screening tool to assess for anxiety and depression during initial ART treatment evaluation itself would be helpful.

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Conflicts of interest

There are no conflicts of interest.

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