

**KNOWLEDGE, WILLINGNESS AND ACCEPTABILITY OF THE USE  
OF ASSISTED REPRODUCTIVE TECHNOLOGY AMONG  
INFERTILE WOMEN ATTENDING ADEOYO MATERNITY  
HOSPITAL, IBADAN, NIGERIA**

**BY**

**Ifunanya Precious IBEZUTE**

**B.Sc. (Ed) Health Education (University of Benin)**

**MATRIC. NO.: 203458**

A project in the Department of Health Promotion and Education submitted to  
Faculty of Public Health

In partial fulfillment of the requirement of the degree of

**MASTER OF PUBLIC HEALTH  
(POPULATION AND REPRODUCTIVE HEALTH)**

Of the

**UNIVERSITY OF IBADAN**

**MAY, 2019**

## ABSTRACT

Several reports indicate that infertility is the most frequent reason for gynaecological consultation in Nigeria. Medical advances have shown that most cases of infertility are treatable. All kinds of Assisted Reproductive Technologies (ARTs) have been introduced to eliminate infertility problems. There is dearth of information on the knowledge and willingness of women towards the use of ART. This study therefore investigated the knowledge, acceptability and willingness of the use of assisted reproductive technology among infertile women attending Adeoyo Maternity Hospital, Ibadan.

A descriptive cross-sectional survey was conducted among 200 consenting infertile women aged between 22-48 years attending the gynaecological clinic of Adeoyo Maternity Hospital. Respondents were selected through a systematic sampling method from the clinic records and the weekly appointment register in the gynecological clinic which was obtained from the staff. A semi-structured interviewer-administered questionnaire with six (6) sections and items was used to elicit information from the participants. Knowledge was measured on an 8-point scale; score  $\geq 4$  was classified as good,  $\geq 2.5-4$  as fair and  $< 2$  as poor. Data collected were analysed using descriptive statistics and Chi-square test at p value 0.05 level of significance.

The mean ages of the respondents were  $34.9 \pm 5.5$  years. 56% of respondents are within the ages of 31 - 40 years old and 15.5% were between the age group of 41 - 48 years old. Most of the respondents were Christians (66%) and 71% were Yorubas. Forty three percent were more willing to use IVF and 5.5% were likely to use gestational surrogacy. Factors identified by respondents for the non-uptake of ART included cost of procuring ART, religious beliefs, husband's permission, fear of side effect, risk and the family's permission to use ART. Religion had the major influence (92.5%) for non-uptake of ART. Overall level of knowledge of ART as a way to manage infertility was determined good with a mean score of  $4.5 \pm 1.5$  as 63.7% of respondents having good knowledge of ART as a way to manage infertility, 9.5% of the respondents had fair knowledge and 36.5 % poor knowledge.

This study established a good level of knowledge of ART as a way to manage infertility however, details of some of the procedure were not well known to the women attending this clinic. Years of experience of infertility was found to be significant towards willingness and

acceptability to make use of ART services. Based on the findings it is recommended that an educational intervention aimed at educating women on the benefits of different Assisted Reproductive Technology methods should be implemented at different religious institutions highlighting the success rate and risk involved to allow women make a better-informed decision.

**Key words:** Assisted Reproductive Technology, Infertility, Infertile Women.

**Word count:** 448

UNIVERSITY OF IBADAN LIBRARY

## DEDICATION

This work is dedicated to Almighty God for his love, mercy and abundant blessings bestowed on me throughout this programme, in him alone my hope is found.

UNIVERSITY OF IBADAN LIBRARY

## ACKNOWLEDGEMENT

My profound gratitude goes to God Almighty the giver of life who has enabled me to start and successfully complete this project despite many challenges, he alone deserves my praise.

My special thanks goes to my beloved parents Mr and Mrs Innocent and Abigail Ibezute, my siblings; Amaka Ibezute, Chukwudi Ibezute, Chidebere Anagor, Onyedika Ibezute and Chinonso Ibezute for their moral support and financial support put together to ensure the successful completion of this programme.

My special thanks goes to my supervisor Professor Oyedunni S. Arulogun for approving this project topic and my appreciation to Dr M.A. Titiloye who assisted my supervisor for a short period to guide, correct, support and encourage me during the course of this project.

I say thank you to all my lecturers, Dr O.E Oyewole, Professor O.Oladepo Professor A.J Ajuwon, Mr. John Imaledo, Dr F.O Oshiname, Dr Mojisola M.Oluwasanu Dr Yetunde O. John-Akinola, Dr I.O Dipeolu, and Mrs Adeyimka. T. Desmennu for the knowledge that they have imparted in me through the various course which they have taught me through the period of my academic study. I also say thank you to all non-teaching staff especially Mr Oyeyemi for his support.

I also want to acknowledge my friends and colleagues in the Faculty of Public Health especially Gloria Onuh for all your support. Thank you.

## CERTIFICATION

I hereby certify that this study was carried out by IBEZUTE Ifunanya Precious under my supervision in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan.

---

### Supervisor

Oyedunni S. Arulogun

B.Ed., M.Ed., MPH, Ph.D. (Ib), Dip HIV Management and Care (Israel),  
FRSPH (UK), CCST (Nigeria).

Professor

Department of Health Promotion and Education,  
Faculty of Public Health, College of Medicine,  
University of Ibadan, Nigeria.

## TABLE OF CONTENTS

### CONTENTS

	<b>PAGE</b>
Title page	i
Abstract	ii
Dedication	iv
Acknowledgement	v
Certification	vi
Table of Content	vii
List of Tables	x
List of Figures	xi
List of Appendices	xii
List of Abbreviations	xiii
Definition of Terms	xiv
<b>CHAPTER ONE: INTRODUCTION</b>	
1.0 Background to the study	1
1.1 Statement of the problem	2
1.2 Justification	3
1.3 Research Questions	4
1.4 Broad Objective	4
1.5 Specific Objectives	4
1.6 Hypotheses	5
<b>CHAPTER TWO: LITERATURE REVIEW</b>	
2.1 Overview of Infertility	6
2.1.1 Primary and Secondary infertility	7
2.2 Nature and extent of infertility as a public health problem	8
2.3 Aetiology of Infertility	9
2.4 Assisted Reproductive Technology	10
2.5 Knowledge of the use of ART in Nigeria	13
2.6 Acceptability towards the uptake of ART	14

2.7	Position of Religion in ART	15
2.7.1	Islamic Religion and ART	16
2.7.2	Roman Catholic and Religion	17
2.8	Conceptual frame work	18

### **CHAPTER THREE: METHODOLOGY**

3.1	Study Design	20
3.2	Description of the Study Area	20
3.3	Study Population	21
3.4	Inclusion and Exclusion criteria	21
3.5	Sample size determination	21
3.6	Sampling Procedures	22
3.7	Procedures for data collection	22
3.8	Instrument for data collection	23
3.9	Validity	23
3.10	Reliability	24
3.11	Data management and Analysis	24
3.12	Ethical Considerations	25

### **CHAPTER FOUR: RESULTS AND ANALYSIS**

4.1	Respondent's socio demographic characteristics	26
4.2	Respondent's awareness	33
4.3	Respondent's source of information on ART	33
4.4	Respondent knowledge of ART	36
4.5	Acceptability of the use of ART	38
4.6	Willingness towards uptake of ART	41
4.7	Factors that may be responsible for non-uptake of ART	43
4.8	Hypotheses Testing	45

### **CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATION**

5.1	Respondent socio demographic characteristics	49
5.2	Awareness and knowledge of ART	50
5.3	Acceptability and willingness to use ART	50
5.4	Factors responsible for non-uptake of ART	51



5.5	Implication of the study findings for health promotion and education	51
5.6	Conclusion	51
5.7	Recommendation	52
	References	53

UNIVERSITY OF IBADAN LIBRARY

## LIST OF TABLES

	<b>PAGE</b>
Table 2.1: A Summary of Data on Knowledge and Acceptability to use ART in Nigeria	14
Table 4.1: Respondents socio-demographic characteristics	27
Table 4.1.1: Respondents socio-demographic characteristics	31
Table 4.2: Respondents' awareness and Source of Information on ART	34
Table 4.3: Respondents level of awareness	35
Table 4.4: Respondents knowledge of ART	37
Table 4.5 Acceptability and willingness to use ART	38
Table 4.6: Factors that may be Responsible for Non-Uptake of ART	44
Table 4.7.1: Relationship between respondents' socio-demographic characteristics and their knowledge of ART	46
Table 4.7.2: Relationship between respondents' knowledge and acceptability of ART	47
Table 4.7.3: Relationship between respondents' socio-demographic characteristics and acceptability of ART	48

## LIST OF FIGURES

	PAGE
Figure 2.1 Precede model	19
Figure 4.1: Respondents ethnicity	28
Figure 4.2: Age group distribution of respondents	29
Figure 4.3: Respondents' years of child expectation	32
Figure 4.4: Sources of information on ART	35
Figure 4.5: Acceptability of the Use of Assisted Reproductive Technology	39
Figure 4.6: Acceptability of ART types	40
Figure 4.7: Respondents willingness towards the uptake of ART	42

UNIVERSITY OF IBADAN LIBRARY

## LIST OF APPENDICES

	PAGE
Appendix I: Informed consent English version	58
Appendix II: Informed consent Yoruba version	60
Appendix III: Questionnaire English version	62
Appendix IV: Yoruba version	67
Appendix V: Knowledge scale marking scheme	72
Appendix VI: Ethical approval	73

UNIVERSITY OF IBADAN LIBRARY

## **LIST OF ABBREVIATIONS**

**ART:** Assisted Reproductive Technology

**ICMART:** International Committee Monitoring Assisted Reproductive Technologies

**WHO:** World Health Organization

**IVF:** In Vitro Fertilization

**GIFT:** Gamete Intra Fallopian Transfer

**ICSI:** Intra Cytoplasmic Sperm Injection

**ZIFT:** Zygote Intra Fallopian Transfer

**CDC:** Center for Disease Control

UNIVERSITY OF IBADAN LIBRARY

## DEFINITION OF TERMS

**Infertility (Clinical Definition):** Infertility is a disease of the reproductive system defined by World Health Organization as the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.

**Assisted Reproductive Technology (ART):** ART is all treatments or procedures that include the in-vitro handling of human oocytes and sperm or embryos for establishing a pregnancy. This includes, but is not limited to IVF and trans-cervical embryo transfer, gamete intra fallopian transfer, zygote intra fallopian transfer, tubal embryo transfer, gamete and embryo cryopreservation, oocyte and embryo donation and gestational surrogacy (WHO/ICMART, 2009).

**In vitro fertilization (IVF):** IVF is an ART procedure that involves extra corporeal fertilization or fertilization where by an egg (or more than one egg) is retrieved from the body of a woman and combined with sperm outside the body to achieve fertilization and then implanted in the woman uterus (Reproductive technology council).

**Gestational carrier (surrogate):** This is a woman in whom a pregnancy resulted from fertilization with third party sperm and oocytes. She carries the pregnancy with the intention or agreement that the offspring will be parented by one or both persons that produced the gametes (ICMART, 2009).

**Gamete intra fallopian transfer (GIFT):** This is an ART procedure in which both gametes (oocytes and sperm) are transferred to the fallopian tube. So, fertilization occurs in the woman body (ICMART, 2009).

**Intra cytoplasmic sperm injection (ICSI):** It is an IVF procedure in which a single spermatozoon is injected through the zonapellucida into the oocyte (matured egg). Then the embryo is transferred to the uterus or fallopian tube (ICMART, 2009).

**Zygote intra fallopian transfer (ZIFT) or Tubal Embryo Transfer:** This is an ART procedure in which the zygote, in its pronuclear stage of development, is transferred into the fallopian tube not uterus (ICMART, 2009).

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 BACKGROUND TO THE STUDY**

The population of the world had been on the increase, evident by high fertility trends especially in developing countries. The joy of every marriage is for the couple to procreate and raise children of their own (Olugbenga, Adenike, Adebimpe, Olarewaju, Olaniyan and Olufemi, 2014). ‘As result of this, it is commonly argued that scarce health care resources and family planning activities should be directed towards fertility management in densely populated area where fertility rates are high’ (Hammarberg and Kirkman, 2013). It is true that there is a high fertility trend in the world but despite this the prevalence of infertility cases tend to be on the increase worldwide, particularly in Africa as reported from several African societies. In fact, an infertility belt has been described in Africa (Okonofua, 2003).

Infertility is a social and cultural problem that makes People Living with Infertility to seek solutions through different means. Infertility is a disease of the reproductive system which affects both men and women with almost equal frequency (Ali, Sophie, Iman, Khan, Ali, Shaikh, and Farid-ul-Hasnain, 2011). According to World Health Organization (WHO) infertility is defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. Infertility is seen, as a situation of diminished or absence of being able to produce offspring biologically, either in male or female (Akande, 2008).

In Nigeria, there is noted increase in the incidence and prevalence of infertility (Olugbenga et al, 2014; Oladeinde, 2009; Ashiru, 2008; Akande, 2008; Anate, 2006). Several reports indicate that infertility is the most frequent reason for gynecological consultation in Nigeria (Omotayo, Olajide, Adekunle, Hadijjat, Titilayo, Abayomi, and Ganiyu, 2017). More than 50% of gynecological caseloads are as a result of infertility consultations, and over 80% of laparoscopic investigations are for the management of infertility. (Omotayo et al, 2017).

Medical advances have shown that most cases of infertility are treatable. All kinds of Assisted Reproductive Technologies (ARTs) have been introduced to eliminate infertility problems. High technology options that aid conception are In vitro Fertilization (IVF), Gamete Intra Fallopian Transfer (GIFT), Trans cervical Embryo Transfer, Zygote Fallopian Transfer, Intra cytoplasmic Sperm Injection (ICSI) Gamete and Embryo Cryopreservation, Oocyte and Embryo Donation, and Gestational Surrogacy (Ikechebulu, 2013). It is estimated that approximately about 3.5 to 5 million children have been born worldwide following ART treatment (ESHRE, 2008). Assisted Reproductive technology has been reported to relieve more than 50 percent of infertility cases (Olugbenga et al, 2014). There are no accurate figures and proper documentation of success rates in many African countries, (Ajayi, 2012) but in Nigeria, this innovation has changed the prospect of thousands of married couples that were unable to have children.

Despite breakthroughs recorded from ART, several barriers limit accessibility to this technology including availability and affordability (Olugbenga et al, 2014). The level of awareness and knowledge are commensurately low despite reported high demand for ART brought about by high rate of infertility in Nigeria and many other developing countries. Hence, determining the level of awareness/knowledge and acceptability on ART treatment and factors influencing acceptability of the use of ART among women would be useful in sensitizing and planning public enlightenment programs on advance infertility and treatment

### **1.1 STATEMENT OF THE PROBLEM**

Infertility is a major public health problem. Globally, it is estimated that one in seven couples have problems becoming pregnant irrespective of the level of development in each country (Ali et al, 2011). Infertility rates among married couples in African countries range from 15% to 30% (Omotayo et al, 2017). Infertility is undeniably very significant among couples in Nigeria with the ratio of one to five (1:5) (Oladeinde, 2009). It has been described as the most important reproductive health concern of Nigeria women (Okonofua, 2003). Among the Nupes and Gwari, infertility rate is 10.5 percent, 10 percent among the Tiv, and 6.9 percent among the Chaamba (6.9) all in the Central zone of Nigeria. The rate is between 13.5 to 14.3



percent among the Hausa, Fulani and Kanuri respectively in the Northern zone. While, among the Igbos and other ethnic groups within the Eastern Zone including Cross River state, the percentages are 19.1 and 16 respectively. In the case of South Western Nigeria infertility rate is reported to be 14 percent (Oladeinde, 2009; Adegbola, 2007). In all, Nigeria's infertility rate is estimated to be 20 to 30 percent of total married couples (Anate, 2006). The estimation is higher than the reported cases (Oladeinde, 2009; Ashiru, 2008; Akande, 2008; Anate, 2006).

The availability of Assisted Reproductive Technology (ART) has ensured that infertile couples can address the problem using available technologies. Since its evolution over the last three decades, ART have resulted in the birth of more than five million children worldwide (International committee monitoring assisted reproductive technologies (ICMART), 2012). The advances in reproductive technologies have opened up new frontiers in medically assisted human reproduction as they have being used to assist many couples to achieve conception and parenthood (Adekile, 2012). National estimates indicate that 4.3% of all women who gave birth in Australia in 2014 received some form of ART treatment (AIHW, 2016) Success have being recorded from IVF in the whole of West, East and Central Africa which shows that ART are feasible and successful in a low resource settings were staff are trained and equipment are available (Ola, 2013; Kibwana, 2003).

While ART is available in Nigeria, cost of this service is a limiting factor to the widespread use. Although affordability of ART is major determinant of low use of ART in Nigeria, it is not the only factor. The level of awareness and knowledge of ARTs is still commensurately low despite breakthroughs recorded (Olugbenga et al, 2014), and also the issue of acceptance of ART due to culture and religion are also limiting factors to the widespread (Arowolo, Sunday, and Ayodele, 2014).

## **1.2 JUSTIFICATION OF THE STUDY**

In most African setting, parenthood is culturally mandatory and childlessness is socially unacceptable; this is because children are highly desired addition to the family and the society. The repercussions of infertility go beyond 'not just having a child of your own'. It is

associated with incomprehensible and immeasurable psychological and social consequences which impact more on the female (Adebiyi, Ameh, Avidime, Abdulsalam, 2011)

There are limited treatment options currently available for infertile couples (Olugbenga et al, 2014). The challenges associated with infertility have necessitated different health care-seeking behaviors ranging from spiritual, traditional/alternative health care to orthodox medical types.

The findings from this study will be useful in sensitizing and planning public health program for uptake of this modern infertility treatment, which has relieve the burden of more than 50% of infertility cases worldwide. It will also help identify the types of ART that individuals will be willingly to adopt and utilize if made available in this health institution and provide evidence for policy formulation and implementation for management of infertility problem through a new, effective and efficient technology.

### **1.3 Research Questions**

1. What is the knowledge of ART among infertile women attending Adeoyo Maternity Hospital?
2. What is the level of willingness to use ART among infertile women attending Adeoyo Maternity Hospital?
3. What is the level of acceptability of the use of ART among infertile women attending Adeoyo Maternity Hospital?
4. What are the factors influencing non- uptake of ART among infertile women attending Adeoyo Maternity Hospital?

### **1.4 Broad Objective**

The main objective of this study is to investigate the level of knowledge, acceptability and willingness to make use of assisted reproductive technology among infertile women attending Adeoyo Maternity Hospital, Ibadan.

### **1.5 Specific Objectives**

1. Assess the level of awareness and knowledge of ART among infertile women attending Adeoyo Maternity Hospital.

2. Determine the level of acceptability of use of various ART among infertile women attending Adeoyo Maternity Hospital.
3. Determine the level of willingness to use of various ART among infertile women attending Adeoyo Maternity Hospital.
4. Identify factors influencing non-uptake of use of ART among infertile women attending the Adeoyo Maternity Hospital.

### **1.6 Hypotheses**

1. There is no significant association between the socio demographic characteristics and their level of knowledge of ART.
2. There is no significant association between the knowledge of ART and acceptability of use of ART.
3. There is no significant association between the socio demographic characteristics and acceptability of use of ART.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Overview of Infertility

Inability to have pregnancy, maintain a pregnancy, carry a pregnancy to a live birth by woman (WHO, 2012) or conceive as expected affects men and women alike as both genders reported associated psychological distress, depression and low self-esteem (Chachamovich et al, 2010; Cui, 2010; Hollos, 2003) and it is a major public health problem with devastating consequences and has been described as an important reproductive health concern of women and a common reason for gynecological clinic consultations in Nigeria (Olugbenga et al, 2104). It has extends beyond the loss of human potential and unrealized self. As such, it is a cause of physical, social and verbal abuse of couples affected (Ola, 2013).

Individuals and couples are increasingly seeking the assistance of reproductive services to assist with fertility in circumstances where they are unable to bring their reproductive desires to fruition, such as when a viable other sex partner is not available or when thwarted by infertility (Dooley, 2014). Difficulty with conception, called infertility, is a common reason for young couples to present to their primary physician. Most experts define infertility as the inability to conceive after at least one year of unprotected sexual intercourse. As such women who are able to get pregnant but then have recurrent miscarriages are also said to be infertile (Davidova and Pechova, 2014). This term 'infertility' is used synonymously with sterility, infecundity, childlessness and sub fertility and are used both interchangeably and inconsistently (Mascarenhas, Cheug, Mothers and Stevens, 2012).

Black medical dictionary defines infertility as when a couple has not achieved a pregnancy after one year of regular unprotected sexual intercourse. Similar definition was provided by practice committee of the American society for Reproductive Medicine in 2013 (ASRM) as the failure to achieve a successful pregnancy after 12 months or more of appropriate timed unprotected sexual intercourse or therapeutic donor insemination. Prasanna (2010) stated that 24 months of trying to get pregnant by women are recommended as the definition for infertility. In the opinion of Gurunath et al 2011, definition of infertility differ, with demographers tending to define infertility as childlessness in a population of women of

reproductive age , while epidemiological definition is based on ‘trying for’ or ‘time to’ a pregnancy, generally in a population of women exposed to a probability of conception.

To provide further understanding of the concept of infertility, U.S Departmental of Health and Human Services sees infertility to means not being able to get pregnant after one year of trying or six months, if a woman is 35 years or older. ‘Women who can get pregnant but are unable to stay pregnant may also be infertile’. This is also in line with what CDC in 2015 defines infertility to be “not being able to get pregnant (conceive) after one year of unprotected sex”, therefore, it is advised that ‘women who do not have regular menstrual cycles, or are older than 35 years and have not conceived during a 6 month period of trying, should consider making an appointment with a reproductive endocrinologist- infertility specialist’

To further provide a clear view of the problem at hand, The World Health Organization (WHO) in 2013 defines infertility as follow: “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse (and there is no other reason such as breastfeeding or postpartum amenorrhea). Primary infertility is infertility in a couple who have never had a child. Secondary infertility is failure to conceive following a previous pregnancy. Infertility may be caused by infection in the man or woman, not often there is no obvious underlying cause”

The emotional, physical and financial cost borne by couples experiencing infertility can be substantial (Macaulso et al, 2010) and it has been found out that it has extended beyond just pregnancy or its absence, it has significant public health consequences including psychological distress (Baket et al 2012), social stigmatization, economic, constrains (Wu et al 2012) and later, the onset of adult disease in both men and women (Merritt et al 2013).

### **2.1.1 Primary and Secondary infertility**

Primary infertility is where a couple has never had children, or has been unable to achieve pregnancy after one year of having unprotected sexual intercourse (Davidova and Pechova, 2014). Mascarenhas et al 2012 sees primary infertility as the absence of a live birth for women who desire a child and have been in a union for at least five years, during which they have not used any contraceptives.

Secondary infertility is defined as the inability of a sexually active and non-contraceptive woman who had previously had a live birth to have a child despite cohabitation and the wish to become pregnant for at least 12 months (Alhassan et al 2014). In a comprehensive sentence, secondary infertility can be a situation where a couple have had children and achieved pregnancy previously, but are unable to conceive at this time, even after of having unprotected sexual intercourse.

The reason for infertility may involve one or both partners. These abnormalities or inability to conceive as at when dues are dependent on different factors which extends from natural, environmental, chemical to behavioral and health status of an individual. In the remaining 10%, no objective cause can be identified (Bovian Griffiths and Venetis, 2011; WHO, 2013).

## **2.2 Nature and Extent of Infertility as a Public Health Problem**

According to the WHO, globally, 48.5 million of reproductive ages are affected by infertility (Mascarenhas et al, 2012; WHO, 2010). Globally, it is estimated that one in seven couples have problems becoming pregnant irrespective of the level of development in each country (Ali et al, 2011). Infertility rates among married couples in African Countries ranges from 15% to 30% (Omokanye et al, 2017)

The infertility health condition is very common in Africa according to 2011 report from the World Health Organization (WHO). Infertility has recently been construed to be serious problem in Sub Saharan Africa, 'This problem seems to be viewed as of low priority with reference to the effective and efficient allocation of available health resources by national governments as well as by international donors sponsoring either research or service delivery in the public health sector (Akinloye, 2011). In Sub- Saharan Africa, the prevalence varies widely from 9% in Gambia and 11.8% in Ghana to 21.2% in north-western Ethiopia and 20% - 40% in Nigeria (Adewunmi et al, 2012). Africa thus shares a large burden of infertility due to its double burden of disease, and the inability to manage and treat sexually transmitted infections effectively and efficiently has been established scientifically to be a major contributing factor to infertility.

Infertility seems to be on the increase in Nigeria. It has been described as an important reproductive health concern of women and a common reason for gynecological clinic

consultation (Olugbenba et al 2014). As such, the prevalence of infertility in Nigeria has been study demographic graphic survey, epidemiological survey and clinical consultation. The management of the Nordiac fertility clinic, an assisted reproductive services center in Lagos, Nigeria reported in 2010 that over 40% to 50% of consultations in gynecological clinic in the country are done for infertility and that infertility affects 20%- 25% of married couples in Nigeria. This was in agreement with what Okunofua found out in 2005 that infertility is a major burden on clinical service delivery in the country, being more than 50% of gynecological caseloads and constituted over 80% laparoscopic investigation.

### **2.3 Aetiology of Infertility**

Different factors are contributing to infertility across the globe. Major risk factors infertility includes increasing age, obesity, and sexually transmitted infection (Dooley, 2014). Established and possible causes of infertility according to CDC in 2014 may include genetic abnormalities, aging and certain acute and chronic disease, behavioral risk factors (e.g. body weight, smoking) and exposure to certain environmental, occupational and infectious agent. A woman is most fertile in her early 20s. After age 35, the chance that a woman can get pregnant drops greatly (especially after age 40). The age when fertility starts to decline varies woman to woman (MedlinePlus.com). In terms of ovarian reserve, a typical has 12% of her reserve by age thirty and only about 3% at the age forty with 81% of variations reserve due to age alone (Wallace and Kelsey, 2010). As cited in Ekeh in 2011, analysis of the relationship between female age and fertility found that by age thirty, 7% of couples were infertile; by age thirty-five, 11% couples were infertile; by age forty, 33% were infertile and by age forty-five, 87% of couples were already infertile, thus making age as one of the single and most important factor in female fertility.

As online medical encyclopedia of Medline Plus and CDC 2014 outlined several factors to the cause of infertility, among these include inability of a fertilized egg or embryo to survive once it attaches to the lining of the womb (uterus), failure of the fertilized egg not to attach to the lining of the uterus, inability of eggs to move from the ovaries to the womb, problems resulting from the failure of ovaries to produce eggs, autoimmune disorders, birth defects that affect the reproductive tract, cancer or tumor, clotting disorders. Other contributing factors include diabetes, drinking too much alcohol, smoking, obesity, too much of exercise, eating

disorders or poor nutrition, growths (such as fibroids or polyps) in the uterus and cervix, medicines such as chemotherapy drugs, hormones imbalances, older age, ovarian cysts and polycystic ovary syndrome (PCOS), pelvic infection or pelvic inflammatory disease (PID), damages done to womb from sexually transmitted infection, abdominal surgery, surgery done to prevent pregnancy (tubal ligation) or failure of tubal ligation reversal (reanastomiasis), thyroid disease, physical and emotional factors (Medline Plus, 2014; CDC, 2014).

Environment and occupational hazards account for an unknown proportion of male infertility but are suspected causes of declining human sperm quality in industrialized countries (Rolland et al, 2013). One example of a recognized, preventable risk factor for infertility in women and men is untreated sexually transmitted infection (STI). In particular, infection with *Chlamydia trachomatis* increases the risk of pelvic inflammatory disease (PID) in women (Oakeshott et al, 2010) and if left untreated, according to Oakeshott et al, PID can cause structural or functional fallopian tube damage known as tubal factor infertility.

#### **2.4 Assisted Reproductive Technology (ART)**

According to Fathalla in 2002 “our human species is not exactly known for its willingness to comply with divine instruction. But when God said unto them ‘Be fruitful and multiply’, they were more than eager to comply. In achieving the mandate of Divine creation, majority of couples had no problem in conceiving as at when due and expected. A minority, however were distressed because of delay or inability to conceive and bring forth children (WHO, 2002). As such, medicine tried to help them to conceive naturally without assistance (Fathalla, 2002).

Over the last two decades, Assisted Reproductive Technology (ART) assists reproduction, increasing the chances of conception, diagnosis and embryo selection (Ola, 2011). Further into the future, ART allowed a better understanding of the early stages of human development and differentiation, and open up a new field of stem cell research, bringing a new hope for the treatment of certain serious diseases, for which no effective treatment is currently available (Fathala, 2002) and has rapidly increased and the number of countries



now practicing ART has multiplied many times and its now widely available in Asia, the Middle East, South America, and parts of Africa (Ola, 2013).

The first recorded experiment with artificial insemination in human occurred in the late 1700s when Scottish-born surgeon John Hunter impregnated a woman with her husband's sperm, resulting in successful pregnancy, and in 1884 American Physician William Pancoast performed a modified artificial insemination procedure when he injected sperm from a donor into a woman who was under anesthesia (Encyclopedia Britannica 2013). The woman, who was married gave birth to a baby nine months later and did not know that she has being impregnated with donor sperm. Her husband, whom Pancoast determined was infertile, later found out about the procedure from Pancoast. Later on, the birth of Louise Brown in 1979, through the technique of in vitro fertilization by Robert G. Edwards and Patrick Steptoe, was a path breaking step in control of infertility; it is in retrospect, considered as one of the most used ARTs that have over the last three decades into a suite of mainstream medical intervention that have resulted in the birth of more than five million children worldwide (ICMART 2012) and there has being a significant increase in the use of assisted reproductive technologies in many developed countries like Canada, making it an important medical advances of the last century.

Stanford in 2013 reported that the number of ART cycles (which are primarily in vitro fertilization [IVF] cycles) performed in the United States has increased from 99, 629 in 2000 to 163,039 in 2011, and ART procedures were used for more than 1% of total births in the 2011. The most recent national estimates indicate that 3.8% of all women who gave birth in Australia in 2011 received some form of ART (Macaldowie et al, 2011). This has led to the birth of 3.5 million babies worldwide with the aid of ARTs treatment (Sullivan 2010). This is evidence in it use in Australia, where about 3.3% of all babies born in 2008 (56,923 births) were a result of IVF (Sullivan, 2010) and many more were associated with ovulation assistance or artificial insemination.

Infertility is increasingly being overcome through advancements in fertility treatment in particular assisted reproductive technologies (ARTS), and through these assistance whether

minimal or high level, aims to optimize the chances of having singleton pregnancy and the birth of a healthy baby (AFP,2012).

Medicine net (2013) defines Assisted Reproductive Technology (ART) as group of different methods used to help infertile couples. Assisted Reproductive Technology (ART), according to WHO and ICMART (2008), is defined as ‘all treatment procedures that include the in-vitro handling of both human oocytes and sperm, or embryos, for the purpose of establishing a pregnancy’, ART works by removing eggs from a woman’s body. The eggs are then mixed with sperm to make embryos are then put back in the woman’s body.

Medicine net reports that success rates vary and depend on many factors. Some things that affect the success rate of ART include: age of the partners, reason for infertility clinic, type of ART, if the egg is fresh or frozen and if the embryo is fresh or frozen. According to the 2011 CDC report on ART, the average percentage of ART cycles that led to live birth were 39% in women under the age of 35, 30% in women aged 35-37, 21% in women aged 37-40, 11% in women aged 41-42. The report based on the CDC’s 2013 Fertility Clinic Success Rates Report shows that, there were 190,773 ART cycles performed at 467 reporting clinics in the United States during 2013 resulting in 54,323 live births (deliveries of one or more living infants) and 67, 996 live born infants. According to the CDC, of the 190,773 ART cycles performed in 2013, 27,564 were banking cycles in which the intent of the ART cycles was to freeze all resulting eggs or embryos for future use and for which none expectation of pregnancy or birth was approximately 1.5% of all infants born in the United States using ART.

Developing countries are no exception to this development, Ola in 2013 that various forms of ART are now available in Nigeria and other sub regions since the Lagos University Teaching Hospital team of Giwa-Osagie, Ashiru and Abisogun produced pregnancies through IVF in 1984, 1986 and a live birth in 1989 (Giwa-Osagie et al (1987). As such artificial insemination (DI), in-vitro fertilization [IVF], gamete intra fallopian transfer [GIFT], zygote intra fallopian transfer [ZIFT], intra cytoplasmic sperm injection[ICIS], embryo freezing and

embryo donation, surrogacy are now widely available in Nigeria, but in the hands of over 15 private hospital managers [Orhue, 2010].

Individuals and couples are increasingly seeking the assistance of reproductive services to assist with fertility in circumstances where they are unable to bring their reproductive desires to fruition, such as when a viable other sex partner is not available or when thwarted by infertility (Obuna, Ndukwe, Ugbonna, Ejikeme and Ugbonna, 2012).

### **2.5 Knowledge of the Use of Assisted Reproductive Technologies in Nigeria**

The last quarter of the 20th century has witnessed several major advances in reproductive medicine. One of the most widely publicized, celebrated and, at the time, controversial medical landmarks in this area was the birth, in 1978, of the first human baby resulting from in vitro fertilization (IVF) (WHO, 2002) and since then, IVF, one of the methods from in vitro fertilization (IVF) (WHO, 2002) and since then, IVF, one of the methods and procedures of assisted reproduction, has become a routine and widely accepted treatment for infertility (WHO, 2002). According to a study carried out by Olugbenga et al, 2014 among women attending gynecological clinic in tertiary institution in Osun state only 46% of the respondents were aware of ART. The same study also shows that healthcare workers in the clinic constituted about a third of the major sources of the women awareness on ART, revealing the fact that the use of Assisted Reproductive Technology practice is still low, especially in developing countries, Nigeria inclusive, where challenges of conception may continue as long as education and poverty reduction are not intensified (Olugbenga, et al, 2014). This could be attributed to the low proportion of those who knew about ART services or the benefits of the services to solving infertility issues in this region. In a study conducted in 2017 by Omokanye, et al, among infertile couples attending ART unit of the Department of Obstetrics and Gynecology, UITH, Ilorin, 87.3% were aware of ART services but this can be as a result that ART services were being provided.

## 2.6 Acceptability towards the Uptake of Assisted Reproductive Technologies

Davidova & Pechova in 2014 reports ‘that the use of ART has rapidly increased over the years, not only because of the current trend for postponing parenthood to a later age, but also due to so called medical tourism, increasing numbers of foreigners seek health care services, and assisted reproduction in particular in the Czech republic’. In the study conducted by Jimoh et al in 2011, ‘the willingness of respondent to utilize ART in general is good, however, there are gaps waiting to be filled in terms of factors that will influence the utilization and uptake of ART services, this include the cost of the treatment options as well as the ethical issues of regulation, gamete donation and surrogacy’. A study done in Enugu, south-eastern Nigeria, among medical students in 2008 showed that only 24 of 81 female respondents(29.6%) were willingly to accept donor semen should the need arise, and in Yaounde, Cameroon, only 19.6% of infertile respondent would actually accept donor the practice of artificial insemination if the need arose (Savage, 1992; Onah, Agbata and Obi, 2008; Ugwu, et al, 2014) and this has been seen as one of the cheapest ART procedures, ranging from about 50,000- 150,000 naira (US\$312.50 -937.50) (Ugwu et al, 2014).

In a study conducted by Adesiyun et al, in 2011, perception on babies conceived from assisted conception treatment revealed that 52% of patients interviewed could not comment if they are normal and natural babies. Majority of parents could not affirm if they will agree to the use of donor gamete or zygote for their treatment.

**Table 2.1 A Summary of Data on Knowledge and Acceptability to use Assisted Reproductive Technologies in Nigeria**

Author/ year of publication	Setting	Sample	Findings
Adesiyun, Ameh, Avidime and Muazu, 2011	Women attending fertility clinic in Zaria Nigeria	196	(76.5%) have heard of ART treatment. 92% agreed to use of ART; 29.3% agreed to oocyte donated; 64.7% said they do not know 18.0% would not mind the use of donor sperm; 78.7% patients do not know if they can.
Okwelogu,	Women attending	500	70(37.2%) accepted to undergo

Azuikelkechebelu and Nnebue, 2012	fertility clinics in Anambra, Nigeria.		IVF procedure; 79.7% rejected IVF, all rejected surrogacy.
Bello, Akinajo and Olayemi, 2014	Women seeking infertility treatment in Ibadan, Nigeria	307	59.3% would accept ART 59.3% would accept IVF as treatment; 37.8% would accept surrogacy as treatment; 35.2% would accept donor eggs and 24.7% would accept donor sperm.
Olugbenga et al, 2014	Women attending gynecological clinic in tertiary institution in Osun state	257	Only 46% of the respondents were aware of ART. About 73.5% of those that were aware would opt for it. 35% of those who rejected IVF claimed that the cost was high, 31.1% of them believed that only God gives babies while 18.9% was of the opinion that the procedure may fail. 25.6% believed ART babies are artificial babies.
Omokanye et al, 2017	infertile couples attending ART unit of the Department of Obstetrics and Gynecology, UITH, Ilorin	559	87.3% were aware of ART services. Less than half (48.8%) were aware of surrogacy while majority (85.7%) rejected the use of surrogate mother

### 2.7 Position of Religion in Assisted Reproductive Technologies

Religion and cultures of the various peoples control the lives and transactions of the various groups in Nigeria. The law, religion and culture of the Nigeria people seem to be in firm accord with the code of medical ethics as it relates to abortion and euthanasia (Odia, 2014).

As such the Nigeria Penal code regards euthanasia and abortion done (except done in order to save the life of the mother) as murder. This harmony between law, religion, culture and medical ethics, however does not apply to the medical practices of organ transplantation, assisted conception and its related practices and limb amputations (Odia, 2014).

### **2.7.1 Islamic religion and ART**

A different conclusion can be equal ethical merit, related to the different factors that contribute to undertaking ethical reflection. For instance, much consideration ART involves gamete and embryo donation, but in the Islamic tradition, where conceiving children and raising them in religious faith are particularly important values, so too is the integrity of a family's genetic lineage' (Dickens, 2002). Accordingly, in this context, gamete and embryo donation from outside a married couple is ethically unacceptable, but within a marriage artificial techniques may be employed to achieve pregnancy. According to Inhorn and Gurtin, (2012) religious considerations illustrate the paramount importance of practicing reproductive medicine according to Islamic Law but third party reproductive assistance is largely banned across the Sunni Muslim world, stretching from Morocco to Malaysia, making this prohibition widely relevant for infertile Muslim couples from many countries. As cited in Inhorn and Gurtin, (2012) Sunni Islam outlines in a seminal Fatwa (an authoritative religious proclamation issued by an esteemed religious scholar) the following:

- Artificial insemination with the husband's semen is allowed, and the resulting child is the legal offspring of the couple.
- In vitro fertilization of an egg from the wife with the sperm of her husband followed by the transfer of the fertilized embryo(s) back to the uterus of the wife is allowed, provided that the procedure is indicated for a medical reason and is carried out by an expert IVF physician.
- An excess number of fertilized embryos can be frozen through cryopreservation. The frozen embryos are the property of the couple alone and may be transferred to the same wife in a future frozen cycle, but only during the duration of the marriage contract.

- Sperm or gonads may be cryopreserved before exposure to radiotherapy or chemotherapy and used later in life by the same individual who has survived cancer treatment.
- Pregnancy in post-menopausal women is allowed using a woman's own cryopreserved embryos, oocytes, or in the future ovaries.

### **2.7.2 The Roman Catholic Church and ART**

In contrast, the Roman Catholic branch of Christianity limits acceptable human reproduction to natural intercourse between married couples, but may tolerate transfer of a donated ovum to an infertile woman's reproductive system for natural insemination there by her husband. So artificial conception may therefore be ethically available to a Muslim but not to an observant Roman Catholic Couple and ovum donation may be ethically available to a Roman Catholic but not an observant Muslim couple (Dickens, 2002).

In vitro fertilization has been a source of moral, ethical and religious controversy since its development. Although members of all religious groups can be found on both sides of the issues, the major opposition has come from Roman Catholic Church, which in 1987 issued a doctrinal statement opposing IVF on three grounds: the destruction of human embryos not used for implantation; the possibility of in vitro fertilization by a donor other the husband, thus removing reproduction from the marital context; and the severing of an essential connection between the conjugal act and procreation (Encyclopedia Britannica, 2013). It is of note that the Roman Catholic Church encourages and officially recognized gamete intra fallopian tube transfer (GIFT) as the only one of the ART for the infertility treatment (Ekeh, 2011).

Opinions of other vary and are salient on this matter, as many churches have been seen to encourage and establishes ART fertility clinic in Nigeria, for example, a discussion with the Fertility Specialist of Vine Branch Medical Centre, a hospital belonging to the Vine Branch International Church, located in Ibadan, confirmed the existence and the utilization of various ART procedures in their hospitals.

## **2.8 Conceptual Framework**

PRECEDE MODEL will be used in this study to explain human behaviours as related to knowledge, acceptance to use ART and factors influencing non acceptability of the use of ART as a way to manage infertility among infertile women.

### **Precede model**

This model provides a comprehensive structure for assessing health and quality of life needs of the populace and designing, implementing and evaluating health promotion and other public health programmers' to meet these needs. It was developed by Green, Kreuter and associates in 1970 and modified in 1999. The PRECEDE acronym stands for Predisposing, Reinforcing, Enabling Constructs in Education/Environmental Diagnosis and Evaluation.

### **Predisposing factors**

The characteristics of individuals such as age, educational level, knowledge, cultural beliefs, duration of infertility, religious belief that may affect the respondent knowledge and acceptance of the use of assisted reproductive technology

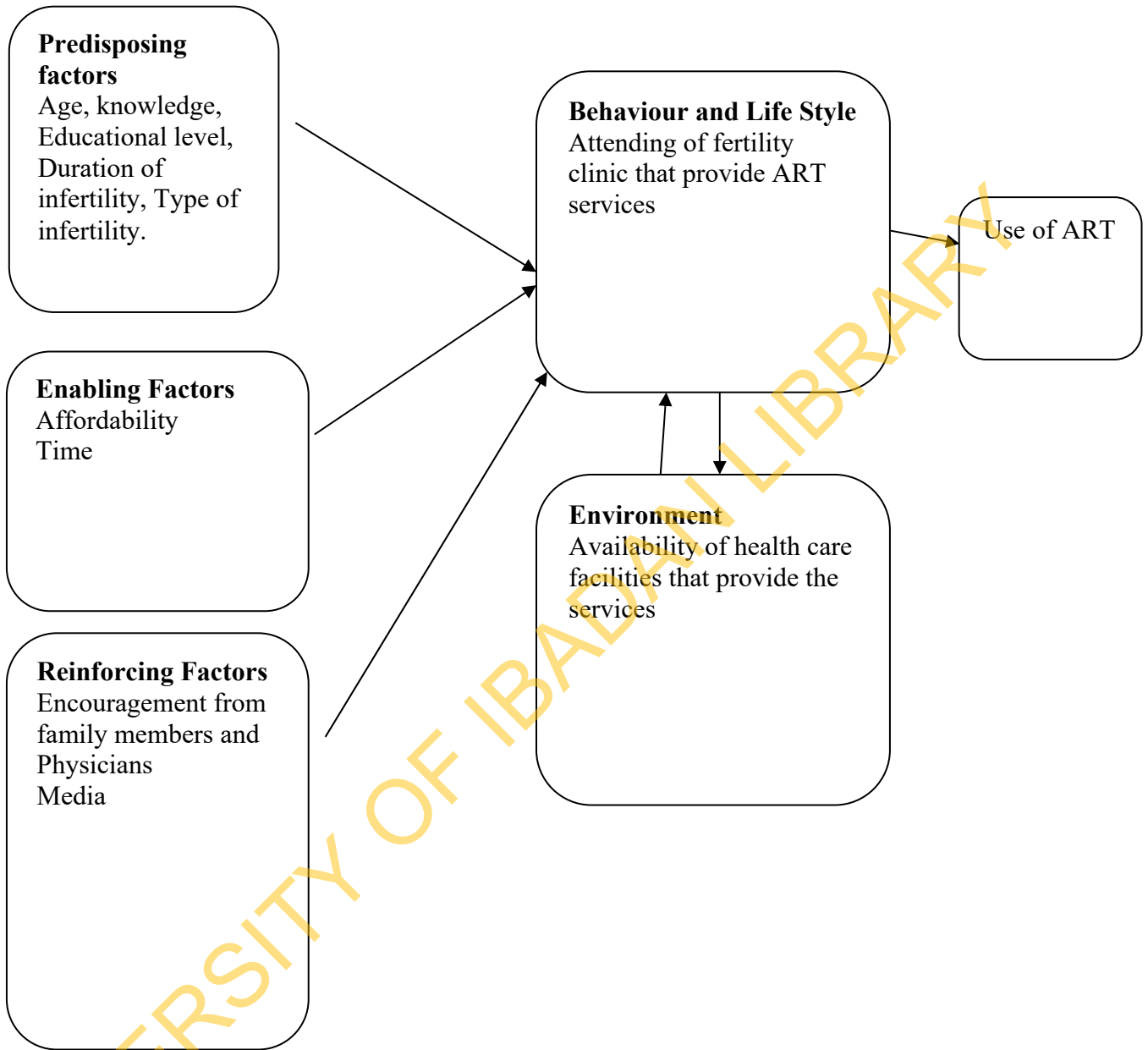
### **Reinforcing Factors**

The reinforcing factors include influence of significant others such as friends, peer groups, parents, mass media, acquaintances, contacts in schools and work place. Friends and peer pressure are relevant factors that can also influence the opinion and belief of the respondent about the use of ART.

### **Enabling Factor**

These are factors that enable people to act on their predisposition. They include money, availability of health care facilities that provide Assisted Reproductive Technology services.





Source: Modified from Green and Kreuter, 1999

**Figure 2.1 Precede model**

## CHAPTER THREE

### METHODOLOGY

#### 3.1 Study Design

A descriptive cross-sectional study, using quantitative research method was employed for this study and the study was carried out in Adeoyo Maternity Teaching Hospital gynecological clinic in Ibadan North Local government. The questionnaire measured the knowledge of infertile women on different assisted reproductive technologies that can be used to treat infertility; their level of acceptability and willingness of the use of assisted reproductive technology and factors that influencing non-acceptability of use assisted reproductive technology among infertile women.

#### 3.2 Description of the Study Area

This study was carried out among infertile women attending the gynecological clinic of Adeoyo Maternity Teaching hospital, located in Ibadan North Local government area of Oyo State. The hospital is located in south western Nigeria. Ibadan city has an area of 3,080 km square and a population of about 3,800,000 according to 2006. The hospital is state owned public health institution.

The hospital is highly patronized by Ibadan residents especially those of low and middle socio economic status. It also serves as referral center for many primary health centers and private clinic within Ibadan and its environment. Presently, the Teaching Hospital has clinical and non-clinical departments. The clinical departments include: gynecological wards, labor room, lying in ward I,II, III, antennal ward, immunization, post caesarean section ward, family planning, physiotherapy, main and minor theatre, Life-saving scheme (LSS), pharmacy, Medical records, Laboratory, X ray, sexually transmitted infection (STI) unit, casualty unit DOT (Tuberculosis) and leprosy clinic. The non-clinical departments also include the administration, account, laundry, crèche, electrical, maintenance, catering, tailoring, main medical store, zonal medical store and health education unit. It renders health care services that always attract highest number patients.

### 3.3 Study population

This study was carried out among women visiting the gynecological clinic especially for fertility issues and who were currently receiving care and utilizing the clinic medical care. The target population was women who were married and were within the age group of 20 and 50 years. Patients who attended routine appointment as stated by their consultants during the periods of 3<sup>rd</sup> September and 8<sup>th</sup> October 2018 were recruited into the study

### 3.4 Inclusion and Exclusion Criteria

#### Inclusion Criteria

This study included the following persons:

1. Women who have fertility related problems as reported by the patients themselves.
2. Women who gave consent
3. Women who were between the ages 20 and 50 years.

#### Exclusion Criteria

The study excluded:

1. Women who do not have fertility related problems as reported by patient themselves.
2. Women who did not give consent.

### 3.5 Sample Size Determination

The sample size was calculated using Leslie Kish (1965) formula

$$n = \frac{Z^2 pq}{d^2}$$

n = minimum sample size

Z = Standard normal deviation set at 1.96 normal interval

p = prevalence, 0.14 (Oladeinde, 2009)

q = proportions that does not have the characteristics being investigated (q = 1-p), q= 1-0.14= 0.86

d = Level of significance set at 0.05 (precision set at 5%)

Therefore, the sample size  $n = (1.96)^2 \times 0.14 \times 0.86$

$$0.05 \times 0.05$$

$$n = 184.$$

Therefore the minimum sample size N is 184 that is a minimum of one hundred and eight four respondent should be recruited after which a non response rate was calculated and the result shown below.

A non- response rate of 10% of 196:  $(184 \times 10) \div 100 = 18$

Sample size:  $184 + 18 = 202$

Eighteen (18) non response rates were then added to the calculated minimum sample in order to address any possible case of incomplete response.

Therefore the sample size was 202; of these 202 participants 2 did not answer the questions on willingness to make use of ART.

Survey for the remaining 200 participants were used for the final analysis

### **3.6 Sampling Procedure**

A probability sampling method was employed for this study. The study made use 200 out of 1000 women who utilized the gynecological clinic for infertility treatment in the hospital annually, and the respondent were selected through a simple random sampling method with the use of clinic records and the weekly appointments register in the gynecological clinic obtained from the clinical staff.

### **3.7 Procedure for Data Collection**

The following procedures were adopted recruitment:

First a consecutive number was assigned to every woman who came to the clinic on appointment, check up or treatment through the use of patients' card and receipts submitted to the clinic record officer on the day of data collection. An average of 20 patients visited the clinic on clinic days. The clinic runs from Monday through Thursday, making use of Mondays and Thursday for registration, data collection and booking of appointment for new patients while Tuesday and Wednesday used for consultations with gynecologist for those appointments as scheduled by their doctors. The register in which the patients' data were recorded during their visit to the clinic serves as a sampling frame.

Secondly, systematic sampling procedure was used to select the required number of women for the study. This was done by dividing the total number of women from the clinic register by the desired number of women to be selected A sampling interval of two (2) was gotten

hence, every second woman from the list of those who were presented on each day of the clinic till the desired sample size was achieved.

Therefore, women selected were briefed of the study and objectives. Eligible participants who refused to participate were replaced with other patients who consented and signed the consent for before administrations of instruments for data collection. Those who ask question where informed about its objective.

Data were collected by the researcher and her assistants, explanations were also provided to those who sought explanation on the various form of assisted reproductive technologies under investigation. An average of 10 respondents was interviewed daily for 5 weeks. Collection of data was carried out using these steps every day until the required sample size was achieved.

During the period of data collection, 255 women with infertility issues at the gynecological clinic were approached to participate in the study. Of this 255 persons contacted and invited to participate, 202 consented.

### **3.8 Instrument for Data Collection**

A semi-structured, pre-tested interviewer administered questionnaire was used as the tool for data collection. The questionnaire consist of five sections

Section A- Socio demographics of the respondent

Section B-Awareness and source of information on the use of Assisted Reproductive Technology.

Section C- knowledge questions on Assisted Reproductive Technology

Section D- Acceptability questions on the use of various Assisted Reproductive Technology methods,

Section E- Willingness towards uptake of the use of Assisted Reproductive Technology

Section F- Factors influencing non uptake of Assisted Reproductive Technology

### **3.9 Validity of Instrument**

There was an extensive review of literature to ensure appropriate content and face validity. Construct validity was also be ensured by making sure that variables in the theoretical framework are well represented in the instrument. The instrument was also subjected to

review by independent peers, supervisor and other experts in the department of Health Promotion and Education

### **3.10 Reliability of Instrument**

The reliability of the questionnaires was established before it was used. This was done as follow: first it was pretested among 10% of the total sample size (i.e. 20 respondents approximately) among women attending Gbagada General Hospital gynaecological clinic, Lagos state. The data collected during the pretest were analyzed and the Cronbach alpha coefficient was used to establish the questionnaire's reliability. In this approach, a coefficient score of 0.5 was adjudged to be reliable; the reliability increases as it approaches 1. In this study the Cronbach alpha coefficient score obtained was 0.7 indicating that it was very reliable.

### **3.11 Data Management and Analysis**

A serial number was written on each copy of the questionnaire for easy identification and recall of any instrument with problems for correction. Each of the administered copies of the questionnaire was checked and reviewed for purpose of completeness and accuracy. The data contained in the copies of the questionnaire was coded and entered into the computer. A template was designed on the Statistical Package for the Social Sciences (SPSS version 21) software for entry of the coded data. The data entered into the computer were analyzed using descriptive statistics such as mean, percentage and inferential statistics (Chi-square test, t-test and f-test at  $P = 0.05$ ). Respondents' knowledge was measured using a 16- point, scale. The knowledge of respondents was determined and their knowledge scores categorized as poor (0 to 6 points), fair (8 to 10 points) or good (12 to 16 points). For each of the section, on willingness and acceptability a score of 50% and above was regarded as good while a score below 50% was regarded as poor. Descriptive statistics was used to analyze variables such as socio demographics, chi square test was used to determine association between dependent and independent variables while regression analysis was used to measure factors influencing the non-acceptability of the use of assisted reproductive technology.

### **3.12 Ethical Consideration**

Ethical approval was obtained from the Oyo State Ethical Review Committee and Permission was also gotten from the Hospital Authority. Respondents were requested to sign the provided informed consent (see appendix VI) before they were interviewed. They were informed that participation in the study was voluntary and that they were not going to suffer any consequences if they choose not to participate.

The study was conducted in accordance to the stipulated ethical norms concerning the use of human participants in research. The research participants were informed of the following:

#### **1. Confidentiality of data**

That serial numbers and not names of participants were used to maintain confidentiality. The respondents were assured that their responses would be kept confidential and that the questionnaires would be kept safe in a locked cupboard. They were also told that research data in the computer system would be password-protected and accessible to the investigator only.

#### **2. Beneficence to Participants**

The study would not have a direct benefit to respondents. Participants were told that findings of the study would be forwarded to relevant stake-holders.

#### **3. Non-maleficence (non-harmful) to Participants**

The participants were told that the study is non-invasive and would not physically harm the participants. They were also told that there were some questions which respondents might find uncomfortable to answer as they might be related to their privacy.

#### **4. Right of decline/withdrawal from the study without loss of benefits**

Participants were informed that they were free to decide to participate or not to participate and that they could choose to discontinue at any point during the process of the interview. In addition they were informed that they would not suffer any adverse consequences whatsoever if they choose not to participate.

## CHAPTER FOUR

### RESULTS

#### 4.1 Respondent's socio-demographic characteristics

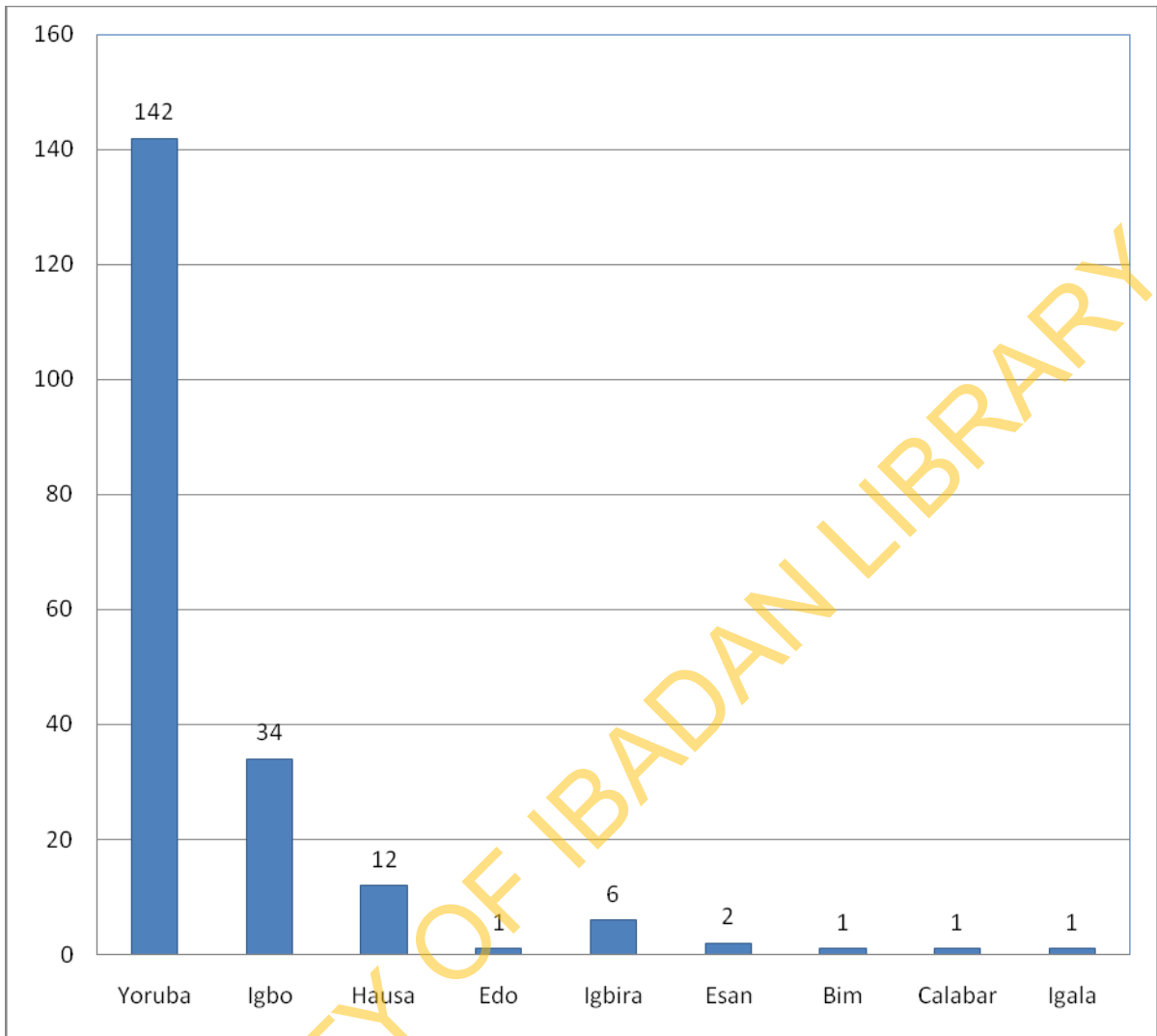
There were a total of two hundred (200) women interviewed for this study and the socio demographic profile of the respondents are described and presented in this chapter. There were one hundred and ninety seven (99.0%) married women in this study, there were no unmarried women for this study however, there were two (1%) divorced women in this study. Christianity is the most dominant religion among respondents (66%), Islam accounted for 34.0% of the respondents. Educational status of the respondents showed that most respondents had educational status higher than primary school, with 94 respondents having secondary and tertiary education each. Majority of the respondents (40.5%) are business women, followed by government workers (18.5%), Professionals (18.5%) and office workers (13.5%) (Table 4.1.1).

Majority of the respondents (71%) are of Yoruba ethnicity, followed by Igbo (17%), Hausa (5%), Igbira (2%) and Esan (1%), other ethnicity recorded for this study include: Edo, Bini, Calabar and Igala (Figure 4.1). The age of respondents ranged from 22 years to 48 years old with a mean age of  $35.0 \pm 5.50$ , more than half (56%) of the respondents are within the ages of 31 years and 40 years old while the least proportion (15.5%) fall between the age group of 41 years to 48 years old (Figure 4.1.1).

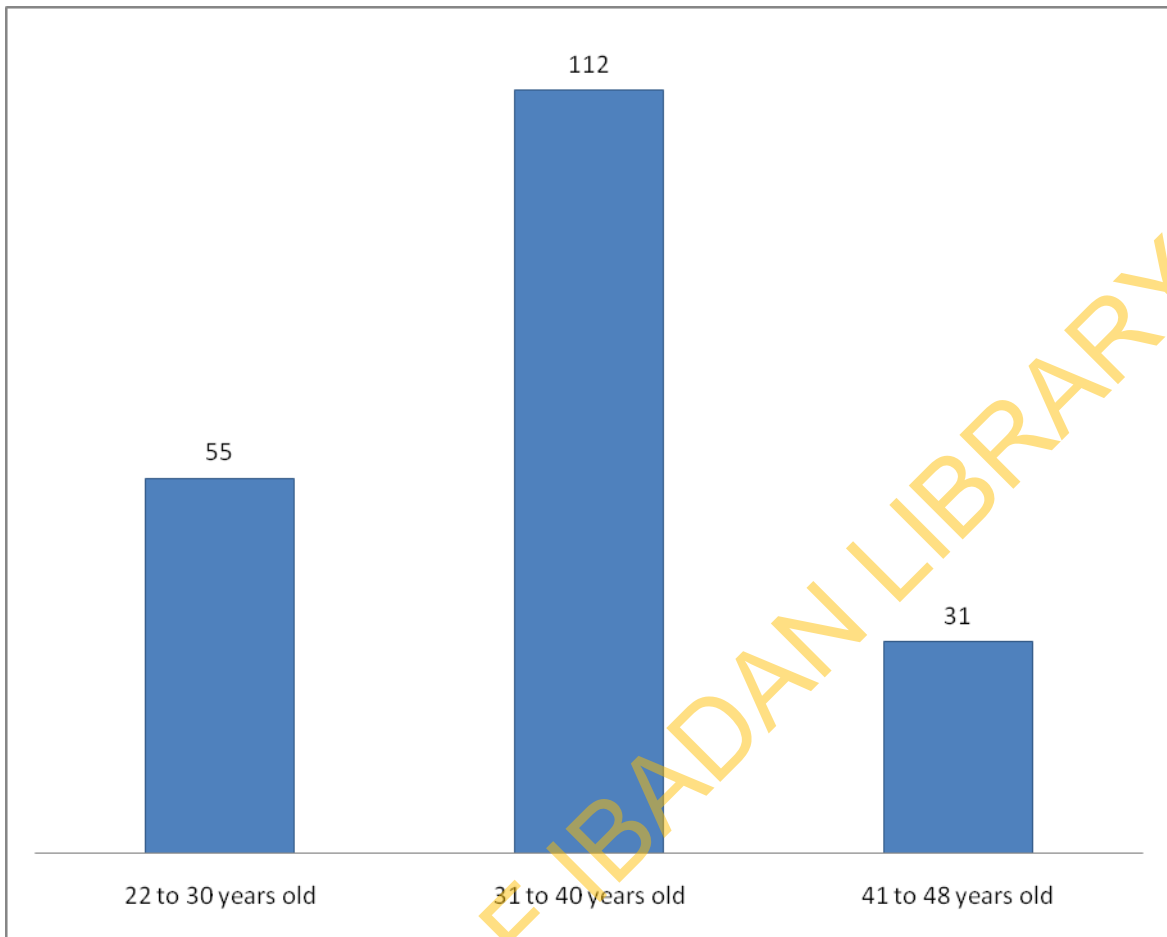


**Table 4.1: Respondent's socio-demographic characteristics****(N=200)**

<b>Variables</b>		<b>Frequency</b>	<b>Percentage</b>
<b>Marital status</b>	Single	0	0.0
	Married	198	99.0
	Divorced	2	1.0
<b>Religion</b>	Christianity	132	66.0
	Islam	68	34.0
<b>Education</b>	Primary	12	6.0
	Secondary	94	47.0
	Tertiary	94	47.0
<b>Occupation</b>	Government worker	37	18.5
	Office worker	27	13.5
	Business woman	81	40.5
	Farmer	3	1.5
	Student	3	1.5
	Professional	37	18.5
	Not employed	12	6.0
<b>Monthly income</b>	₦10,000 to ₦50,000	21	10.5
	₦50,000 to ₦100,000	59	29.5
	₦100,000 to ₦150,000	17	8.5
	₦150,000 to ₦250,000	99	49.5
	₦250,000 to ₦300,000	4	2.0



**Figure 4.1: Respondent's ethnicity**



**Figure 4.2: Age group distribution of respondents**

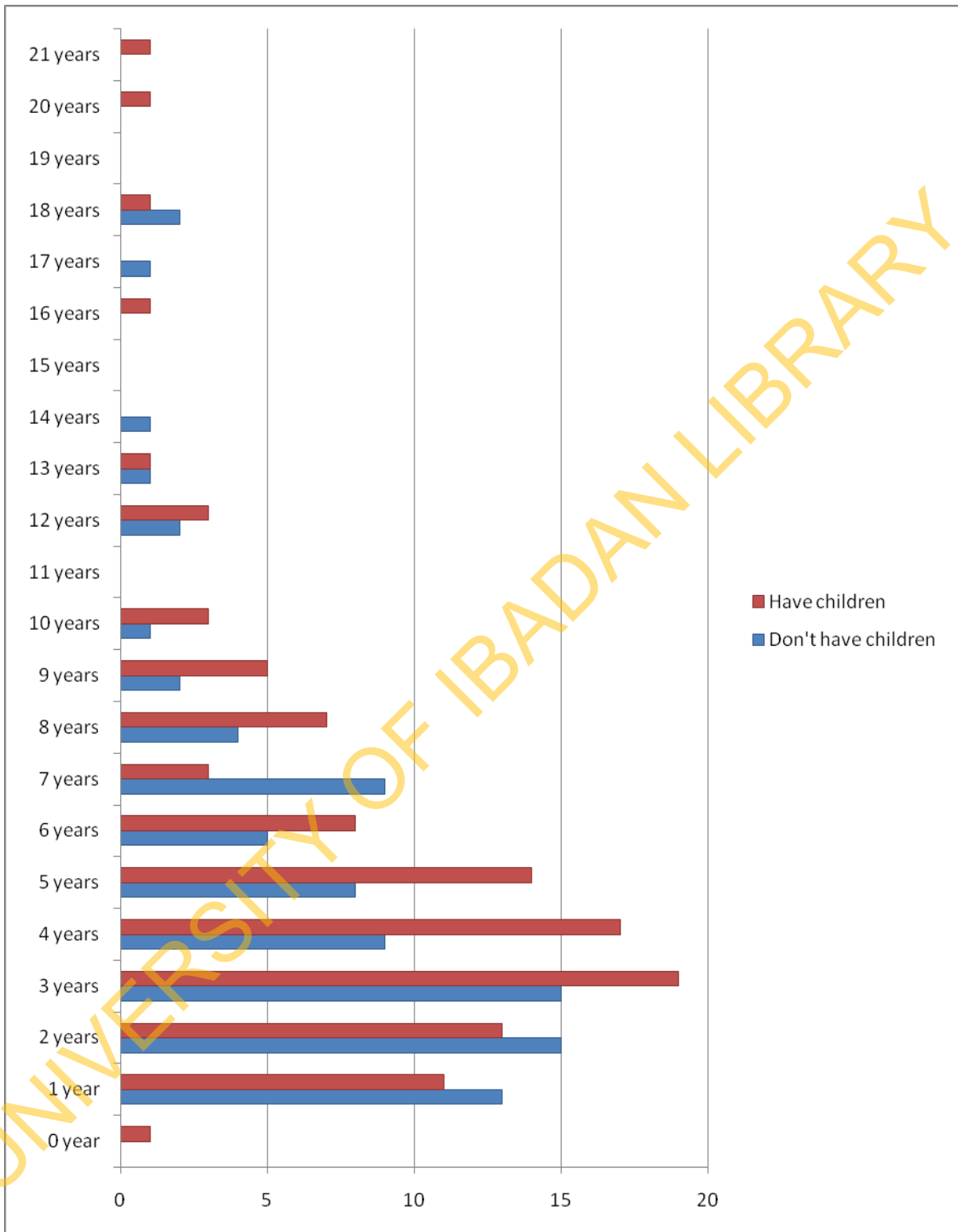
Many of the respondents (72%) have been married for 10 years and below while a smaller proportion of the respondents have been married more than 10 years. More than half of the respondents (51.5%) have had children, there are as much as 8 children to a mother, and however, 71.4% of respondents who have children have just a child each, and followed by twenty (17.9%) respondents who have 2 children each. Data shows that majority (61.5%) of the respondents have been visiting the fertility clinic repeatedly and not their first time coming to the clinic. Additionally, respondents have attended the facility clinics for as much as 9 times, although two respondents claimed to have been attending the clinics “*many times*” (Table 4.1.2).

Eighty eight (88) respondents do not have children and have been expecting children from between 1 year to 18 years, data showed that most respondents (17.0%) have been expecting children for 2 and 3 years. Also, for respondents who have children, expectation period is recorded to be as high as 1 to 21 years of expectations; furthermore most of the respondents (17.4%) have been expecting children for 3 years, followed by seventeen respondents (15.6%) who have been waiting for 4 years (Figure 4.1.3).

**Table 4.2: Respondent's socio-demographic characteristics (N=200)**

<b>Variables</b>		<b>Frequency</b>	<b>Percentage</b>
<b>Years in Marriage</b>	<10 years	145	72.0
	>10 years	55	27.5
<b>Do you have any child?</b>	Yes	105	51.5
	No	95	46.5
<b>Is this your first time coming?</b>	Yes	77	35.0
	No	123	61.5
<b>How long have you been coming?</b>	1 – 3	122	61.0
	4 - 6	68	34.0
	>7	10	5.0

UNIVERSITY OF IBADAN LIBRARY



**Figure 4.1.3: Respondent's years of child expectation**

#### **4.2 Respondent's awareness on Assisted Reproductive Technology**

Respondents awareness of Assisted Reproductive Technology (ART) was good with more than half (53.5%) of the respondent claiming “yes” to the question that “have you heard about assisted reproductive technology (ART) treatment before?”. When the respondents were asked “Do you know anywhere that they provide Assisted Reproductive Technology services around you?” majority of the respondents (78.5%) selected “no”. Respondents overall level of awareness was determined to be low, with a score of  $0.74 \pm 0.75$  (37%). Data revealed that 44% of the respondents have low level of awareness ( $< 0.8$ ) while 37% of respondents have a high level of awareness; however, 19% of the respondents recorded a very high level of awareness (Table 4.2.1).

The sources of information on ART was assessed and it was gathered that Radio (30.2%), Television (25.6%), health care providers (39.7%), friends (16.6%), books (1.5%), Family members (3.5%), Internet (16.1%) and Social media (19.1%) (Figure 4.2.1)

#### **4.3 Respondent's source of information on ART**

Many of the respondents (72%) have been married for 10 years and below while a smaller proportion of the respondents have been married more than 10 years. More than half of the respondents (51.5%) have had children, there are as much as 8 children to a mother, and however, 71.4% of respondents who have children have just a child each, and followed by twenty (17.9%) respondents who have 2 children each. Data shows that majority (61.5%) of the respondents have been visiting the fertility clinic repeatedly and not their first time coming to the clinic. Additionally, respondents have attended the facility clinics for as much as 9 times, although two respondents claimed to have been attending the clinics “*many times*”.

Eighty eight (88) respondents do not have children and have been expecting children from between 1 year to 18 years, data showed that most respondents (17.0%) have been expecting children for 2 and 3 years. Also, for respondents who have children, expectation period is recorded to be as high as 1 to 21 years of expectations; furthermore most of the respondents (17.4%) have been expecting children for 3 years, followed by seventeen respondents (15.6%) who have been waiting for 4 years.

**Table 4.2: Respondent's awareness**

(N=200)

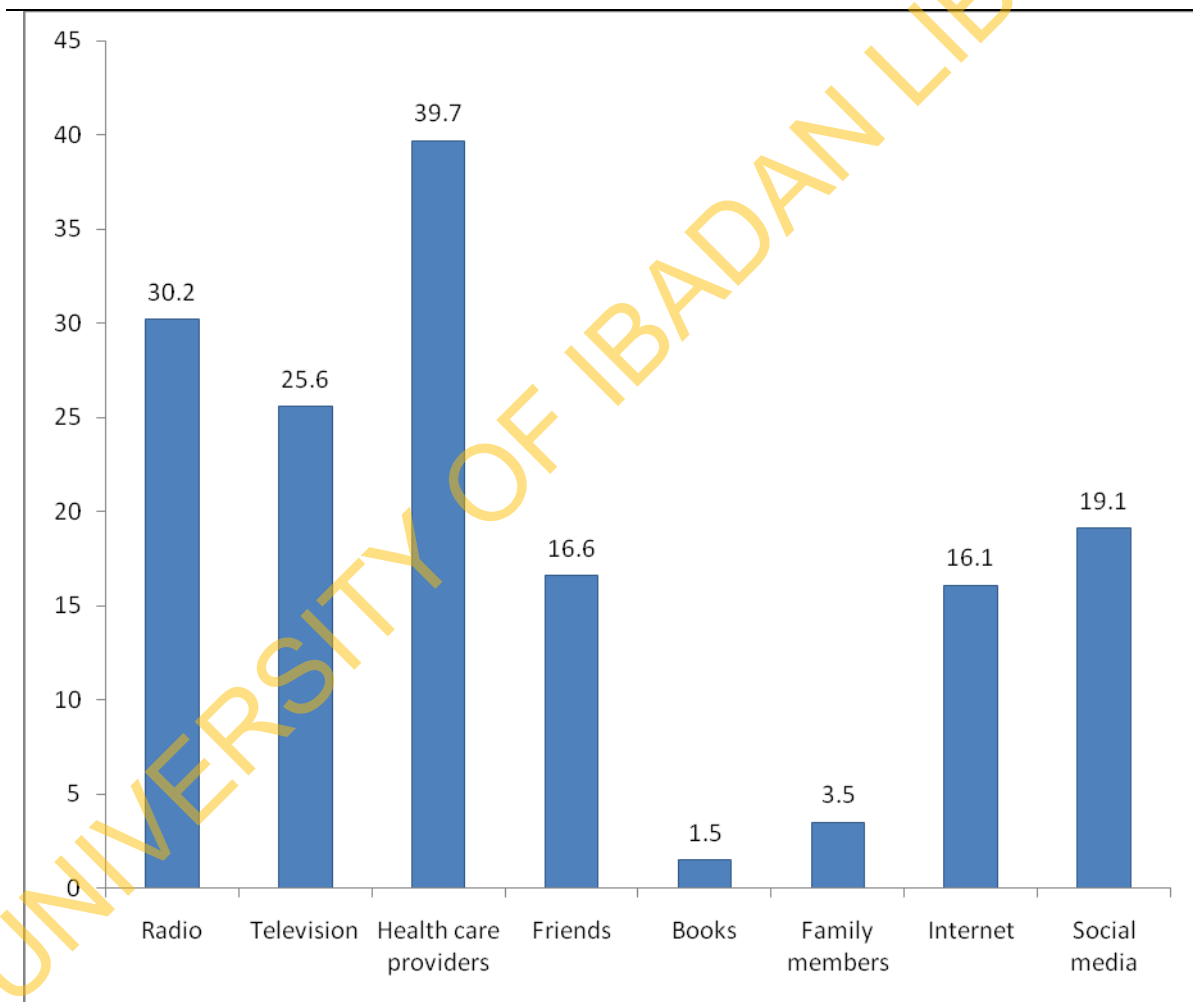
<b>Variables</b>	<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Heard about assisted reproductive technology treatment before?	Yes	107	53.5
	No	93	46.5
Do you know anywhere that they provide Assisted Reproductive Technology services around you?	Yes	60	30
	No	140	67.0

UNIVERSITY OF IBADAN LIBRARY



**Table 4.3: Respondent's level of awareness**

Level of awareness	Frequency	Percentage
Poor $< 0.8$	88	44
Fair $0.8 \geq < 1.16$	74	37
Good $\geq 1.16$	38	19



**Figure 4.2.1: Sources of information on ART**

#### 4.4 Respondent's knowledge of ART

Respondents were asked “assisted reproductive technology is used to manage infertility” and more than half of the respondents (52.5%) responded “yes”, a significant proportion of the respondents (46.5%) selected “don't know” when asked “assisted reproductive technology involved the handling of female egg and sperm in the laboratory to help conceive pregnancy” while 49.5% responded “yes”. More than half of the respondents responded “yes” that “gestational surrogacy is not a method use in assisted reproductive technology” while 43% responded “don't know”. Additionally, “assisted reproductive technology can be used to treat low sperm count in male” was claimed to be true by 28% of the respondents who selected “yes”, however, most respondents (67%) selected “don't know”. Most of the respondents (49%) did not know if “assisted reproductive technology involves having sexual intercourse to be able to conceive pregnancy”. Furthermore, when respondents were asked “in vitro fertilization involves fertilization of the female egg and sperm in the laboratory to form embryo and then inserted back into the woman's uterus”, most respondents (66.5%) claim they “don't know”. Finally, data showed that most respondents (64%) also “don't know” that “assisted reproductive technology sometimes use donated eggs or sperm” (Table 4.3.1).

Overall level of knowledge of respondents on ART was determined to be good with a mean score of  $4.5 \pm 1.5$  (63.57%). Additionally, 3% of the respondents had very poor knowledge of ART ( $< 2.1$ ), while 36.5% of the respondents had poor knowledge ( $2.1 \geq < 3.5$ ), there were 9.5% of the respondents who had good knowledge ( $3.5 \geq < 4.9$ ) and most of the respondents (47%) had very good knowledge of ART ( $\geq 4.9$ ) (Table 4.2.2).

**Table 4.4: Respondents knowledge of ART**

<b>Statement</b>	<b>Yes (%)</b>	<b>No (%)</b>	<b>Don't know (%)</b>
Assisted reproductive technology is used to manage infertility*	105 (52.5)	11 (5.5)	82 (46.5)
Assisted reproductive technology involve the handling of female egg and sperm in the laboratory to help conceive pregnancy*	99 (49.5)	8 (4.0)	93 (46.5)
Gestational surrogacy is not a method use in assisted reproductive technology **	109 (54.5)	5 (2.5)	86 (43.0)
Assisted reproductive technology can be used to treat low sperm count in male*	56 (28.0)	10 (5.0)	134 (67.0)
Assisted reproductive technology involves having sexual intercourse to be able to conceive pregnancy**	78 (39.0)	24(12.0)	98 (49.0)
In vitro fertilization involves fertilization of the female egg and sperm in the laboratory to form embryo and then inserted back into the woman's uterus*	57 (28.5)	10 (5.0)	133 (66.5)
Assisted reproductive technology sometimes use donated eggs or sperm *	62 (31.0)	10 (5.0)	128 (4.0)

\* **Correct statement**\*\* **Incorrect statement**

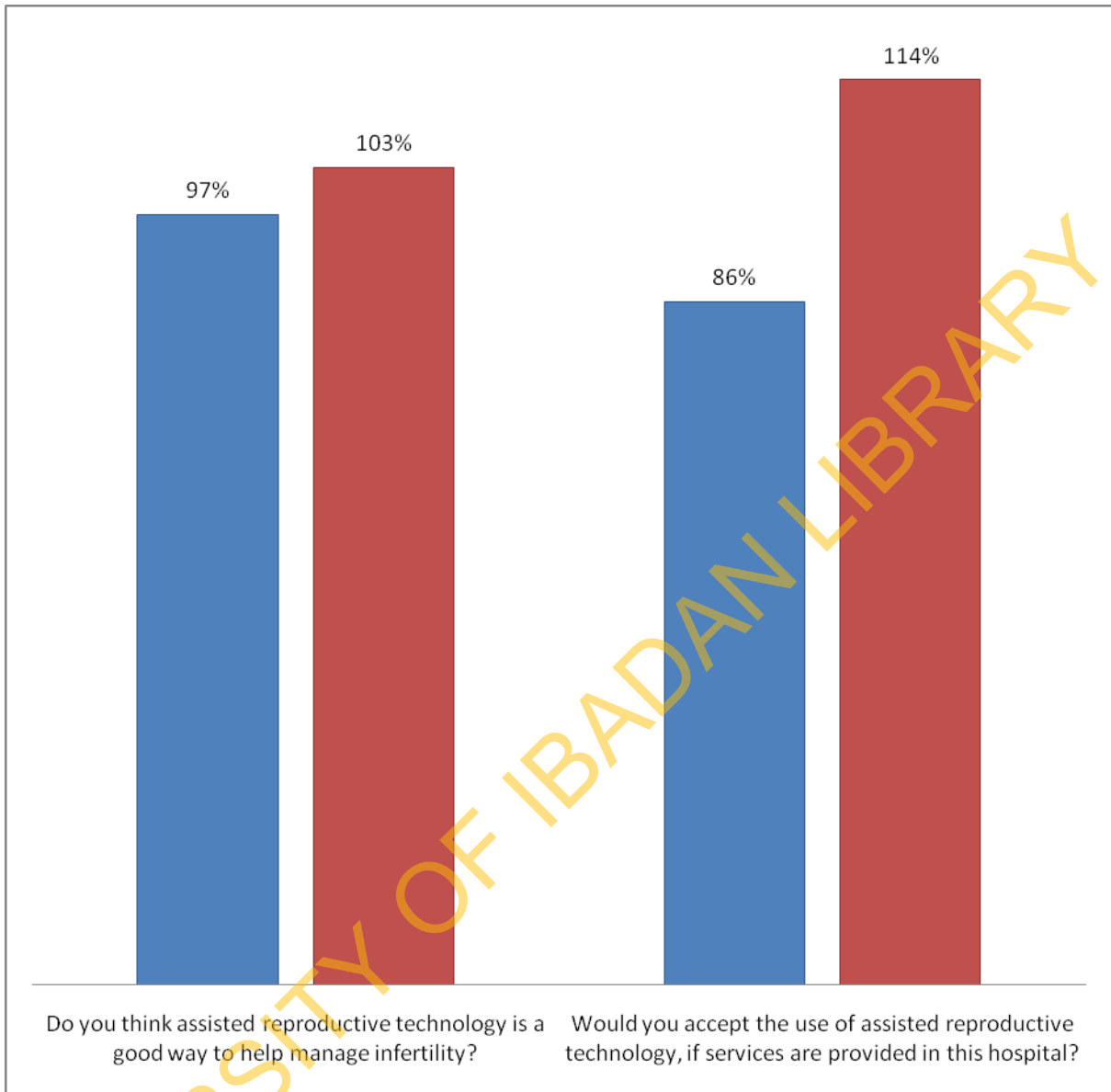
#### 4.5 Acceptability of the Use of Assisted Reproductive Technology

More than half of respondents (51.5%) responded “no” to the question asked that “do you think assisted reproductive technology is a good way to help manage infertility”, likewise, more respondents (57%) responded “no” to the question asked “would you accept the use of assisted reproductive technology, if services are provided in this hospital” (Figure 4.4.1).

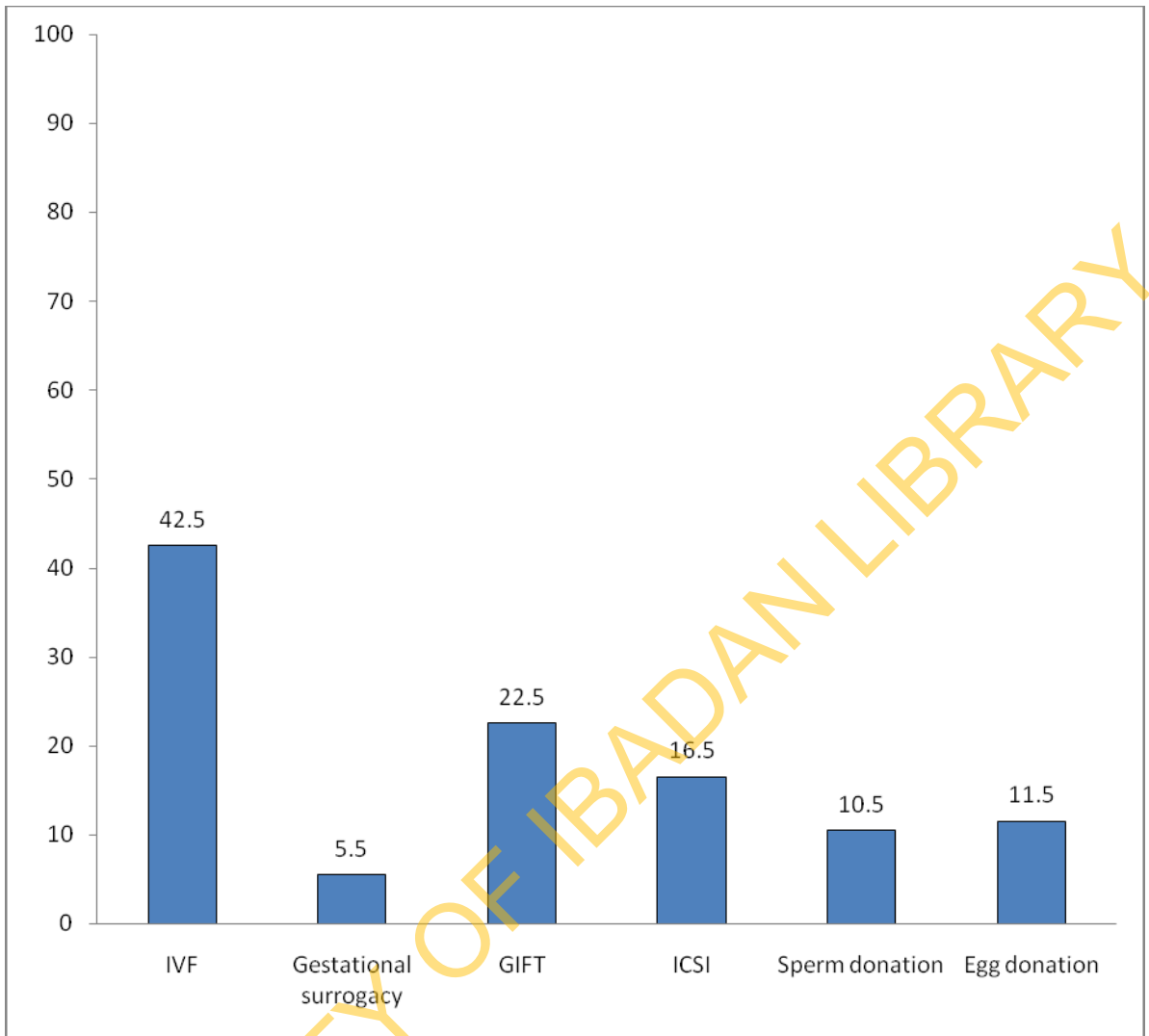
The acceptability level of selected types of ART among respondents, In Vitro Fertilization (IVF) was accepted by 42.5% of the respondents, gestational surrogacy was accepted by 5.5% of the respondents, gamete intra fallopian transfer (GIFT) was accepted by 22.5% of the respondents, Intra cytoplasmic sperm injection (ICSI) was accepted by 16.5%, sperm donation was accepted by 10.5% of the respondents and egg donation was accepted by 11.5%

**Table 4.5 Acceptability of the Use of Assisted Reproductive Technology**

Variables	Response	Frequency	Percentage
I accept use IVF as ART	Yes	107	53.5
	No	93	46.5
I accept Intra cytoplasmic sperm injection	Yes	60	30
	No	140	67.0



**Figure 4.5: Acceptability of the Use of Assisted Reproductive Technology**

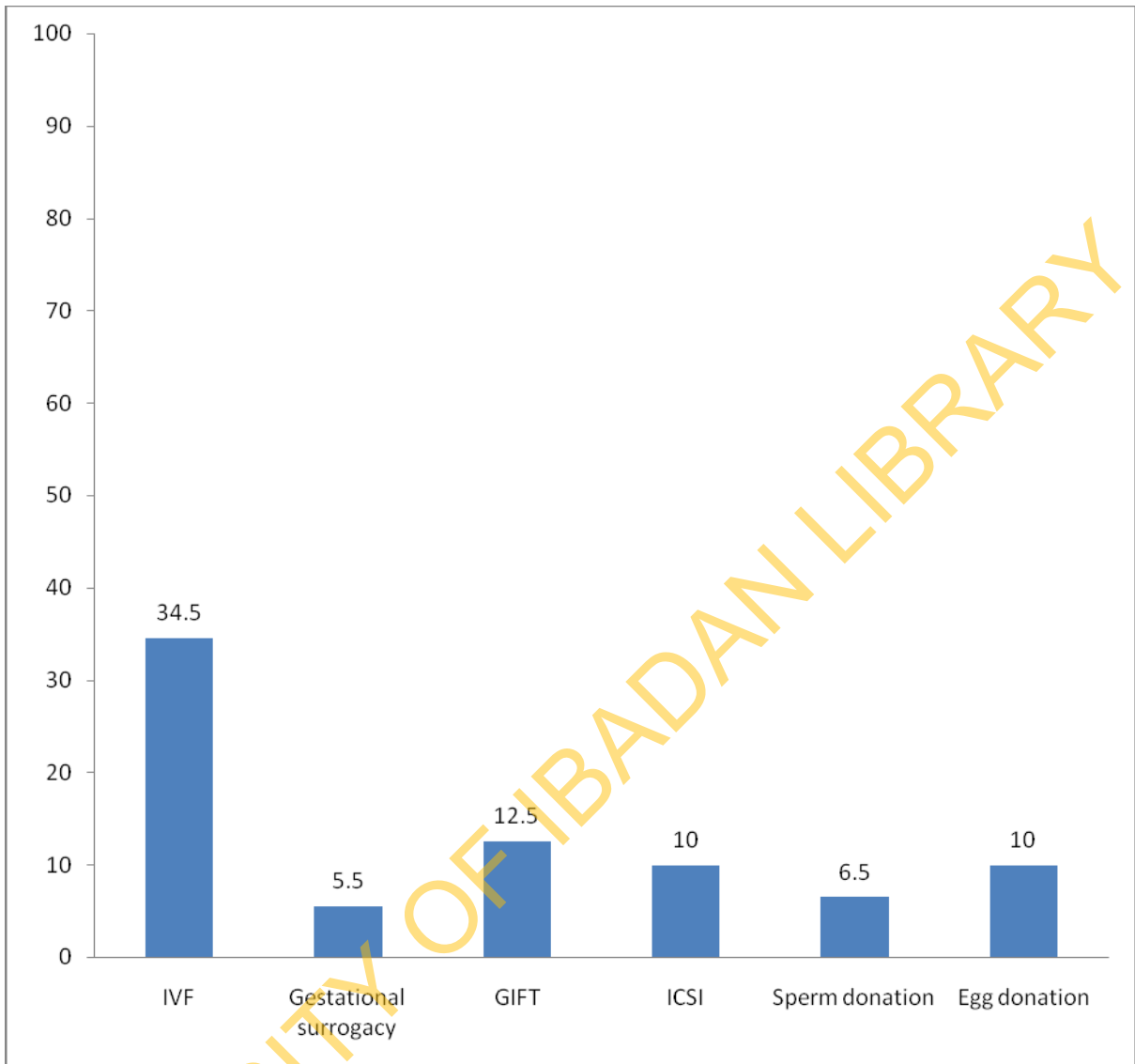


**Figure 4.6: Acceptability of ART types**

#### **4.6 Respondents willingness towards the uptake of ART**

The level of willingness towards selected types of ART among respondents was assessed, willingness to use In Vitro Fertilization (IVF) was 34.5% by the respondents, gestational surrogacy was determined at 5.5% willingness by the respondents, gamete intra fallopian transfer (GIFT) was recorded at 12.5% level of willingness by the respondents, Intra cytoplasmic sperm injection (ICSI) was recorded at 10.0% willingness level by respondents, sperm donation was found at 6.5% willingness level by the respondents and egg donation was recorded at 10% willingness by respondents (Figure 4.5).

UNIVERSITY OF IBADAN LIBRARY



**Figure 4.5: Respondents willingness towards the uptake of ART**



#### 4.7 Factors that may be Responsible for Non Uptake of ART

Majority of the respondents (62%) agreed that “Assisted reproductive technology (ART) is too expensive (lack of fund)”. Additionally, most respondents (79.5%) agreed to the statement that “I don’t need ART,I can conceive on my own”. It was further shown that majority (92.5%) agreed that “I believe in God for an intervention”. Respondents claimed “my husband will not agree to use ART” with 76% of them selecting “agree”. However, 39.5% and 39% of the respondents agreed and disagreed to the statement that “babies born through ART are artificial babies” respectively. Most respondents (42.5%) disagreed to the statement “ART babies will not be socially acceptable”. Furthermore, a higher proportion of the respondents (40.5%) disagreed to the statement that “ART babies will be defective”. Additionally, “the fear of risk and side effect” was agreed to by 77% of the respondents. The statement “my religion and belief will not allow me to use ART for conception” was agreed to by 77.5% of the respondents. More than half of the respondents (56%) agreed that “poor knowledge of ART procedure” is a factor to use of ART. A larger proportion of the respondents (47.5%) agreed that “absence of qualified medical personnel” is a factor. Finally, most respondents (73.5%) agreed that “my family will not accept the use of ART” as a factor (Table 4.6).

Among other reasons for non-uptake of ART by respondents, include: the thought of the “*baby will not last*”, “*baby not acceptable by God*”, “*the person that carried the baby will claim the baby*”, “*it is against my faith*” and “*personal reason*”.

**Table 4.6: Factors that may be Responsible for Non Uptake of ART**

<b>Variable</b>	<b>Agree (%)</b>	<b>Undecided (%)</b>	<b>Disagree (%)</b>
Assisted reproductive technology (ART) is too expensive (lack of fund)	124 (62.0)	12 (6.0)	59 (29.5)
I don't need ART i can conceive on my own	159 (79.5)	28 (14.0)	10 (5.0)
I believe in God for an intervention	185 (92.5)	7 (3.5)	7 (3.5)
My husband will not agree to use ART	152 (76.0)	22 (11.0)	18 (9.0)
Babies born through ART are artificial baby	79 (39.5)	36 (18.0)	78 (39.0)
ART babies will not be socially acceptable	71 (35.5)	36 (18.0)	85 (42.5)
ART babies will be defective	79 (39.5)	29 (14.5)	81 (40.5)
Fear of risk and side effect	154 (77.0)	20 (10.0)	17 (8.5)
My religion and belief will not allow me to use ART for conception	155 (77.5)	24 (12.0)	13 (6.5)
Poor knowledge of the ART procedures	112 (56.0)	29 (14.5)	51 (25.5)
Absence of qualified medical personnel	95 (47.5)	42 (21.0)	54 (27.0)
My family will not accept the use of ART	147 (73.5)	16 (8.0)	29 (14.5)

## 4.7 Hypotheses Testing

**Hypothesis 1:** There is no significant association between the socio demographic characteristics and their level of knowledge of ART. Linear regression was used in testing if there is an association between the socio-demographic characteristics of respondents and their knowledge of ART. It was found that there is a statistical association between respondents socio-demographic characteristics and their knowledge of ART with R Square = 0.273 and P = 0.00. This means that the socio-demographic characteristics of respondents has a 27.3% influence on their knowledge of ART. Educational level of respondents contributed the most ( $\beta = 0.423$ ) to their knowledge of ART. The null hypothesis is hereby rejected (Table 4.7.1).

**Hypothesis 2:** There is no significant association between the knowledge of ART and acceptability of use of ART. Linear regression was used in testing if there is an association between knowledge and acceptability of use of ART. It was found that there is a statistical association between respondents knowledge and acceptability of ART with R Square = 0.393 and P = 0.00. This means that the knowledge of respondents has a 39.3% influence on their acceptability of ART. The null hypothesis is hereby rejected (Table 4.7.2).

**Hypothesis 3:** There is no significant association between the socio demographic characteristics and acceptability of use of ART. Linear regression was used in testing if there is an association between respondents' socio-demographic characteristics and acceptability of use of ART. It was found that there is a statistical association between respondents socio-demographic characteristics and acceptability of ART with R Square = 0.193 and P = 0.00. This means that the socio-demographic characteristics of respondents has a 19.3% influence on their acceptability of ART. Religion of respondents contributed the most ( $\beta = 0.155$ ) to acceptability of ART by respondents. The null hypothesis is hereby rejected (Table 4.7.3).

**Table 4.7:1 Relationship between respondents' socio-demographic characteristics and their knowledge of ART**

<b>Model</b>	<b>Sum of squares</b>	<b>Df</b>	<b>Mean square</b>	<b>Sig.</b>	<b>R square</b>	<b>Null hypo</b>
<b>Regression</b>	150.019	14	10.716	0.000	0.273	Rejected
<b>1 Residual</b>	398.536	185	2.154			
<b>Total</b>	548.555	189				

<b>Model</b>	<b>Unstandardized coefficients</b>		<b>Standardized coefficient</b>
<b>Marital</b>	-0.775	0.925	-0.057
<b>Religion</b>	-0.319	0.257	-0.093
<b>Ethnicity</b>	0.012	0.086	0.009
<b>Age</b>	-0.036	0.022	-0.142
<b>Education</b>	1.108	0.205	0.423
<b>Occupation</b>	-0.047	0.064	-0.053
<b>Income</b>	-0.040	0.068	-0.040
<b>Years in marriage</b>	-0.010	0.023	-0.043
<b>Do you have any child</b>	-0.046	0.306	-0.015
<b>How many children</b>	-0.012	0.141	-0.008
<b>How long expecting children (don't have)</b>	-0.004	0.045	-0.008
<b>How long expecting children (have)</b>	-0.005	0.038	-0.011
<b>First time coming</b>	-0.335	0.217	-0.113
<b>How long coming?</b>	0.033	0.066	0.039

**Table 4.7.2 Relationship between respondents' knowledge of ART & acceptability of ART**

<b>Model</b>		<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>Sig.</b>	<b>R Square</b>	<b>Null hypothesis</b>
1	Regression	215.654	8	26.957	0.000	0.393	Rejected
	Residual	332.901	191	1.743			
	Total	548.555	199				

UNIVERSITY OF IBADAN LIBRARY

**Table 4.7.3: Relationship between respondents' socio-demographic characteristics and acceptability of ART**

<b>Model</b>	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>Sig.</b>	<b>R Square</b>	<b>Null hypothesis</b>
1 Regression	9.479	14	0.677	0.000	0.193	Rejected
Residual	39.541	185	0.214			
Total	49.020	199				

<b>Model</b>	<b>Unstandardized Coefficients</b>		<b>Standardized Coefficients</b>
	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>
Marital	0.091	0.292	0.023
Religion	0.160	0.081	0.155
Ethnicity	0.012	0.027	0.031
Age	0.009	0.007	0.119
Education	0.006	0.065	0.008
Occupation	0.026	0.020	0.098
Income	0.021	0.021	0.070
Years in marriage	0.004	0.007	0.063
Do you have any child	-0.064	0.096	-0.070
How many children	-0.001	0.044	-0.002
How long expecting children (don't have)	-0.035	0.014	-0.242
How long expecting children (have)	-0.016	0.012	-0.123
First time coming	0.284	0.068	0.322
How long coming?	-0.034	0.021	-0.132

## CHAPTER FIVE

### DISCUSSION, CONCLUSION AND RECCOMENDATION

This study explores the level of knowledge, acceptance and willingness to make use of assisted reproductive technology among infertile women attending Adeoyo Maternity Hospital, Ibadan. This chapter explains the result presented in the previous chapter. The demographic characteristics of the respondents, their knowledge and acceptance of Assisted Reproductive Technology and willingness to make use of it were investigated. The implication of the findings of this study to health promotion and education was also discussed and recommendations were made at the end of this report.

#### 5.1 Respondent's socio-demographic characteristics

Respondents were predominantly married women who were attending the fertility clinic for this study, this may be attributed to the definition of infertility by the WHO (2013) as "*a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse*", going by this definition, majority of individuals who fall within this category are married especially with the cultural expectation of having a baby within the first 12 months of marriage. Most of the respondents in this study have secondary and tertiary level of education, showing a higher literacy rate, this may also be attributed to a high employment rate with respondents being employed as business owners, civil servants and members of professional bodies.

Respondents' age ranged from 22 years old to 48 years old, this is in line with the reproductive age of women according to WHO, and this will establish the need of these women to get pregnant. Additionally, most of the women in this study are of age between 31 years old and 40 years old, this is in line with the infertility definition by the US Department of Health and Human Services who sees infertility to mean not being able to get pregnant after one year of trying or six months, if a woman is 35 years or older.

Majority of the respondents have been married less than 10 years and have been coming to the fertility clinics repeatedly more than once, repeated coming was recorded for as much as 9 times by respondents. Infertility rate was determined as 44%, this is higher than infertility rates recorded among married couples in African Countries at 15% to 30% by Omokanye *et*

*al.* (2017), however from a study by Adewunmi *et al.* (2012) established that prevalence of infertility in Nigeria ranges from 20% to 40%. Primary infertility was more pronounced among respondents for as long as 2 to 3 years while secondary infertility was more pronounced among respondents for as long as 3 to 4 years.

## **5.2 Awareness and knowledge of ART**

This study showed a low level of awareness about ART among respondents, especially on the availability of ART services in the fertility clinic attended. Mass media was found to be major sources of information on ART by respondents. However, likewise a study carried out by Olugbenga *et al.* (2014) where it was established that healthcare workers in the clinic constituted about a third of the major sources of the women awareness on ART, a similar finding was found in this study where health care workers contributed 39.7% to sources of information on ART.

Knowledge of respondents on ART was found to be good ( $4.45 \pm 1.53$ ), however, a significant proportion of respondents had very low knowledge of how ART helps in treating low sperm count, the process of in vitro fertilization and the use of donated sperm and eggs for conception. This may be attributing to the reduced level of awareness exhibited by respondents (Omokanye *et al.*, 2017).

## **5.3 Acceptability and willingness to use of ART**

General acceptance of ART was met with mixed reaction as half of the respondents do not think ART is a good way of conceiving and would not accept the use of ART, even if it is provided, this finding is contrary to findings by Jimoh *et al.* (2011) where of respondents' willingness to utilize ART in general is good. Willingness of respondents to use In Vitro Fertilization (IVF) was 34.5% by the respondents, this appears to have the highest level of willingness in all the types of ART assessed lower level of willingness to use gestational surrogacy, gamete intra fallopian transfer (GIFT), Intra cytoplasmic sperm injection (ICSI), sperm donation and egg donation was recorded by respondents. Different studies have established similar findings, Savage (1992), Onah *et al.* (2008) and Ugwu *et al.* (2014) stated low level of willingness to accept donor semen.



#### **5.4 Factors responsible for uptake of ART**

Different factors were identified by respondents for the uptake of ART and there were a number of significant factors, some which include cost of procuring ART, religion beliefs, husband's permission, fear of side effect and risk and the family's permission to use ART. This was propounded by findings from Adesiyun *et al.* (2011) who opined that women's inability to comment if the offspring will be normal and natural babies. The influence of religion on uptake of ART is also a very high ( $\beta = 0.155$ ;  $P = 0.000$ ), this was expressly documented by Inhom *et al.* (2012), Dickens (2002) and Ekeh (2011) highlighting the role of Islam religion and the Roman Catholic doctrine in the uptake of ART.

#### **5.5 Implication of the study findings for health promotion and education**

This study has highlighted essential evidence towards the uptake of ART within the context of women in Ibadan, level of awareness of respondents was low, likewise was their average level of knowledge on ART. One of the major findings of this study is the statistical significant relationship of knowledge of ART on the respondents' acceptability. Therefore, in an effort to improve acceptability of ART by women, there is need for an educational intervention aimed at educating women on the benefits of different ART methods. Mass media is a major avenue identified from this study as a viable source of information for ART services, this will need to be explored as it will accessible to multiple women of different social economic status either via television and radio. Local radio and television stations need to be approached and lobbied into a radio or television female health programs aimed at improving fertility knowledge and practice.

Furthermore, uptake of ART of respondents was determined to be influenced by the cost of treatment and religion; there is a need to advocate for health promotion program in different religious institution aimed at improving women's attitude and perception towards ART. More importantly, there is need to lobby for policies aimed at making selected ART services accessible to women at subsidized rate.

#### **5.6 Conclusion**

This study has established a low level of awareness of ART services in the fertility clinic and a fair level of knowledge, however, details of some of the procedure were not well known to

the women attending this clinic. The study brought to light the level of acceptability of the ART services by respondents, highlighting the in vitro fertilization as the most accepted of all the ART services in the clinic. Acceptability of ART was determined to be statistically influenced by religion of respondents, revealing the strong influence religion has on fertility health. Other factors identified by respondents to influence use of ART include: cost of treatment, husband and family's permission to use ART and the perceived thoughts of the *"baby will not last"*, *"baby not acceptable by God"*, *"the person that carried the baby will claim the baby"*, *"it is against my faith"* and *"personal reason"*. Additionally, willingness to use any of the ART services was low.

### **5.7 Recommendations**

Based on findings from this study, the following recommendations were made:

1. It is recommended that an educational intervention aimed at educating women on the benefits of different ART methods should be implemented at different religious institutions highlighting the success rate and risk involved to allow women make a better informed decision.
2. Partial or total funding of infertility services, including ART, will go a long way to restoring hope to patients who are ceaselessly trying to conceive by all means.
3. Health professionals should also provide enlightenment of the existence of ART to women during clinic health education periods, to enable those who are willing to make use of it.
4. Intervention aimed at improving fertility needs to have men and extended family members recruited as it has been established in this study that they play an important role in influencing use of ART by women.
5. A further exploratory study needs to be carried out with the aim of investigating attitude and perception of men towards ART services; this will in turn eliminate external mitigating factors from husbands and further improve chances of uptake of ART services.

## REFERENCES

- Abayomi A. 2015. Treating severe male factor infertility: True life story, Nordica fertility Report Nigeria Tribune Newspaper, Retrieve from <http://tribuneonline.com/treating-severe-male-factor-infertility-true-life-example>
- Adesiyun A.G. Ameh N., Avidime S. and Muazu A. 2011. Awareness and perception of Assisted Reproductive Technology practice amongst women with infertility in Northern Nigeria, Vol 11, No.9; 144-148. <http://doi.org/10.4236.13027>
- Adewunme A. A., Etti, E.A., Tayo A.O., Rabi, K.A., Akindele R.A., Ottun, T. A. and Akinlusi, F.M., 2012. Factors associated with acceptability of child adoption as a management option for infertility among women's in a developing country. *International Journal of women's Health, Vol 4, No.1; 365-373.* <http://doi.org/10.2147/IJWH.S31598>
- Akande E.O. 2008. Affordable assisted reproductive technologies in developing countries; PROS AND CONS Human Reproductive Health. *Enabling Sustained Health Equity Monograph; Vol 4, No.4; 12-14.*
- Akinloye O. 2011. A review of management of infertility in Nigeria: Framing the ethics of a National health policy. *International Journal of Women's Health, Vol 2, No.3; 265-275.*
- Akinlusi F.M 2012. Factors associated with acceptability of child adoption as a management option for infertility among women in a developing country. *International journal for women's Health. Vol 12, No.4; 365-372*
- Alhassan A., Ziblim A., R and Muntaka S.2014. A survey on depression among infertile women in Ghana. *Biomedical Center for women's health. Vol 14, No.1; 1-6.*
- Ali, Sophie, Iman, Khan, Ali, Shaikh, and Farid-ul-Hasnain. 2011. Knowledge, perceptions and myths regarding infertility among selected adult population in Pakistan: A cross-sectional study. *Biomedical Center for Public Health No.11; 760*
- Bello F., Akinajo O., and Olayemi O. 2014. In-vitro Fertilization, Gamete Donation and Surrogacy: Perceptions of Women Attending an Infertility Clinic in Ibadan, Nigeria. *African Journal of Reproductive Health, Vol 18, No.6, 127-133.*
- Bolvin J., Rice, F., Hay, D., Harold, G. Lewis, A., Van Den Bree, M.M.B., and Thapar, A. 2009. Association between maternal older age, family environment and parent and child wellbeing in families using assisted reproductive techniques to conceive.

*Journal of Social Science and Medicine, Vol 68, No.11; 1948-1955.*  
Doi:10.1016/j.socscimed.

Brown R. and Harper, J. 2012. The clinical benefit and safety of current and future assisted reproductive technology. *Reproductive Bio Medicine Online, Vol 125, No.2, 108-117*

Disease Prevention and Control Public Health Agency of Canada 'November 2007,  
<http://www.phac-aspc.gc.ca/aids-sida/publication/epi/pdf/epi.pdf> C. Gilling-Smith  
J.D.M. Nicopoullous, A.E.Semprini.

Dooley B. A. 2014. Altitudes toward assisted reproductive technology: the effects of gender, relationship status, age and sexual orientation. Family Sciences University of Kentucky, Retrieved from [//uknowledge.uky.edu/hes-ets/11](http://uknowledge.uky.edu/hes-ets/11)

Dyer S.J 2007. The value of children in African countries insights from studies on infertile  
*Journal of psychrosometry and obstetrics and gynaecology; Vol 28, No.2; 69-77*

Dyers S. and Patel M. 2012. The economic impact of infertility on women in developing countries a systematic review facts views. *Journal of Obstetrics and Gynaecology, Vol 4, No.2; 102-109*

Ekeh N.I. 2011. The infertile couple and modern cost effective management Bloomington, USA: *Journal of Obstetrics and Gynaecology Vol 5, No.12; 67-97*. Obtainable at [www.xlibris.com](http://www.xlibris.com)

Giwa - Osagie O.F. 2001. ART in developing countries with particular reference to sub-Saharan Africa. In current practices and controversies in assisted reproduction – Report of a WHO meeting. Geneva, Switzerland. 17-21 Sept pp 22-30

Gooshiki E. and Allahbedashti N. 2015. The process of justifying assisted reproductive technologies in Iran. *Indian Journal of Medical Ethics. Vol 12, No.2; 57-96*.

Hamilton B.E., Martin J.A. and Ventura S.J. 2012 Births: Preliminary data for 2011. Vol 61, No. 5. Hyattville,MD: National Center for Health Statistics Retrieved from [http://www.cdc.gov/nchs/data/nvsr61\\_05.pdf](http://www.cdc.gov/nchs/data/nvsr61_05.pdf)

Hammarberg, K. and Kirkman M. 2013. Infertility in resource- constrained settings moving towards amelioration. *Reproductive Bio Medicine online, Vol 26, No.2; 189-195*.  
<http://doi.org/10.1016/j.rbmo..11.009>

- Hollos M. 2003. Profile of infertility in Southern Nigeria: A woman voices from Makin. *African Journal of Reproductive Health*; 4-6.  
<http://www.nlm.nih.gov/medlinesplus/ency/article/001191.htm>. Concept of infertility
- Infertility. 2013. Encyclopedia Britannica. Encyclopedia Britannica Ultimate Reference Suite. Chicago: Encyclopedia Britannica.
- Inhorn M.C. and Gurtin, Z.B. 2012. Infertility and assisted Reproduction in the Muslim Middle East: social, Religious, and resource considerations FVV in Obstetrics and Gynaecology, Monograph 24-29.
- Jimoh A., Saka A.R., Salaudeen G.A., Raji H.,Yahaya L. and Dare. J. 2011. Sperm bank scheme and surrogacy institution: willingness and utilization of assisted reproductive technology among women of reproductive age group in Ilorin, Nigeria. *Journal of Obstetrics and Gynaecology Vol 2, No.1*; 33-39.
- Macaldowie A., Wang Y.A., Chughtai, A.A. and Chambers G.M. 2012. Assisted reproductive Technology in Australia and New Zealand 32-38.
- Makar R.S. and Toth T.L 2002. 'The evaluation of infertility', *Journal of Clinical Pathology. Vol 11, No.7*; 95-103. PMID 14569805
- Makuch M.Y., Petta, C.A., Osis, M.J.D. and Bahamondes L. 2010. Low priority level for Infertility services within the public sector: A Brazilian case study. *Human Reproduction. Vol 25, No.1*; 430-435.
- Mustapha A., Adesiyun A.G., Yusuf A.J., Abdullahi J.R. and Lawal B.2015. Psychosocial morbidity in women attending an infertility clinic in Northwestern Nigeria it is the worst misfortune of a woman. *Journal of Gynecology and Obstetrics. Vol 3, No.1*; 6-12 doi10.11648/j.jgo.20150301.12
- Odia O.J. 2014. The relation between law, religion, culture and medical ethics in Nigeria. *Journal of Global Bioethics. Vol 26, No.3*; 164-169.  
 Doi:10.1080/11287462.2014937949
- Okonofua F.E. and Odunsi K. 2003. Infertility in sub-Saharan Africa. In Contemporary Obstetrics and Gynaecology for Developing countries; Women Health and Action Research Centre (WHARC), Benin City. Page 128-156
- Okonofua F.E. and Obi H. 2009 Specialized versus conventional treatment of infertility in Africa: time for a pragmatic approach. *Africa Journal Reproductive Health. Vol 13, No1*; 9-15.

Okwelogu I.S., Azuike E.C., Ikechebulu J.I. and Nnebue C.K.C 2012. In vitro fertilization practice: Awareness and perceptions among women attending Fertility Clinics in Okija, Anambra State, Nigeria. *African medical Journal Vol 3, No.2; 22-25.*

Oladeinde Y. 2009. Why infertility is increasing in Nigeria? *National Life, Vol 2, 6-8; 41*

Olugbenga B., Adenike I., Adebimpe W.O., Olarewaju S.O., Olaniyan A. and Olufemi S. 2014. Prevalence of Infertility and Acceptability of Assisted Reproductive Technology among Women Attending Gynecology Clinics in Tertiary Institutions in Southwestern Nigeria. *Journal of Obstetrics and Gynecology (Sunnyvale). Vol 4, No.1; 210.* doi:10.4172/2161-0932.1000210

Ombelet W. 2007. Affordable In Vitro Fertilization for developing countries. *Reproductive Biomedicine online. Vol 15, No.3; 257-265.*

Omokanye L.O., Olatinwo A.O., Durowade K.A., Raji S.T., Biliaminu S.A., Salaudeen G.A. 2017. Assisted reproduction technology: Perceptions among infertile couples in Ilorin, Nigeria. *Saudi Journal of Health Science; Vol 6, No.1; 4-8.*

Onah H.E., Agbata T.A., and Obi S.N. 2008. Attitude to sperm donation among medical students in Enugu, south eastern Nigeria. *Journal of Obstetrics and Gynecology. Vol 28, No.1; 96-99.*

Orhue A.A.E. 2010. Assisted reproduction technology in a resource limited setting. Department of Obstetrics and Gynaecology, University of Benin Teaching Hospital, Benin City, Nigeria

Orhue A. and Aziken M. 2008. Experience with a comprehensive university hospital based Infertility programme in Nigeria. *International Journal of Obstetrics and Gynaecology: Vol 101, No.1; 11-15*

Orijji E.O. 2008. Comparative study of the impact of past pregnancy outcome on future fertility. *Singapore Medical Journal. Vol 49, No.1; 1021-1024.*

Owolabi A.T., Fasubaa, O.B., and Ogunyi S.O. 2013. Semen quality of amle patners of infertile couples in Ile-ife, Nigeria. *Nigeria Journal of Clinical Practice. Vol 16, No.1; 37-40*

Panti, A. A. and Sununu Y. T. 2014. The profile of infertility in a teaching hospital in North West Nigeria. *Sahel Medical Journal Vol 17, No.1, 7 -11.* doi.org/ 10.4103/ 1118-8561. 129145

Pennings G. 2012. Ethical issues of infertility treatment in developing countries FVV in Obstetrics and Gynaecology. MonoGraph 17-23, [http:10.1093/humrep/den142](http://10.1093/humrep/den142)

Ugwu, E.O., Odoh, G.U., Obi S.N. and Ezugwu, F. O. 2014. Acceptability of artificial donor insemination among infertile couples in Enugu, southeastern Nigeria, *International Journal of Women's Health. Vol 6, No.1; 201-205.*

WHO 2012. National, regional and global trends in infertility prevalence since 1990: A Systematic analysis of 277 health surveys.  
[www.who.int/reproductivehealth/topic/infertility/burden/en/](http://www.who.int/reproductivehealth/topic/infertility/burden/en/)

World Health Organization (1991): infertility. A tabulation of available data on prevalence of primary and secondary infertility. Geneva, WHO programme on Maternal and Child Health.

Zegers-Hochschild G.D., Adamson J., Mouzon O., Ishihara R., Mansour K., Nygen E., Sullivan, and S.Vander Peol. 2009. The international committee for monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) Revised Glossary on ART terminology, on behalf of ICMART and WHO, *Human Reproduction Vol 24, No.11, 2687*, doi:1093?humrep?dep343

Zhang Y., Margolese S., Yudin M.H., Raboud J.M., Diong C., Hart T.A. and Loutify, M.R. 2012. Desires, Need, Perception and Knowledge of Assisted Reproductive technologies of HIV- positive women reproductive age in Ontario, Canada, 2012. <http://doi.org/10.5402/2012/853503>

**APPENDIX I**  
**ENGLISH INFORMED CONSENT FORM**

**IRB Research Approval Number:**

**This approval will elapse on:**

**Title of research:** Knowledge and acceptability of the use of Assisted Reproductive Technology among infertile women attending Adeoyo Maternity Hospital in Ibadan North Local Government area.

**Name of researcher:** This study is being conducted by Ibezute Ifunanya Precious a postgraduate student in the department of Health Promotion and Education, Faculty of Public Health, College of Medicine University of Ibadan.

**Purpose of research:** The purpose of this study is to investigate the Knowledge and acceptability of the use of Assisted Reproductive Technology among infertile women attending Adeoyo Maternity Hospital.

**Sample size and procedure for data collection:** A total of 200 infertile women attending gynaecological clinic in Adeoyo Maternity Hospital would be recruited for this study using a multi stage sampling procedure to select eligible respondents.

**Expected duration of the research and participant(s) involvement:** This process of this study will last for one month. You are to provide answers to the questions contained in the questionnaire. The questionnaire is expected to last about 15 minutes to complete.

**Risk(s):** There is no physical risks in participating in this study. However, there are some questions on socio - demographic characteristics which some respondent would find it uncomfortable to answer.

**Cost to participating of joining the research:** Participation will cost you nothing. It will however take a little of your time.

**Benefit:** At the end of the research, findings will be useful in the design of interventions or strategies aimed at preventing and controlling childhood diarrhoea.

**Confidentiality:** All information collected in this study will be given coded numbers. Names of participants will not be written on the questions. In addition, your name or any other identifiers will not be used in any publication or report emanating from this study.

**Voluntariness:** Your participation in this research is entirely voluntary.



**Consequences of participants' decision to withdraw from the research and procedure for orderly termination of participant:** You can choose to withdraw from the research at any time without any penalty. Please also note that some of the information that has been obtained about you before you choose to withdraw may have been used in reports and publications.

**Statement of Person Obtaining Inform Consent:** I have fully explained the nature and scope of the research to \_\_\_\_\_ and have provided sufficient information to him/her which is needed by him/her to make informed decision

**Date** \_\_\_\_\_ **Signature** \_\_\_\_\_

**Name** \_\_\_\_\_

**Statement of Person Giving Consent**

I have read the description of the research and the research has been explained to me in a language I understand or have been translated into a language I understand. I understand that my participation is voluntary. I know enough about the purpose, methods, risk, and benefits of the research study to judge that I want to take part in it. I understand that I may freely stop being part of this study at any time. Finally, I have received a copy of this consent form and additional information sheet to keep for myself.

**Date** \_\_\_\_\_ **Signature** \_\_\_\_\_

**Name** \_\_\_\_\_

## APPENDIX II

### IMO ÀTI ÌTÉWÓGBÀ ÈRỌ ÌRÀNÌWÓ ÌPÈSÈỌMỌ LÁÀÁRÍN ÀWỌN OBÌNRIN TÍ KÒ RỌMỌ BÍ TÍ WỌN NÌ LỌ SÍ ILÉ ÌWÒSÀN AGBÈBÍ ADÉỌYÓ.

#### **IRB iwadiitẹwọgbànọmba:**

#### **Itẹwọgbàiyiyo ko jani:**

Imọ àti itẹwọgbà èrọ ìrànìwọ ìpèsè ọmọ láàárín àwọn obìnrin tí kò rọmọ bí tí wọn nì lọ sí ilé ìwòsàn agbèbí Adéọyó.

**Orukọtioluwadi:** Iwadi yi ti wa ni waiye nipasẹ Ibezute Ifunanya Precious, omo Ile-ẹkọ giga ti Ibadan ni ẹka Igbelaruge Ilera ati Ẹkọ

**Idi ti iwadi:** Imọ àti itẹwọgbà èrọ ìrànìwọ ìpèsè ọmọ láàárín àwọn obìnrin tí kò rọmọ bí tí wọn nì lọ sí ilé ìwòsàn Agbèbí Adéọyó.

**Sample size and procedure for data collection:** Lapapọ irinwo igbeláàárín àwọn obìnrin tí kò rọmọ bí tí wọn nì lọ sí ilé ìwòsàn agbèbí Adéọyó.

**Akoko ti a yẹ fun iwadi:** Ilana yii yoo ṣiṣe fun osu kan. O ni lati pese idahun si ibeere ti o wa ninu iwe ibeere naa. Awọn ibeere ti wa ni o ti ṣe yẹ lati pari ni ogun iṣeju

**Ewu:** Ko si awọn ewu ti ara ni kopa ninu iwadi yii. Sibesibe, awọn ibeere kan wa lori awọn abuda-ti-ara-ẹni-ara ati ihuwasi ibalopọ ti diẹ ninu awọn olufisun yoo ko lati ma le dahun.

**Awọn iye owo lati kopa ninu didopọ mọ iwadi yii:** kopa yo ona o ohunkohun. O yoo, sibesibe, ya diẹ ninu akoko rẹ.

**Anfaani:** Ni opin iwadi naa, awọn awari yoo wulo ni idamo awọn ogbon imo ati ki o ṣe idiwo idaamu ti aini alaye ti o to lori lilo awọn media media ati ipa rẹ lori iwa ibalopọ ti awọn ọdọ

**Asiri:** Gbogbo awọn alaye ti a gba ni iwadi yii ni ao fun ni nọmba. Awọn orukọ ti awọn eniyan ti o idahun kii yoo wa lori awọn ibeere. Ni afikun, orukọ rẹ tabi awọn ami idanimọ miiran kii yoo lo ni eyikeyi kii yoo wa lori iwe tabi iroyin.

**Iyọda:** Rẹ ikopa ninu iwadi yi ni o ṣee igbọkanle atinuwa. **Awọn abajade ti ipinnu awọn olukopa lati yọkuro ninu iwadi ati ilana fun létòlètò ifopinsi:** O le yan lati yọ kuro ninu iwadi ni eyikeyi akoko lai si ijiya kankan. Jọwọ ṣe akiyesi pe diẹ ninu awọn alaye ti a ti gba lati ọdọ rẹ ṣaajuki o to yan lati yọ kuro ni a le lo ninu awọn iroyin ati awọn iwe aṣe.

### **Gbólóhùn ti Ènìyàn**

Mo ti şe alaye ni kikun ti iseda ati darapo mo iwadi naa fun \_\_\_\_\_ ati wi pe mo ti pese alaye ti o to fun

**Ojo** \_\_\_\_\_ **Ibuwolu** \_\_\_\_\_

**Oruko** \_\_\_\_\_

### **GbólóhùntiÈnìyànti fi asesiiwadi**

Mo ti ka apejuwe ti iwadi naa ati pe a ti şe alaye fun mi ni ede ti o ye mi. Mo mo wipe ikopa mi je atinuwa. Mo mo nipa idi, awon ona, ewu, ati awon anfani ti iwadi yii lati darapo ati şe alabapin ninu re. O ye mi pe mo le ma tesiwaju niuu iwadi yii. Nikeyin, Mo ti gba fomu iwadiitewogba ati iwe ifowosi alaye fun ara mi.

**Ojo** \_\_\_\_\_ **Ibuwolu** \_\_\_\_\_

**Oruko** \_\_\_\_\_

UNIVERSITY OF IBADAN LIBRARY

**APPENDIX III**  
**QUESTIONNAIRE**

**Knowledge, acceptability and willingness of the use of Assisted Reproductive Technology among infertile women attending Adeoyo Maternity Hospital**

Dear Respondent

My name is IBEZUTE IFUNANYA PRECIOUS, a post graduate student of the department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. The purpose of this study is to investigate knowledge and acceptability of assisted reproductive technology among infertile women attending tertiary Adeoyo Maternity Hospital in Ibadan. The findings from this study will help in the design of programs and formulation of policies aimed at improving fertility in health care facility. The survey will only take about 10 minutes to complete and participation is voluntary. By participating you will not experience any risk, if you decide to complete the survey, your identity will be kept strictly, you do not have to write your name on this questionnaire, also try to give honest answers to the question being asked and your maximum cooperation will assist in making this research a success.

Would you like to participate in this study? 1. Yes  2. No

Please append your signature as an agreement to participate in the study \_\_\_\_\_

**SECTION A: Socio demographics variables**

**In this section please tick (√) in the appropriate boxes that correspond to your answers.**

1. Marital status: 1) Married  2) Divorced/separated  3) widowed

2. Religion: 1) Christianity  2) Islam  3) Traditionalist  4) others specify \_\_\_\_\_

3. Ethnicity : 1) Yoruba  2) Igbo  3) Hausa  4) Others specify \_\_\_\_\_

4. Age at last birthday \_\_\_\_\_

5. Level of Education: 1) Primary education  2) Secondary education   
3) Tertiary education  4) none

6. Occupation: 1) Government worker  2) Officer worker  3) Business woman

4) Farmer  5) student  6) Professional  7) not employed  8) Others specify

7. Average income per month: 1) less than 10,000  2) 10,000 to 50,000   
8. 3) 50,000 to 100,000  4) 100,000 to 150,000  5) 150,000 to 200,000   
200,000 to 250,000  7) 200,000 to 250,000  8) 250,000 to 300,000   
9) above 300,000

9. Years in marriage: \_\_\_\_\_

10. Do you have any child already: 1 Yes  2 No

11. If yes how many children do you have? \_\_\_\_\_

12. How long have you been expecting children (if you **DON'T HAVE** any child yet)?  
\_\_\_\_\_

13. How long have you been expecting children (if you **HAVE** a child already)?  
\_\_\_\_\_

14. Is this your first time of coming to this hospital fertility clinic? 1 Yes  2 No

15. How long have you being coming to this fertility clinic? \_\_\_\_\_

#### SECTION B: Awareness and Source of Information on ART

16. Have you heard about assisted reproductive technology (ART) treatment before?

Yes ( ) No ( )

17. If you have heard about assisted reproductive technology treatment, where? (Tick as many that applies

1) Radio

2) Television

3) Health care providers

4) Friends

5) Books

6) Family members

7) Internet

8) Social media

9) Others specify \_\_\_\_\_

10) None

18. Do you know anywhere that they provide Assisted Reproductive Technology services around you? 1) Yes  2) No

**SECTION C Knowledge Question on Assisted Reproductive Technology**

**Please indicate Yes or No to the following statements to the best of your knowledge**

	Statement	Yes	No
18	Assisted reproductive technology is used to manage infertility		
19	Assisted reproductive technology involve the handling of female egg and sperm in the laboratory to help conceive pregnancy		
20	Assisted Reproductive Technology can sometimes fail when used		
21	Assisted reproductive technology can be used to treat low sperm count in male		
22	Assisted reproductive technology involves having sexual intercourse to be able to conceive pregnancy		
23	In vitro fertilization involves fertilization of the female egg and sperm in the laboratory to form embryo and then inserted back into the woman's uterus		
24	Assisted reproductive technology sometimes use donated eggs or sperm		
25	Gestational surrogacy is a method use in assisted reproductive technology		

**SECTION D Acceptability of the Use of Assisted Reproductive Technology**

**Please indicate Yes or No to the following statement as it applies to you**

	STATEMENT	Yes	No
25	Do you think assisted reproductive technology is a good way to help manage infertility?		
26	Would you accept the use of assisted reproductive technology, if services are provided in this hospital?		
	<b>Which of the under listed assisted reproductive technology would you accept to use</b>		

27	<b>In vitro fertilization (IVF):</b> an ART procedure where by an egg (or more than one egg) is taken from the body of a woman and combined with sperm in laboratory <b>to ensure that it is fertilized first</b> by the sperm.		
----	---	--	--

	After fertilization egg continues to develop to form an embryo (a baby like structure), the embryo is later transferred back into the woman's womb to form pregnancy		
28	<b>Gestational surrogacy:</b> is an arrangement where a woman, agrees to carry another's person's sperm and eggs <b>in her own body for 9 months</b> until she give birth and the baby is given the people who donated the sperm and egg.		
29	<b>Gamete intra fallopian transfer (GIFT):</b> an ART procedure in which both gametes (female eggs and sperm) are transferred to the woman's womb after being prepared in the laboratory, but the eggs and sperm <b>are not fertilized in the laboratory</b> before inserting into the woman's womb.		
30	<b>Intra cytoplasmic sperm injection (ICSI):</b> a procedure in <b>which a single sperm</b> is injected into the egg shell of the woman done in the laboratory without involving sexual intercourse of both you and your partner, before being transferred to the womb of the woman.		
31	Would you accept the use of donated sperm which is not your spouse to help you have children		
32	Would you accept the use of donated egg by another woman to help you have children		

**SECTION E: Willingness towards the Uptake of Assisted Reproductive Technology**

**Please indicate Yes or No to the following statement as it applies to you**

	<b>Which of the under listed ART would you be willingly to make use if services is provided in this hospital</b>	Yes	No
34	In vitro fertilization (IVF)		

35	Gestational surrogacy		
36	Gamete intra fallopian transfer (GIFT)		
37	Intra cytoplasmic sperm injection (ICSI)		

38	Would you be willingly to use donated sperm which is not your spouse to help you have children		
39	Would you be willingly to use donated egg by another woman to help you have children		

**SECTION F: Factors that may be Responsible for Non Uptake of Assisted Reproductive Technology (even when services are provided)**

	Variable	Agree	Undecided	Disagree
40	Assisted reproductive technology (ART) is too expensive (lack of fund)			
41	I don't need ART i can conceive on my own			
42	I believe in God for an intervention			
43	My husband will not agree to use ART			
44	Babies born through ART are artificial baby			
45	ART babies will not be socially acceptable			
46	ART babies will be defective			
47	Fear of risk and side effect			
48	My religion and belief will not allow me to use ART for conception			
49	Poor knowledge of the ART procedures			
50	Absence of qualified medical personnel			
51	My family will not accept the use of ART			

52. Other reasons for non-uptake of the use of ART (specify)

---



---



---



**APPENDIX IV**  
**YORUBA TRANSLATION**

**Imọ àtí itẹ̀wọ̀gbà ẹ̀rọ ìrànlọ́wọ̀ ipèsè ọmọ láàárín àwọn obìnrin tí kò rọmọ bí tí wọ̀n n lọ sí ilé iwòsàn agbẹ̀bí Adéòyọ.**

Olùdáhùn mi tòótó,

Orúkọ mi ni IBEZUTE IFUNANYA PRECIOUS, akekoo gboye keji ni ẹka igbélékè ilera àtí ètò ẹ̀kọ́, ẹ̀ka ẹ̀kọ́ ilera ará ilú, kólẹ̀jì tí iwòsàn, Ifáfiti tí ilú Ìbàdàn. Idi iṣẹ̀ yìí ní lati ṣe wadii

**Imọ àtí itẹ̀wọ̀gbà ẹ̀rọ iranlọwọ ipèsè ọmọ láàárín àwọn obìnrin tí kò rọmọ bí tí wọ̀n n lọ sí ilé iwòsàn** agbẹ̀bí ni Ibadan. Abajade ise yii yoo ṣe ranwo lati ṣe eto ati abadofin ti yoo ran idagbasoke ohun elo iromọ bi. Iwadii yii ko ni gbaju iṣeju mewaawo lati dahun ati wi pe, ewe, ikopa kii ṣe kan-n-pa. ko si ewu ninu kikopa ninu iwadii yii, ti o ba si pinu lati kopa, aridaju wa wi pe a o ṣe aabo fun idanimọ re. O ko nilo lati ko oruko re si ori iwe ibeere yii. Rii daju wi pe o ṣe otitọ ninu idahun ti o pese fun awon ibeere ti a bi o. Ajoṣepo re pelu oluwadii yii yoo je ki ise yii je aseyori.

Nje o nife lati kopa ninu iwadii yii? 1. Beeni  2. Beeko

Dakun buwo lu iwe yii ti o ba seleri lati kopa ninu iwadii yii. \_\_\_\_\_

**Abala A: ibeere abuda eni ajemo awujo**

Ni abala yii, dakun fala si inu akamo ti o ba idahun re lo.

1. Ipo ebi :1) alokolaya  2) akokokaya  3) Opo
2. Esin : 1. Onigbagbo  2. onimale  3. elesin ibile   
4. esin omiran (toka re) \_\_\_\_\_
3. Eya: 1) Yoruba  2) Igbo 3) Hausa  4) esin omiran (toka re) \_\_\_\_\_
4. Kini ojori re ni ayeje ojo ibi ti o kojá? \_\_\_\_\_ (ni odun)
5. leburu eko : 1) eko iwe mefa  2) eko sekondir  3) eko iwe giga   
4) n ko ka
6. isese : 1) oshese ijoba  2) oshese ofiisi  3) alajapa  4) agbe  5) akokoo  akomose 7) alainise  8) omiran (toka re)
7. Ida owo oṣu: 1) din ni 10,000  2) 10,000 si 50,000  3) 50,000 si 100,000   
4) 100,000 si 150,000  5) 150,000 si 200,000  6) 200,000 si 250,000   
200,000 si 250,000  8) 250,000 si 300,000  9) 300,000 soke

8. ọdun igbeyawo: \_\_\_\_\_
9. Njẹ o ti bimọ ri?: 1 beṅni  beṅko
10. Bi o ba jẹ beṅni, ọmọ meloo? \_\_\_\_\_
11. O to igba wo ti o ti n reti ọmọ bibi (bi o ko ba ni ọmọ)? \_\_\_\_\_
12. O to igba wo ti o ti n reti ọmọ bibi (bi o ba ti bi ọmọ)? \_\_\_\_\_
13. Njẹ igba akọkọ rẹ re e ni ile iwosan ipese oyun? 1. Beṅni  2 beṅko
14. O to igba wo ti o ti n wa si ile iwosan ipese oyun? \_\_\_\_\_

**Abala B: Akiyesi ati orirun ifilọ nipa ẹrọ iranlọwọ ipèsè ọmọ**

15. Njẹ ẹ ti gbọ nipa ẹrọiranlọwọipèsèomóbíbiṭeṭeṭe? Beṅni  beṅko
16. Bi o ba ti gbọ nipa re, nibo ni o ti gbọ ọ? (mu iye ti o ba ero rẹ lo)
- 1) ẹro asọromagbesi
  - 2) ẹro amohun-maworan
  - 3) oniṣe ilera
  - 4) ọrẹ
  - 5) iwe
  - 6) ẹbi
  - 7) ẹrọ ayara-bi-aṣa
  - 8) ikani amuludun
  - 9) òmíràn (tòka rẹ) -----
  - 10) Rara
17. Ẹ o mọ ibi ti iṣe isin ẹrọ iranlọwọ ipèsè ọmọ bíbíwa ni agbegbe rẹ? 1) beṅni   
beṅko

**Abala D: Ibeere nipa imo lori i ẹrọ iranlọwọ ipèsè ọmọ**

**Dakun tọka boya beṅni tabi beṅko si awọn ibeere wọnyi gẹgẹ bi oye rẹ ti mọ**

	Afọ	Beṅni	Beṅko
18	Ẹrọ iranlọwọ ipèsè ọmọwulo lati wa ojutuu si airọmọbi		
19	Ẹrọ iranlọwọ ipèsè ọmọniṣe pẹlu ibojuto eyin ibimọ inu obinrin ati atọ ọkunrin ninu ile- iṣewadii lati ẹ iranwọ fun iloyun.		
20	A le lo ẹrọ iranlọwọ ipèsè ọmọ lati ẹ iwosan si iṣakọle		
21	Ẹrọ iranlọwọ ipèsè ọmọ bíbímaa n daṣe sile leṅkoṅkan.		
22	Ẹrọ iranlọwọ ipèsè ọmọ bíbíniṣe pẹlu ibalopo ki oyun to waye		

23	Jiji abe obinrin niise pelu aji eyin ibomọ obinrin pelu ato omokunrin ni ile-isewadii latise ipese ikeji omọ ki won sile kii bo oju ara obinrin naa pada.		
24	Erọ iranlowo ipese omọ bibinigba miiran maa n se ipese eyin ibimọ obinrin tabi ato okunrin		
25	Gbigbe eyin ibimọ obinrin miiran ati ato okunrin sinu ara re fun oşu mesan-an titi di igba ti yoo bimọ je imoşe ti a n lo ninu erọ iranlowo ipese omọ bibi		

### Abala E: Itewogba lilo Erọ iranlowo ipese omọ bibi

#### Dakun toka boya beeni tabi beko si awon ibeere wonyi gege bi oye re ti mo

	AFO	Beeni	Beko
26	Nje o ro pe erọ iranlowo ipese omọ bibidara lati dena airomọ bi?		
27	Nje o fara mo ilo erọ iranlowo ipese omọ bibi, ti ilo re ba wa ni ile iwosan.?		
<b>Ewo ninu awon erọ iranlowo ipese omọ bibi ni iwo yoo fowo si tabi se egbe fun ki obinrin kopa:</b>			
28	<b>In vitro fertilization (IVF):</b> eyi ni ilana ti eyin ibimọ tabi opo eyin ibimọ lati ara obinrin yoo di gbigba sile ti a o si poopọ pelu ato omokunrin ninu ile isewadii lati le je ki o ji latari ato ti a fi poopọ. Nigba ti eyin ibimọ ba jipepe tan, yoo te siwaju lati maa dagba lati jo ibi ikeji omọ (aworan ikoko), ibi omọ, leyin-o-reyin, yoo di didapada sinu ile omọ obinrin lati le di oyun.		
29	<b>Gestational surrogacy:</b> eyi je adehun ti obinrin se lati gbe eyin ibimọ obinrin miiran ati ato okunrin sinu ara re fun oşu mesan-an titi di igba ti yoo bimọ ti yoo fi gbe omọ naa fun awon ti won fi ato eyin ibimọ sile.		
30	<b>Gamete intra fallopian transfer (GIFT):</b> je ilana erọ iranlowo ipese omọ bibi ti eyin ibimọ obinrin ati ato okunrin yoo di dida pada sinu ile omọ obinrin leyin ti won ba ti se ipese re ninu ile-isewadii. Amọ eyin		

	ibimọ ati atọ yii ko tii lagbara lati inu ile işewadii ki wọn to da pada si inu ile ọmọ obinrin		
31	<b>Intra cytoplasmic sperm injection (ICSI):</b> eyi ni ilana ti o jẹ pe atọ kan şoşo ni wọn yoo fi sinu eyin ibimi obinrin ninu ile işewadii layi si ibalopo pẹlu ololufe ẹni ki wọn to kii sinu ile ọmọ obinrina.		
32	Njẹ o faramọ lati gba atọ okunrin ti kii şe ololufe rẹ lati le pese ọmọ fun ọ		
33	Njẹ o le gba eyin ibimọ obinrin miiran lati ran ẹ lowo lati le bimọ		

**Abala E: fifinu-findo gba lilo ẹrọiranlowọ ipèsè ọmọ bíbí**

Dakun mu yala beṅni tabi beṅko si awọn atojọ afo gege bi o ti ye

	<b>Ewo ninu awon ẹrọiranlowọ ipèsè ọmọ bíbí ni o yan laayo bi wọn ba pese rẹ fun ọ ni ile iwosan</b>	Beṅni	Beṅko
34	Gbigba eyin ibimọ ti wọn ti popọ pẹlu atọ okunrin ninu ile işewadii pada sinu obinrin ( In vitro fertilization) IVF		
35	Gigbe eyin ibimọ ti kiise ti ẹni fun oşu meşan-an (Gestational surrogacy)		
36	Eyi ni dida eyin ibimọ pada sinu obinrin nigba ti ko tii dagba (Gamete intra fallopian transfer) GIFT		
37	Fifi atọ kan şoşo sinu eyin ibimi obinrin ninu ile işewadii layi si ibalopo (Intra cytoplasmic sperm injection) ICSI		
38	Njẹ o le gba atọ okunrin ti o yatọ si ololufe rẹ lati le bimọ?		
39	Njẹ o le gba eyin ibimọ obinrin miiran lati le jẹ ki o bimọ?		

**Abala F: Awọn ohun ti o le mu ikuna ba ẹrọ iranlowọ ipèsè ọmọ bíbí (koda ti işe wọn ba wa ni le)**

	Ferabu	Mo faramọ	Nko mo	N ko faramo
40	ẹrọ iranlowọ ipèsè ọmọ bíbí wọn ju (aisowo)			

41	Nko nilo ẹrọ iranlọwọ ìpèsè ọmọ bíbílàtì bimọ. Mo le loyun fun ra mi			
42	Mo gbagbọ ninu idasi Ọlorun			
43	ọkọ mi ki yoo faramọ ẹrọ iranlọwọ ìpèsè ọmọ bíbí			
44	ọmọ tí a bí látì ara ẹrọ iranlọwọ ìpèsè ọmọ bíbí kii jẹ ọmọ gidi			
45	Aye kii tẹwọ gba ọmọ tí a bí látì ipase ẹrọ iranlọwọ ìpèsè ọmọ bíbí			
46	ọmọ tí a bí látì ara ẹrọ iranlọwọ ìpèsè ọmọ bíbí ma a jẹ alaisan			
47	Ijaya ewu ati atubotan tikodara			
48	ẹsin ati igbagbọ mi ko faye gba mi lati lo ẹrọ iranlọwọ ìpèsè ọmọ bíbí lati le loyun.			
49	Aisi imọ to dara nipa ilana ẹrọ iranlọwọ ìpèsè ọmọ bíbí			
50	Aisi oṣiṣe ilera ti o gbege			
51	Awọn ẹbi mi ki yoo faramọ lilo ẹrọ iranlọwọ ìpèsè ọmọ bíbí			

52. Awọn idi miiran wo ni o ni ti o ko file lo ẹrọ iranlọwọ ìpèsè ọmọ bíbí (tọkawọn)

---



---



---

**APPENDIX V**  
**Knowledge Scale/Marking Scheme**

S/N	Knowledge of Assisted Reproductive Technology	Response		Maximum Score
		Yes	No	
Q18	Assisted reproductive technology is used to manage infertility	Correct	Incorrect	1
Q19	Assisted reproductive technology involve the handling of female egg and sperm in the laboratory to help conceive pregnancy	Correct	Incorrect	1
Q20	Assisted Reproductive Technology can sometimes fail when used	Correct	Incorrect	1
Q21	Assisted reproductive technology can be used to treat low sperm count in male	Correct	Incorrect	1
Q22	Assisted reproductive technology involves having sexual intercourse to be able to conceive pregnancy	Incorrect	Correct	1
Q23	In vitro fertilization involves fertilization of the female egg and sperm in the laboratory to form embryo and then inserted back into the woman's uterus	Correct	Incorrect	1
Q24	Assisted reproductive technology sometimes use donated eggs or sperm	Correct	Incorrect	1
Q25	Gestational surrogacy is a method use in assisted reproductive technology	Correct	Incorrect	1
				8