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Identifying Depression and Anxiety in Infertile Females

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Abstract

Background: *Infertility is a major life crisis which can lead to the development of psychiatric symptoms and negative effects on the quality of life of affected females, but the magnitude of the effects may vary depending on cultural expectations.*

Aim: *To assess the sociodemographic variables and measures of depression and anxiety as predictors of psychiatric morbidity in infertile women compared to controls.*

Materials & Methods: *The present cross-sectional study was conducted in Dept. of Psychiatry, Mahatma Gandhi Medical College and Hospital, Jaipur. The sample comprised of 30 infertile females (Group I) attending OPD of Dept. of Reproductive Medicine, MGH and fulfilling the specific inclusion and exclusion criteria were included in the study. 30 healthy females with similar socio-demographic profile (preferably the relatives of the infertile women) were recruited as control group (Group II). Prior to the participation in the study, a full informed written consent was taken from the participants. All study participants were evaluated with a socio-demographic performa, Hamilton Rating Scale for Depression (HAM-D) and Hamilton Anxiety Rating Scale (HAM-A).*

Results: *In our study, there were no significant differences observed when the socio-demographic parameters of both the groups were compared in terms of age, domicile, duration of marriage, education level, religion and type of family. Statistically high significant differences were observed on the mean scores of HAM-D and HAM-A between the two groups, suggesting higher depression and anxiety levels in infertile females. Also, the percentage of psychiatric morbidity in terms of severity as assessed by the cut-off scores of HAM-D and HAM-A was observed to be significantly higher in the infertile women as compared to controls.*

Conclusion: *The study concludes that infertile females, due to any given cause or whether or not undergoing treatment tend to have significantly higher prevalence of depressive and anxiety disorders than fertile women. And this aspect has been under-evaluated and under-reported which has now become a major life-crisis and needs to be assessed in future studies as well. Psychological support and early psychiatric treatment in case of severe mental issues could lead to an improvement in the health and the quality of life of infertile couples and could potentially improve infertility treatment outcomes.*

Keywords: *Infertility, Depression, Anxiety, Psychiatric morbidity*

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I. Introduction

Infertility, defined by the World Health Organization (WHO) as ‘‘a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.[1] WHO estimates that 60 to 80 million couples worldwide currently suffer from infertility.[2] Infertility varies across regions of the world and is estimated to affect 8 to 12 per cent of couples worldwide.[3,4] The WHO estimates the overall prevalence of primary infertility in India to be between 3.9 and 16.8 per cent.[2] The prevalence of primary infertility in India varies across states and also has been shown to vary across tribes and castes within the same region in India. However, it should be noted that many of these estimates use different definitions of infertility and consider different time periods, which makes direct comparisons difficult between any studies.[5]

Total infertility is classified into primary and secondary infertility. Definitions of primary infertility vary between studies, but the operational definition, put forth by the WHO, defines primary infertility as the:

"Inability to conceive within two years of exposure to pregnancy (*i.e.*- sexually active, non-contracepting, and non-lactating) among women 15- to 49-year-old." Secondary infertility refers to the "Inability to conceive following a previous pregnancy." Globally, most infertile couples suffer from primary infertility.[1]

The causes for infertility can involve one or both partners. In about one-third of cases, the cause of infertility involves only the male, in another one-third of cases only female and in the remaining cases both the male and female or no cause can be identified. There are various causes of infertility, few of the causes that contribute to infertility are endocrinological, anatomical, genetic and immunological reasons.[6] Some of the causes of infertility other than the physiological conditions include lifestyle factors, infection, environmental and occupational hazards and advancing maternal age.[7] Excessive exercise, obesity, weight-loss, weight-gain, eating disorders, malnutrition, and caffeine, alcohol or nicotine consumption are included in the lifestyle factors that play a crucial role in causing infertility.

Infertility often results in substantial negative social and psychological effects for the affected couple, particularly the woman. There are many studies about the aetiology and treatment of infertility but relatively few about the psychological and social effects of infertility. The inability to conceive children is experienced as highly stressful by infertile women. It is recognised as a stressor with a potential to cause destruction at personal, emotional, interpersonal, occupational and social levels.[8] Infertility is often experienced as a bio-psychosocial crisis accompanied by adverse cognitive-performance and affective outcomes, such as overgeneralisation of the loss of control over reproduction to other aspects of life, hopelessness, feelings of unfulfillment, inability to plan for the future and compromised ability to find alternate goals and meaning in life, social withdrawal, anxiety and depression. Although quantitative psychological assessments of infertile women have shown equivocal results with respect to depression and anxiety, the qualitative descriptive literature on female infertility demonstrates that infertile women are more likely to experience higher levels of psychological distress than fertile comparators.

Infertility and severity of Depression have a bidirectional relationship, i.e, infertility is known to cause affective symptoms and on the other hand Depression leads to infertility. Prevalence of Depression is usually higher between the second and third years of infertility because of the inability to conceive.[9] This important relationship between infertility and depression is highlighted by some studies which suggest that high depression levels in women may result in lower percentages of pregnancy and lower commitment to future in-vitro fertilisation cycles. The proposed mechanisms through which depression could directly affect infertility involve the physiology of the depressed state such as elevated prolactin level, disruption of the hypothalamic-pituitary- adrenal axis and thyroid dysfunction.[10] It is assumed that stress has a direct effect on cortisol level production, by increasing the release hormones from pituitary and therefore, a negative effect on fertility.

Researchers have studied different dimensions of infertility impacts on couples. They concluded that infertility can be considered as life crisis, chronic illness and the combination of these. Due to the complicated treatments and high levels of stress, infertility has become a feature of chronic physical illness. Other studies have confirmed the reduced quality of life after infertility.[11,12,13]

Moreover, although this psychological distress has not been shown to affect the success of fertility treatment[14], previous reports do suggest higher levels of emotional distress in infertile women that underwent unsuccessful fertility treatment.[15,16] Therefore, female infertility and an unsuccessful fertility treatment process likely have a negative impact on quality of life (QoL), defined by the World Health Organization (WHO) as "an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns."

However, there is not enough evidence in the existing literature, to conclude that women experiencing infertility are more psychologically distressed than controls. Several studies have although suggested that individuals with infertility experience poor self-esteem, grief, depression, anxiety, marital distress, sexual distress and poor quality of life, but these reports haven't been uniformly replicated. Prevalence of psychiatric disorders in infertile women have also not been clearly determined. Though it is possible that cultural differences can significantly alter the response of infertile women to their infertility; Psychological status, psychiatric morbidity and quality of life of infertile women have been poorly researched in non-Western cultures.

AIM

In this study, our aim was to assess the sociodemographic variables and measures of depression and anxiety as predictors of psychiatric morbidity in infertile women compared to controls.

II. Materials & Methods

Study design:

It was a cross-sectional study, conducted in the Department of Psychiatry; along with the Department of Reproductive Medicine in Mahatma Gandhi Medical College and Hospital, Jaipur from June 2019 to August

2019. The study was conducted after due approval from the Ethical Committee. All the research participants provided with written informed consent for the collection of data and subsequent analysis.

Sample characteristics:

Using a common and consensually agreed protocol, random sampling was used to structure the sample such that given number of infertile and fertile candidates were recruited spanning the adult age range of 18-55 years of age and were divided in two heads: Cases and Controls.

Total 70 participants were there in the study which were further divided in two separate heads: Group I (Cases) and Group II (Controls). Group I included 40 females coming to the OPD of Reproductive medicine, out of which 8 refused to participate in the study and 2 did not complete testing. Rest of the 30 infertile females fulfilling the inclusion and exclusion criteria were taken up for the study.

Group II included 30 fertile controls from outpatient facilities (preferably the relatives of the infertile women*)* meeting the below-mentioned inclusion and exclusion criteria.

The inclusion criteria for Group I were as follows: Married women, of fertile age, seeking infertility treatment, who met the diagnostic criteria for primary infertility (defined as having never gestated and no contraception after marriage), a normal sex life, and cohabitation with a male marriage partner for at least 2 years. The inclusion criteria for Group II (fertile controls) were as follows: healthy women with a positive birthing history, bearing at least 1 child. The exclusion criteria for all participants were as follows: Participants with evidence of any co-morbid medical or Psychiatric illness, participants who did not consent, were not cooperative, had difficulty understanding the content of the questionnaire, or candidates possessing another disease adversely affecting their QoL.

Measurement tools:

1. A semi-structured performa designed to include socio-demographic details of the patients and controls.
2. HAM-D: It is an interview-based measure of depression, intended to be used as an index of severity of depression. It consists of 21 items, 17 of which are scored, though a modified 24 item scale is also available. Of the 17 items scored, 9 are rated on a 5-point scale & 8 on 3-point scale. The scoring of the scale is as follows: Normal, Mild, Moderate, Severe and Very severe Depression. The scale has been shown to have moderate internal consistency, high validity and inter-rater reliability.[17]
3. HAM-A: It is the most widely used scale for measuring anxiety. It is a clinician rated scale consisting of 14 items rated according to the severity (from 0 to 4). The scoring of the scale is as follows: Mild, Mild-Moderate and Moderate-Severe Anxiety. HAM-A has been thoroughly evaluated and has been found to have adequate reliability and validity.[18]

Statistical analysis:

Closely following the WHO definition of primary infertility, women were defined as having primary infertility if they were married (or with their main partner) for longer than two years, sexually active, not using modern contraception, and without children. The prevalence of primary infertility and corresponding 95 per cent confidence intervals (CIs) were estimated. Secondary infertility was not measured.

Female characteristics were selected to test their association with both the groups. Demographic variables including age (in years), Domicile (Urban or Rural), Family type (Nuclear, extended or Joint), Religion (Hindu or Muslim), Education status (Illiterate, Primary, Middle, Secondary, Senior Secondary, Graduate, Post-Graduate) and Occupation were examined as categorical variables.

Patients and controls were then rated by the interviewer on HAM-D and HAM-A.

The data was then analysed using the Statistical Package for Social Sciences (SPSS, 1998, Chicago, IL). Chi-square test was done for categorical variables and student 't' test was done for continuous variables to look for differences between the patients and controls. A p value < 0.05 was considered statistically significant.

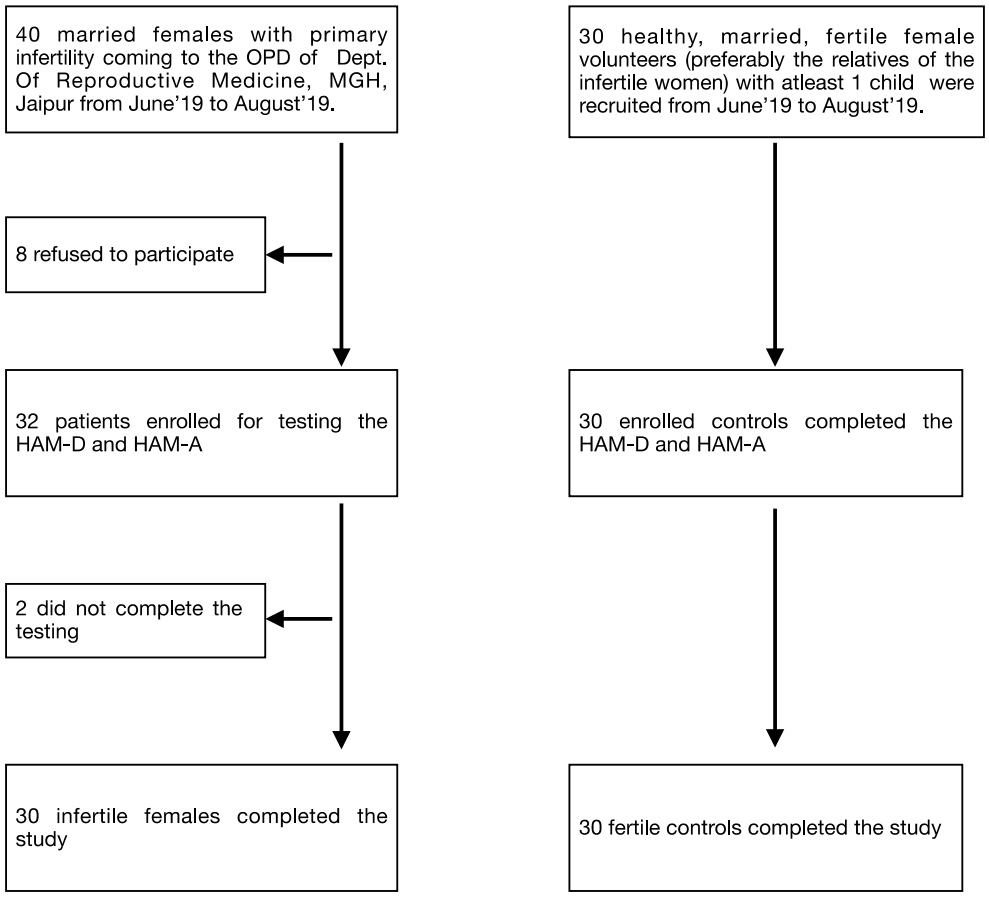

Figure 1. Flowchart of the study

III. Results

In total, 30 infertile females and 30 controls belonging to GROUP I and GROUP II respectively completed the study and were included in the analysis. The demographic details of patients and controls are shown in Table 1,2 & 3. The age in both the groups ranged from 20 years to 55 years of age as described in Table 1.

Table 1: Age wise distribution in the two groups

AGE GROUP	GROUP 1	GROUP II
20-30	15	18
31-45	11	9
46-55	4	3
Total	30	30

As per Table 2, the mean [S.D.] age of the individuals in the infertile group was 28 [4.73] years and that in the fertile control group was 28.8 [5.38] years (t=0.70, p=0.486). There was no significant difference observed in the duration of marriage between groups: the infertile group had been married for an average of 5.6 years while the healthy control group had been married for an average of 7.1 years (t=1.79, p=0.079).

Table 2: Mean Age & Duration of Marriage comparison in the two groups

	GROUP I	GROUP II	
Mean Age (in years) [S.D]	28 [4.73]	28.8 [5.38]	t=0.70 p=0.486
Duration of marriage (in months) [S.D]	67.2 [41.44]	85.2 [44.87]	t=1.79 p=0.079

Table 3 compares the demographic characteristics of the two groups. There were no significant differences in the context of Domicile, Family Type, Religion and level of education between the infertile and fertile women. However, there was a statistically high significant difference observed w.r.t occupation as majority of the infertile females (83.3%) were housewives and only 53% of the healthy controls were housewives while others were either self-employed, labourers or were engaged in other jobs.

Table 3: SOCIO-DEMOGRAPHIC PROFILE OF BOTH THE GROUPS

	GROUP I	GROUP II	X^2	P value
DOMICILE				
Urban	24 (80%)	23(76.7%)	0.052	0.819
Rural	6 (20%)	7 (23.3%)		
FAMILY TYPE				
Nuclear	16 (53.34%)	15 (50%)	0.066	0.967
Nuclear Extended	13 (43.33%)	14 (47%)		
Joint	1 (3.3%)	1 (3%)		
RELIGION				
Hindu	26 (86.7%)	25 (83.3%)	0.274	0.601
Muslim	4 (13.3%)	5 (16.7%)		
EDUCATION LEVEL				
Illiterate	2 (6.7%)	2 (6.7%)	7.613	0.268
Primary	1 (3.3%)	4 (13.3%)		
Middle	9 (30%)	8 (26.7%)		
Secondary	3 (10%)	3 (10%)		
Senior Secondary	4 (13.3%)	1 (3.3%)		
Graduate	8 (26.7%)	9 (30%)		
Post-Graduate	3 (10%)	3 (10%)		
OCCUPATION				
Self-employed	3 (10%)	8 (26.7%)	19.714	**0.0001***
Housewife	25 (83.3%)	16 (53.3%)		
Labourer	0	4 (13.3%)		
Other	2 (6.7%)	2 (6.7%)		

Table 4: Comparison of Mean scores on rating scales in both the groups

SCALE	GROUP I		GROUP II		X^2	P value
	Mean	S.D.	Mean	S.D.		
HAM-D	9.32	5.96	3.10	2.58	6.45	**<0.001***
HAM-A	5.88	4.23	2.43	2.36	4.68	**<0.001***

Mean scores obtained in the HAM-D and HAM-A scales in both the groups were compared and the details of which are mentioned in Table 4. Statistically high significant differences between infertile females and healthy controls were observed in both the measures used. Infertile females scored higher compared to healthy controls in HAM-D and HAM-A suggesting higher depression and anxiety levels.

Using the cut-off scores recommended for these two instruments, depression and anxiety disorder were assessed and the results are shown in Table 5. The percentage of psychiatric morbidity was significantly high in the infertile women as compared to controls. On HAM-D, Mild - Moderate depression was present in around 37% of infertile and 3% of control women. Severe-Very Severe depression in 17% infertile and none of the controls. As far as Anxiety disorder is concerned, Mild-Moderate Anxiety on HAM-A rating scale was present in 33% of infertile women and only 10% healthy controls. Severe Anxiety as per HAM-A was present in only 7% of the infertile women and none of the healthy controls had severe anxiety and the difference between the two groups was not significant.

Table 5: Psychiatric Morbidity on Rating Scales

	GROUP I	GROUP II	X^2	P value
HAM-D				
Mild-Moderate Depression	11 (36.7%)	1 (3.3%)	9.316	**<0.01***
Severe-Very Severe Depression	5 (16.7%)	0	3.702	**<0.05***
HAM-A				
Mild-Moderate Anxiety	10 (33.3%)	3 (10%)	4.550	**<0.05***
Severe Anxiety	2 (6.7%)	0	0.575	<0.448

IV. Discussion

Researchers have studied different dimensions of how infertility impacts on females. They concluded that infertility can be considered as life crisis, chronic illness and the combination of these. Due to the complicated treatments and high levels of stress, infertility has become a feature of chronic physical illness.[11]

This present study estimated and compared the socio-demographic details, psychiatric morbidity (Depression & Anxiety) in fertile and infertile women. However, there were no significant differences observed when the socio-demographic variables were compared between the two groups. But statistically significant results were observed on comparing the depressive and anxiety symptoms on their respective assessment scales.

Both the depressive and anxiety symptoms on HAM-D and HAM-A scales respectively were more severe in infertile women than in healthy fertile controls and the results were even statistically significant as per our study. When we utilised the cut-off scores recommended for the standardised instruments to diagnose psychiatric morbidity, there was a significant increase in the psychiatric morbidity observed in the infertile women. This suggests that even though many infertile women do not meet the criteria for a psychiatric diagnosis, Clinically, when structured interview and operationalised diagnostic criteria are used to assess co-morbidity, a considerable proportion of them actually suffer from significant psychological distress. Our results are in keeping with the high levels of psychological distress in infertile women reported in the literature by several researches who also have concluded that infertile women are more at risk of mental and emotional disorders, depression, anxiety, low self-esteem and marital dissatisfaction.[19] Many international studies also report a significantly higher severity of depressive and anxiety symptoms and a significantly higher prevalence of depressive and anxiety disorders among infertile women than among fertile women.[20,21,22,23]

One study of 112 women being treated for infertility in Taiwan reported that 23% met diagnostic criteria for an anxiety disorder, 17% for major depressive disorder, and 10% for dysthymic disorder; thus over 40% had one of these common mental disorders, a much higher prevalence than the 10% to 12% reported in the general population.[20] Internationally representative studies of community-dwelling women in the United States, and in Finland reported that infertility was associated with high rates of anxiety symptoms.[21,24]

This study has several implications for management. As a significant proportion of infertile women report emotional symptoms, hence, they need to be regularly assessed and those at a risk for developing a psychiatric disorder should be identified. This could be done by administering standardised questionnaires, psychotherapies, pharmacotherapies, support groups, etc.

As this study is one of the few conducted studies for assessing prevalence of psychiatric morbidities (Depression & Anxiety), the findings need to be replicated in future studies. And other psychiatric morbidities like psychosis, OCD, etc. also need to be more evaluated in infertile females. Longitudinal studies are necessary beginning at the initial consultation for infertility, to understand the course of the psychological distress and morbidity and treatment of infertility progress.

V. Limitations

1. The study was conducted in a tertiary hospital and is representative of the flow of patients at this hospital. So, the findings from this study cannot be generalized. The sample size of the present study was small, and the findings need to be explored further with a larger sample size.
2. All the findings of this study are based on assessment using rating scales; hence, it is possible that infertile women have somatic symptoms as a result of some physical problem itself or due to drugs which might result in inflated ratings of psychopathology. So, brief interview followed by rating on such assessment scales could be a useful assessing procedure in clinical set-up to assess psychiatric morbidity.
3. As our hospital is a referral centre, it is possible that our patients were more complicated cases of infertility, had been on a treatment for a longer duration and hence may show increased rate of psychiatric morbidity.
4. Patients were at various stages of treatment at the time of assessment and hence, this could be a confounding factor.
5. Several factors that may affect the psychosocial effects of infertility (e.g., duration of infertility, use of different fertility treatments, etc.) were not considered.

VI. Conclusion

Infertility remains a significant social problem and a challenge for healthcare systems worldwide. Due to the medicalisation of the problem of infertility, the priority of the specialised infertility centres is the treatment of the physical problems. The psychological problems are often neglected and not given their due importance. Ignoring the psychological factors and merely considering infertility as a medical problem therefore creates huge obstacles in understanding & treating such individuals from a holistic point of view. Hence, infertile

women should be routinely evaluated for psychological disturbances and psychiatric morbidity to maximise their health.

Further studies are needed to evaluate the relationship between mental state and fertility, yet it seems to be a problem that deserves particular attention. Psychological support and early psychiatric treatment in case of severe mental issues could lead to an improvement in the health and the quality of life of infertile couples and could potentially improve infertility treatment outcomes.

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Conflict of interest
The authors report no conflict of interest related to this manuscript.

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