www.ajbrui.org

Afr. J. Biomed. Res. Vol. 22 (May, 2019); 157- 165

Research Article

Anxiety and Depressive Disorders Among Infertile Women Attending Clinic in A Nigeria Teaching Hospital

***Sulyman D.[a], Ayanda K.A.[a], Aminu B.M.[b] and Dattijo L.M[b]**

Department of Psychiatry, Abubakar Tafawa Balewa University Teaching Hospital, Bauchi, Nigeria.
Department of Obstetrics and Gynaecology, Abubakar Tafawa Balewa University Teaching Hospital, Bauchi.

ABSTRACT

Children are highly valued, and childlessness is culturally not acceptable in any typical sub-Saharan African community. Involuntary infertility is associated with significant distress and psychological disturbances, and different psychiatric disorders have been reported among women undergoing fertility treatment. This study aimed to determine prevalence of anxiety and depressive disorders and factors that were predictive of these disorders among women with infertility problem that were attending clinic at a Northeastern Nigerian Teaching Hospital. The study was a cross-sectional, questionnaire-based survey of two hundred and seven adult women on treatment for infertility. Their sociodemographic variables were obtained by the use of pro formal questionnaire and clinical parameters were obtained from their case notes. Hospital anxiety and depression scale was used to determine the presence of anxiety and/or depression using cut-off point of 11. Eighty-five respondents had anxiety and/or depressive disorders which constituted 41.1% of the studied population. Fifty-seven respondents (27.5%) had anxiety disorders while fifty-three (25.6%) had depression and thirty-seven-people (17.9%) had co-morbidity for both disorders. The factors that were predictive of depression were: previous marriage, lack of support, stigmatizing behaviours, tuba-uterine factor as the cause of infertility and surgical method of treatment. Similarly, factors that were predictive of anxiety disorder were: stigmatizing behaviours and lack of supports. Others were long duration of infertility treatment and surgical treatment for infertility as against medical treatment. This study found high prevalence of depression and anxiety disorders among women on treatment for infertility and recommend that more attention be paid to their mental health.

Keywords: *infertility, anxiety disorder, depression, Nigeria*

*Author for correspondence: *E-mail*: *sulymanlanredaud@gmail.com*

Received: February 2018; Accepted: April, 2019

Abstracted by:
Bioline International, African Journals online (AJOL), Index Copernicus, African Index Medicus (WHO), Excerpta medica (EMBASE), CAB Abstracts, SCOPUS, Global Health Abstracts, Asian Science Index, Index Veterinarius

INTRODUCTION

Children are seen as fruits of marriage and highly valued in sub-Sahara African (Dyer, 2007). Great importance is placed on fertility and childlessness is culturally unacceptable (Ibisomi and Mudege, 2013). Therefore, presence of infertility causes worry and sorrow for the affected couples in different cultural settings more especially the women (Seyede *et al*, 2014).

Infertility is a common problem in sub-Sahara African in which Nigeria is not an exception (Larsen, 2000, Panti and Sununu, 2014). Infertility is regarded as not being able to conceive or carry pregnancy to viability despite having regular sexual intercourse without using contraceptive devices over a period of one year (WHO, 2010, Markar and Toth, 2002). Rates of infertility vary across the globe. Bolvin *et al* reported prevalence rates ranging from 3.5% to 16.7% in the developed world while Larsen reported range of 20% to 30% in Nigeria (Bolvin *et al*, 2007, Larsen, 2000). Dattijo *et al* reported prevalence rate of 23.9% in Bauchi state in their study among patients seen at the gynaecology and obstetrics department of Abubakar Tafawa Balewa University Teaching Hospital, Bauchi, Nigeria. (Dattijo *et al*, 2016)

Male and female factors have been found in cases of infertility to be almost of equal proportion, and both genders have been found to be responsible either singly or in combinations to problems of infertility (Inhorn, 2003). However, women usually bear the burden of infertility and its consequences in most African communities (Chimbatata and Malimba, 2016).

Woman is expected to be pregnant and starts to be having children shortly after marriage. In a situation in which this did not happen on time, there are usually complaints and blame from the family and in-laws directed to the wife. These

infertile women are usually isolated, stigmatized, abused, ostracized and often neglected not only by their families but also by the community in some cases (Hammarber, 2013, Orji *et al*, 2002). Other social problems that may result from barrenness may include partner abuse and they may even be disinherited (Pasi *et al*, 2011).

Therefore, it does not come as a surprise that there is high prevalence of psychiatric morbidity among women with infertility. Different prevalent rates have been found in various studies depending on the locality. Klemetti *et al* (2010) found increased prevalence of dysthymia and anxiety disorders among infertile women than general population. A Polish study among couples who had infertility problems reported 35.4% of their subjects having depression and 19.5% had anxiety disorders (Drosdzol, 2009). Ukpong and Orji found that 42.9% of women with infertility that attended clinic in southern Nigeria to be having depression, and 37.5% had Anxiety disorder (Ukpong and Orji, 2006).

Various factors have been associated with the development of psychiatric morbidities among this population group. Age of the patients is a factor that has been associated with presence of psychiatric disorder. Patients who are above age of 30 years have significantly increased risk for development of psychiatric disorders. Female gender is also associated with comorbid psychiatric disorders (Drosdzol and Skrzypulec, 2009, Volgsten *et al*, 2008). In the study by Drosdzol and Skrzypulec (2009), low level of education and unemployment were also found to be significantly associated with mental health problem among infertile women. Noorbala *et al* found that non-working women with infertility problem have higher risk of developing psychiatric disorders than working-class women with the same problem (Noorbala *et al*, 2009).

Duration of marriage and invariably the duration of infertility are other factors that have been shown to be negatively correlated with the presence of poor mental health (Drosdzol and Skrzypulec, 2009). However, Upkong and Orji did not find any relationship between level education and employment status with the development of psychiatric disorders among women with infertility. The significant factors associated with the presence of mental illness in their own cohorts were advanced age of the subjects and primary infertility. They also noted that lack of husband' support was a significant factor (Ukpong and Orji, 2006).

Due to the high rate of infertility and increasing number of couples seeking treatment for infertility, it is important to assess the mental wellness or otherwise of this group of patients in this part of the world. This will allow a holistic approach in their management. This study therefore aimed to determine the prevalence of anxiety and depressive disorders among women attending fertility clinic at Abubakar Tafawa Balewa University Teaching Hospital Bauchi, Nigeria. It also examined sociodemographic and clinical variables that are predictive of presence of these disorders.

MATERIALS AND METHODS

Study setting: the study was carried out at Abubakar Tafawa Balewa University Teaching Hospital, Bauchi.

Study population: the adult women attending the infertility clinic of the hospital constituted the study population. The study was carried out at the infertility clinics twice weekly over a period of six months (July to December, 2017). A total number of two hundreds and seven (207) respondents that gave their written informed consent were recruited into the study.

Exclusion Criteria

1. Patients with prior history of psychiatric illness before infertility.
2. Patients that refused to give informed consent.
3. Patients who were below 18 year of age at the time of the study.

Instruments: the following instruments were used for the study

1. Pro forma questionnaire: this was developed by the researchers to obtain socio-demographic variables of the respondents.
2. Hospital Anxiety and Depression Scale (HADS): this was developed by Zigmond and Snaith (1983) and had been validated in Nigeria to be suitable for use in both clinic and community settings (Abiodun, 1994).
3. Medical data sheet: this was used to extract relevant data from the patients' case notes on medical history of the respondents, causes of infertility and types of treatment offered.

Procedure: All eligible respondents attending infertility clinic were included during the period of the study which lasted for six months. The respondents were given information on the purpose of the study and only those who gave their written informed consent were interviewed by research assistants. The research assistants administered the pro forma questionnaires to obtain the socio-demographic variables. Relevant clinical information such as type of infertility, probable causes, risk factors and types of treatment offer were extracted from case notes of the respondents.

Subsequently, Hospital Anxiety and Depression Scale was administered to the respondents and any respondent with cut-off score of 11 is considered to be positive for the psychopathology

Ethical consideration: Approval for the study was obtained from Ethics and Research Committee of Abubakar Tafawa Balewa University Teaching Hospital, Bauchi.

Data Analysis: Data was analyzed using Epi-info version 6.04d. Frequency table was generated and means were calculated using t-test. The level of statistical significant was set at 5% confidence limit for two tailed test.

RESULTS

Social demographic and clinical variables of the respondents: A total of two hundred and seven responded accepted to participate in the study. Their age ranged between 19 and 43 years with the mean age of 29.6 years (SD ± 4). The predominant type of marriage was monogamy which constituted 59.9%. Only twenty-eight (13.6%) of the respondents have had at least one previous marriage before the current one.

Twenty-four (11.6%) of the study population had no formal education, and almost 40% of them were educated up to tertiary level. About one-third of the respondents were employed at the time of the study. One hundred and seven (80.7%) of these women reported adequate support from their husbands. Seventy-five (36.2%) of them reported stigmatizing behaviours from their husbands and/or relatives as a result of their infertility (Table 1).

Table1
Sociodemographic variables of the respondents (N= 207)

Variables	Frequency n (%)
Age	
<=30	91 (44.0)
>30	116 (56.0)
Types of marriage	
Monogamy	124 (59.9)
Polygamy	83 (40.1)
Other Wives have Children*	
No	13 (15.1)
Yes	70 (84.9)
Previous marriage	
No	178 (86.4)
Yes	28 (13.6)
Education	
Not educated	24 (11.6)
Primary	26 (12.6)
Secondary	78 (37.7)
Tertiary	79 (38.2)
Employment Status	
Employed	65 (31.4)
Unemployed	142 (68.6)
Adequate Support	
No	40 (19.3)
Yes	167 (80.7)
Stigmatizing Behaviours	
No	132 (63.8)
Yes	75 (36.2)

**- response rate for this item was 83*

The predominant type of infertility reported among the studied group was primary infertility. This was reported by about 60% of the respondents. Greater proportions (80%) of these women attending the clinic have duration of infertility of less than 10 years. The commonest cause of infertility in the study population was tubal/uterine factors (38.7%). Hormonal factors were responsible for infertility in about 13.5% of them. Male factors were implicated in about 14% of the cases and the remaining 33.8% were still being investigated or of unknown causes. Majority (61.8%) of the respondents in this study were been managed medically, about 12% were receiving surgical treatments while another 20% were on combination of medical and surgical treatment and barely around 5% of these patients were receiving no form of treatment at the time of the study. One hundred and fourteen (58.2%) of the respondents were on treatment for less than or equal to twelve months and only 17 (8.7%) had been on treatment for greater than 5 years (Table 2).

Table 2.
Clinical Characteristics of the respondents (N= 207)

Variables	Frequency n (%)
Types of infertility	
Primary	120 (60.4)
Secondary	82 (39.6)
Duration of infertility	
Less than 5	85 (41.1)
5 – 10	80 (38.7)
11 – 15	22 (10.6)
16 – 20	16 (7.7)
Greater than20	4 (1.9)
Causes of infertility	
Tubal and Uterine Factors	80 (38.7)
Hormonal/Ovarian Factors	28 (13.5)
Male Factors	29 (14.0)
Unknown	70 (33.8)
Types of treatment	
Medical	128 (61.8)
Surgical	68 (32.9)
None	11 (5.3)
Duration of Treatment (in month) *	
1 -12	114 (58.2)
13- 24	37 (18.8)
25- 60	28 (14.3)
Greater than 60	17 (8.7)

**- response rate for this item was 196*

Psychiatric disorders among the respondents: From the analysis of the HADS using 11 as the cut off point for presence of psychopathologies, eighty-five respondents had anxiety and/or depressive disorders. This is 41.1% of the studied population. Fifty-seven respondents (27.5%) had anxiety disorders while fifty-three (25.6%) had depression. It is important to note that thirty-seven-people (17.9%) had co-morbidity (both anxiety and depressive disorders).

Sociodemographic and clinical variables of respondents with depression and anxiety disorders: Slightly larger proportions of respondents with depressive disorders were older than those without depressive illnesses. However, this did not reach a statistically significant level. Those respondents who had depression were more likely to be in polygamous marriages than those without depression (52.8% as against 35.7%). This reached a statistically significant level. Other socio-demographic variables which were significant

statistically were those who had married more than once, those with lower level of education, those that reported lack of support and respondents who experienced stigmatizing behaviours (type of marriage, χ^2 =4.8; p-value=0.028: previous marriage, χ^2 =10.52; p-value=0.002:education, χ^2 =8.15; p-value=0.042: support, χ^2 =7.431; p-value=0.006: stigmatizing behaviours, χ^2 =6.673; p-value= 0.009) (Table 3).

Table3.
Sociodemographic Variables of the Respondents with Depressive Disorders Compared with Those without Depressive Disorders

Variables	NORMAL	ABNORMAL	χ^2	P-value
Age				
<=30	68 (44.2)	24 (45.3)		
>30	86 (55.8)	29 (54.7)	0.002	0.964
Types of marriage	99 (64.3)	25 (47.2)		
Monogamy	55 (35.7)	28 (52.8)	4.8	0.028
Polygamy				
Other Wives have Children*				
No	11 (20.0)	2 (7.1)	1.451	0.228
Yes	44 (80.0)	26 (92.9)		
Previous marriage				
No	141 (91.6)	39 (73.6)	10.525	0.0012
Yes	13 (8.4)	14 (26.4)		
Education				
Not educated	13 (8.4)	11 (20.8)		
Primary	23 (14.9)	3 (5.7)		
Secondary	60 (39.0)	18 (33.9)	8.15	0.0425
Tertiary	58 (37.7)	21 (39.6)		
Employment Status				
Employed	45 (29.2)	20 (37.7)	1.327	0.2493
Unemployed	109 (70.8)	33 (62.3)		
Adequate Support				
No	23 (14.9)	17 (32.1)	7.431	0.0064
Yes	131 (85.1)	36 (67.9)		
Stigmatizing Behaviours				
No	106 (68.8)	26 (49.1)	6.673	0.00978
Yes	48 (31.2)	27 (50.9)		

HADS (Depression), *- response rate for this item was 83

Thirty-seven (69.8%) of the respondents with depression have primary infertility as against 88 (57.1%) among respondents without depression. There was no significant association between duration of infertility and duration of treatment with development of depressive disorders. However, there was a statistically significant association between causes of infertility (tubo-uterine factor) and type of treatment offered (surgical treatment) with the depression (Causes of infertility, χ^2 =8.407, p-value= 0.038; type of treatment, χ^2 =10.79; p-value= 0.012) (Table 4).

Table 4.
Clinical Variables of the Respondents with Depressive Disorders Compared with Those without Depressive Disorders

Variables	NORMAL	ABNORMAL	χ^2	P-value
Types of infertility				
Primary	88 (57.1)	37 (69.8)	2.645	0.103
Secondary	66 (42.9)	16 (30.2)		
Duration of infertility				
Less than 5	65 (42.2)	20 (37.7)		
5 – 10	62 (40.3)	18 (33.9)		
11 – 15	12 (7.8)	10 (18.9)	4.339	0.362
16 – 20	13 (8.4)	3 (5.7)		
Greater than20	2 (1.3)	2 (3.8)		
Causes of infertility				
Tubal and Uterine Factors	51 (33.1)	29 (54.7)		
Hormonal/Ovarian Factors	23 (14.9)	5 (9.4)	8.407	0.038
Male Factors	25 (16.2)	4 (7.5)		
Unknown	55 (35.7)	15 (28.3)		
Types of treatment				
Medical	102 (66.2)	26 (49.1)	6.646	0.036
Surgical	43 (27.9)	25 (47.1)		
None	9 (5.8)	2 (3.8)		
Duration of Treatment*				
1 -12	86 (59.3)	28 (54.9)	0.986	0.804
13- 24	25 (17.2)	12 (23.5)		
25- 60	21 (14.5)	7 (13.7)		
Greater than 60	13 (9.0)	4 (7.8)		

*HADS (Depression), *- response rate for this item was 196*

These statistically significant variables were subjected to a second stage analysis (logistic regression) and the parameters that were predictive of depression were: previous marriage, lack of support, stigmatizing behaviours, surgical treatment and tubal factor as cause of infertility. Type of marriage and level of education lost their significance. (Type of marriage, OR= 2.0526; 95% CI=0.9865-4.2708; P-value= 0.0544: previous marriage (OR=4.503; 95% CI= 1.677-12.093; P-value=0.002: education, OR= 6681; 95% CI= 0.2106-2.119; P-value= 0.443) lack of support, OR=0.3454; 95% CI= 0.1456-0.8192; P-value=0.0158) stigmatizing behaviours, OR= 2.709; 95% CI= 1.301-5.631; P-value= 0.00), surgical method of treatment, OR= 0.2935, 95% CI= 0.902-0.9552; P-value= 0.0417), tubal factor as the cause of infertility (OR= 0.3465; 95% CI= 0.1576-0.7618; P-value= 0.0084) (Table 5)

Respondents with anxiety disorders were also slightly older than those without anxiety disorders. There were no predominant types of marriage between respondent with anxiety disorders and those without. Also there were no significant differences between the two groups in term of previous marriage, children from other wives and level of education attained.

Table 5
Logistic regression of significant variables for depressive disorder

Variables	Odd Ratio	95% C.I	P-value
Education	1.6681	0.2106-2.119	0.443
Type of marriage	2.0526	0.9865-4.2708	0.0544
previous marriage	4.503	1.677-12.093	0.002
lack of support	0.3454	0.1456-0.8192	0.0158
stigmatizing behaviours	2.709	1.301-5.631	0.000
surgical treatment	0.2935	0.902-0.9552	0.0417
tubal factor	0.3465	0.1576-0.7618	0.0084

Table 6.
Sociodemographic Variables of the Respondents with Anxiety Disorders Compared with Those without Anxiety Disorders

Variables	NORMAL	ABNORMAL	χ^2	P-value
Age				
<=30	68 (45.3)	23 (40.4)		
>30	82 (54.7)	34 (59.6)	0.416	0.519
Types of marriage				
Monogamy	96 (64.0)	28 (49.1)	3.806	0.0511
Polygamy	54 (36.0)	29 (50.9)		
Other Wives have Children*				
No	11 (20.4)	2 (6.9)	2.593	0.107
Yes	43 (79.6)	27 (93.1)		
Previous marriage				
No	134 (89.3)	45 (78.9)	3.809	0.0509
Yes	16 (10.7)	12 (21.1)		
Education				
Not educated	15 (10.0)	9 (15.8)		
Primary	19 (12.7)	7 (12.3)		
Secondary	60 (40.0)	18 (31.6)	2.075	0.0557
Tertiary	56 (37.3)	23 (40.3)		
Employment Status				
Employed	121 (80.7)	21 (36.8)	36.827	0.0000
Unemployed	29 (19.3)	36 (63.2)		
Adequate Support				
No	21 (14.0)	19 (33.3)	9.903	0.0016
Yes	129 (86.0)	38 (66.7)		
Stigmatizing Behaviours				
No	107 (71.3)	25 (43.9)	13.494	0.0000
Yes	43 (28.7)	32 (56.1)		

*HADS (Anxiety), *- response rate for this item was 83*

There were statistically significant differences between respondents with anxiety disorders and those without in term of employment status, support from spouses and stigmatizing behaviours from relatives. While less than 40% of respondents who were employed had anxiety disorder, greater than 60% of the respondents who were unemployed had with anxiety disorders. More than one-third of those with anxiety disorders reported lack of support from their spouses and roughly 56% of them also reported stigmatizing behaviours against them from the families and relatives as against only 28.7% of those respondents without anxiety disorders who reported same. (Employment status, χ^2 =36.82; p-value= 0.000: lack of support, χ^2 = 9.803; p-value= 0.001: stigmatizing behaviors, χ^2 =13.49; p-value= 0.000) (Table 6)

Table 7
Clinical Variables of the Respondents with Anxiety Disorders Compared with Those without Anxiety Disorders

Variables	NORMAL	ABNORMAL	χ^2	P-value
Types of infertility				
Primary	87 (58.0)	38 (66.7)		
Secondary	63 (42.0)	19 (33.3)	1.297	0.2547
Duration of infertility				
Less than 5	65 (43.3)	20 (35.1)		
5 – 10	57 (38.0)	23 (40.3)	8.455	0.0762
11 – 15	11 (7.3)	11 (19.3)		
16 – 20	13 (8.7)	3 (5.3)		
Greater than20	4 (2.7)	0 (0.0)		
Causes of infertility				
Tubal and Uterine Factors	54 (36.0)	26 (45.6)	2.312	0.5102
Hormonal/Ovarian Factors	20 (13.3)	8 (14.0)		
Male Factors	21 (14.0)	8 (14.0)		
Unknown	55 (36.7)	15 (26.3)		
Types of treatment				
Medical	98 (65.3)	30 (52.6)	6.854	0.032
Surgical	42 (28.0)	26 (45.6)		
None	10 (6.7)	1 (1.8)		
Duration of Treatment*				
1 -12	92 (65.2)	22 (40.0)		
13- 24	18 (12.8)	19 (34.6)	15.857	0.0012
25- 60	21(14.9)	7 (12.7)		
Greater than 60	10 (7.1)	7 (12.7)		

HADS (Anxiety), *- response rate for this item was 196

Greater significant of respondents who were being treated with both surgical and medical treatments concurrently (33.3%) reported more anxiety symptoms than those on medical treatment only or those not yet on any form of treatment. Also those respondents who had been on treatment for greater than twelve months were more represented among the group with anxiety disorders. (Type of treatment, χ^2 =9.555; p-value= 0.022: duration of treatment, χ^2=15.857; p-value= 0.001). Other clinical variables were not statistically significantly associated with presence of anxiety disorders (Table 7).

After these factors were subjected to a second stage analysis by way of logistic regression, stigmatizing behaviours, lack of supports, surgical form of treatment and duration of infertility were predictive of presence of anxiety disorders among the respondents. Stigmatizing behaviours (OR= 0.933; 95% CI= 1.518-5.668; P-value= 0.001); lack of support (OR=0.336; 95% CI= 0.1600-0.7061; P-value=0.004), employment status (OR= 0.5964; 95% CI= 0.2997-1.1869; P-value= 0.141); surgical form of treatment (OR=0.3754; 95% CI= 0.1721-0.8187; p-value= 0.0138) and duration of treatment (OR=0.4204; 95% CI= 0.1949-0.9071; P-value= 0.0272) (table 8).

Table 8
Logistic regression of significant variables for anxiety disorders

Variables	Odd Ration	95% C.I	p-value
employment status	0.5964	0.2997-1.1869	0.141
lack of support	0.336	0.1600-0.7061	0.004
Stigmatizing behaviours	0.933	1.518-5.668	0.001
surgical treatment	0.3754	0.1721-0.8187	0.0138
duration of treatment	0.4204	0.1949-0.9071	0.0272

DISCUSSION

This study was aimed to assess anxiety and depressive disorders among women attending infertility clinic of a tertiary health facility in the Northeastern Nigeria Around 60% of our sampled population had primary infertility, while others had secondary infertility with or without living children. Omoaregba *et al* reported that about 73% of their studied group had primary infertility in a study in Southern Nigeria (Omoaregba *et al*, 2011).

Tubal/uterine factors were still the commonest causes of infertility in our study (38.7%). This was followed by unknown causes (33.3%) then male factors contributing 14% to causes of infertility. Panti and Sununu had reported that female factors (mostly tubal/uterine factors) constituted around 42.9% and male factors, 19.7% as causes of infertility in a Northern Nigeria study (panti and Sununu, 2014). This was in contrast to the generally held knowledge that cases of male factors in infertility are around one-third, female factors also contributing one-third, and combination of male and female factors making up the last one-third (inhorn, 2003). However, it is important to note that causes of infertility were unknown in about 33% of our respondents. Knowing that male partners may not willingly surrender themselves for fertility investigation in this environment due to cultural beliefs that pay more attention to women in cases of infertility, significant proportions of these unknown causes might end up being cases resulting from male factors (Culley *et al*, 2013).

This study found a high prevalence rates for both anxiety and depressive disorders. More than 40% of the respondents have either or both clinical conditions. This is similar to some studies in Nigeria where prevalent rates of psychiatric disorders among infertile women were assessed. Ukpong and Orji found prevalence of 46.4% for psychiatric morbidity in their study (Ukpong and Orji, 2006). Oladeji and OlaOluwa reported prevalence of 52.7% for cases of depression among infertile women attending clinic in Ogbomoso, Southwestern Nigeria (Oladeji and OlaOluwa, 2017).

Percentage of respondents having depression in this study was 25% while 27% of them had anxiety disorders. Aghanwa *et al* found 29.7% of their studied population to be having depression, while Ukpong and Orji reported that 42.9% of their own studied population had depression and 37.5% had anxiety disorder. Co-morbidity for the two disorders was high among their studied group (Ukpong and Orji, 2006; Aghanwa *et al*, 1999).

A study by Volgesten *et al* among infertile couples undergoing IVF in Sweden reported lower rates of anxiety and depressive disorders among infertile women (10.9% for Depressive disorder and 14.8% for anxiety disorder) (Volgesten *et al*, 2008). The disparity might be due to differences in importance attached to having children in the two cultures. However, it is important to note that co-morbidity of the two conditions was high in their own study which is similar to the findings of this study.

A number of socio-demographic and clinical factors were significantly associated with the presence of depression in our study. These factors included women in polygamous relationship, women with previous marriages and those with low level of education. Lack of social support from spouses, families and in-laws was also found to be an important factor, so also was stigmatizing behaviours toward the women as the result of their inability to bear children. However, those factors that actually predicted the presence of depression (after logistic regression) were previous marriages, lack of adequate support, stigmatization, tubal/uterine as a factor responsible for the cause of infertility as well as those on surgical treatment.

Women who have had to divorce and remarry as a result of infertility and could not yet conceive in the new relationship might be more affected with worries and might be the reason why they are more represented among depressed individuals in this study. While discussing psychological issues related to infertility, Klock emphasized that loss of relationship (e.g. marriage) as a result of infertility, increases the risk of developing psychiatric disorders (Klock, 2011).

Lack of support also predicts development of depression among women undergoing infertility treatment. Treatment of infertility could be tasking and expensive. This is the period the woman would need all the necessary support be it moral, emotional, physical and financial. Anyone who lacks such support at that crucial period may be predisposed to psychological stress hence, development of depressive illness (Klock, 2011). Therefore, it is not surprising that several investigators have reported lack of this support as factor responsible for development of psychiatric morbidity among infertile women seeking treatments (Ukpong and Orji, 2006; Aghanwa *et al*, 1999). This study was not an exception.
Similarly, stigmatizing behaviours are common because of cultural belief that women are to be blamed for cases of infertilities. Infertility might be the reason for the husbands to marry other wives and there is increased risk of abuse

(Hammarberg *et al*, 2013). Where this is present, risk of woman developing depression increases.

Though tubal/-uterine factor was one of the commonest causes of infertility in this part of the world, it is also found to be associated with the presence of depression in our study. There are several factors that could result to tubal and/or uterine problems which might ultimately lead to infertility problems. Some of these are infections, pelvic inflammatory disease, previous instrumentation, septic abortion, previous pelvic surgery, uterine fibroid, etc. When the eatiology of infertility could be traced to past actions, habits and or faults of an individual, this might give rise to guilt feelings in the individual and might eventually lead to depression. One factor that determines better mental outcome of infertility treatment whether it is successful or not is when the individual knows that she is not responsible for the cause of infertility (Gameiro *et al*, 2014).

It was also observed that respondents who have had surgery as part of their treatment options tend to have depression more than those that were offered medical treatment only. This might be as the result of the fact that surgical treatment is culturally considered as been more dangerous and for more severe cases. Aghanwa *et al* also noted that respondents who had surgery and abortion were more represented among those with psychiatric morbidity (Aghanwa *et al*, 1999).

Our study did not find any relationship between ages of the respondents, and depressive disorders, though respondents with these disorders tend to be older. This was in conformity with findings from study conducted by Volgsten *et al* where age was not a factor known to be associated with the development of psychiatric morbidity among women with infertility problem (Volgsten *et al*, 2008). Though Ukpong *et al* reported in their study in southeastern Nigeria that age was significantly associated with presence of psychiatric disorders. Another study in the South southern Nigeria reported that age of the respondents is associated with increased psychological distress (Omoaregba *et al*, 2011). Likewise, Drosdzol *et al* reported that there is increased risk of psychiatric disorders in infertile women older than 30 years (Drosdzol *et al*, 2009).On the contrary, Gameiro *et al* reported that older age was actually a protective factor from developing mental health problems in individuals undergoing treatment for fertility (Gameiro *et al*, 2014).

Type of infertility was not found to be associated with presence of both anxiety and depressive disorders in this study. Omoaregba *et al* reported similar finding in their study on psychosocial characteristics of women with infertility in Benin, Southern Nigeria (Omoaregba *et al*, 2011). In contrast, Ukpong and Orji reported that primary infertility is associated with development of psychiatric disorders (Ukpong and Orji, 2006). Baldur-Felskov *et al* found presence of at least a living child to be protective against development of psychiatric disorders in women with fertility problems in a large Danish register-based cohort study (Baldur-Felskov *et al*, 2013). Conversely, Klemetti *et al* reported that women with secondary infertility may experience more panic disorders than those with primary infertility (Klemetti *et al*, 2010).

Though polygamy lost its significance when subjected to logistic regression analysis in this study, some studies found polygamy as factors that were predictive of presence of psychiatric morbidity among individuals with infertility. Aghanwa *et al* reported that polygamy was associated with presence of mental ill health among infertile women in Nigeria (Aghanwa *et al*, 1999). Likewise, Alosaimi *et al* also reported that polygamy was associated with the development of mental health problems among women with infertility, in their study among infertile couples in Saudi Arabia (Alosaimi *et al*, 2015).

Considering factors that were predictive of presence of anxiety disorders among women with infertility, three of the factors that were predictive of depression were also predictive of presence of anxiety disorder. These were lack of support from spouses and important people in respondents' lives, stigmatizing behaviours toward the respondents as the result of their inability to have children of their own, and respondents being offered surgical method of treatment. The other factor which was predictive of presence of anxiety disorder but not associated with the development of depression in this study was long duration of treatment without positive result.

Infertility treatment could be demanding financially, this could require pulling resources together especially in low socio-economic society like Nigeria. Not getting all the necessary support especially from ones' spouse could be emotionally traumatizing. So, it is not a surprise that lack of necessary support had been a recurrent index as a factor predictive of development of psychiatric disorders in different settings. Ukpong *et al* found lack of support as associated factor in the development of psychiatric disorders, like we did in this current study (Ukpong *et al*, 2006). Lack of financial support by the spouse was reported to be associated with higher prevalence of anxiety disorder in a cross-sectional study among infertile women in Hungary (Lakatos *et al*, 2017) Long duration of treatment was found to be predictive of anxiety disorder among our respondents in this study. Respondents who had been on the treatment of infertility for greater than twelve months and were yet to be pregnant tend to have more anxiety disorders than those who were on treatment for less than twelve months. This was similar to finding by Gameiro *et al* were unsuccessful treatment of infertility was predictive of presence of psychiatric morbidity (Gameiro *et al*, 2014). This might be as a result of disappointment in the initial hope that patients' infertility problem might easily be solved by orthodox medical treatment.

This study being a clinic-setting study might make it not to be generalizable to every woman with infertility in this region, as many women with fertility problems might present to and seek treatments and solutions to their problem from other sources aside from orthodox care. Many may seek treatment from prayer houses, herbalists and diviners. A community-based study might be more representative.

In conclusion, this study found high prevalence of anxiety and depressive disorders among women with infertility problems attending fertility clinic. Anxiety and depression have been described as primary emotional consequences of infertility (Klemetti *et al*, 2010). Factors predictive of these psychiatric disorders were also highlighted. It is important therefore, that increase attention be given to mental health of

women undergoing fertility treatment. Incorporating psychotherapeutic treatment into the care of infertile couples has been found to be beneficial (Burn, 2007; Cousineau and Domar, 2007). There is, therefore, increase need for more collaboration between health professionals taking care of patients undergoing fertility treatment and mental health professionals so as to promptly discover these mental health problems and manage them accordingly.

REFERENCES

Abiodun OA(1994). A validity study of the hospital anxiety and depression scale in general hospital unit and community sample in Nigeria. Br J Psychiatry, 165(5): 669-72

Adashi EY, Cohen J, Hamberger L, Jones HW, jr de Krester DM, Lunenfeld B, Rosenwaks Z, van Steiteghem A (2000). Public perception on fertility and its treatment: an international survey. Hum Reprd., 15: 330-334

Aghanwa HS, Dare FO, Ogunniyi SO (1999). Socio-demographic factors in mental disorders associated with infertility in Nigerian. J Psychosom Res., 46: 117-23

Alosaimi FD, attuwirqi MH, Bukhari M, Abotalib Z, Bin Saleh S (2015). Psychiatric disorders among infertile men and women attending three infertility clinics in Riyadh, Saudi Arabia. Ann Saudi Med, 35(5): 359-367.

Baldur-Felskov B,Kjaer SK, Albieri V, Steding-Jessen M, Kjaer T, Johansen C, Dalton SO, Jensen A (2013). Psychiatric disorders in women with fertility problems: results from a large Danish register-based cohort study. Hum Reprod., 28(3): 683-690

Bolvin J, Bunting L, Collins JA, Nygren KG (2007). International estimates of infertility prevalence and treatment-seeking; potential need and demand for infertility medical care. Hum Reprod., 22; 1506-1512

Burn LH (2007). Psychiatric aspects of infertility and infertility treatment. Psychiatric Clinic of North American, 30(4): 689-716

Chen TH, Chang SP, Tsai CF, Juang KD (2004). Prevalence of depression and anxiety disorders in an assisted reproductive technique clinic. Him reprod., 19(10): 2313-8

Clumbatata NBW and Malimba C (2016). infertility in sub-Saharan Africa: a woman's issue for how long? A qualitative review of literature. Open Journal of Social Science, 4: 96-104

Cousineau TM and Domar AD (2007). Psychological impact of infertility. Best Practice and Research, Clinical Obstetrics and Gynaecology, 21(2): 293-308

Culley L, Hudson N, Lohan M (2013). Where are all men? The marginalization of men in social scientific research on infertility. Reproductive Biomedicine Online ; 27: 225-235

Dattijo LM, Andreadis N, Aminu BM, Umar NI, Black KI (2006). The prevalence and clinical pattern of infertility in Bauchi, Northern Nigeria Trop J Obstet Gynaecol,33 (1):76-85

Drosdzol A and Skrzypulec V (2009). Depression and anxiety among Polish infertile couples- an evaluative prevalence study. J Psychosom Obstet Gynaecol, 30(1): 11-20

Dyer ST (2007). the value of children in African countries: insights from studies on infertility. J Psychosom Obstet Gynaecol, 28(2): 69-77

Fassino S, Piero A, Boggio S, Piccioni V, Garzaro L (2002). Anxiety, depression and anger suppression in infertile couples: a control study. Hum Rprod., 17: 2986-2994

Gameiro S, Vanden Belt-Dusebout AW, Bleiker E, Braat D, Van Leeuwen PE, Verhaak CM (2014). Do children make you happier? Sustained child-wish and mental health in women 11-17 years after fertility treatment. Hum Reprod, 29(10): 2238-46

Hammarberg M and Kirkman M (2013). infertility in resource-constrained settings: moving towards amelioration. Reproductive BioMedicine Online, 26 (2): 189-195

Ibisomi L and Mudege NN (2013). Childlessness in Nigeria: perceptions and acceptability. Culture Health and Sexuality, 16(1): DOI: 10:1080/13691058:2013.839828

Inhorn MC (2003). Global infertility and globalization of new reproductive technologies: illustration from Egypt. Soc Sci Med, 56: 1837-51

Klemetti R, Raitanen J, Sihvo S, Saarni S, Koponen P (2010). infertility, mental disorders and wellbeing: a nationwide survey. Acta Obstet Gynecol Scand, 89(5): 677-82

Klock S (2011). Psychological issues related to infertility. Libr Women's Med, (ISSN 1756-2228): DOI: 10:3843/GLOWM.10413

Lakatos E, Szigeti JF, Ujma PP, Sexty R, Balog P (2017). Anxiety and depression among infertile women: a cross-sectional survey from Hungary. BMC Women's Health, 17: 48

Larsen U (2000). Primary and secondary infertility in sub-Saharan African. Int J Epidemiol, 29: 85-91

Makar RS and Toth TL (2002). The evaluation of infertility. Am J Clin Pathol, 117: 95-103

Noorbala AA, Ramezanzadeh F, Abedinia N, Naghizadeh MM (2009). Psychiatric disorders among infertile women. Soc Psychiatry Psychiatr Epidemiol., 44(7): 587-91

Olajide SA and OlaOluwa AD (2017). Depression among infertile women in Ogbomosoland. South African Family Practice, 60(2): 41-45

Omoaregba JO, James BO, Lawani AO,Morakinyo O, Olotu OS (2011). Psychosocial characteristics of female infertility in a tertiary health institution in Nigeria. Ann Afri Med, 10(1): 19-24

Orji EO, Kuti O, Fasuba OB (2002). Impact of infertility on marital life in Nigeria. Int J Gynaecol Obstet, 79: 61-2

Panti AA and Sununu YT (2014). The profile of infertility in a teaching hospital in North West Nigeria. Sahel Med J, 17: 7-11

Pasi AL, Hanchate MS, Pasha MA (2011). Infertility and domestic violence: causes, consequence and management in Indian scenario. Biomed Res., 22(2): 255-258

Seyede BH, Masoumeh S, Abouali V (2014). The emotional-psychological consequences of infertility among onfertile women seeking treatment; result of qualitative study. Iran J reprod. Med., 12(2): 131-138

Ukpong DI and Orji EO (2006). Mental health of infertile women in Nigeria. Turk Psikiyatri Derg, 17: 259-65

Volgsten H, SkoogSvanberg A, Ekselius L, Lundkvisi O, Poromaa S (2008). Prevalence of psychiatric disorders in infertile women and men undergoing in-vitro fertilization treatment. Hum Reprod., 23(9): 2056-2063

World Health Organization (2010). Mother or nothing. The agony of infertility. WHO Bulletin, 88: 877953

Zigmond AS and Snaith RP (1983). The hospital anxiety and depression scale. Acta Psychiatrica Scandinavica, 67(6): 361-370

.