INFERTILITY AND PSYCHIATRIC MORBIDITY AMONG FEMALES
AT THE AMINU KANO TEACHING HOSPITAL, KANO NIGERIA

BY

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FACULTY OF PSYCHIATRY

NOVEMBER 2012
DECLARATION

I HEREBY DECLARE THAT THIS WORK IS ORIGINAL AND HAS NOT BEEN PRESENTED IN PART OR WHOLE TO ANY OTHER COLLEGE FOR A FELLOWSHIP NOR HAS IT BEEN SUBMITTED ELSEWHERE FOR PUBLICATION

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE PAGE</td>
<td>i</td>
</tr>
<tr>
<td>DECLARATION</td>
<td>ii</td>
</tr>
<tr>
<td>CERTIFICATION</td>
<td>iii – v</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>vi</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>xii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>xiii</td>
</tr>
<tr>
<td>SUMMARY</td>
<td>xiv</td>
</tr>
<tr>
<td>CHAPTER ONE: INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.0  Background to the Study</td>
<td>1</td>
</tr>
<tr>
<td>1.1  Research Problem Definition</td>
<td>2</td>
</tr>
<tr>
<td>1.2  Relevance to Clinical Practice</td>
<td>3</td>
</tr>
<tr>
<td>1.3  Justification</td>
<td>3</td>
</tr>
<tr>
<td>CHAPTER TWO: LITERATURE REVIEW</td>
<td>5</td>
</tr>
<tr>
<td>2.1  Introduction</td>
<td>5</td>
</tr>
<tr>
<td>2.2  Causes</td>
<td>6</td>
</tr>
<tr>
<td>2.3  Major Causes of Female Infertility</td>
<td>6</td>
</tr>
<tr>
<td>2.4  Psychogenic Infertility</td>
<td>8</td>
</tr>
<tr>
<td>2.5  Treatments for Female Infertility</td>
<td>9</td>
</tr>
</tbody>
</table>
2.6 Infertility and Psychiatric and Disorders

2.6.1 Causal Effects of Psychiatric Disorders on Infertility

2.6.2 Psychiatric Disorders

2.6.3 Stress and Infertility

2.7 Psychological Resilience, Social Support and Infertility

2.8 Infertility and Psychiatric Morbidity

2.8 Infertility and Psychiatric Morbidity in Nigeria

2.9 Treatment of Psychiatric and Psychological Complications of Infertility

CHAPTER THREE: STUDY OBJECTIVES

3.1 General Aim

3.2 Specific Objectives
CHAPTER FOUR: METHODOLOGY

4.1 Background of the Study Area

4.2 Study Design

4.2.1 Study Population

4.2.1.1 Inclusion Criteria

4.2.1.2 Exclusion Criteria

4.2.2 Sample Size

4.2.3 Sampling Technique

4.2.3.1 Instruments of Data Collection

4.2.3.1a The GHQ-12

4.2.3.1b The 14-Item Resilience Scale

4.2.3.1c Oslo Social Support Scale (OSS-3)

4.2.3.1a Schedule for Clinical Assessment in Neuropsychiatry (SCAN)

4.3 Ethical Consideration

4.4 Study Procedure

4.4.1 Study Patients and Data Source

4.4.2 Data Analysis
CHAPTER FIVE: RESULTS

5.1 Socio-Demographic Characteristics of Participants 30

5.2 Gynaecological Characteristics of Participants 32

5.3 Psychiatric Morbidity: Prevalence and Patterns 34

5.4 Prevalence of Psychiatric Diagnosis among the GHQ-12 Cases 35

5.5 Pattern of Psychiatric Diagnosis 36

5.6 Summary Statistics of Weighted and Screen Prevalence 37

5.7 Observed Prevalence of Psychiatric Morbidity 39

5.8 Sociodemographic Comparison of Psychiatric Morbidity 40

5.9 Gynaecological Comparison of Psychiatric Morbidity 42

5.10 Resilience Characteristics of Participants 44
5.11 Social Support Characteristics of Participants 45
5.12 Multivariate Analysis of Predicting Variables 46

CHAPTER SIX: DISCUSSION 47
6.1 Summary of Findings 47
6.2 Sociodemographic Characteristics 47
6.3 Gynaecological Characteristics 50
6.4 Prevalence and Pattern of Psychiatric Morbidity 52
6.5 Contributors to Development of Psychiatric Morbidity 57

CHAPTER SEVEN: 61
7.1 Limitations of Study 61
7.2 Strengths of Study 62
7.3 Implications of Study 62

CHAPTER EIGHT: CONCLUSION AND RECOMMENDATION 64
8.1 Conclusions 64
8.2 Recommendations 64
REFERENCES

APPENDIX 1

Sociodemographic/Gynaecological Characteristics Questionnaire 80

General Health Questionnaire 12 81

Oslo Social Support Index 81

14-Item Resilience Scale 82

APPENDIX II

Consent Form 83

Ethical Approval 84
DEDICATION

This work is dedicated to my parents for their continued prayers and support, my wife (Halima) for her friendship, love and support, my treasures (Fadila and Rahama), and the two hundred and eighty-one participants that took part in this study.
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SUMMARY

INTRODUCTION
Infertility has continued to constitute a major source of psychological burden for couples globally. This burden has been shown from several researches to be much heavier on the females, and was largely unrecognised by managing gynaecologist(s).

OBJECTIVES
This study was aimed at evaluating the prevalence and clinical pattern of psychiatric morbidity among adult female patients attending Aminu Kano Teaching Hospital (AKTH) infertility clinic, including the impact of their psychological resilience and social support.

METHOD
Over a three month period, 281 respondents were interviewed using a sociodemographic questionnaire, a screening instrument: General Health Questionnaire version 12 (GHQ-12); and two psychosocial instruments: Resilience Scale and Oslo Social Support Scale. All probable cases with a score of 3 or more on GHQ-12 were interviewed using the Schedule for Clinical Assessment in Neuropsychiatry (SCAN). Psychiatric diagnosis was made in accordance with the diagnostic criteria of the 10th edition of the International Classification of Diseases (ICD-10).

RESULTS
The point prevalence of psychiatric morbidity in this study was 29.2% with a weighted prevalence rate of 64.8% projected onto the Kano infertile population. Depression (21%) was the most occurring diagnosis. Anxiety disorders and Somatisation were diagnosed in 6% and 2% respectively. There was a significant relationship between psychiatric morbidity and age, educational status, religion, duration of marriage, resilience and social support characteristics of
respondents (p<0.05). Regression analysis of the 6 associated variables revealed high educational attainment and low social support as the two main contributors to the development of psychiatric morbidity in the study population.

CONCLUSION
About one-third of infertile women in this study had psychiatric morbidity with depression being the most prevalent diagnosis. Psychiatric morbidity was significantly associated with low resilience, low social support, increasing age, high educational attainment, religion and longer duration of marriage. The associations that suggested aetiologic relevance were high educational status and low social support. The study demonstrated the need to include Consultant-Liaison Mental Health Practitioners in the management of women with infertility in order to meet their unmet mental health needs.
CHAPTER 1

INTRODUCTION

1.0 BACKGROUND TO THE STUDY

Infertility, a leading cause of chronic health problem faced by 1 in 10 couples, globally, is defined by the National Institute for Health and Clinical Excellence (NICE) as failure to conceive after a series of regular, unprotected sexual intercourse for 2 years in the absence of known reproductive pathology. The prevalence of infertility in Africa is higher than in the rest of the world. The prevalence in sub-Saharan Africa ranges between 14-32% and in Nigeria it is estimated to be from 10.5-14.6%. The uniqueness of infertility problems in the sub-Saharan regions earned it the ‘infertility belt’ title that runs from west to central, and down to southern African regions.

In Nigeria, 3 in 100 Nigerian women of all ages were reported never to have mothered a child. Infertility was observed to account for 50% of attendance at gynaecological clinics in Nigeria and seems to be on the increase at the current rate of 20%. This increase suggested that there will be a proportional rise in infertility various sequelae and co-morbidities among Nigeria infertile population.

Infertility, as a health problem, has definite physiological, psychological and social implications. In other words, the relationship between psychiatry and infertility has been described as one with a double impact. First is the impact of infertility and its treatment on mental wellbeing. The other is psychiatry having its own toil on infertility. The latter is mainly described as psychogenic as well as impacts effected through sexuality experienced in the male as impotence or poor sperm quality, and hormonal disturbances and vaginismus in the female.
The impact of infertility on psychiatric wellness has been described by several studies as general psychosocial “unwellness”\textsuperscript{12-16}. First, infertility places a great emotional burden on the infertile couple. This mental anguish can present as both an acute life crisis and initially a non-event with probable consequent long-term complications for the individual, his/her partner, their relationship, and family and friends\textsuperscript{12}. Thus, the consequences of infertility are many. They include social exclusion, stigmatisation, diminished status, defectiveness, reduced competence, role failure, verbal, physical and mental abuse, marriage breakdown, neglect, abandonment, economic deprivation and mental disharmony and clinical psychiatric syndromes\textsuperscript{13-16}.

These toils of infertility in most societies are much heavier on the woman due to both biological and social reasons\textsuperscript{17}. Although, the morbidity due to infertility is high, it often goes unnoticed and will ultimately contribute to mortality resulting therein. Thus, recognising this should go a long way in reducing the double impact negatively affecting the well-being of couples as there are effective treatment modalities available, but sadly under-utilised.

1.1 RESEARCH PROBLEM DEFINITION

Infertility has continued to be a major source of biopsychosocial burden\textsuperscript{12} for couples, globally. And this burden is on the increase despite the availability of varying successful physical treatment which has been, partly, the source of the suffering. In developing countries with large and increasing prevalence of infertility and dearth of appropriate qualified professionals to manage this, the impact of the burden recognized at present could be described as a tip of the ice-berg.

In Nigeria, previous studies on this phenomenon are mainly from southern part\textsuperscript{18-28} of the country and few similar studies in northern part\textsuperscript{29,30} of the country has adequately addressed the prevalence or patterns of psychiatric burdens of infertility. These few studies from the northern
part of Nigeria are mainly from north central with paucity of studies from north western Nigeria, the place of the current study.

1.2 RELEVANCE TO CLINICAL PRACTICE

Infertility is a leading source of psychiatric burden faced by couples globally, and especially, in developing countries with a higher prevalence. With this increased suffering comes the urgent need to mount surveillance in infertility clinics. This surveillance would be geared towards the recognition of the psychiatric co-morbidities for early and prompt referral. This is because, the chicken or the egg phenomenon is fully illustrated in the relationship between infertility and psychiatric “unwellness”.

The information that was generated, with the completion of this study, has provided an insight on the prevalence and clinical patterns of psychiatric morbidities among this important group in the Nigerian society. Also, it has helped to draw attention of attending gynaecologists to the varying psychiatric patterns of presentation, so that early and prompt referral to psychiatric services can be made for primary prevention. It went further to suggest the need for including Consultation-Liaison psychiatrists in the managing team.

1.3 JUSTIFICATION

Infertility, being a highly public phenomenon in developing world, Nigeria inclusive, is one with a harsh public stigma and devastating consequences. Several studies exist in the West on this reproductive morbidity with its pattern of psychiatric sequelae, and the latter contributions to morbidity and mortality arising therein. However, some literatures in Africa do identified some psychiatric morbidity related to infertility, but mainly as screen prevalence. Northern Nigeria, a place where infertility is at its highest, globally, is not left out.
Furthermore, it is unclear whether infertility with its psychiatric morbidity in North western Nigeria is patterned as in other part of the world. And if not, is it more in occurrence or less. If less, could other factors like resilience and social support account for this when present. These, therefore, implied that the managing team must be better informed of infertility clinical psychiatric profile, outcome, and implications. It is hoped that this will help minimise infertility-related psychiatric morbidity, as well as to increase compliance with management plan and preventive measures.
CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Infertility is defined by the National Institute for Health and Clinical Excellence (NICE) as failure to conceive after a series of regular unprotected (hetero-) sexual intercourse for 2 years in the absence of known reproductive pathology\(^2\). This is similar to the World Health Organisation (WHO) definition recommending 2 years of exposure to risk of pregnancy\(^35\). Infertility can be primary as in the couple’s inability to conceive despite repeated unprotected intercourse for at least 12 months\(^36\). Secondary infertility, on the other hand, is one in which the couple has previously conceived but is subsequently unable to conceive within 12 months, despite repeated unprotected intercourse\(^36\).

2.2 PREVALENCE OF INFERTILITY

The epidemiology of infertility revealed the highest prevalence in Africa which earned some regions in it the title of ‘infertility belt’\(^6,7,36\). The infertility belt extends from the West African countries of Senegal, Mali, Burkina Faso, Niger, and northern Nigeria through Cameroon, Gabon, Congo, Central African Republic, Zaire, Zambia, and southwest Sudan, to the East African countries of Uganda, southwestern Kenya, Ethiopia and Tanzania\(^6,7,36\), and Lesotho in the South\(^6,7,36\). Africa has a high secondary/primary infertility ratio which is converse to what is obtainable in Asia, Latin America and the developed nations\(^36\). This goes to buttress the fact that most cases of infertility in Africa are preventable, as the ‘infertility belt’ corresponds quite well with the acquired immune deficiency syndrome (AIDS) belt\(^21\). And both infertility and AIDS are associated with sexually transmitted infections (STIs).
In Nigeria, the prevalence of infertility is currently put at 20%\textsuperscript{8,9} which is higher than a 1991 survey reporting 15.15\%\textsuperscript{37}. The 1991 survey also reported figure of 9.2\% and 21.1\% for both primary and secondary infertility\textsuperscript{22} respectively. It was estimated in the Nigeria Demographic and Health Survey (DHS) of 2008, that 3 in 100 Nigerian women of all ages have never mothered a child\textsuperscript{5}. Infertility has accounted for more than 50\% of attendances at gynaecological clinics in Nigeria\textsuperscript{8}.

2.3 CAUSES OF INFERTILITY

The dilemma of the egg and hen phenomenon is well represented here in the relationship between the development of psychiatric “unwellness” and infertility, and vice versa i.e. psychological, social, anatomic, or physiological alterations can interfere with the occurrence of pregnancy. In other words, the aetiology of infertility can be classified based on the biopsychosocial model, with the majority of causes falling under the biomedical causes. Furthermore, these causes can be sub-classified as male (40\%), female (40\%), shared male/female (10\%) and unknown factors (10\%)\textsuperscript{38}.

2.3.1 MAJOR CAUSES OF FEMALE INFERTILITY

The most common causes of female infertility include fallopian tube damage or blockage, endometriosis, ovulation disorders, elevated prolactin, polycystic ovary syndrome (PCOS), early menopause, benign uterine fibroids and pelvic adhesions\textsuperscript{15,38–40}. Blocked or damaged fallopian tubes prevent eggs from getting to the uterus and sperm from getting to the egg. Leading causes include pelvic inflammatory disease, sexually transmitted infections (STIs) and previous sterilisation surgery. Tubal damage may result in ectopic pregnancy, the risk of which increases with each occurrence of tubal infection.
Endometriosis is a condition in which endometrial tissue (the uterine lining that sheds with each monthly period) grows outside the uterus, thus affecting the function of the ovaries, uterus and fallopian tubes. Painful menstrual periods, irregular or heavy bleeding, possibly repeated miscarriages and infertility are the likely manifest symptoms.

Ovulation disorders are any condition (usually hormonal, especially causing low levels of luteinizing hormone [LH] and follicle-stimulating hormone [FSH]) that prevents the release of a mature egg from an ovary. Specific causes include hypothalamic-pituitary injury and tumours, as well as excessive exercise, starvation and some medications.

Hyperprolactinaemia is high level of prolactin that affects ovulation in non-pregnant or non-nursing women. Possible causes include pituitary tumour and some medications like antipsychotics.

Polycystic ovary syndrome (PCOS) is a condition in which the ovaries contain many small cysts that result in hormonal imbalances (especially high androgen) affecting ovulation. PCOS is also associated with insulin resistance and obesity.

Early menopause (premature ovarian failure) is the absence of menstruation and the depletion of ovarian follicles before age 40. Cause is mainly idiopathic but immune system diseases, radiation or chemotherapy treatment, and smoking, just to mention but a few, have also been implicated.

Other causes in women include: use of certain medications like contraceptives; thyroid problems (hyperthyroidism or hypothyroidism can interrupt the menstrual cycle and cause infertility); cancer and its treatment (especially female reproductive cancers and cancer therapy of irradiation and chemotherapy); other medical conditions (like cushing's disease, sickle cell disease, kidney disease and diabetes, can delay fertility or cause infertility); excessive caffeine
consumption; functional hypothalamic amenorrhoea (from anorexia nervosa, bulimia, intense exercise, severe stress, low body weight, or severe depressive disorder); and age have all been implicated in female infertility\textsuperscript{15,23,24,25}.

Studies have suggested that female fertility peaks at 20–24 years of age, begins to decrease at 30–32 years of age, and declines rapidly after 40 years of age. All are related to progressive depletion of the number of follicles and high incidence rates of abnormalities in the aging oocytes\textsuperscript{15,38,39,40}.

“Combination infertility” is the term used to describe couples who have both male and female infertility problems, or when one partner has more than one fertility problem, with symptoms varying according to causes\textsuperscript{15,38,39,40}.

“Unexplained infertility” is used when physicians can't find a cause for infertility after a full series of tests and assessments. Some experts think that being significantly over- or underweight, exercising excessively, environmental toxins and psychological issues may be contributing factors, but no direct links have, however, been confirmed\textsuperscript{15,38,39,40}.

\section*{2.4 PSYCHOGENIC INFERTILITY}

“Unexplained infertility” is often erroneously equated with psychogenic infertility\textsuperscript{60}, i.e. infertility caused solely by psychological factors. Therefore unexplained infertility encompasses both inadequately diagnosed organic disorders and the psychogenic causes\textsuperscript{60,61}. The prevalence of psychogenic infertility is likely to be 5\%\textsuperscript{61}. The “psychogenic model” purporting that psychic distress can cause infertility is still a controversy in psychosomatic medicine\textsuperscript{61}. However, pseudocyesis and stress-induced amenorrhoea come to support the claim that emotional states do influence menstrual and reproductive functions.
A case for infertility in the psychogenic realm is seen during the pre-ovulation (follicular) phase of the menstrual cycle, in which the emotion-processing areas of the brain are very active. In an emotionally depressed mind, there will be consequent lowering of oestrogen levels and decrease dopamine transmission leading to setback of the ovulation process with the resultant non-maturation of ovulation causing infertility problems.

2.5 TREATMENTS FOR FEMALE INFERTILITY

Female tube blockages treatments include hysterosalpingography and laparoscopic surgery. The former is a diagnostic and therapeutic procedure. Hysterosalpingography is therapeutic for it lysed minor/mild uterine adhesion and partial tubal occlusion. Laparoscopic surgery is the surgical opening of small areas of blocked fallopian tubes. If surgery fails, in vitro fertilisation is an option. Surgical excision of the pituitary adenoma, fibroid and other tumour are indicated in some women\textsuperscript{15,38,39}.

Treatment for polycystic ovary syndrome (PCOS) and ovulation problems is mainly by the use of ovulation-stimulating drugs such as clomiphene. Others include the use of follicle-stimulating hormones, human chorionic gonadotrophin (HCG) and in vitro fertilisation (IVF). Gamete intra-fallopian transfer (GIFT) and zygote intra-fallopian transfer (ZIFT) are modifications of IVF. Insulin-sensitising medications, such as metformin (glucophage), have been used to treat women with PCOS via reduction in androgen levels, which is an off-label use of this medication. Ovulatory problems related to hyperprolactinaemia can be treated with dopamine receptor agonists, such as bromocriptine or cabergoline\textsuperscript{15,38,39}.

Endometriosis can be treated both surgically and medically. The former is with Laparoscopic surgery to remove abnormal tissue or unblock tubes and assisted conception treatments, while the latter employ the use of GnRH agonist therapy, which reduces endometrial
lesions via suppression of ovarian hormones. Commonly used medications are leuprolide acetate, goserelin acetate, and nafarelin acetate nasal spray. Danazol is a testosterone derivative that induces an anovulatory state causing atrophy of endometrial tissue, and is occasionally used in the medical treatment of endometriosis. Lastly, poor egg quality is treated with egg donation or surrogacy\textsuperscript{15,38,39}.

Shared infertility treatment follows determination of appropriate causes. Rates of success vary, depending on causes. Treatment for the unexplained infertility is mainly timed intercourse, beyond which there is no specific treatment. Some couples try fertility drugs and assisted conception procedures such as in vitro fertilisation, which have usual success rates. How long the couple has been infertile is important. Couples, who are with unexplained infertility, and have been trying for less than 5 years to get a baby, do have about a 15-30\% chance of becoming pregnant in a given year. After 5 years, fewer than 10\% become pregnant without treatment\textsuperscript{15,38,39}. Adoption is an alternative, available when all efforts to have children failed\textsuperscript{41}.

2.6 INFERTILITY AND PSYCHIATRIC DISORDERS

2.6.1 CAUSAL EFFECTS OF PSYCHIATRIC DISORDERS ON INFERTILITY

Infertility, being a significant loss phenomenon comes with distressing typical emotions of shock, grief, depression, anger and frustration, as well as loss of self-esteem, self-confidence, and a sense of control over one’s destiny\textsuperscript{42,43}.

Syme\textsuperscript{44} chronicled the emotional impact of infertility in his staging which he termed the emotional stages of infertility\textsuperscript{44}. This is as follows:
Stage 1. Numbness

During this time of dissociation, the thought is that it cannot be true, and actual physical signs such as loss of appetite, difficulty concentrating, and problems associated with memory can occur.

Stage 2. Yearning

This phase is accompanied by feelings that they are alone in infertility. It is particularly painful to see babies. This makes the couple to avoid social situations where children are present. Also, feelings of jealousy and anger are common during this phase. Anger is directed at both the self and others.

Stage 3. Disorganisation and despair

This is the longest phase. It lasts a minimum of 6 months. Anger and guilt from the prior phase continued as outbursts of rage increased. There is concern about being out of control and the fear of being alone as their social activities continued to be limited in order to avoid the sight of babies and pregnant women. The social support network for the couple may also be less available due to the discomfort of being with such angry, tense, unhappy people. As with previous phases, tears are unpredictable and can be embarrassing. This phase may be accompanied by feelings of hopelessness and helplessness which are most often associated with depression.

4. Reorganisation

This phase is hallmarked by acceptance and reordering of one's life. It can take the couple 2-5 years to reach such a state of equilibrium.
2.6.2 PSYCHIATRIC DISORDERS

Infertility can precipitate and perpetuate psychiatric disorders or exacerbate a pre-existing psychiatric problem\(^\text{15}\). It is logically expected that psychopathologies will follow failed reorganisation of the emotional conflicts of loss which in this case is the inability to procreate. This, in psychological mechanism is termed the “psychological consequences model” (as infertility causing or perpetuating psychological distress). Below are the descriptions of the common psychiatric disorders which coexist with infertility.

**Adjustment Disorders**

Adjustment is a measure of one’s ability to adapt to new circumstances\(^\text{45}\) which in the case of infertility is experienced as ‘multiple losses\(^\text{46}\) – loss of potential children, loss of genetic continuity, loss of pregnancy, loss of a life goal, loss of self-esteem, loss of relationships, loss of health, loss of financial security, and loss of control over one’s body\(^\text{47}\). These losses come with several anxiety-depressive symptoms which increase with the duration of infertility as well as the presence or absence of social support and good attachment style\(^\text{48}\). It is these symptoms that made up adjustment disorders which have been documented to be the commonest psychiatric sequale of infertility\(^\text{47-49}\).

**Anxiety Disorders**

Anxiousness as a symptom is common at every stage of infertility from pre-diagnosis, diagnosis, treatment and outcome\(^\text{20,21,49-51}\). This anxiousness when overwhelming and differentially persistent, becomes anxiety disorder described historically by Morel as a situation where “One is struck at the rapidity with which maladaptive emotions arise, at the instantaneous nature with which certain fixed ideas are implanted in the mind, leading to unmotivated fears, to
impulsions that are virtually irresistible, to ridiculous fears that sometimes take the proportion of a kind of generic fearfulness.” A research has named anxiety disorder as the second most prevalent psychiatric comorbidity in infertile women. Commonly diagnosed anxiety disorders in infertility are panic disorder, generalized anxiety disorder and obsessive compulsive disorders. One or two of this can coexist with adjustment disorder or depression.

**Depression**

The third phase of emotional response to infertility is often characterized by neurocognitive features of depression (helplessness, worthlessness, hopelessness etc.) which have been described clinically as common in chronic physical illness, infertility inclusive. Several research have diagnosed depression as one of the three top common psychiatric illnesses in infertility.

**Infertility and Other Psychiatric Morbidity**

Some not so commonly diagnosed psychiatric disorders (and not necessarily rare) are dysthymia, eating disorders, somatoform disorders, conversion disorders, and sexual dysfunction. Other psychiatric disorders may also be diagnosed in infertility but are of few occurrences. Research also revealed that psychiatric morbidity is commoner among the female compared to their male counterparts.

**2.6.3 STRESS AND INFERTILITY**

A study has found out that stress can have a big effect on fertility. This is because stress can decrease a person's plan to have a child which is a highly valued social phenomenon. Stress hormones affect the hypothalamo-pituitary-gonadal (HPG) axis. In couples under stress, the reproductive hormone (prolactin), when pathologically produced may induce hypogonadism which is oestrogen deficiency in women and testosterone deficiency in men. These
hormones (oestrogen and testosterone) stimulate fertility and their deficiency has been implicated in infertility.

Hyperprolactinaemia induced male-hypogonadism has been implicated in decreased libido and impotency (sexual dysfunction), and thus affecting male fertility. In women, hyperprolactinaemia cause the hypothalamus to stop the secretion of gonadotrophin releasing hormone (GnRH), which in turn will affect the release of both the luteinizing hormone (LH) and follicle-stimulating hormone (FSH). As these hormones stimulate ovulation, fertility is also affected.

Hyperprolactinaemia causing hypo-oestrogen has been implicated in several psychopathology and thus impacting psychiatric morbidity in infertility-related cause. Research revealed that hyperprolactinaemia independent of hypo-oestrogen may cause psychological distress, anxiety, and hostility58,59 while hypoestrogenism may impact dopamine thereby precipitating and/or perpetuating psychotic symptoms58,59.

2.7 PSYCHOLOGICAL RESILIENCE, SOCIAL SUPPORT AND INFERTILITY

Resilience is a psychological process developed in response to intense life stressors that facilitate healthy functioning62. In the context of infertility journey, it is how the memories of unanticipated reproductive losses were regrouped emotionally and nurtured into capacity to find a new pathway that leads to positive emotional growth onto wellness and continued wellbeing63. A study demonstrated that resilience was significantly and inversely correlated with fertility-specific stress and general distress among infertile women in 9 fertility clinics in Michigan64.

Social support on the other hand is defined as the physical and psychological comfort provided by other people65. The impacts of social support has been health-wise operationalised
into structural and functional domains\textsuperscript{66,67}. Social support has been shown to be significantly and negatively correlated with infertility-related stress domains\textsuperscript{68}. This hence purports that, social support is a critical component of factors affecting how women adjust to their infertility problems. Thus, both resilience and social support are critical aspects of positive mental health that when present and high, confer protectiveness against psychiatric “unwellness”.

\subsection*{2.8 INFERTILITY AND PSYCHIATRIC MORBIDITY}

Most of the subjective feelings\textsuperscript{42,43} associated with infertility often overlap with depressive/anxiety symptoms\textsuperscript{20,48,49}. Despite these overlaps researchers have consistently documented high rates of psychiatric morbidity with infertility\textsuperscript{20-22,48,49,55}. A review by Baxter and Colleague\textsuperscript{15}, quoted a 40.2\% prevalence of psychiatric morbidity among infertile women in a treatment clinic. The same review\textsuperscript{15} reported the rate of 23.2\% for anxiety disorders, and 26.8\% for depression. The anxiety and depression rate reported in the Baxter’s review is lower than that reported in an Iranian study (46\% for anxiety and 40\% for depression)\textsuperscript{95} and much higher than that reported in an Egyptian study (19.6\% for anxiety and 17.8\% for depression). However, there is ambiguity on the duration of infertility being associated with severity of depression\textsuperscript{15}.

A Ghanaian\textsuperscript{34} and a South African\textsuperscript{31} studies identified high psychosocial burden faced among their study participants. The Ghanaian study\textsuperscript{34} used self developed structured instrument to assess subjective emotional burden of infertility which is found to be more on the female than on the males. The South African study\textsuperscript{31} on the other hand utilizes the Symptom Check List (SCL-90) to assess the level of psychological burden faced by the infertile women. The infertile South African subjects reported higher mean psychological burden compared to their control.
The age ranges for the study participants in the Western studies\textsuperscript{15,48} were comparable to that from Iran\textsuperscript{95}, Egypt, Ghana\textsuperscript{34}, and South Africa\textsuperscript{31} studies. However, the Western studies\textsuperscript{15,48} utilises semi-structure diagnostic instruments compared to the rest. One of the south African\textsuperscript{32} studies also study the impact of infertility on the male couple, which is a major difference compared to some of the above studies.

2.8.1 INFERTILITY AND PSYCHIATRIC MORBIDITY IN NIGERIA

Several researches have been carried out in Nigeria on infertility-related psychiatric morbidity and were either qualitative or quantitative in nature. The former explore the sociomedical\textsuperscript{19,21,23}, gender-based violence\textsuperscript{18,24}, and psychological trauma\textsuperscript{19,20}. Among the latter are psychiatric morbidity prevalence\textsuperscript{22,25-30}, and patterns of anxiety and depression\textsuperscript{22,25-30}.

One of the earlier previous researches related to infertility in Nigeria was by Abiodun et. al.\textsuperscript{59}. They described psychiatric morbidity in a gynaecological outpatient clinic in Nigeria using the 30-item General Health Questionnaire (GHQ-30) and the 9\textsuperscript{th} edition of the Present State Examination (PSE-9)\textsuperscript{59}. This research gave a prevalence rate of 35.2\% for psychiatric morbidity and included infertility as one of the associated factors\textsuperscript{59}. Other studies utilise the GHQ-30 and the GHQ-12, yielding a prevalence of 46.4\textsuperscript{41} and 37.0\%\textsuperscript{61}, respectively in Ife and Lagos. These Nigerian prevalences were within similar range to those found in western countries\textsuperscript{15,48}. The pattern of psychiatric morbidity in these two Nigerian studies was assessed by the use of screening instruments such as GHQ, HADS (Hospital Anxiety Depression Scale) and BDI (Beck Depression Inventory) for the anxiety/depression rates reported. This was unlike the western studies that utilised diagnostic instruments like the Schedule for Clinical Interview according to DSM IV Axis I psychiatric disorders (SCID-I)\textsuperscript{48} and Mini-International Neuropsychiatry Inventory (MINI)\textsuperscript{15}. The studies from other African countries like Ghana\textsuperscript{34} and South Africa\textsuperscript{31,32}
did not give prevalence rates but did identify increased psychological suffering among the infertile populations.

The screen prevalence rates for anxiety disorders among infertile women in Ife and Lagos were 37.5% and 30.8% respectively. Their corresponding depression rates were 42.9% and 22.0%, respectively. These were much higher than the rates found in western countries for both anxiety (23.5%)\textsuperscript{15} and depression (17.0%)\textsuperscript{15}. However, most western studies reported adjustment disorders as the most occurring psychiatric disorders among their study population with a mean prevalence of 16%\textsuperscript{47-49}.

One of the few study on psychiatric morbidity of male accompanying their wives to infertility clinic was reported in another Ife study\textsuperscript{26}, and the screen rate of anxiety disorder vs depression were 24.2% and 20.0%, respectively. This may be similar to a South African\textsuperscript{32} and a western study\textsuperscript{49} looking at psychological burden among men with couple infertility.

Apart from the two north-central Nigerian studies\textsuperscript{29,30} available to the researcher and that semi-structurally measured the prevalence of psychiatric morbidity and the rates of individual diagnosis, the other Nigerian studies measured screened rates for anxiety disorders and/or depression in their study groups. Also, these two north-central Nigerian studies\textsuperscript{29,30} were on females attending gynaecologic clinic rather than infertility clinic, alone – the focus of this study. Thus it is noted that the present study like the north-central Nigerian studies will go further than the other previous ones to give semi-structure diagnosis rather than screened diagnosis among the infertile women, a major weakness of earlier studies. Furthermore, there is paucity of literature on the impact of resilience and social support on the mental well being of Nigerian women with infertility. This study hoped to provide some literature on these important modifiers of psychological wellness, particularly among the study sample.
2.9 TREATMENT OF PSYCHIATRIC COMPLICATIONS OF INFERTILITY

Several options that can help couples and individuals cope with infertility, its treatment and comorbid psychiatric problems, exist. Some of these options include: conventional psychiatric medications; biopsychosocial counseling\textsuperscript{11}; individual, marital, and/or cognitive-behavioural group therapy\textsuperscript{69}; infertility support groups\textsuperscript{57}; reading related information materials/books\textsuperscript{57}; use of the internet to talk about infertility\textsuperscript{70}; and child adoption for irreversible cases\textsuperscript{26}.

The application of one or more of these treatments may be appreciated in the 5 stages of infertility given by Gerrity\textsuperscript{71}. Her study showed that the stages increase proportionally with a corresponding increase in psychological/psychiatric “unwellness” except for the last stage\textsuperscript{71}. As appearance of mental symptoms and signs differs on gender bias\textsuperscript{71}, it, however, gets to its highest in the 3\textsuperscript{rd} and 4\textsuperscript{th} stages\textsuperscript{71}. These stages are:

1. Prediagnosis: Less than 1 year after suspecting a problem and still in the process of a diagnostic workup.
2. Treatment beginners: Diagnostic workup is well under way, and a treatment plan has been started (usually less than 2 years of fertility problems, one diagnosed problem, may or may not have seen a specialist).
3. Treatment regulars: Tried more than one treatment, must have been seen by more than two specialists, or have been involved in treatment for more than 2 years but less than 5.
4. Persisters: 5 or more years of medical interventions, multiple problems, unexplained infertility, and multiple specialists.
5. Concluded treatment: Have completed the medical component of infertility and have no plans to continue. Reasons include (a) diagnosed with an unsolvable medical problem, (b) have biological children, (c) have adopted, or (d) have decided to remain childfree.

Ultimately, relaxation techniques is a skill that needs to be taught to all infertile couples for the fact that infertility and its treatments often cause considerable stress. Examples of such techniques include: mindfulness meditation, deep breathing, guided imagery, and yoga.
CHAPTER 3

STUDY OBJECTIVES

3.1 GENERAL AIM

The main aim of this study was to determine the prevalence and clinical types of psychiatric morbidity among adult female patients attending Aminu Kano Teaching Hospital (AKTH) infertility clinic.

3.2 SPECIFIC OBJECTIVES

The specific objectives were to:

i. assess the prevalence of psychiatric morbidity among adult female patients with infertility that were attending Aminu Kano Teaching Hospital infertility clinic;

ii. describe the types and the associated sociodemographic and gynaecological factors;

iii. determine possible association between psychiatric morbidity and resilience characteristics of participants; and

iv. determine possible association between psychiatric morbidity and social support characteristics of participants.
4.1 BACKGROUND OF THE STUDY AREA

The study was conducted at the infertility clinic of Aminu Kano Teaching Hospital, Kano, Nigeria. The hospital served as a referral centre for the host State, Kano, and other neighboring States like Jigawa, Katsina, Zamfara, Bauchi, Gombe, and Yobe as well as the neighboring countries like Niger Republic. The Hospital has a bed capacity of 310. It has 14 clinical departments with Psychiatry being the first, and all fully supported with well equipped laboratories. The study was carried out in the Gynaecologic Outpatient Clinic, specifically the infertility clinic.

The infertility clinic is run together with other gynaecological clinics. This takes place in the afternoon from 2p.m till 4p.m on Monday to Thursday. Each clinic is run by 2-3 consultants and four resident doctors. In addition are accessory medical staff including nurses, record officers and clinic assistants. All patients presenting to the clinics will first report to the record officer for documentation, before being sent to meet the nurses who usually record their vital signs and get them ready to meet the doctors.

4.2 STUDY DESIGN

The current study was cross-sectional in design and it hoped to give a point view of the psychiatric morbidity among the study population over the three months study period.

4.2.1 STUDY POPULATION

All patients attending the infertility clinic who met the selection criteria will be recruited for the study and serve as the population to be studied.
4.2.1.1 INCLUSION CRITERIA

a. All adult female patients attending the infertility outpatient clinic of Aminu Kano Teaching Hospital

b. Age 18 to 50 years-old (age 18 years is the legal age of attaining adulthood and 50 years is the typical perimenopausal period)

c. Those literate in English, and

d. Those that consented.

4.2.1.2 EXCLUSION CRITERIA

1) Those who did not meet the inclusion criteria above

2) Those that have previous psychiatric disorders before the infertility

4.2.2 SAMPLE SIZE

The sample size was determined using the formula for single proportion developed by Cochran\(^2\).

\[ N = \frac{Z^2pq}{\alpha^2} \]

\( N \) = required minimum sample size

\( Z \) = standard normal deviation which at 90% confidence limit is 1.64\(^7\)

\( p \) = proportion of psychiatric “unwellness” in infertile women in Ile-Ife, Osun, Nigeria was 46.4\(^2\)

\( q = 1-p \)

\( \alpha \) = the desired level of precision for confidence interval, expressed as decimal or percentage is .05 or 5%, respectively.

Therefore,
\[ N = 1.64^2 (0.464)(1-0.464)/0.05^2 = 268 \]

Sample size will be approximated to 281 at 5% attrition rate.

4.2.3 SAMPLING TECHNIQUE

Patients that have satisfied the inclusion criteria were recruited consecutively until the required sample size was obtained.

4.2.3.1 INSTRUMENTS USED

Data were collected in two stages. The first was through the use of self-administered questionnaires to literate patients fulfilling the selection criteria. The latter was through an interviewer-administered semi-structured questionnaire using Schedule for Clinical Assessment in Neuropsychiatry (SCAN)\(^7\). The first stage involved the use of socio-demographic questionnaire for personal and gynaecological information, the 12-item General Health Questionnaire (GHQ-12), the 3-item Oslo Social Support Scale\(^7\) (OSS-3) and the 14-item Resilience Scale\(^7\) (RS-14).

4.2.3.1a – THE GENERAL HEALTH QUESTIONNAIRE-12 (GHQ-12)

The GHQ-12 is a short version of the original GHQ developed by David Goldberg\(^7\) for use in general medical practice. It is the shortest version of the original 60-item questionnaire. Other versions included the 20-, 28- and 30-item versions. The GHQ can distinguish between psychological ill-health and well-being, as well as in the assessment of the symptoms of anxiety, depression and social dysfunction. It has been validated and used in this environment in both academic and field studies\(^7\)\(^7\). The validity of GHQ-12 as determined by Gureje and colleague\(^7\) at the 0/1 cutoff are sensitivity of 67%, specificity of 74%, positive predictive value 59%,
negative predictive value 80% and overall misclassification rate of 29%. The GHQ-12 in this study was scored on a bimodal scale (0,0,1,1) with cut-off point of 3 as the norm. All the respondents with scores less than 3 were regarded as having no psychological morbidity while those that scored 3 and above were considered as having psychological/psychiatric morbidity.

4.2.3.1b – THE 14-ITEM RESILIENCE SCALE (RS-14)

The 14-item resilience scale (RS-14) is a measure of psychological resilience, that is, the capacity to withstand life stressors, thrive and make meaning from challenges. This short version is an offshoot of the original 25-item psychological Resilience Scale of Wagnild and Young. The RS consists of a 17-item "Personal Competence" subscale and an 8-item "Acceptance of Self and Life" subscale for a total of 25 items. Resilience, as construed by Wagnild, comprises of 5 essential characteristics of meaningful life (purpose), perseverance, self-reliance, equanimity and existential aloneness (i.e. coming home to yourself). The first of these characteristics is identified as the most important as it lays the foundation for the other four. The RS and its short form have good validity and reliability (Cronbach’s α range of 0.72 – 0.94) from several western studies. Both instruments had also been validated for use in Nigeria by Abiola and Udofia (Cronbach’s α for RS and RS-14 were 0.87 and 0.81 respectively; r of RS with RS-14, HADS-depression subscale and HADS-anxiety subscale were 0.97, -0.28 and -0.26 respectively). Both instruments (RS and RS-14) are scored on a likert scale of 1 to 7 yielding scores that group respondents into: low, moderate and high resilience scores.

4.2.3.1c – OSLO SOCIAL SUPPORT SCALE (OSS-3)

The Oslo 3-item Social Support Scale provides a brief measure of social functioning and has been considered a good predictor of mental health. It covers different fields of social
support, as it measures the number of people the respondent feels close to, the interest and concern shown by others, and ease of obtaining practical help\textsuperscript{83}. Unfortunately, its structure and reliability (Cronbach’s $\alpha = 0.60$)\textsuperscript{82,83} have not been well-documented despite its widespread use in several European countries, but its brevity and the availability of normative data are strong considerations\textsuperscript{84}. The Oslo Social support Scale had been validated in Nigeria\textsuperscript{78} and the findings were presented at the 2010 (Enugu) Annual General meeting and Scientific Conference (AGM/SC) of the Association of Psychiatrists in Nigeria (APN)\textsuperscript{85}. The sum ranges from 3 (minimum) to 14 (maximum) and group social support as poor (3-8), moderate (9-11) and strong (12-14).

4.2.3.1d – SCHEDULES FOR CLINICAL ASSESSMENT IN NEUROPSYCHIATRY (SCAN)

The Schedules for Clinical Assessment in Neuropsychiatry (SCAN) is a World Health Organisation (WHO) instrument that comes as an offshoot of the 9\textsuperscript{th} edition of the Present State Examination (PSE-9)\textsuperscript{74}. It helps in assessing, measuring and classifying the psychopathology and behaviour associated with the major psychiatric syndromes of adult life. It has four components: the Tenth edition of PSE, the glossary of differential definitions, the Item Group Checklist (IGC) and the Clinical History Schedule (CHS)\textsuperscript{74}. The interview incorporates a computer program, the CATEGO, which generates ICD-10 and DSM-IV diagnoses. Training in the use of SCAN was obtained from the Nigeria WHOSCAN Training Centre. (Training was obtained in January 2011 during the SCAN Training Workshop organised by the National Postgraduate Medical College of Nigeria, Faculty of Psychiatry in collaboration with the Nigeria WHOSCAN Training Centre, Ibadan).
4.3 ETHICAL CONSIDERATION

1. Ethical clearance was obtained from the ethical committee of Aminu Kano Teaching Hospital before the commencement of the study.
2. The provision of the HELSINKI declaration was respected.
3. Informed consent was sought and obtained from each subject.
4. All data collected from participants was kept secret.
5. Participants were adequately informed about the study.
6. Immediate benefits included detection of comorbid psychiatric “unwellness” and appropriate treatment was advised.
7. Later benefits were for subsequent patients utilising the infertility services with respect to screening and prompt referral as well as integration of ongoing psychological management e.g. counselling as part of the overall infertility management.
8. The study was not in any way used to the detriment of the patient.
9. Taking part in the study was voluntary as participant has liberty to refuse to participate in the study without any negative consequence(s).

4.4 STUDY PROCEDURE

4.4.1 STUDY PATIENTS AND DATA SOURCE

All patients attending the gynaecological infertility clinic of AKTH who met the inclusion criteria were, through their consent recruited for the study. Personal history and clinical/laboratory details were obtained and participants were given GHQ-12, Oslo social support questionnaire and 14-item resilience scale questionnaire to fill in the first stage of the
study. The participants self-filled the questionnaire and the other 3 instruments and the scoring of the GHQ-12 was done by the researcher.

The second stage aimed to establish the point prevalence of psychiatric morbidity using the SCAN. All that score above the GHQ-12 norm (3 and above) for psychological/psychiatric wellness were administered the SCAN by the interviewer. In addition, 10% (i.e. 20) of those that had negative GHQ scores were also randomly selected using systematic sampling with the aid of random number table and were interviewed for the second stage.

The first and the second stages were conducted either on the same day or within few days of each other. This was aimed at minimizing the possibility of discordant findings on the instruments (GHQ-12 and WHOSCAN).

The first stage took about 5-10 minutes, because it was self-administered while the second stage with WHOSCAN lasted an average of 45 minutes per interviewee. The study was conducted over a period of 3 months (June/July 2011 to September 2011) and the targeted study population size was attained.

4.4.2 DATA ANALYSIS

All completed instruments were entered onto the Microsoft Excel Spreadsheet and cleaned. Thereafter, the data were coded in the Statistical Package for Social Sciences (SPSS-16) for analysis. However part of the analysis was done manually, especially to double check the results. The analysis was carried out using descriptive statistics with means and differences assessed. Student t- test and Chi square tests were used to determine the test statistics for continuous and categorical data respectively, with p < 0.05 regarded as significant. Cronbach’s alpha was calculated to determine the internal consistency of the resilience and social support
measures utilised in this study. Multiple regression analysis was also done for the significant variables to determine the most important statistical predictors in this study.

The prevalence of psychiatric disorder was determined by using the weighting method that has been employed in two-stage epidemiological surveys in psychiatric research\textsuperscript{86a}. This is by taking the weighted sum of prevalences of ‘true’ cases within each of the strata defined by the first-stage screening questionnaire. This in algebraic notation has been termed the Horvitz-Thompson\textsuperscript{86b} estimator and mathematically represented as

\[
\Pi = \frac{\Sigma w_i y_i}{\Sigma w_i}
\]

\(\Pi\) – estimate of the prevalence
\(\Sigma\) = ‘the sum of’
\(w_i\) – the ith subject’s sampling weight
\(y_i\) – the ith second stage subject: will be 1 if is a ‘true’ case or 0 if otherwise

Based on the above, the weighted prevalence will be manually calculated as demonstrated below:

a) Number of people in each stage of assessment

<table>
<thead>
<tr>
<th>Response Category of Test</th>
<th>First Stage</th>
<th>Second Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Scorers (h)</td>
<td>(Nh_1)</td>
<td>(Nh_2)</td>
</tr>
<tr>
<td>Low Scorers (l)</td>
<td>(Nl_1)</td>
<td>(Nl_2)</td>
</tr>
</tbody>
</table>

b) Results of second stage assessment

<table>
<thead>
<tr>
<th>Response Category of Test</th>
<th>Cases</th>
<th>Non-cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Scorers</td>
<td>(ah_r)</td>
<td>(bh_r)</td>
</tr>
<tr>
<td>Low Scorers</td>
<td>(cl_r)</td>
<td>(dl_r)</td>
</tr>
</tbody>
</table>
c) Weighted data

<table>
<thead>
<tr>
<th>Response Category of Test</th>
<th>Cases</th>
<th>Non-cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Scorers</td>
<td>( \frac{ah_1 \times Nh_1}{Nh_2} = a )</td>
<td>( \frac{bh_1 \times Nh_1}{Nh_2} = b )</td>
</tr>
<tr>
<td>Low Scorers</td>
<td>( \frac{cl_1 \times Nl_1}{Nl_2} = c )</td>
<td>( \frac{dl_1 \times Nl_1}{Nl_2} = d )</td>
</tr>
</tbody>
</table>

Therefore:

**Weighted prevalence**  
\[
\frac{a + c}{a + b + c + d} \times 100
\]

**Sensitivity**  
\[
\frac{a}{a + c} \times 100
\]

**Specificity**  
\[
\frac{d}{b + d} \times 100
\]

**Positive Predictive Value (PPV)**  
\[
\frac{a}{a + b} \times 100
\]

**Negative Predictive Value (NPV)**  
\[
\frac{d}{c + d} \times 100
\]

**Misclassification**  
\[
\frac{b + c}{a + b + c + d} \times 100
\]
CHAPTER 5

RESULTS

At the end of the 3-month period of study, 281 infertile women who met the inclusion criteria were recruited for the study out of the 539 women who presented within this period at the infertility clinic. All the recruited patients fully participate in the study.

5.1 Sociodemographic Characteristics of Participants

Table 5.1 shows the sociodemographic characteristics of participants. The participants mean age was 28.6 years (SD ± 1.6) and age range of 18 – 42 years. Majority (97.5%) of the participants was married and 32.0% had been married for 5-9 years. The mean duration of marriage of all the participants was 10.7 years (SD ± 8.0) with minimum and maximum duration of marriage of 2 and 31 years respectively. About two-third (65.5%) of the participants had up to secondary education and beyond. Occupation of more than half of the participants were major group 12 (e.g. full-time housewives) according to the 2008 International Standard Classification of Occupation and 41 (14.6%) belong to major group 5 (e.g. traders). There were more Muslims (85.8%) than Christians (14.2%), and Hausas (91%) were the most dominant ethnic group.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (281/100% )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age Group (Years)</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>143 (50.9)</td>
</tr>
<tr>
<td>30 and above</td>
<td>138 (49.1)</td>
</tr>
<tr>
<td>Mean Age = 28.6 years (SD±1.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
</tr>
<tr>
<td>Islam</td>
<td>241 (85.8)</td>
</tr>
<tr>
<td>Christianity</td>
<td>40 (14.2)</td>
</tr>
<tr>
<td><strong>Educational Status</strong></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>97 (34.5)</td>
</tr>
<tr>
<td>Secondary</td>
<td>123 (43.8)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>61 (21.7)</td>
</tr>
<tr>
<td><strong>Occupation (ISCO Classification)</strong></td>
<td></td>
</tr>
<tr>
<td>Major group 2 (e.g. Civil Servants)</td>
<td>35 (12.5)</td>
</tr>
<tr>
<td>Major group 5 (e.g. Trading)</td>
<td>41 (14.6)</td>
</tr>
<tr>
<td>Major group 6 (e.g. Farming)</td>
<td>9 (3.2)</td>
</tr>
<tr>
<td>Major group 7 (e.g. Tailoring)</td>
<td>16 (5.7)</td>
</tr>
<tr>
<td>Major group 11 (e.g. Students)</td>
<td>27 (9.6)</td>
</tr>
<tr>
<td>Major group 12 (e.g. House wife)</td>
<td>153 (54.4)</td>
</tr>
<tr>
<td><strong>Duration of Marriage (years)</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>156 (55.5)</td>
</tr>
<tr>
<td>10-19</td>
<td>85 (30.3)</td>
</tr>
<tr>
<td>&gt;19</td>
<td>40 (14.2)</td>
</tr>
<tr>
<td>Mean (SD) = 10.7 years (±8.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>Hausa</td>
<td>248 (88.3)</td>
</tr>
<tr>
<td>Ibo</td>
<td>11 (3.9)</td>
</tr>
<tr>
<td>Yoruba</td>
<td>14 (5.0)</td>
</tr>
<tr>
<td>Others</td>
<td>8 (2.8)</td>
</tr>
</tbody>
</table>
5.2 Gynaecological Characteristics of Participants

The gynaecological characteristics of the respondents are shown in Table 5.2. Primary infertility constituted the larger type of infertility (197; 70.1%) and secondary infertility was reported by 84 (29.9%) of the respondents. The mean duration of infertility was 8.3 years (SD ± 6.9), though 59.8% of the participants had been infertile for more than 5 years (i.e. treatment persisters) according to the Gerrity staging of infertility. Causes of infertility were found in 138 (49.1%) of the respondents. As shown in Table 4.2, tubal factors (76; 27%) were the most common cause of infertility. This was closely followed by myometrial factors (26; 9.3%) and hormonal factors (15; 5.3%). Husband factors were reported in 10 (3.6%) of the respondents and the other factors comprising of Asherman’s syndrome, complications of vesico-vaginal fistula, ovarian factors and endometrial factors were reported in 11 (3.9%).

As regards therapeutic interventions for infertility, those without any treatment accounted for more than half (155; 55.0%) of the participants and would signified the need for psychological intervention. Surgical intervention (64; 22.8%) accounted for majority of the intervention most of the respondents underwent. Hysterosalpingography was the second most common intervention that most participants received. Twelve (4.3%), had one form of medication or the other.
Table 5.2 – Gynaecological Characteristics of Respondents (N=281)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (281/100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type of Infertility</strong></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>197 (70.1)</td>
</tr>
<tr>
<td>Secondary</td>
<td>84 (29.9)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Duration of Infertility (years i.e. Gerrity Stages 3 and 4)</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;5 (Stage 3)</td>
<td>113 (40.2)</td>
</tr>
<tr>
<td>=/&gt;5 (Stage 4)</td>
<td>168 (59.8)</td>
</tr>
<tr>
<td><strong>Mean (SD) = 8.3 years (±6.9)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Causes of Infertility</strong></td>
<td></td>
</tr>
<tr>
<td>Tubal Factors</td>
<td>76 (27.0)</td>
</tr>
<tr>
<td>Myometrial Factors</td>
<td>26 (9.3)</td>
</tr>
<tr>
<td>Hormonal Factors</td>
<td>15 (5.3)</td>
</tr>
<tr>
<td>Husband Factors</td>
<td>10 (3.6)</td>
</tr>
<tr>
<td>Others</td>
<td>11 (3.9)</td>
</tr>
<tr>
<td>Unknown</td>
<td>143 (50.9)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Treatment Procedure Currently on</strong></td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td>12 (4.3)</td>
</tr>
<tr>
<td>Hysterosalpingography</td>
<td>48 (17.1)</td>
</tr>
<tr>
<td>Surgical</td>
<td>64 (22.8)</td>
</tr>
<tr>
<td>Others</td>
<td>2 (0.7)</td>
</tr>
<tr>
<td>Nil</td>
<td>155 (55.1)</td>
</tr>
</tbody>
</table>
5.3 Prevalence of Psychiatric Morbidity among the Participants

The number of probable cases as determined by GHQ-12 was 80 out of the 281 respondents giving a screen prevalence of 28.5% (i.e. 80/281). This is depicted by Figure 5.1 below.

Figure 5.1 – Distribution of GHQ-12 caseness among the respondents
5.4 Prevalence of Psychiatric Diagnosis among the GHQ-12 Cases

Table 5.3 shows the SCAN diagnosis of the 80 GHQ-12 positive participants who went through the second stage of the study. All those identified as cases (i.e. GHQ-12 positives) were subjected to diagnostic interview using schedule for clinical assessment in neuropsychiatry (SCAN). ICD-10 diagnosis was made in 71 of the 80 identified cases, and gave a prevalence of 25.2% (i.e. 71/281).

Table 5.3 – The SCAN Diagnostic Outcome of GHQ-12 Positive Respondents

<table>
<thead>
<tr>
<th>ICD-10 Diagnosis</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressive episode (F32)</td>
<td>52</td>
</tr>
<tr>
<td>Generalized Anxiety Disorder (F41.1)</td>
<td>14</td>
</tr>
<tr>
<td>Somatisation Disorder (F45.0)</td>
<td>5</td>
</tr>
<tr>
<td>Total Diagnosis</td>
<td>71</td>
</tr>
<tr>
<td>Nil Diagnosis</td>
<td>9</td>
</tr>
<tr>
<td>Total (all+nil diagnosis)</td>
<td>80</td>
</tr>
</tbody>
</table>
5.5 Pattern of Psychiatric Diagnosis among the Randomly Selected GHQ-12 non-Cases

Table 5.4 shows the SCAN diagnosis among the randomly selected GHQ-12 negative participants. Twenty (i.e. 10%) of the participants who scored below the GHQ-12 cut-off point (screened as non-cases) were randomly selected using systematic sampling with the aid of random number Table and subsequently subjected to SCAN diagnostic interview. Eleven of these 20 identified GHQ-12 negative participants also had ICD-10 diagnosis. The observed point prevalence (i.e. all the ICD-10 diagnosis made over the total participants) from the study is therefore 29.2% (i.e. [71+11]/281)

<table>
<thead>
<tr>
<th>ICD-10 Diagnosis</th>
<th>Interview Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressive Episode (F32)</td>
<td>6</td>
</tr>
<tr>
<td>Generalized Anxiety Disorder (F41.1)</td>
<td>3</td>
</tr>
<tr>
<td>Somatisation Disorder (F45.0)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Diagnosis</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>
5.6 Summary Statistics of Weighted Prevalence and GHQ-12 Screening Validity Coefficients

Table 5.5 shows the summary statistics of weighted prevalence and GHQ-12 screening validity coefficients. The periodic weighted psychiatric morbidity prevalence rate is 64.8% (i.e. \([71 + 111] / 281\)) respectively. The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and misclassification rate of the GHQ-12 to the weighted SCAN diagnostic outcomes were 39.0%, 90.9%, 88.8% and 44.8% respectively.
### Table 5.5 – Summary Statistics of Weighted Prevalence and GHQ-12 Screening Validity Coefficients

**a) No. of people in each stage of assessment**

<table>
<thead>
<tr>
<th></th>
<th>Test</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Scorers</td>
<td>( nh_1 = 80 )</td>
<td>( nh_2 = 80 )</td>
</tr>
<tr>
<td>Low Scorers</td>
<td>( nl_1 = 201 )</td>
<td>( nl_2 = 20 )</td>
</tr>
</tbody>
</table>

**b) Results of 2\(^{nd}\) stage assessment**

<table>
<thead>
<tr>
<th></th>
<th>Cases</th>
<th>Non-cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Scorers</td>
<td>( ah_r = 71 )</td>
<td>( bh_r = 9 )</td>
</tr>
<tr>
<td>Low Scorers</td>
<td>( cl_r = 11 )</td>
<td>( dl_r = 9 )</td>
</tr>
</tbody>
</table>

**c) Weighted Data**

<table>
<thead>
<tr>
<th></th>
<th>Non cases</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Scorers</td>
<td>( ah_r \times nh_1 = \frac{71 \times 80}{nh_2} )</td>
<td>( bh_r \times nh_1 = \frac{9 \times 80}{nh_2} )</td>
</tr>
<tr>
<td>Low Scorers</td>
<td>( cl_r \times nl_1 = \frac{11 \times 201}{nl_2} )</td>
<td>( dl_r \times nl_1 = \frac{9 \times 201}{nl_2} )</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted Prevalence</td>
<td>( (a+c) \times 100/(a+b+c+d) )</td>
<td>( = 64.8% )</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>( a \times 100/(a+c) )</td>
<td>( = 39.0% )</td>
</tr>
<tr>
<td>Specificity</td>
<td>( d \times 100/(b+d) )</td>
<td>( = 90.0% )</td>
</tr>
<tr>
<td>PPV</td>
<td>( a \times 100/(a+b) )</td>
<td>( = 88.8% )</td>
</tr>
<tr>
<td>NPV</td>
<td>( d \times 100/(c+d) )</td>
<td>( = 44.8% )</td>
</tr>
<tr>
<td>Misclassification</td>
<td>( (b+c) \times 100/(a+b+c+d) )</td>
<td>( = 42.6% )</td>
</tr>
</tbody>
</table>
5.7 Observed Prevalence of Psychiatric Morbidity among the Participants

Figure 5.3 shows the observed pattern (i.e. types) of psychiatric morbidity among the respondents. The most common diagnosis made is depression, followed by generalized anxiety disorders and then Somatisation disorders.

Figure 5.2 – The Observed Prevalence of Psychiatric Morbidity among the Participants
5.8 Sociodemographic Comparison of Respondents with Psychiatric Diagnosis

Table 5.6 shows the relationship between sociodemographic characteristics of the participants with psychiatric diagnosis compared to those without. Many of the respondents were less than 30 years old, but psychiatric diagnosis was more likely if the participants (49; 35.5%) were aged 30 years and above. This was statistically significant (p = 0.022). There is a significant relationship between psychiatric diagnosis and educational status of the respondents (p = 0.022). Infertile women who were more educated (i.e. secondary and tertiary) constituted about two-third of the participants in this study and had more psychiatric morbidity (62; 33.7%) compared to the one-third with primary education (20; 20.6%).

The infertile women who had been married for 19 years and above (14.2%), who accounted for one-seventh of the participants were also found to have more psychiatric morbidity compared to participants who had been married for less than 19 years of marriage. This finding is significant and implied that the longer the duration of marriage the more likely an infertile woman will develop psychiatric morbidity. Religious inclination of the respondents was also found to significantly contribute to the development of psychopathology, and majority of those affected were Christians (42.5%). The non-Hausas (13; 39.4%) had more psychiatric morbidity compared to the Hausas (69; 27.8%). This finding in the ethnic group of respondents however, did not significantly contribute to the development of psychopathology.
Table 5.6 – Sociodemographic Comparison of Respondents with Psychiatric Diagnosis (N=281)

<table>
<thead>
<tr>
<th>Variables</th>
<th>SCAN Diagnosis (n=82)</th>
<th>Nil SCAN Diagnosis (n=199)</th>
<th>$\chi^2$-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (Years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30 years</td>
<td>33 (23.1)</td>
<td>110 (76.9)</td>
<td>5.251</td>
<td>0.022*</td>
</tr>
<tr>
<td>30 years and above</td>
<td>49 (35.5)</td>
<td>89 (64.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islam</td>
<td>65 (27.0)</td>
<td>176 (73.0)</td>
<td>4.003</td>
<td>0.045*</td>
</tr>
<tr>
<td>Christianity</td>
<td>17 (42.5)</td>
<td>23 (57.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Educational Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>20 (20.6)</td>
<td>77 (79.4)</td>
<td>5.256</td>
<td>0.022*</td>
</tr>
<tr>
<td>Secondary/Tertiary</td>
<td>62 (33.7)</td>
<td>122 (66.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Duration of Marriage (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>48 (30.8)</td>
<td>108 (69.2)</td>
<td>9.446</td>
<td>0.009*</td>
</tr>
<tr>
<td>10-19</td>
<td>16 (18.8)</td>
<td>69 (81.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;19</td>
<td>18 (45.0)</td>
<td>22 (55.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hausa</td>
<td>69 (27.8)</td>
<td>179 (72.2)</td>
<td>3.445</td>
<td>0.328**</td>
</tr>
<tr>
<td>Igbo</td>
<td>3 (27.3)</td>
<td>8 (72.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoruba</td>
<td>7 (50)</td>
<td>7 (50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>3 (37.5)</td>
<td>5 (62.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*=p<0.05; **=Yate’s correction
5.9 Gynaecological Comparison of Respondents with Psychiatric Diagnosis

Table 5.7 shows the relationship between gynaecological characteristics of participants and psychopathological outcome (i.e. psychiatric diagnosis). Among those with psychiatric diagnosis, majority (36.9%) had secondary infertility, and it was not significant. Similarly insignificant were duration of infertility, causes of infertility and whether currently on treatment or not. Majority of those with psychiatric diagnosis relative to those without one had been infertile for almost a decade (31.2%), had known causes (32.6%) for their infertility and were majorly on surgical intervention (39.1%).
Table 5.7 – Gynaecological Comparison of Respondents with Psychiatric Diagnosis (N=281)

<table>
<thead>
<tr>
<th>Variables</th>
<th>SCAN Diagnosis (n=82)</th>
<th>Nil SCAN Diagnosis (n=199)</th>
<th>$\chi^2$-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Infertility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>51 (25.9)</td>
<td>146 (74.1)</td>
<td>3.458</td>
<td>0.630</td>
</tr>
<tr>
<td>Secondary</td>
<td>31 (36.9)</td>
<td>53 (63.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of Infertility (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>37 (32.7)</td>
<td>76 (67.3)</td>
<td>1.160</td>
<td>0.281</td>
</tr>
<tr>
<td>=/&gt;5</td>
<td>45 (26.8)</td>
<td>123 (73.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Causes of Infertility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>45 (32.6)</td>
<td>93 (67.4)</td>
<td>1.541</td>
<td>0.214</td>
</tr>
<tr>
<td>Unknown</td>
<td>37 (25.9)</td>
<td>106 (74.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment on</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td>4 (33.3)</td>
<td>8 (66.7)</td>
<td>6.531</td>
<td>0.221</td>
</tr>
<tr>
<td>Hysterosalpingography</td>
<td>10 (20.8)</td>
<td>38 (79.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical</td>
<td>25 (39.1)</td>
<td>39 (60.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>0 (0.0)</td>
<td>2 (100)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td>43 (27.7)</td>
<td>112 (72.3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.10 Resilience Characteristics of Participants according to Psychiatric Diagnosis

Table 5.8 shows the association between psychiatric (i.e. SCAN) diagnosis and resilience characteristics of the respondents. The mean resilience scores of all respondents was 72.0 (SD = 14.5). The Cronbach’s alpha coefficient for the RS-14 in these infertile women was 0.81 and it demonstrated a very high internal consistency in these participants. The mean resilience scores of infertile women with psychiatric diagnosis was 69.0 (SD = 14.9) and significantly lower for those without psychiatric diagnosis 73.3 (SD = 14.2). The comparison of resilience scores of participants with psychiatric diagnosis with those without was statistically significant (t = 2.259; p = 0.025) implying that women with low resilience scores were likely to develop psychiatric morbidity relative to those with high resilience scores.

Table 5.8 – Association between SCAN Diagnosis and Resilience Characteristics of Respondents (N=281)

<table>
<thead>
<tr>
<th>Resilience Score</th>
<th>SCAN Diagnosis (n=82)</th>
<th>Nil SCAN Diagnosis (n=199)</th>
<th>Total N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>19 (38.0)</td>
<td>31 (62.0)</td>
<td>50 (17.8)</td>
</tr>
<tr>
<td>Moderate</td>
<td>32 (19.5)</td>
<td>132 (80.5)</td>
<td>164 (58.4)</td>
</tr>
<tr>
<td>Low</td>
<td>31 (46.3)</td>
<td>36 (53.7)</td>
<td>67 (23.8)</td>
</tr>
</tbody>
</table>

Chi-square test = 18.767  P-value = <0.001*

| Mean             | 69.0                  | 73.3                      | 72.0       |
| Standard Deviation | 14.9                  | 14.2                      | 14.5       |

t-test = -2.259  P-value = 0.025*

* = significant at p<0.05
5.11 Social Support Characteristics of Participants according to Psychiatric Diagnosis

The social support characteristics of respondents are shown in Table 5.9. The mean social support scores of respondents was 11.5 (SD = 2.3). The Cronbach’s alpha coefficient for the Oslo Social Support scale in this study was 0.56 demonstrating a relatively low but acceptable internal consistency. The mean social support characteristics of respondents with psychiatric diagnosis was 10.9 (SD = 2.8) and lower when compared to the mean score of 11.7 (SD = 2.0) of those without psychiatric diagnosis (11.7). This relationship was statistically significant (t = 2.259; p = 0.005) and depicted an implication that infertile women with low social support characteristics were likely to develop psychiatric morbidity.

**Table 5.9 – Association between SCAN Diagnosis and Social Support Characteristics of Respondents (N=281)**

<table>
<thead>
<tr>
<th>Social Support Score</th>
<th>SCAN Diagnosis (n=82)</th>
<th>Nil SCAN Diagnosis (n=199)</th>
<th>Total N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>43 (24.9)</td>
<td>130 (75.1)</td>
<td>173 (61.6)</td>
</tr>
<tr>
<td>Moderate</td>
<td>18 (28.1)</td>
<td>46 (71.9)</td>
<td>64 (22.8)</td>
</tr>
<tr>
<td>Low</td>
<td>21 (47.7)</td>
<td>23 (52.3)</td>
<td>44 (15.7)</td>
</tr>
</tbody>
</table>

Chi-square test = 8.924  P-value = 0.012*

<table>
<thead>
<tr>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.9</td>
<td>2.8</td>
</tr>
<tr>
<td>11.7</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Mean = 11.5  Standard Deviation = 2.3

T-test = -2.853  P-value = 0.005*

*= significant at p<0.05
5.12 Multivariate Analysis of Predicting Variables (Table 5.10)

Simultaneous multiple regression analysis was conducted to investigate the most important predictors of psychiatric diagnosis when the combination variables were the statistically significant age group, religion, duration of marriage, educational status, resilience and social support characteristics of the participants. The multiple regression coefficient (R) was 0.311 with an R squared ($R^2$) value of 0.097. The ANOVA (F) was 4.174 and significant ($p = <0.001$). The significant ANOVA implied that all these predictors combine together to significantly predict the development of psychopathology. The beta coefficients are presented in Table 5.10. Educational status and social support were the two variables that significantly predicted the development of psychopathology when all the seven variables were included. The adjusted R squared value was 0.074. This indicates that 7.4% of the variance contributed to the making of SCAN diagnosis and was explained by the model. According to Cohen and Cohen, this was a significant effect.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>STANDARD ERROR</th>
<th>BETA</th>
<th>T-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.017</td>
<td>0.030</td>
<td>-0.056</td>
<td>-0.571</td>
</tr>
<tr>
<td>Marital duration</td>
<td>-0.006</td>
<td>0.005</td>
<td>-0.105</td>
<td>-1.143</td>
</tr>
<tr>
<td>Religion</td>
<td>-0.086</td>
<td>0.095</td>
<td>-0.066</td>
<td>-0.908</td>
</tr>
<tr>
<td>Education</td>
<td>-0.158</td>
<td>0.061</td>
<td>-0.165</td>
<td>-2.609*</td>
</tr>
<tr>
<td>Resilience</td>
<td>0.003</td>
<td>0.002</td>
<td>0.103</td>
<td>1.617</td>
</tr>
<tr>
<td>Social support</td>
<td>0.030</td>
<td>0.013</td>
<td>0.154*</td>
<td>2.429*</td>
</tr>
<tr>
<td>Constant</td>
<td>1.610</td>
<td>0.198</td>
<td></td>
<td>8.122</td>
</tr>
</tbody>
</table>

Note - $R^2 = 0.07$; $F = 4.16$; $p<0.05$;
B = regression coefficient; beta = standardized regression coefficient
CHAPTER 6

DISCUSSION

6.1 Summary of Findings

The present study was carried out in a clinical setting with more than four-fifths of the participants being Hausas. More than two-thirds of the respondents had primary infertility. The point prevalence of psychiatric morbidity in this study was 29.2% with a weighted prevalence rate of 64.8% projected onto the Kano infertile population. Depression was the most occurring diagnosis made. This study also found a relatively low sensitivity and moderately high specificity for GHQ-12. There was a significant relationship between psychiatric morbidity/non-morbidity and age, educational status, religion, the duration of marriage, resilience and social support characteristics of respondents. Regression analysis of the 6 predictor variables revealed educational status and social support as the two main contributors to the development of psychiatric morbidity in the study population.

6.2 Sociodemographic Characteristics

This study was carried out in a clinical setting in one of the Federal Teaching Hospital in North-western Nigeria. This hospital charges relatively higher for services rendered compared to those of state-owned general hospitals in the same region. Thus not many people from lower socio-economic status patronise this hospital. The skewed nature of these service users (i.e being in the
upper socio-economic class) might affect the findings related to the sociodemographic variables reported in this study.

Majority of the participants in this study group were Hausas. This finding is not surprising considering that the study took place in Kano, the most populous city in Northern Nigeria. This shows that the most predominant ethnic group of the study is Hausas. The presence of other Nigerian ethnic groups in the study is an indication of the diverse nature of Kano environs. This may not be unconnected with Kano being centre of commerce in Nigeria. The larger proportion of Muslims in this study is a further manifestation of the cultural enclave of most of the participants. This finding of larger proportion of Muslims participants in this study is in agreement with a recent study from Ilorin\(^30\) (57.5%) suggesting that the predominant users of Government Hospital facilities were the larger Muslim community characteristic of Ilorin and Kano environs. This observation also goes for the Benin\(^27\) study finding larger Christian participants, a reflection of the religious/cultural enclave of the Benin participants.

The participants mean age in this study was strikingly lower than that found in other studies conducted outside the North-western/North-eastern parts of Nigeria with mean age range of 32.8 – 34.9 years (34.5\(^{22}\) years from Ukpong and Orji in Ife, 32.8\(^{30}\) years from Makanjuola et. al. in Ilorin and 34.9\(^{28}\) years from Fatoye and colleagues in Ife). The study mean age was also lower but closer than that from South Africa (29.2 years). This difference may be accounted for by the early age of girls’ marriage common in northern part of Nigeria and highest in North-western zone\(^88\). The Population Council report corroborated this by documenting that 78% of girls in North-western Nigeria were married before the age of 18 years\(^88\).
The participants’ mean age of marriage was higher in our study compared to the Makanjuola et. al. Ilorin study\textsuperscript{30}. This difference further lends credence to the reported earlier age of girls marriage in the study setting of North-western Nigeria with mean age of marriage of 15.2 years\textsuperscript{5} compared to Ilorin, a North-central setting with higher mean age of marriage of 18.3 years\textsuperscript{5}. Both of these two regions mean age of marriage were even lower than that from Southern Nigeria with mean age of marriage of 20.9 years in South-south\textsuperscript{5}, 21.8 years in South-west\textsuperscript{5} and 22.8 years in South-east\textsuperscript{5}. Studies from Ghana\textsuperscript{34}, South Africa\textsuperscript{31} and the west\textsuperscript{15,48} were not particular about the mean age of marriage of their participants. However, the Iranian participants\textsuperscript{95} had a lower mean age (24.2 years) than in the current study subjects.

The number of respondents with longer years of formal education (i.e. 12 years and above) in this study is higher than expected. This high literacy recorded in this study is attributable to the skewness of patients patronising the hospital. It further explains the reason(s) and better attitudes of the participants for the search for solution to the problem of infertility. However, this high literacy level of 65.5\% is higher than that found in the Omoaregba et. al. (57\%) Benin\textsuperscript{27} study, and was also in contrast to the Demographic and Health Survey (DHS)\textsuperscript{5} report of a general low formal female education (4.6\%) in the North-western part of Nigeria. This study value in length of formal education is however lower than that found among the South African (86.6\%) participants\textsuperscript{31}. Nevertheless, having high level of education seems to be a health promotive factor for seeking treatment for infertility.

In this study, more than 60\% (i.e. major groups 11[students] and 12 [housewives]) of our participants were considered as labour without remuneration. This may be due to the fact that most women in North-western Nigeria were culturally expected to be dependent on their husbands. This is in contrast to the 2008 NDHS indicating a lower 38.6\% of women in Kano to
be unemployed compared to our study participants. It also contradicts the Ukpong (87.5%) Ife’s study\textsuperscript{22}, Makanjuola et. al. (51.9%) Ilorin study\textsuperscript{30} and Omoaregba et. al. (65.0%) Benin study\textsuperscript{27}, where most of the people seeking infertility treatment were gainfully employed. However, the fact that the hospital services are expensive, one may presume that most of the participants relatively belong to the upper socioeconomic class. Studies outside Nigeria did not include this among variables tested among their participants\textsuperscript{15,31,34,95}.

The sociodemographic variables showed a trend of relative decrease in infertility proportion as the women increases in chronological age as well as in their duration of marriage. This may be a factor associated with their fecundity. This similar pattern was also found in the Makanjuola et. al. Ilorin study\textsuperscript{30} and Omoaregba et. al. Benin study\textsuperscript{27}.

### 6.3 Gynaecological Characteristics

This study found primary infertility to be the most common type of infertility in the studied population. This is in contrast to the typical higher secondary/primary infertility ratio common in Africa compared to Asia, Latin America and the developed nations\textsuperscript{36}. This may be attributed to the fact that our study location (i.e. Northern Nigeria) is part of the world infertility belt\textsuperscript{6,7,36,88}, and that most of the participants had education period of 12 years and above. The same reason may also account for the reverse findings seen in studies from Ukpong’s study and Makanjuola et. al. Ilorin’s study which reported secondary infertility as the most common type of infertility. However, the Omoaregba et. al Benin study\textsuperscript{27} also found high rate of primary infertility compared to secondary infertility among their study population and was comparable to the
current study finding. The South African participants\textsuperscript{31} share a similarity with this study by having high primary infertility proportion (69.2\%) among their study population.

The mean duration of infertility in this study is higher than that found in the Makanjuola et. al. Ilorin study\textsuperscript{30} (5.4 years) and than the Iranian 5.5 years. The earlier age of marriage in North-western Nigeria may also account for this difference\textsuperscript{5}. The relative decrease in duration of infertility with increasing age noted in this study was also noted for the Makanjuola et. al. study in Ilorin study\textsuperscript{30}. This might be a function of decreasing fecundity rate with increase in chronological age.

The finding in this study that tubal factor is the commonest known cause of infertility is not surprising. This has been a consistent finding from studies around the world\textsuperscript{39,40} and Nigeria\textsuperscript{30} when causes of infertility were reported. Araoye\textsuperscript{89} in an epidemiological review of infertility, identified infection, which usually damaged the fallopian tubes, as the primary cause in 50-80\% of cases. Furthermore, Makanjuola et. al.\textsuperscript{30} added that the restrictive laws on abortion and the strong moral and religious doctrine against abortion in Nigeria might be implicated for most of the septic abortions responsible for a significant proportion of pelvic infections and fallopian tube damage. These complications of abortion arise because abortion is widely carried out by unqualified personnel. Also contributory to fallopian tubes damage from infections is the fact that indiscriminate sexual activity may lead to sexually transmitted infections and diseases. This is particularly important in Nigeria where there is early initiation of sexual activity (17.7 years for women and 20.6 years for men) before marriage\textsuperscript{5}. Also contributory was the high rate of teenage pregnancy especially in North-western Nigeria\textsuperscript{5} (9.9\%) compared to other zones with rate ranging from 1.5\% in South-south to 8.3\% in North-east. The high teenage pregnancy often
resulted in practice of unsafe abortion and thus the high tubal damage from the concomitant complication(s).

The commonest type of treatment modality that the participants had in this study was surgical intervention. This is not surprising considering that tubal factor is the commonest known cause of infertility in this and other studies\textsuperscript{30,39,40}. The management of fallopian tube damage is primarily surgical i.e. tubal reconstructive surgery. This from the work of Lalos and colleagues\textsuperscript{90} carried pre-operative fear and anxiety and post-operative depression. This treatment modality may contribute to development of psychiatric symptoms among infertile women, which is a major objective of this study. The high proportion of participants (55.0\%) in this study without any treatment makes a case for psychological intervention, which can be provided at any stage of the management of infertility. This on its own merits the inclusion of mental health practitioners into the infertility managing team.

\textbf{6.4 Prevalence and Pattern of Psychiatric Morbidity}

At 29.2\%, the prevalence of psychiatric morbidity in this study is much higher than in the normal Nigerian female population finding of 8.0\%, as reported in the 2002 – 2003 National Survey of Mental Health and Wellbeing\textsuperscript{96}. Thus infertility carries high psychiatric morbidity and hence increased suffering for this study population. This therefore supported Gureje and colleagues\textsuperscript{91} finding of a high level of unmet need for mental health services in Nigeria, for most if not all of this study participants’ psychosocial suffering were unidentified by the managing gynaecologists.
The prevalence of psychiatric morbidity in this study is lower than what was reported in western studies\textsuperscript{15,48} and in previous similar Nigerian studies\textsuperscript{22,26,27,28,30} reporting a range of 37.4\% to 59\%. Ukpong et. al.\textsuperscript{22} in 2006 reported a rate of 46.4\% in Ife which was higher than a later 2007 study by Fatoye et. al.\textsuperscript{28} reporting 39.9\% in the same environment. Coker et. al.\textsuperscript{26} in 2010 reported (37.4\%) a lower prevalence than the two Ife studies which were in the same South-western Nigeria region. The Lagos study, however differed from Ukpong et. al Ife study as the Lagos study was carried out in women with primary infertility alone, compared to the Ife study that studied women with both type of infertility. It seemed that the more the proportion of participants with primary infertility, the less the prevalence of psychopathology that will be reported. Other reasons for the decreased prevalence rate in the Lagos study, apart from Lagos being a cosmopolitan city seemed to have been echoed by Makanjuola et. al.\textsuperscript{30} as: better attitude to the problem of infertility; better rate of conception among those seeking treatment; and increased emphasis on quality rather than the number of children. All these and the fact that all the participants in the current study had formal education with more than two-third having 12 years and above educational period may account for the present study relatively lower prevalence rate compared to the Lagos and Ife studies.

The more recent studies from North-central by Makanjuola et. al.\textsuperscript{30} (in Ilorin) and South-south Omoaregba et. al.\textsuperscript{27} (in Benin) reported much higher rates than in all the above mentioned studies. Makanjuola et. al.\textsuperscript{30} reported a prevalence rate of 48.8\% in Ilorin and Omoaregba et. al.\textsuperscript{27} reported 59\% as the prevalence of psychiatric morbidity in Benin. Both studies contain higher proportion of secondary infertility compared to the present study and may contribute to the higher prevalence rates in them. The Ilorin study had a more appreciable sample size of 160 participants while the Benin study utilised 100 participants; and both studies’ samples were
smaller than in this study. The Ilorin study utilized a semi-structured instrument (Present State Examination [PSE]) while the Benin study used screening instrument (GHQ-28). The Ilorin study is comparable to the present study by the use of similar semi-structured instrument in both studies. The PSE is however the immediate preceding version of SCAN, and may be less reliable thereof. Furthermore, the Ilorin study is a one stage study unlike the current study that is in two stages. These differences may account for the lower prevalence in this study compared to the other Nigerian studies.

While taking note of all the above differences, it was still surprising to find this relatively low prevalence rate considering the fact that Northern Nigeria is part of the infertility belt of the world\textsuperscript{6,7,36}, and especially that the study took place in a culture where high societal value is placed on fertility. However, the low prevalence of psychiatric morbidity in this study may be expressing the socio-cultural view on infertility from majority of the participants who are Hausas that interpreted infertility as a divine decree upon themselves, rather than a self/socially induced disadvantage/loss\textsuperscript{92} common in southern Nigeria. The self disposition of loss/disadvantage often carried the risk of developing psychiatric morbidity. The view of majority of the participants can be deduced from the themes of popular Hausa literature and video film that centers on crime, violence, money, power, status, love and marriage\textsuperscript{93}. The southern Nigeria movies themes according to Aje and Abifarin\textsuperscript{94}, depicted women with all the aforementioned themes but also include child abuse, prostitution and particularly infertility and the plight of the barren women. The literature and movie themes were employed to explain this socio-cultural phenomenon because they are a ‘mirror’ of the society, for to watch a home movie is to gain insight into the attitudes and preoccupations of the average Nigerian\textsuperscript{94}. 

54
The most common type of psychiatric morbidity diagnosed in this study was depression, followed by Generalised Anxiety Disorders and then Somatisation disorders. This pattern of psychiatric morbidity goes contrary to studies in Western countries\textsuperscript{15,48,52} that identified adjustment disorder as the most common psychiatric disorder among infertile women unlike depression in this study. This may be the case for the western samples for they were recruited during the early phase of their infertility (i.e. infertility duration of less than 2 years), compared to our samples that had been infertile for 2 years and above. The finding of depression more commonly in the present study may imply that the participants might have progressed beyond the evolving stage of adjustment disorder through probable Post Traumatic Stress Disorder (PTSD) and currently in depression. This may be deduced from the current study that found more psychopathology among participants who were aged 30 years and above and of infertility duration of more than 10 years. However, this study pattern (i.e. types) of psychiatric morbidity agreed with other Nigerian studies that identified depression commonly among infertile women and then anxiety disorders\textsuperscript{22,26-28,30}.

The rate of depression in this study is lower than that reported in the Ilorin study (37.5\%)\textsuperscript{30} that utilised a semi-structured diagnostic interview as in this study in making their diagnosis. The finding of more psychopathology among the Ilorin participants may be due to having more people belonging to the lower socio-economic class, having more proportion of secondary infertility (78.2\%) which typically were commoner among the elderly infertile women and carries more psychopathologic risk than in those with primary infertility. Also, the Ilorin study had more people who had been treated (69.2\%) for their infertility compared to this study with the reverse. It has been shown in the review by Baxter and colleagues\textsuperscript{15} that treatment for infertility also carried risk for developing psychopathology.
The two Ife\textsuperscript{22,28} studies discussed earlier above, that used screening instruments also arrived at higher depression rate range (40.4% - 42.9\%) than in this study. This may also be accounted for by the high proportion of secondary infertility in their study population as well as the sociocultural view of the participants on infertility which have been described by Koster-Oyekan\textsuperscript{92} as self inflicted loss or disadvantage. The Lagos study by Coker et al.\textsuperscript{26} reported a depression rate of 22.0\% which is much lower than in Ife and Ilorin studies, but higher than in the present study. This might be explained by the fact that all the Lagos participants had primary infertility compared to the Ife and Ilorin studies. However, the higher rate of depression among the Lagos subjects compared to the current study might be due to the ongoing investigation they are under as at the time of data collection.

This study also reported a lower generalised anxiety disorder rate compared to the Ilorin study (11.3\%)\textsuperscript{81}. This similar finding but of higher rates was reported in the Ife\textsuperscript{22,26} and Lagos\textsuperscript{28} studies that used screening instruments for determining their anxiety disorder rate ranging between 37.5\% and 42.9\%. The detection of somatization disorders among this study population is a major difference of this study compared to previous Nigerian studies\textsuperscript{22,26,28,30}. This study rate is however smaller than an Iranian study\textsuperscript{95} that identified somatoform disorders (30.0\%) among their infertile women. This might be so for the Iranian study, though with apparent sound methodology, interviewed 100 infertile women (which is quite lower than this study participants size), and utilized a self-administered structured screening/diagnostic tool (PHQ i.e. Patient Health Questionnaire) rather than the interviewer semi-structured diagnostic instrument (SCAN) employed in the present study.
6.5 Contributors to Development of Psychiatric Morbidity

Findings from this study identified some variables role in the development of psychiatric morbidity. These variables were age group, type of religion, duration of marriage, educational status, resilience and social support characteristics of the participants. However, educational status and social support were found to be the most important contributors to the development of psychiatric morbidity and may therefore carry aetioologic attributes.

The age group of participants significantly contributed to the development of psychiatric morbidity. This is particularly so for women age 30 years and above, as increase in chronological age carried a corresponding decrease in fecundity. In addition to the decrease in fecundity is the reality of overwhelming failure in marital success which is measured in the number of children a woman had, especially in the Nigeria context. Also, peri-menopausal period have been associated with increase in psychiatric morbidity when compared with pre and post-menopausal periods. All these factors are expected to contribute to the development of infertility related psychiatric morbidity in this study population. This outcome presents a similar picture to that found by Makanjuola et. al among their Ilorin subjects aged 30 years and above, but this was not statistically significant.

Psychiatric morbidity was also more prevalent in women who had been married for more than 19 years. Apart from the shame and stigma of infertility, the women who had been married for longer years were also older, likely to have secondary infertility and also carried the risk of decreased fecundity. The combination of these issues might contribute to the development of psychiatric morbidity. This finding was in contrast to the Makanjuola et. al. Ilorin’s study that
reported more psychiatric morbidity (98.7%) among their participants who had been infertile for less than 19 years duration. The Ilorin study was however not statistically significant.

Religion is also one of the significant sociodemographic variables that contributed to the development of psychiatric morbidity in this study. Religion is often a major determinant of the socio-cultural view of a group of people and as explained earlier, Hausas often interpret infertility as a divine decree while the non-Hausa who were predominantly Christians rather viewed infertility as a self/socially induced disadvantage/loss. This finding is in agreement with the Omoaregba et. al. Benin study having more Christians with psychopathology compared to other faith groups. The Benin study is however not statistically significant in comparison with the current study.

The study also showed that infertile women with no psychiatric morbidity had high resilience characteristics compared to those with psychiatric morbidity. Wagnild and Connor et al. studies had shown that resilience is related to vulnerability and mental health indexes via particularly belief and spiritual values. Spirituality, according to Wagnild, is the most important aspect of resilience that keeps one's sense of purpose or meaning in life focused and goal-oriented. It is this ingredient that was believed to confer the protective factor and increase resistance against psychopathology. This finding agreed with Sexton et. al. study finding a negative correlation between resilience and infertility-specific distress, general distress and depression. Thus, checking the resilience of infertile women may help medical practitioner to differentiate between those needing resilience enhancing skills and therapy (i.e. saliostatic therapy) and those not needing it. It will further help in identifying the resilience activities and practices of the resilient individuals compared to the less resilient who are at risk of developing psychiatric morbidity. This would be an interesting area of study for future researches,
particularly for the fact that resilience seems stand at the core of the health promotive global policy of World Health Organisation\textsuperscript{98}.

Educational status is one of the two very important contributors to the development of psychiatric morbidity among these infertile women. Higher educational status (\(\geq 12\) years) that predominates in the study population and serving a contributory role in the development of psychiatric morbidity has been argued to be from several trends noticed in well educated infertile women. These trends were delay in age of first marriage (4 years more in educated female Nigerians than others without formal education)\textsuperscript{5}, delay in starting planned child birth\textsuperscript{22,27}, a difference in socialisation that emphasises rewarding life over the desire to have a child\textsuperscript{99}, female autonomy (as in autonomy through knowledge [exposure of women to the modern world]; decision-making autonomy; interaction with a wider social circle; emotional autonomy; and economic and social autonomy as in self reliance, and control over economic resources)\textsuperscript{100} and lastly high child mortality (has been found to be linearly related to female education)\textsuperscript{100}. These trends have been explained as motivational factors induced by education especially at secondary level and beyond. The consequent linear or non-linear relationship of high education to the development of infertility\textsuperscript{100} also contributed to the ensuing infertility-related psychiatric morbidity\textsuperscript{27,99}.

Another very important contributor to the development of psychiatric morbidity among the study population was social support. The social support characteristics of respondents with psychiatric diagnosis were lower compared to those without psychiatric diagnosis. This agrees with previous studies in Nigeria that identified specific social support variables like absence of support from husband and his relations\textsuperscript{30}, presence of discrimination against women\textsuperscript{30}, women paying for the
treatment by themselves\textsuperscript{22} etc as contributory social support factors to the development of psychiatric morbidity.

The impact of social support generally in health and illness is operationalised through the two pathways of biological and behavioural mechanisms\textsuperscript{101}. This is because social support biologically modifies the pro-inflammatory biomarkers like interleukin-6 (IL-6)\textsuperscript{102} and behaviourally motivates towards adoption of positive health behaviour and adherence henceforth\textsuperscript{103}. Thus social support will when positively present effect health promotion in various life situations and buffers the untoward effects of stressors that any individual may be going through\textsuperscript{104}. The pioneering research on the social causation of disease is from the study of Brown and Harris\textsuperscript{105}. Patel and colleagues\textsuperscript{106} in a review of social determinants of mental disorders identified social disadvantage and in the context of the current study low social support as parts of the determinants of mental disorder (depression). Thus social support works in tandem with educational status and of course with the other insignificant variables from the multivariate analysis as part causation of psychiatric morbidity among this study population.

Other variables in this study that did not significantly contribute to the development of psychiatric morbidity were ethnicity of the respondents, type of infertility, duration of infertility, causes of infertility and type of treatment modality the participant were on. All these do carry an increase in stress load for the infertile women with psychiatric morbidity despite being not significant. They however must be taken into consideration in the whole management of infertile women. This is because one previous study has found that the treatment modality\textsuperscript{90} that patients were on does contribute significantly to the development of psychiatric morbidity.
CHAPTER 7

LIMITATIONS, STRENGTH AND IMPLICATIONS OF STUDY

7.1 Limitations of study

1. This was a hospital-based study and the results obtained may not be representative of the general population. It is possible that most patients with infertility may not have presented to hospital in the first instance due to multiple factors and include educational and financial constraints.

2. This study was cross-sectional in design and any socio-demographic correlate does not imply causality. This was demonstrated by the outcome of the multiple regression analysis.

3. All participants had formal education which may make the generalisation more to the western educated female populace of Kano and its environs.

4. Psychosocial characteristics and associates were assessed by subjects’ self-report. Several factors may affect patients’ motivation to correctly identify or disclose their “psychosocial features”. Effort to reduce this was by the present study employing the use of performance measures (e.g. GHQ-12, Resilience Scale and Oslo Social Support Scale) that objectively clarify psychosocial characteristics of the participants.

5. Elements of bias could have been introduced into the study as a result of non-random selection of participants and inability to blind the investigator.

6. This study found a relatively low sensitivity and moderately high specificity for GHQ-12 at cutoff point of 2/3 implying that GHQ-12 may miss several infertile women with psychopathology. This cut-off point, the participants’ bias and the socio-demographic differences that exist among our participants and other infertile women attending the
infertility clinic and who did not participate in the study due to their non-proficiency in English language (an educational factor) and of being below the age of inclusion in the study may account for this.

7. The non-utilisation of a non-infertile group as a control group which previous studies in Nigeria did made use of. However, the repeated findings of higher psychopathology in infertile women compared to other gynaecological cases from previous studies make this study plausible.

7.2 Strengths of study
1. Several standardised instruments were used to assess psychosocial (i.e. resilience and social support) characteristics of the respondents.
2. Moderate sample size was used.
3. The determination of psychiatric morbidity by use of WHOSCAN
4. This study also provides validation for Resilience Scale and Oslo Social Support Scale among infertile women.

7.3 Implications of the Study
Infertility is a problem that occurs in one in 5 couples in Nigeria and 1 in two women attending gynaecological clinics in Nigeria. The rate of psychiatric morbidity among infertile women attending clinics in Nigeria ranges from 29.2% (current study) to 48.8%30, and yet psychiatric strategies and interventions emphasised from various researches and geared toward the identification and treatment of psychiatric problems among the infertile
population are seldom utilized in the clinical management of infertile women. The present study goes beyond previous studies in using structured instruments in identifying psychosocial characteristics which contributed to the development of psychiatric morbidity. This laid a foundation for the subsequent psychosocial interventional practices that are sensitive to the special needs of this infertile group.

The prevalence of fertility-related psychiatric problems is not likely to decrease in the near future. This is because the managing gynaecologists are not adept in recognising the psychosocial/psychiatric dynamics in this group and thus the consequent increase suffering for the infertile women. Therefore, it becomes paramount that gynaecologists be trained in the recognition of the warning signs of psychological risk factors through utilisation of screening instruments (e.g. GHQ-12) and for subsequent prompt referral for further psychiatric intervention(s). At best the creation of a multi-disciplinary team (psychiatrist inclusive) for the management of infertility will go a long way in reducing and perhaps eliminating the related psychiatric morbidity.

Finally, this study demonstrated that more than half of the participants were not on any form of medical intervention and thus further emphasised the need to include mental health team in the management of infertility. This is because psychological interventions which can be provided by mental health team is cheap and can always be applied at all level of infertility management.
CHAPTER 8
CONCLUSION AND RECOMMENDATION

8.1 Conclusions

About one-third of infertile women in this study had psychiatric morbidity with depression being the most prevalent diagnosis. Psychiatric Morbidity was significantly associated with low resilience, low social support, increasing age, being divorced, high educational status, religion, and longer duration of marriage. The associations that suggested aetiological relevance were higher educational status and low social support.

The study has significant implication for policy makers that about one-third of infertile women attending infertility clinic at Aminu Kano Teaching Hospital had psychiatric morbidity and that more than half of them are usually on no treatment modality. This emphasized the need to include mental health practitioners in the management of women with infertility in order to meet their unmet mental health needs.

8.2 Recommendations

1. Creating a multidisciplinary management team or consultation-liaison approach with a mental health team is ideal for the treatment of infertility.

2. Where the above is not feasible, training gynaecologists to employ simple screening tools (e.g. GHQ-12) to identify psychological distress as well as obtaining a history of common psychosocial stressors would aid early identification of psychosocial distress and inform prompt referral for psychiatric interventions.

3. A probable better option that the above two for the Nigeria context is to make robust the syllabus of undergraduate medical education that will facilitate earlier and better
identification of psychiatric symptomatology and subsequent early referral for psychiatric management.

4. Future studies should address the deficiencies of the present study by using a larger sample size and conducting a community study.

5. Specifically more studies are needed to determine more associates of psychiatric morbidity among infertile women by employing more standardized performance measures. This will pave way for proactive preventive and interventional (treatment) approaches to reducing psychiatric morbidity in this population.

6. Although not specifically investigated in this study, an integrated resilience enhancing therapy till its attainment (i.e. saliostasis) and social support therapy (i.e. sociotherapy) may possibly prevent and/or reduce psychopathology in patients with infertility.

7. Because of moderately high level of psychiatric morbidity among these infertile women, therapeutic counseling may be more effective if initiated before, during and after the infertility treatment. Thus, infertile women's present levels of distress and coping resources should be assessed at least prior to initiating infertility treatment to provide the patients with opportunities to learn and practice new adaptive behaviors that could enhance their ability to cope with infertility and the associated-distress of medical interventions.
REFERENCES


6. Emily McDonald Evens: A Global Perspective on Infertility: An Under Recognized Public Health Issue; 2004; on: http://cgi.unc.edu/research/pdf/Evens.pdf, browsed on 25-03-10 @ 10.00pm

7. Ulla Larsen: Infertility in sub-Saharan Africa, a paper presented at the international Quetelet seminar on the topic “Reproductive health in the developed and developing countries: From knowledge to action” at the Institute of Demography of the Catholic


11. Gerrity D. A.: A Biopsychosocial Theory of Infertility. The Family Journal; 2001; 9; 151 on http://tfj.sagepub.com/cgi/content/abstract/9/2/151 accessed on 04-02-2010 by 5.00 p.m.


Sociological Association; 2003, Atlanta Hilton Hotel, Atlanta, GA Online <.PDF>. 2009-05-26 from http://www.allacademic.com/meta/p107569_index.html browsed on 26-03-10


22. Upkong D. and Orji E. O.: Mental Health of Infertile Women in Nigeria. Turkish Journal of Psychiatry; 2006; 17(4)


36. **Centers for Disease Control and Prevention (CDC):** Infertility (Chapter 7) in Family Planning Methods and Practice: Africa. Second Edition. Atlanta, Georgia: United States Department of Health and Human Services, Centers for Disease Control and Prevention,
National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health, 2000; on:


39. Major causes of infertility (chart) undated on

http://www.babycentre.co.uk/preconception/suspectingaproblem/majorcauses/?_requestid=863647 browsed on 13-05-10

40. Causes of infertility; by Mayo Clinic Staff. On

http://www.mayoclinic.com/health/infertility/ds00310/dsection=causes browsed on 13-05-10


42. The Psychological Impact of Infertility and its Treatment, on


46. **Mahlstedt P.**: The psychological component of infertility. Fertility and Sterility; 1985; 43:335-346


56. Zimbardo P.: Discovering Psychology - health mind and behavior.wmv (updated);

Zimbardo P. series host, on

http://www.learner.org/discoveringpsychology/23/e23expand.html?pop=yes&pid=1520#
browsed on 30-05-10

57. Klock C. S.: Psychological Issues Related to Infertility; 2008; on


58. Meaney A. M. and O’Keane V.: Prolactin and Schizophrenia: Clinical Consequences of Hyperprolactinaemia - a Minireview; Life Sciences 2002; 71 979–992 on


73. Joanne Birchall: Sampling and Samples on:
   http://www.marketresearchworld.net/index.php?option=com_content&task=view&id=23&Itemid=1&limit=1&limitstart=2 pg 3 of 4; browsed on 06-0610


http://bjp.rcpsych.org/content/174/2/95.full.pdf, assessed on 22-01-2012.

http://bjp.rcpsych.org/content/174/2/95.full.pdf, assessed on 22-01-2012.


88. Child marriage briefing, Nigeria. Population Council; 2004; on;
http://www.popcouncil.org/pdfs/briefingsheets/NIGERIA.pdf


93. **Friniss G.:** Hausa popular literature and video film: the rise of cultural production in times of economic decline, 2003 on: [http://www.ifeas.uni-mainz.de/workingpapers/FurnissHausa.pdf](http://www.ifeas.uni-mainz.de/workingpapers/FurnissHausa.pdf), assessed on 14-01-2012.


95. **Anwar M., Meshkibaf M. H., and Kokabi R.:** Study of psychiatric disturbance in infertile women. Iranian Journal of Reproductive Medicine, 2006; 4:2; 73-75.


98. **World Health Organization:** WHO Mental Health Declaration for Europe; facing the challenges, building the solutions, 2005.

99. **Wischmann T., Stammer H., Gerhard I. and Verres R.:** Psychosocial characteristics of infertile couples: a study by the ‘Heidelberg Fertility Consultation Service’. Human


APPENDIX 1

INFERTILITY AND PSYCHIATRIC MORBIDITY AMONG FEMALES AT THE AMINU KANO TEACHING HOSPITAL, KANO, NIGERIA –

SOCIODEMOGRAPHIC/GYNAECOLOGICAL CHARACTERISTICS QUESTIONNAIRE

NOTE: if you are below 18 years of age and/or have had previous history of psychiatric illness PLEASE DONT FILL

1-PERSONAL DATA

Age [ ] year(s)    Marital status………    Duration of marital union [ ] year(s)

Religion ………    Educational Status…………. Occupation ………………………………………

2-CLINICAL DETAILS

Duration of infertility [ ] year(s)    Type of infertility [primary] [secondary]

3-CAUSE OF INFERTILITY (please specify)

Tubal Factors [ ]    Endometrial Factors [ ]    Myometrial Factors [ ]    Ovarian Factors [ ]
Hormonal Factors [↑prolactin] [↓oestrogen] [↓thyroid hormones]
Male Factors [Not Done] [Nil] [Azospermia]    Unknown [ ]    Others (specify please) ………

4-TREATMENTS/INVESTIGATIONS (please specify)

Medication ………    Radiologic ………    Surgical ………
Hormonal ………    Others …………    Nil Currently …………

80
GENERAL HEALTH QUESTIONNAIRE (GHQ-12)
We would like to know how your health has been in general, over the past few weeks.
Please answer the following questions by circling the number that best applies to you.

<table>
<thead>
<tr>
<th>Have you recently….</th>
<th>much less than usual</th>
<th>same as usual</th>
<th>more than usual</th>
<th>much more than usual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Been able to concentrate on whatever you are doing?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lost much sleep over worry?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felt that you were playing a useful part in things?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felt capable of making decisions about things?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felt constantly under strain?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felt that you couldn't overcome your difficulties?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Been able to enjoy your normal day-to-day activities?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Been able to face up to your problems?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Been feeling unhappy and depressed?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Been losing self-confidence in yourself?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Been thinking of yourself as a worthless person?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Been feeling reasonably happy, all things considered?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THE OSLO 3 ITEM SOCIAL SUPPORT INDEX (OSLO-3)

<table>
<thead>
<tr>
<th>How easy can you get help from neighbours if you should need it?</th>
<th>Very easy</th>
<th>easy</th>
<th>possible</th>
<th>Difficult</th>
<th>very difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many people are so close to you that you can count on them if you have serious problems?</td>
<td>none</td>
<td>1-2</td>
<td>3-5</td>
<td>5+</td>
<td></td>
</tr>
<tr>
<td>How much concern do people show in what you are doing?</td>
<td>a lot</td>
<td>some</td>
<td>uncertain</td>
<td>little</td>
<td>No</td>
</tr>
</tbody>
</table>
THE 14-ITEM RESILIENCE SCALE™ (RS-14™)

Please read the following statements. To the right of each you will find seven numbers, ranging from "1" (Strongly Disagree) on the left to "7" (Strongly Agree) on the right. Mark/Star the number which best indicates your feelings about that statement. For example, if you strongly disagree with a statement, click "1". If you are neutral, click "4", and if you strongly agree, click "7", etc.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>STRONGLY DISAGREE</th>
<th>STRONGLY AGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I usually manage one way or another</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I feel proud that I have accomplished things in life</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I usually take things in stride</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I am friend with myself</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I feel that I can handle many things at a time</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I am determined</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I can get through difficult times because I've experienced difficulty before</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I have self-discipline</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I sustain interests in things</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I can usually find something to laugh about</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>My belief in myself gets me through hard times</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>In an emergency, I'm someone people can generally rely on</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>My life has meaning</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>When I'm in a difficult situation, I can usually find my way out of it</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX II

CONSENT FORM

I am Dr Abiola Tajudeen, a resident doctor with the department of Psychiatry, Aminu Kano Teaching Hospital, Kano, conducting a study on ‘INFERTILITY AND PSYCHIATRIC MORBIDITY AMONG FEMALES AT THE AMINU KANO TEACHING HOSPITAL, KANO, NIGERIA’.

I would be very grateful if you would agree to participate in the project as a participant. All that is required of you is that, you will be administered four questionnaires; three initially, and the fourth, if you merit the criteria for further study.

Kindly sign in the space below if you are willing to participate. Participation is entirely voluntary, and refusal to participate will not affect you in any way. Those who are found to have psychiatric comorbidity will be referred for proper specialist evaluation and treatment. Information obtained in this study would be treated with utmost confidentiality.

THANK YOU SO MUCH FOR YOUR TIME

Name of client…………………………………..  Sign/thumbprint……………………..

Date………………………………….

Name of researcher……………………………… Sign………………………………

Date………………………………….