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Dr. Indu Lata
MD, DNB, Additional Professor, Department of Maternal and Reproductive Health, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

Dr. Prabhaker Mishra
PhD, Associate Professor, Department of Biostatistics. Sanjay Gandhi Postgraduate Institute of Medical Sciences. Lucknow, Uttar Pradesh, India

Dr. Adarsh Tripathi
MD, Additional Professor, Department of Psychiatry, King George Medical University, Lucknow, Uttar Pradesh, India

Corresponding Author:
Dr. Indu Lata
MD, DNB, Additional Professor, Department of Maternal and Reproductive Health, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, Uttar Pradesh, India
Email:drindusandeep@gmail.com

Depression among infertile women attending outpatient department of a tertiary care hospital in Northern India: A cross-sectional study

Indu Lata, Prabhaker Mishra and Adarsh Tripathi

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Abstract
Background: Depression is the most common mental health problem in women with infertility worldwide. In India, depression may be more associated with infertility because of social stigma as children are considered to be highly valued to move the next generation.
Methods: The aim of the study was to determine the presence and severity of depression, related to infertility in women. With informed consent 101 infertile women, coming for workup and treatment were included in the study. Data regarding socio-demographic information including age, educational level, occupation, socioeconomic status, duration of married life, and type of primary or secondary infertility were collected. The responses of patients were collected after explaining the Beck Depression Inventories (BDI-II) questionnaires to access the severity of depression in the language of patients by the interpreter.
Results: Mean (standard deviation) and median age (years) of the women 29.44±4.52 yrs and 29 (range: 21-40) with most of the subjects 34.70% (35/101) were within 25-30 years of age group. Analysis of the patient responses regarding the severity of depression with BDII scoring found that 41.60% had minimal depression and 32.70% had moderate depression. The remaining 16.8% and 8.9% of the subjects were suffering from mild and severe depression respectively.
Conclusion: The study found that infertile women had a variable level of depression. The maximum patients had minimal to moderate depression. The depression was more in elder age, unemployed, low-income group women with married life for more than fifteen years.

Keywords: Infertility, Depression, psychological morbidity, BDII scoring, Survey

Introduction
Worldwide infertility is a big and important problem. The prevalence of infertility is high and increasing day by day. Infertility is the inability of a couple to meet conception after a year or more of regular unprotected intercourse [1]. It is considered a health problem of a country if prevalence goes above 15% [2]. The most common mental health problem in infertile women is depression. Depression is a major problem associated with infertility especially in the Northern part of India. It's a social stigma, that children are supposed to continue the name and existence of a family for decades [3, 4]. There are several factors including age, education, duration of married life, duration of infertility, social and husband's family pressure that affects the mental status of infertile couples. Infertility not only causes psychological pressure on the couple; but also develops physical and emotional instability [5, 6]. To get rid of these pressures the infertile couple tries to and go through the different type of activities and treatments and also faces financial burden [7].
In a developing country like India, women are generally considered the only cause, for infertility [8, 9]. Mental, psychological, and social pressure adversely affects the married and social life of the infertile couple. This may lead to arguments, abusing, blaming each other as a cause and domestic violence and ends into divorce [10]. Another stigma that a woman is complete after giving birth to a child and this will enhance her status within family and community. In society, the infertile women are segregated and neglected. The infertile women are often kept away from social and religious events and ceremonies considered as inauspicious. There are no well-defined measures to overcome all these problems [11].
To date, there are very scarce data available on psychiatric morbidity and its coping measures among infertile women in the Indian setting. There is intense need of study to bring forth the infertility related anxiety and depression.

The aim of this study was to find the presence and severity of depression among infertile women in relation to the duration of infertility and other socio-demographic characteristics.

Methods

After approval from Institute Ethical committee (IEC-2017-18-117-IP-105) and informed patient consent this cross-sectional study was conducted at Department of Maternal and Reproductive Health, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, Uttar Pradesh, India from July 2017 to July 2019.

The subjects were asked for any past and family history of depression. Those having a family history and any history of depression, major chronic physical or mental health problems, previous head injury and those on contraception were excluded. For this study primary Infertility was defined as the inability to achieve conception despite unprotected sexual intercourse of at least one year. The secondary infertility was defined as if the conception failed to occur after a previous pregnancy irrespective of the pregnancy outcome in the women despite unprotected sexual intercourse of at least one year. The primary and secondary infertility patients were included in the study.

The participants were the patients who were attending the outpatient department for seeking advice regarding infertility diagnosis and management. Those who qualified the inclusion criteria and gave the written informed consent (101), to participate in this study were enrolled. They were counseled and assured of confidentiality. All participants were explained about the study and about the Beck Depression Inventories (BDI-II) questionnaire in the local language by an interpreter and the best response as a suggested by the patients was collected in BDI-II proforma. Besides BDI scoring, socio-demographic information including age, duration of married life and infertility, educational level, occupation, socio-economic status, were also obtained.

The Beck Depression Inventories (BDI) was developed in 1961, adapted in 1969, and copyrighted in 1979. A second version of the inventory (BDI-II) was developed to reflect revisions in the Fourth Edition Text Revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), a handbook that mental health professionals use to diagnose mental disorders. The sum of all BDI item scores indicates the severity of depression [12]. It includes 21-item self-report multiple-choice inventory to measure the severity of depression. Twenty-one questions testing the presence of symptoms of hopelessness, irritability, lack of concentration and interest, guilt, fatigue, weight loss, and lack of interest in sex. Each item is rated on a 4-point scale ranging from 0 to 3. The maximum total score is 63.

The classification of depression scores involves:

1. 0–13 (Minimal depressive symptoms)
2. 14–19 (mild depression)
3. 20–28 (moderate depression)
4. 29–63 (severe depression).

Sample size estimation

The presence of depression (mild to severe) in infertile women was assumed to be 50%, at minimum two-sided 95% confidence interval and 20% relative error in the given prevalence, estimated sample size came out to be 97. Finally, in this study, we included 101 infertile women. The sample size was estimated using software Power analysis and sample size version -16 (PASS-16, NCSS, LLC, USA).

Statistical analysis

Normality of the continuous variable's was tested and considered normally distributed when Z-score was between ±3.29. Continuous variable´s presented in mean± standard deviation (SD) and median (range i.e. minimum-maximum) while categorical variables presented in frequency (%). One-way ANOVA test was used to compare means when data was normally distributed otherwise Kruskal-Wallis H test was used followed by multiple comparison when overall p value was <0.05. Fisher exact test was used to compare the proportions / test the association between depression levels and socioeconomic demographic and clinical variables when in any cell expected frequency count was less than five. P-value <0.05 was considered as statistically significant. Data were analyzed using software; Statistical package for social sciences, version-23 (SPSS-23, IBM, Chicago, USA).

Results

In the study, out of total 101 patients, the majority of the subjects were within 26-30 years age group (n=40, 37.6%) followed by 31-35 years (n=29, 28.70%) and <26 years (n=20, 21.8%). Most of them (n=86, 85.14%) were unemployed whereas 42(40.5%) and 30(29.70%) were postgraduate and graduated respectively. Maximum subjects were belonging to middle income group (n=56, 55.44%) followed by low income group (n=39, 38.61%). There were equal number of women with married life less than 5 years and in between 5-10 years (each n=44, 43.60%). Most of the women belonged to secondary infertility (62, 61.40%) than primary infertility (41, 40.6%). The maximum number of women belongs to infertile duration of less than 5 years (n=82, 81.20%) [Table 1].

In our study group, out of 101 subjects, maximum have minimal depression (41.6%) followed by moderate (32.7%) and mild (16.8%) while only 8.9% had severe depression [Figure 1]. There was no significant difference was observed in mean age (p=0.567), mean duration of marriage years (p=0.141) and distribution of infertile duration (p=0.938) among four depression levels (p>0.05) [Table 2]. Severe depression (n=9/101) was highest in ≥35 year's age group (25%) followed by 18-25 years (11.8%) while proportions of minimal, mild and moderate depression cases were almost equally distributed among four age groups. Moderate to severe depression was highest in age group of ≥35 years (56.2%) while lowest in the 30-35 age group (36.3%). There was no statistically association was observed between age groups and depression level (p=0.711).Similarly, moderate to severe depression was highest in unemployed females (44.2%), educational qualification of 12th standard (50%), low income group (53.7%), marriage life ≥15 years (100%), Females with primary infertility (46.3%) and in infertility duration at least 15 years (100%). There was no significant association was observed between employment statuses (p=0.100), educational qualification (p=0.315), Income group (p=0.070), duration of married life (p=0.221), type of infertility (p=0.230) and duration of infertility (p=0.178) individually with depression severity [Table 1].

Table 1: Relationship between Socio-economic, demographic and infertility clinical characteristics with extent of depression

Parameters	Total N= 101	%	Minimal depression (n=42, 41.6%)	Mild depression (n=17, 16.8%)	Moderate depression (n=33, 32.7%)	Severe depression (n=9, 8.9%)	P Value
Age (Years)							
18-25	17	16.80	7(41.2)	3(17.6)	5(29.4)	2(11.8)	0.711
25-30	35	34.70	15(42.9)	6(17.1)	12(34.3)	2(5.7)	
30-35	33	32.70	15(45.5)	6(18.2)	11(33.3)	1(3.0)	
≥35	16	15.80	5(31.2)	2(12.5)	5(31.2)	4(25.0)	
Occupation							
Unemployed	86	85.14	36(41.9)	12(13.9)	30(34.9)	8(9.3)	0.100
Employed	15	14.85	6(40)	6(40)	3(20)	0(0)	
Education							
Upto 10th	19	18.80	5(26.3)	5(26.3)	7(36.8)	2(10.6)	0.315
12th	10	9.90	3(30)	2(20)	5(50)	0(0)	
Graduate	30	29.70	10(33.3)	6(20.0)	11(36.7)	3(10.0)	
Postgraduate	42	41.60	24(57.2)	4(9.5)	10(23.8)	4(9.5)	
Income group							
Low	39	38.61	9(23.1)	9(23.1)	15(38.4)	6(15.3)	0.070
Middle	56	55.44	29(51.8)	9(16.2)	15(26.7)	3(5.3)	
High	6	5.94	3(50)	0(0)	3(50)	0(0)	
Married Life (Years)							
0-5	44	43.60	23(52.2)	4(9.1)	13(29.6)	4(9.1)	0.221
5-10	44	43.60	15(34.1)	10(22.7)	16(36.3)	3(6.8)	
10-15	12	11.9	4(33.3)	3(25.0)	4(33.3)	1(8.3)	
≥ 15	1	1.00	0(0)	0(0)	0(0)	1(100)	
Type of Infertility							
Primary	41	40.6	19(46.3)	3(7.3)	14(34.1)	5(12.2)	0.161
Secondary	60	59.4	23(38.3)	14(23.3)	19(31.7)	4(6.7)	
Infertility Duration (Years)							
1-5	82	81.20	34(41.5)	16(19.5)	25(30.5)	7(8.5)	0.178
5-10	15	14.90	7(46.7)	1(6.7)	7(46.7)	0(0)	
10-15	3	2.95	1(33.3)	0(0)	1(33.3)	1(33.3)	
≥ 15	1	0.95	0(0)	0(0)	0(0)	1(100)	

Fisher exact test used, *p<0.05* significant

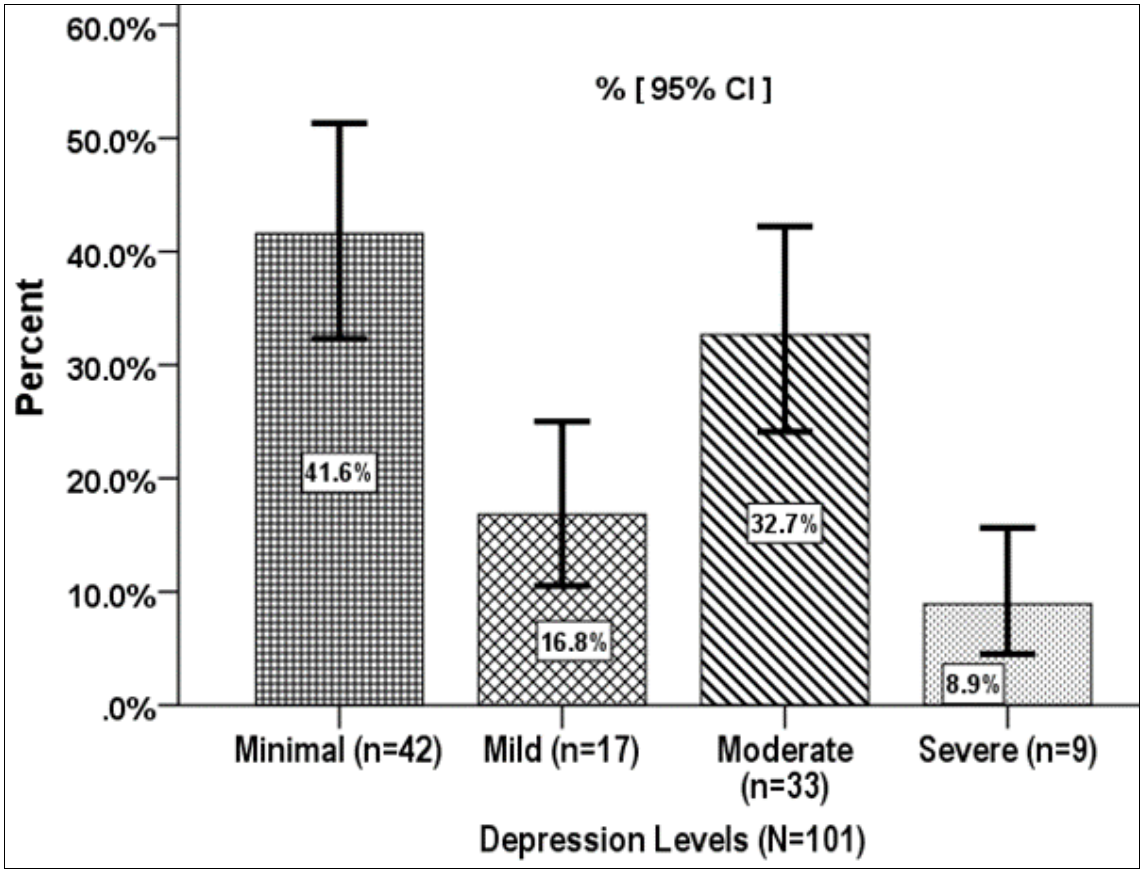

Fig 1: Distribution of levels of depression among the females

Table 2: Distribution of demographic variables among depression levels

Variable´s	Minimal depression (n=42)	Mild depression (n=17)	Moderate depression (n=33)	Severe depression (n=9)	Total (N=101)	P Value
#Age (Years)	29.21±4.57 [28, 21-40]	29.71±4.06 [30, 22-38]	29.12±4.47 [29, 22-39]	31.11±5.62 [31, 24-38]	29.44±4.52 [29, 21-40]	0.675
#Married life (Years)	5.13±2.75 [4, 2-14]	6.18±2.77 [6, 2-12]	5.97±2.75 [6, 2-13]	7.78±6.34 [6, 3-23]	5.82±3.25 [6, 2-23]	0.141
$Infertility duration (Years)	2.90±2.32 [2, 1-12]	2.47±1.36 [3, 1-6]	3.03±2.38 [2, 1-10]	5.22±6.87 [2.5, 1-22]	3.08±2.93 [2, 1-22]	0.938

#Data presented in mean± SD [median, range], One-way ANOVA test used to compare means
$ Data presented in mean± SD [median, range], Kruskal Wallis H test used to compare distributions.
P value computed after comparisons among four depression levels (minimal, mild, moderate and severe). *P< 0.05* significant

Discussion

The purpose of this study was to find the presence and severity of depression among infertile women in relation to the duration of infertility and other socio-demographic characteristics. Literature shows that the prevalence of depression among women suffering from infertility is high and should not be underestimated. In this study depression was more prevalent especially among infertile women aged 26 and above, those with primary infertility, also as those that are diagnosed as infertile for more than 5 years. One should search for the gynaecological causes of infertility, as well as psychological morbidity should be considered as a serious concern affecting these women. Moreover, there are several risk factors that may increase the likelihood of psychological stress; like the presence of two or more abortions, null parity, lack of support from spouse or relatives, etc. The finding of this study provides information about the severity of depression to the duration of infertility in women. The high percentage of depression in the present study could be attributable to the high societal and family demand among the North Indian region women to have their children. As children are seen as a form of social security in old age and as a means of perpetuating the family lineage. The prevalence of depression in the infertile women of Ghana was however found higher (62%) than in our study [13]. Another study reported, even more, higher levels (86.8%) of depression in infertile women [14]. The prevalence of psychiatric morbidity especially depression in infertile patients has been assessed in several countries. Based on BDI, one study found mild to moderate depression in 28.3%, moderate to severe in 7.2% and 1.2% having the most severe depression, that is less than our study [15]. The other study finds that 24.9% had depressive disorders in infertile women [16]. In a Chinese study showed that different levels of mental pressure were found in 83.8% of infertile women, out of which 25 % had moderate or severe depression [17]. There was depression and/or anxiety disorder among 33% of Hong Kong, in 32 % of Scotland infertile women [18]. In one study, women with lower stages of depression and anxiety can be seen during 1–5 years of infertility, but during 6-10 years after an infertility diagnosis, their signs and symptoms become more prominent, especially severe depression had the most common frequency in >15 years of infertility duration. Anxiety and/or depression increases with the duration of infertility, as found in our study [19]. In this study, depression had a negative correlation with education and income group. In other words, with the rise of education level as well as income, depression decrease, this is contradictory to our study, may be related to more child birth expectation and understanding of infertility with increasing education in our subset of patients [14]. Primary infertility is not very common as compare to secondary infertility in study population; the values from our study regarding type of infertility are less in comparison as compared to the data from other developing nations.

In this survey, the presence of minimal and moderate depression was high in infertile women. Depression was more in Infertile women having elder age, unemployed, low-income group and married life for more than fifteen years. It is recommended to screen infertile women for the presence of high-risk factors related to depression and the need for psychosocial assistance and interventions to decrease and prevent the development of severe depression.

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