



## Knowledge and Acceptance of In-vitro Fertilization (IVF) in Surulere Local Government Area, Lagos, South-West Nigeria

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### **Abstract**

*The joy of every married couple especially in Africa is to procreate and enjoy parenthood. However, this ambition is not always true among some couples due to infertility. The negative consequences of infertility are greater in degree in developing countries where modern fertility treatments are scarce and information are lacking. Thus, the primary objective of this study was to examine knowledge and acceptance of In-vitro Fertilization (IVF); one of the modern methods of Assisted Reproductive Technologies (ART) used primarily to address infertility. This is a cross sectional quantitative study conducted among 254 fertile and 45 infertile respondents in three wards of Surulere Local Government Area, Lagos State, Nigeria, to examine the knowledge and acceptance of IVF. Result found that majority of the fertile (62.2%) and of the infertile (64.4%) had no knowledge of ART. However, the majority of the infertile were willing to accept the technology if it can be highly subsidised. Significant relationships exist between respondents' education and knowledge of IVF in the two categories of respondents; knowledge and acceptance of IVF among infertile respondents, and income and the acceptance of IVF among infertile respondents ( $p < 0.05$ ). The study concluded that there is need for public enlightenment of IVF worldwide and the government should set up highly subsidised units across the country to sustain the technology in developing countries, particularly, in Surulere LGA, Southwestern Nigeria.*

***Keywords: Acceptance, In-vitro Fertilization (IVF), Knowledge, Lagos, Nigeria.***

### **Introduction**

Infertility is a reproductive health problem affecting about 10-15% of couples worldwide (Blaževičienė, Jakušvaitė, & Vaškelytė, 2014). Infertility was defined according to the World Health Organization (WHO, 2009) manual as 'a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after at least 12 months or more of regular unprotected sexual intercourse' (Nygren, Sullivan, Zegers-Hochschild, Mansour, Ishihara, Adamson & International Committee for Monitoring Assisted Reproductive Technologies (ICMART) world report, 2011) which could be primary or secondary. Primary infertility was defined as infertile

couples without any previous pregnancy, whereas in secondary infertility, at least one pregnancy has occurred irrespective of the outcome of such pregnancy, whether a live birth or an abortion (Loto, 2017).

The causes of infertility are numerous, including socio-economic factors, lifestyle, reproductive history and childbearing status (Balen & Rutherford, 2007; Mills, Rindfuss, McDonald, & teVelde, 2011). All of these factors contribute to infertility in different ways. Infertility can be in both men and women or one of the couples in marriage relationship. The problem of infertility may not even be traceable to any one of them. In some cases, there are no abnormalities found in the two parties and this is called “unexplained infertility”, while in another minority of couples, problems exist in both of them (Loto, 2017). Female infertility may be a clue to solve ovulation problems, anatomical problems, such as fallopian tube damage or endometriosis (Sabarre, Khan, Whitten, Remes, & Phillips, 2013). In the womb, congenital disorders, muscle tissue gland, endometriosis, polyps and adhesions can also reduce fertility (Palihawadana, Wijesinghe & Seneviratne, 2012). The reasons for male infertility include unusual characteristics of semen, reproductive infection and disorder, erectile dysfunction or ejaculation disorder (Sabarre, *et al.*, 2013).

Couples with conception difficulties may experience negative socio-consequences to some extent and also suffer health challenges such as anxiety, depression, loss of appetite, high blood pressure, mental disorder and sometimes death due to their problems (Adeyemi, 2018). There is a high prevalence of these in African societies where children are highly valued and considered as the main priority for marriage (Adeyemi, 2018). However, the negative socio-consequences experienced by infertile couples are now reduced as a result of technological advancement known as Assisted Reproductive Technologies (ART) (Center for Disease Control and Prevention, CDC, 2017; Loto, 2017).

The Center for Disease Control and Prevention (CDC, 2017) defines ART to include -"all fertility treatments in which both eggs and sperm are handled. In general, ART procedures involve surgically removing eggs from a woman's ovaries, combining them with sperm in the laboratory, and returning them to the woman's body or donating them to another woman." According to CDC,

"ART do not include treatments in which only sperm are handled (i.e., intrauterine or artificial insemination) or procedures in which a woman takes medicine only to stimulate egg production without the intention of having eggs retrieved (Reproductive Health CDC, 2014). In Europe, ART also excludes artificial insemination and includes only procedures where oocytes are handled (Calhaz-Jorge, De Geyter, Kupka, de Mouzon, Erb, Mocanu, Motrenko, Scaravelli, Wyns, & Goossens, 2016; Sorenson, 2006). However, other African studies revealed that intrauterine or artificial insemination is also part and parcel of fertility treatment (Aluko-Arowolo & Ayodele, 2014; Loto, 2017).

Assisted Reproductive Technologies thus includes medical procedures used primarily to address infertility. It involves procedures such as In-vitro Fertilization (IVF), intracytoplasmic sperm injection (ICSI), cryopreservation of gametes or embryos, and/or the use of fertility medication. When used to address infertility, ART may also be referred to as fertility treatment. ART mainly belongs to the field of reproductive endocrinology and infertility. Some forms of ART may be used with regard to fertile couples for genetic purpose. ART may also be used in surrogacy arrangements (Aluko-Arowolo & Ayodele, 2014), although not all surrogacy arrangements involve ART.

In Nigeria, lot of successes have been recorded in the area of reproductive health especially in the use of in-vitro fertilization (IVF), which is one of the methods of ART, especially after the birth of Louise Brown born on July 25, 1978, as a result of research conducted by Edward and Steptoe in England. Thus, Louise Brown is best known as the world's first "test-tube baby."

### **In-Vitro Fertilization (IVF)**

In-Vitro Fertilization (IVF) is one of the modern assisted reproductive technologies designed to help the infertile achieve their aims of parenthood (CDC, 2017). Although now widely accepted, the IVF process had been widely debated within medical and religious circles alike and is considered unethical by many religious groups, and the physicians who practise this method of fertilization continue to face accusations of "playing God" (Medical News Today, 2008).

In-Vitro Fertilization (IVF) is an Art procedure used to help a woman become pregnant. In-vitro fertilization involves removing mature eggs from a woman's ovary, fertilizing the eggs with sperm in a laboratory, and then introducing the resulting embryo into a woman's uterus through the cervix (Centre for Disease Control and Prevention, *et. al.*, 2017). It is a modern method of managing infertility that is not amenable to traditional treatment modalities (Loto, 2017). It was initially developed to overcome infertility due to tubal blockage, but it has since expanded in application to treating medical conditions that include severe male factor infertility, prevention of inheritable diseases and reproduction after cancer therapy (Loto, 2017).

The study emphasised on IVF because it is the most widely recognised assisted reproductive technology which has recorded several success stories all over the world. In Nigeria for example, and indeed in West Africa, Professors Giwa-Osagie and OladapoAshiru in Lagos were credited with the birth of the first IVF baby (Ezechi, Ndububa, Loto, Ezeobi, Kalu, Njokanma, &Nwokoro, 2008). Therefore, determining the knowledge and acceptance of ART practices, particularly IVF, among fertile and infertile couples would be useful in planning public enlightenment programmes on infertility treatment.

Despite the several successes of ART in promoting fertility among couples particularly, using IVF, several studies (Omokanye, Olatinwo, Durowade, Raji, Biliaminu & Salaudeen, 2017; Vitale, Petrosino, La Rosa, & Laganà, 2016; Aluko-Arowolo & Ayodele, 2014) have focused ART only among the infertile couples forgetting the fact that couple considered fertile today may also face the problem of secondary infertility in the nearest future.

### **Research questions**

The following research questions were raised to guide the study:

- i. What is the level of knowledge of IVF among fertile and infertile couples in Surulere LGA, Lagos, Southwest Nigeria?
- ii. What is the level of acceptance of IVF among the infertile couples in Surulere LGA, Lagos, Southwest Nigeria?

- iii. What is the relationship between respondents 'education and knowledge of IVF among fertile and infertile couples in Surulere LGA, Lagos, Southwest Nigeria?
- iv. What is the relationship between respondents 'knowledge and the acceptance of IVF among the infertile couples in Surulere LGA, Lagos, Southwest Nigeria?
- v. What is the relationship between respondents 'income and the acceptance of IVF among the infertile couples in Surulere LGA, Lagos, Southwest Nigeria?

### **Research objectives**

The research objectives are to:

- i. Examine the level of knowledge of IVF among fertile and infertile couples in Surulere Local Government Area, Lagos, Southwest, Nigeria.
- ii. Ascertain the level of acceptance of IVF among the infertile couples in Surulere Local Government Area, Lagos, Southwest, Nigeria.
- iii. Establish the relationship between respondents 'education and knowledge of IVF among fertile and infertile couples in the study area.
- iv. Determine the relationship between respondents 'knowledge and the acceptance of IVF among the infertile couples in the study area; and
- v. Establish the relationship between respondents 'income and the acceptance of IVF among the infertile couples in the study area.

### **Hypotheses**

The study tested the following hypotheses:

- i. There is no significant relationship between respondents' education and knowledge of IVF
- ii. There is no significant relationship between respondents' knowledge and the acceptance of IVF
- iii. There is no significant relationship between respondents' income and the acceptance of IVF

### **Methodology**

This study is a ward-based exploratory survey which adopts the cross-sectional survey research method using ex-post facto research design to examine the knowledge and acceptance of in-vitro fertilization (IVF) in Surulere Local Government Area, Lagos, Southwestern Nigeria. The study population consists of both fertile and infertile respondents recruited from three wards of Surulere Local Government Area (Orile, Aguda and Coker). Data were obtained with the aid of a semi-structured questionnaire which was administered on both categories of respondents.

Surulere LGA is a residential and commercial LGA located on the mainland of Lagos State, Nigeria, with an area of 27.1km<sup>2</sup>. At the last Census in the year 2006, there were 502,865 inhabitants with 260,509 males and 242,356 females and a population density of 21,864 inhabitants per square kilometre. The LGA is bounded to the north by Mushin LGA, to the east by Lagos Mainland LGA, to the South by Apapa and Ajeromi LGAs, and to the west by Amuwo-Odofin and Oshodi-Isole LGAs. The LGA is inhabited by different ethnic groups including Yoruba, Igbo, Hausa and other minority groups but predominantly inhabited by Yoruba speaking people of Nigeria.

The study adopted a multi-stage sampling technique consisting of cluster, simple random, purposive and snowball sampling technique. Surulere LGA has 2 constituencies (each comprising of 6 wards) which were regarded as clusters; one of the constituencies was selected using simple random sampling technique, and from the selected constituency, three wards (Orile, Aguda and Coker) were randomly selected. At the next stage, fertile respondents, male and female were selected using simple random sampling technique, while respondents with fertility problem were purposively selected using snowball sampling technique. The research instrument (semi-structured questionnaire) was divided into two parts: the first part contains the respondent's demographic and economic characteristics while the second part contained the main questions which are linked with the research objectives of the study. One hundred copies of the questionnaire were administered to the fertile respondents, while fifteen copies of the questionnaire were administered on the respondents with fertility problem in each of the selected wards respectively. This implied a total

of 300 copies of the questionnaire were administered to fertile respondents, while 45 copies of the questionnaire were administered to infertile respondents.

Out of the 300 copies of the questionnaire administered on the fertile respondents, 270 copies were returned. Out of the 270 copies returned, 16 copies were not duly completed and so could not be used for analysis. Thus, a total of 254 copies which were duly completed, were analysed for the study, which implied 84.7% response rate. However, all the 45 copies of the questionnaire administered on the infertile respondents were duly completed and returned.

The sample size for the fertile respondents was obtained using Yamane's formula which is

depicted as: 
$$n = \frac{N}{1+N(e)^2}$$

Where n is the sample size, N represents total population (502,865), 1 is a constant factor, e is the margin of error which is assumed to be 10% or 0.1.

Therefore,

$$n = \frac{502,865}{1+502,865(0.1)^2}$$

$$n = \frac{502,865}{1+502,865 (0.01)}$$

$$n = \frac{502,865}{1+5,028.65}$$

$$n = \frac{502,865}{5,029.65} = 99.9$$

Sample size = 100

The sample size obtained using Yamane's formula is 100. Thus, one hundred (100) copies of the questionnaire were administered on the fertile respondents in each of the selected ward in Surulere LGA. In the absence of sampling frame for the infertile respondents in Surulere LGA, the first 15 infertile respondents in each of the selected ward who were identified through snowball sampling

technique and who voluntarily signified their intention to participate in the study, were recruited into the study.

The results from the data collected were presented using descriptive statistics (frequency tables and simple percentages). Chi-square was used to test the strengths of the relationship between variables: respondents' education and knowledge of IVF, knowledge and acceptance of IVF by infertile respondents, and income and acceptance of IVF by infertile respondents. The level of significance was set at  $p < 0.05$ . The data were analysed with the aid of the Statistical Package for Social Sciences (SPSS version 23). Approval to collect the data was obtained at different levels; community level, heads of household and from the individual participant. Respondents were duly informed about the purpose of the study and participation was made voluntary. Anonymity and confidentiality were assured.

## Results and Discussion of Findings

**Table 1: Socio-demographic and Economic Characteristics of Respondents**

| <i>Fertile Respondents</i>    |           |      | <i>Infertile Respondents</i> |      |
|-------------------------------|-----------|------|------------------------------|------|
| Variable                      | Frequency | %    | Frequency                    | %    |
| <b>Ethnic group</b>           |           |      |                              |      |
| Yoruba                        | 131       | 51.6 | 27                           | 22.2 |
| Igbo                          | 56        | 22   | 10                           | 4.4  |
| Hausa/Fulani                  | 33        | 11.8 | 02                           | 13.3 |
| Others (minority)             | 37        | 14.6 | 06                           |      |
| <b>Gender</b>                 |           |      |                              |      |
| Male                          | 98        | 38.6 | -                            | -    |
| Female                        | 156       | 61.4 | 45                           | 100  |
| <b>Age range (years)</b>      |           |      |                              |      |
| Less than 20 years            | 4         | 1.6  | 0                            | 0    |
| 20-25 years                   | 26        | 10.2 | 3                            | 6.7  |
| 26-31                         | 52        | 20.5 | 5                            | 11.1 |
| 32-37                         | 40        | 15.7 | 15                           | 33.3 |
| 38-43                         | 54        | 21.3 | 12                           | 26.7 |
| 44-49                         | 10        | 3.9  | 2                            | 4.4  |
| 50 years and above            | 68        | 26.8 | 8                            | 17.8 |
| <b>Religion</b>               |           |      |                              |      |
| Christian                     | 128       | 50.4 | 21                           | 46.7 |
| Islam                         | 126       | 49.6 | 24                           | 53.3 |
| Traditional                   | -         | -    | -                            | -    |
| <b>Educational attainment</b> |           |      |                              |      |
| No formal education           | 14        | 5.5  | 06                           | 13.3 |
| Primary                       | 26        | 10.2 | 07                           | 15.6 |
| Secondary                     | 54        | 21.3 | 09                           | 20.0 |
| Tertiary                      | 160       | 62.9 | 23                           | 51.1 |
| <b>Marital status</b>         |           |      |                              |      |
| Currently married             | 104       | 40.9 | 28                           | 62.2 |
| Divorcee/Divorcee             | 66        | 26.0 | 05                           | 11.1 |
| Widow/widower                 | 37        | 14.6 | 04                           | 8.9  |
| Separated                     | 47        | 18.5 | 08                           | 17.8 |
| <b>Type of marriage</b>       |           |      |                              |      |
| Polygyny                      | 98        | 38.6 | 31                           | 68.9 |
| Monogamy                      | 156       | 61.4 | 14                           | 31.1 |



|                                |            |            |           |            |
|--------------------------------|------------|------------|-----------|------------|
| <b>Number of children</b>      |            |            |           |            |
| None                           | -          | -          | 16        | 35.6       |
| 1-4                            | 126        | 49.6       | 29        | 64.4       |
| 5-8                            | 95         | 37.4       | -         | -          |
| 9-12                           | 13         | 5.1        | -         | -          |
| Above 12                       | 20         | 7.9        | -         | -          |
| <b>Occupation</b>              |            |            |           |            |
| Civil servant                  | 52         | 20.5       | 10        | 22.2       |
| Artisan                        | 81         | 31.9       | 25        | 55.6       |
| Trader                         | 96         | 37.8       | 06        | 13.3       |
| Farmer                         | 25         | 9.8        | -         | -          |
| Housewife                      | -          | -          | 04        | 8.9        |
| <b>Income/month in Naira ₦</b> |            |            |           |            |
| None                           | -          | -          | 04        | 8.9        |
| ≤ 30,999                       | 30         | 11.8       | 03        | 6.7        |
| 31,000-50,999                  | 42         | 16.5       | 04        | 8.9        |
| 51,000 – 70,999                | 54         | 21.3       | 09        | 20         |
| 71,000 – 90,999                | 46         | 18.1       | 13        | 28.9       |
| 91,000 – 110, 999              | 38         | 14.9       | 02        | 4.4        |
| 111,000 – 130,999              | 23         | 9.1        | 07        | 15.5       |
| 131,000 and above              | 21         | 8.3        | 03        | 6.7        |
| <b>Total</b>                   | <b>254</b> | <b>100</b> | <b>45</b> | <b>100</b> |

Source: Field survey, 2018

Distribution of respondents by ethnic group shows that Yoruba speaking people of Nigeria dominated the two categories of respondents as 51.6% and 60% represented the percentage for the fertile and infertile respondents respectively. This was followed by the Igbo speaking people of Nigeria who shared almost the same percentage (22% and 22.2%) for the fertile and infertile respondents respectively. The percentage sampled from the minority groups were 14.6% for the fertile samples, while that of the infertile respondents was 13.3%. Hausa/Fulani was the least represented among the two categories of respondents. This was such that 11.8% represented Hausa/Fulani for the fertile respondents, while only 4.4% represented Hausa/Fulani among the infertile respondents.

The gender distribution of respondents shows that for the fertile respondents, females constituted the majority of the respondents (61.4%), while 38.6% of respondents were male. This may be due to the fact that females are more concerned with fertility issue than men. For the infertile respondents, all the sample population were females.

The age distribution of the respondents shows that 1.6% of the fertile respondents were less than 20 years, none of the infertile respondents was below the age of 20 years. The table further revealed that 10.2% of the fertile respondents were within the age ranges of 20 and 25 years; only 6.7% of the infertile respondents were within this age range. About 20.5% of the fertile respondents were

within the age ranges of 26 and 31 years; result for the infertile revealed that only 11.1% were found within this age range. Data for the fertile respondents further showed that 15.7%, 21.3%, 3.9% and 26.8% were within the age ranges of 32 and 37, 38 and 43, 44 and 49 and 50 years and above respectively. The age ranges for the infertile respondents showed that 33.3%, 26.7%, 4.4%, and 17.8% were within the age ranges of 32 and 37 years, 38 and 43 years, 44 and 49 years, and 50 years and above respectively.

Religious affiliation of the respondents shows that more than half of the fertile respondents (50.4%) were Christians, 49.6% were Moslems. The majority (53.3%) of the infertile respondents were Moslems and 46.7% were Christians. None of the respondents claimed to be a traditional worshipper. Results on educational qualifications of the respondents showed that the highest percentages of the fertile respondents (62.9%) and 51.1% of the infertile respondents had tertiary education, while 21.3% of the fertile and 20% of infertile respondents had secondary education, 10.2% of the fertile sample and 15.6% of the infertile had primary education and the least, 5.5% of the fertile and 13.3% of the infertile sample had no formal education.

The marital status shows that 40.9% and 62.2% of the fertile and infertile respondents which constituted the largest group were currently married. This was followed by 26% who were divorcee/divorcee, 14.6% that were widow/widower and 18.5% that were separated among the fertile respondents. For the infertile respondents, 11.1% were divorced, 8.9% were widows, and 17.8% were separated.

The form of marriage practices among the fertile respondents shows that 38.6% were polygamous; while a relatively higher percentage (61.4%) were monogamous. On the contrary, for the infertile relationship, the majority (68.9%) of the respondents were in polygamous form of marriage, while only a few (31.1%) were in monogamous form of marital relationship. The inability to produce the desired number of children for those experiencing secondary infertility or inability to produce at all for those experiencing primary infertility probably accounted for the larger percentage of the polygamous form of marriage observed among the infertile respondents compared to the fertile counterparts.

The distribution of respondents according to number of children for the fertile respondents shows that almost half (49.6%) of the respondents have between 1 and 4 children. This is followed by 37.4% who had between 5 and 8 children, and 5.1% who constitute the least number of respondents had between 9 and 12 children, while 7.9% had above 12 children. The large number of children (12 and above) could be as a result of polygyny form of marriage which was practiced by certain percentage of the population of study. For the infertile, 35.6% had primary infertility and thus have gotten no child during the period of data collection. However, other respondents (64.4%) with secondary infertility had between 1 and 4 children.

The occupational distribution of respondents revealed that 20.5% and 22.2% of the fertile and infertile respondents were civil servants respectively. Artisans were 31.9% for the fertile respondents, while artisans constituted the largest percentage of infertile respondents (55.6%). Traders were 37.8% and 13.3% for the fertile and infertile respondents respectively. The least respondents for the fertile were farmers (9.8%). None of the respondents was a farmer among the infertile sample. Data further showed that 8.9% were housewives among the infertile respondents, while none of the fertile respondents was a housewife.

The monthly income of the respondents shows that 8.9% of the infertile respondents receive no monthly income. This could probably be the housewives as some of them claimed to be housewives. None of the fertile respondents belong to this category. However, 11.8% of the fertile respondents earn less than or equivalent to ₦30,999; 6.7% of the infertile also falls in this income level. The result further reveals that 16.5% of the fertile and 8.9% of the infertile respondents earn between ₦31,000- ₦50,999 respectively. In addition, 21.3% of the fertile respondents earn between ₦51,000- ₦70,999, the infertile persons found in this income range was 20%. Approximately 18.1% of the fertile respondents earn between ₦71,000 -₦90,999, the infertile persons that fall within this income level were 28.9%. While 14.9% of the fertile respondents earn between ₦91,000- ₦ 110,000; very few (4.4%) of the infertile also earn within the income range. Roughly 9.1% earn between ₦111,000- ₦130,999 among the fertile, 15.5% of the infertile

respondents also belong to this income group. The least (8.3%) earn ₦ 131,000 and above among the fertile respondents, while 6.7% of the infertile also earn ₦ 131,000 and above.

**Table 2: Distribution of Infertile Respondents by Type of Infertility**

| <i>Infertile Respondents</i> |                  |          |
|------------------------------|------------------|----------|
| <i>Type of Infertility</i>   | <i>Frequency</i> | <i>%</i> |
| Primary                      | 16               | 35.6     |
| Secondary                    | 29               | 64.4     |

Source: Field survey, 2018

Table 2 shows the type of infertility experienced by the infertile women. Data obtained shows that majority (64.4%) of the respondents had secondary infertility. That is, at least one pregnancy has occurred irrespective of the outcome of such pregnancy; whether a live birth or an abortion. However, fewer percentages (35.6%) of the infertile respondents were experiencing primary infertility. That is, they had never been pregnant.

**Knowledge of Respondents on IVF**

**Table 3: Knowledge of Respondents on ART (IVF)**

| <i>Fertile Respondents</i>              |                  |          | <i>Infertile Respondents</i> |          |
|---|------------------|----------|------------------------------|----------|
| <i>Have you heard of IVF?</i>           | <i>Frequency</i> | <i>%</i> | <i>Frequency</i>             | <i>%</i> |
| Yes                                     | 96               | 37.8     | 16                           | 35.6     |
| No                                      | 158              | 62.2     | 29                           | 64.4     |
| Total                                   | 254              | 100      | 45                           | 100      |
| <b>If yes, means of awareness</b>       |                  |          |                              |          |
| Through friends                         | 30               | 31.3     | 05                           | 31.3     |
| Seminars                                | 25               | 26.0     | 03                           | 18.8     |
| Health workers                          | 17               | 17.7     | 06                           | 37.5     |
| Media/internet                          | 19               | 19.8     | 02                           | 12.5     |
| Other means                             | 05               | 5.2      | 0                            | 0        |
| Total                                   | 96               | 100      | 16                           | 100      |
| <b>Perceived knowledge level of IVF</b> |                  |          |                              |          |
| Adequate knowledge                      | 59               | 23.2     | 10                           | 22.2     |
| Partial knowledge                       | 37               | 14.6     | 06                           | 13.3     |
| No knowledge of IVF at all              | 158              | 62.2     | 29                           | 64.4     |
| <b>Total</b>                            | 254              | 100      | 45                           | 100      |

Source: Field survey, 2018

The study investigated both the fertile and infertile respondents' knowledge of IVF. Table 3 showed that while only 37.8% of the fertile respondents and 35.6% of the infertile sample had heard about IVF as a modern technology of assisting the infertile to bring forth a child, a majority (62.2%) of the fertile respondents and 64.4% of infertile respondents had not heard anything

concerning IVF. This implies a low level of public enlightenment or knowledge of the technology in Nigeria, particularly in the study area.

Among those who are aware of the technology, similar percentages (31.3%) heard about the technology through friends among the two categories of respondents. Twenty-six percentage (26%) and 18.8% of the fertile and infertile respectively knew about it through seminars, while 17.7% and 37.5% of the fertile and infertile respectively knew about IVF through health workers, and 19.8% and 12.5% of the fertile and infertile respectively knew about IVF via the media/internet. The least percentage (5.2%) of the fertile respondents knew about IVF through other sources not identified. The result further showed that even among the respondents who had knowledge of IVF, only 23.2% of the sample of the fertile respondents and 22.2% of the total sample of the infertile respondents had adequate knowledge of the technology. Others had heard about the technology but did not have adequate knowledge of the necessary procedure involve.

**Acceptance of ART (IVF)**

**Table 4: Acceptance of IVF by Infertile Respondents**

| Category  | Frequency | %          |
|---|-----------|------------|
| <b>Willing to embark on IVF treatment</b>       |           |            |
| Yes   | 31        | 68.9       |
| No  | 14        | 31.1       |
| <b>Total</b>                                    | <b>45</b> | <b>100</b> |
| <b>Reasons/conditions for acceptance of IVF</b> |           |            |
| If government can support financially           | 19        | 61.3       |
| If I know how to go about it                    | 12        | 38.7       |
| <b>Total</b>                                    | <b>31</b> | <b>100</b> |
| <b>Reasons for non-acceptance of IVF</b>        |           |            |
| Western treatment always has its side effect    | 05        | 35.7       |
| The treatment is a game of chance               | 06        | 42.9       |
| It is God proscribed method of conception       | 02        | 14.3       |
| I have no hope in conceiving again              | 01        | 7.1        |
| <b>Total</b>                                    | <b>14</b> | <b>100</b> |

Source: Field survey, 2018

The infertile respondents were asked if they would be willing to accept and thus adopt the treatment to solve their infertility problems. The majority were willing to accept and embark on the treatment; some (61.3%) were willing to accept on the condition that the government will subsidize and support them financially, while others (38.7%) were willing to accept the treatment if they know how to go about it. However, few (31.1%) of the infertile respondents were not willing to accept IVF treatment for reasons which include: western treatment always had its side effect

(35.7%), the treatment is a game of chance (42.9%), it is God's proscribed method of conception (14.3%), and some women had lost hope in conceiving again (7.1%).

**Test of Hypotheses**

The assumption underlying the test of hypothesis is that when p-value is less than 0.05, the null hypothesis denoted as  $H_0$  is rejected, and the alternative hypothesis denoted as  $H_1$  is accepted and we therefore conclude that there is a significant relationship between the variables tested. But when p-value is greater than 0.05, the null hypothesis denoted as  $H_0$  is accepted, and the alternative hypothesis denoted as  $H_1$  is rejected and we therefore conclude that there is no significant relationship between the variables tested.

**Test of Hypothesis 1**

$H_0$ : There is no significant relationship between respondents' education and knowledge of IVF

$H_1$ : There is a significant relationship between respondents' education and knowledge of IVF

**Table 5: Respondents' Education and Knowledge of IVF**

| Education of respondents | Knowledge of respondents on IVF                              |     |       |  |     |       |
|--------------------------|--|-----|-------|--|-----|-------|
|                          | Fertile Respondents  |     |       | Infertile Respondents                                      |     |       |
|                          | No   | Yes | Total | No   | Yes | Total |
| No formal education      | 0  | 14  | 14    | 0  | 6   | 6     |
| Primary                  | 0  | 26  | 26    | 0  | 7   | 7     |
| Secondary                | 0  | 54  | 54    | 6  | 3   | 9     |
| Tertiary                 | 158  | 02  | 160   | 23   | 0   | 23    |
| Total                    | 158  | 96  | 254   | 29   | 16  | 45    |
|                          | $\chi^2 = 245.599$<br>df = 3,<br>p-value = 0.000<br>p < 0.05 |     |       | $\chi^2 = 36.272$<br>df = 3<br>p-value = 0.000<br>p < 0.05 |     |       |

Source: Field survey, 2018

Hypothesis 1 (Table 5) showed the relationship existing between respondents' education and knowledge of IVF using Chi-square. The result showed a significant relationship between respondents' education and knowledge of IVF for both categories of respondents. At 5% level of significance,  $p < 0.05$  for both categories of respondents. The null hypothesis ( $H_0$ ) is therefore rejected, and the alternative hypothesis ( $H_1$ ) is accepted, and thus, concluded that, there is a significant relationship between respondents' education and knowledge of IVF

**Test of Hypothesis 2**

H<sub>0</sub>: There is no significant relationship between respondents’ knowledge and the acceptance of IVF  
 H<sub>1</sub>: There is significant relationship between respondents’ knowledge and the acceptance of IVF

**Table 6: Knowledge and Acceptance of IVF by Infertile Respondents**

| <i>Knowledge of IVF by Infertile Respondents</i>            | <i>Acceptance of IVF by Infertile Respondents</i> |     |       |
|---|---|-----|-------|
|   | No  | Yes | Total |
| No  | 14  | 15  | 29    |
| Yes   | 0   | 16  | 16    |
| Total   | 14  | 31  | 45    |
| $\chi^2 = 11.212$<br>df = 1,<br>p-value = 0.001<br>p < 0.05 |   |     |       |

Source: Field survey, 2018

Hypothesis 2 (Table 6) showed the relationship existing between respondents’ knowledge and acceptance of IVF for the infertile respondents using Chi-square. The result showed a significant relationship between infertile respondents’ knowledge and acceptance of IVF. At 5% level of significance, p < 0.05. The null hypothesis (H<sub>0</sub>) is therefore rejected, and the alternative hypothesis (H<sub>1</sub>) is accepted, and thus, concluded that, there is a significant relationship between respondents’ knowledge and acceptance of IVF.

**Test of Hypothesis 3**

H<sub>0</sub>: There is no significant relationship between respondents’ income and the acceptance of IVF  
 H<sub>1</sub>: There is a significant relationship between respondents’ income and the acceptance of IVF

**Table 7: Respondents’ Income and Acceptance of IVF by Infertile Respondents**

| <i>Income/month in ₦</i>                         | <i>Acceptance of IVF by Infertile Respondents</i> |     |       |
|--|---|-----|-------|
|  | No  | Yes | Total |
| No income  | 0   | 4   | 4     |
| ≤30,999  | 0   | 3   | 3     |
| 31,000-50,999                                    | 0   | 4   | 4     |
| 51,000-70,999                                    | 0   | 9   | 9     |
| 71,000-90,999                                    | 2   | 11  | 13    |
| 91,000-110,999                                   | 2   | 0   | 2     |
| 111,000-130,999                                  | 7   | 0   | 7     |
| Above 131,000                                    | 3   | 0   | 3     |
| Total  | 14  | 31  | 45    |
| $\chi^2 = 37.104$<br>df = 7, p = 0.000, p < 0.05 |   |     |       |

Source: Field survey, 2018

Hypothesis 3 (Table 7) showed the relationship existing between respondents' income and acceptance of IVF for the infertile respondents using Chi-square. The result showed a significant relationship between infertile respondents' income and acceptance of IVF. At 5% level of significance,  $p < 0.05$ . The null hypothesis ( $H_0$ ) is therefore rejected, and the alternative hypothesis ( $H_1$ ) is accepted, and thus, concluded that, there is a significant relationship between respondents' income and acceptance of IVF.

### **Discussion of Findings**

Infertility is a global health problem and a socially destabilizing condition for couples carrying several stigmas and a cause of marital disharmony. Assisted reproduction technology (ART) offers a chance at parenthood to couples, who until recently would have had no hope of having a "biologically related" child (Omokanye *et al.*, 2017). In-vitro fertilization, which is one of the methods adopted in ART has recorded greater successes in helping the infertile to achieve the joy of parenthood worldwide. However, with increasing numbers of trained IVF specialists and IVF/ART centers in the country, its awareness has been poor.

The majority of the fertile respondents (62.2%) and infertile respondents (64.4%) in this present study had low knowledge of ART services. This is in line with findings of earlier studies carried out in Ibadan (58.3%), Osun (48%), Lagos (51.8%), and Okija, Nigeria (37.6%) where the level of awareness of ART were reported low among respondents respectively (Bello, Akinajo & Olayemi, 2014; Olugbenga, Adebimpe, Olanrewaju, Babatunde, & Oke, 2014; Fabamwo & Akinola, 2013; Okwelogu, Azuike, Ikechebelu, & Nnebue, 2012). Nevertheless, contrasting findings were reported in other studies conducted in Ilorin, Nigeria and northern Nigeria, where high level of awareness was found among respondents (Omokanye *et al.*, 2017; Adesiyun, Ameh, Avidime, & Muazu, 2011).

Although, the present study was conducted in an urban area of Lagos mainland with more than half of the population in the middle social class, a significant number of respondents had not heard of ART, particularly IVF. Even among the respondents who had knowledge of IVF, only 23.2%



of the sample of the fertile respondents and 22.2% of the total sample of the infertile respondents had adequate knowledge of the technology.

A larger percentage of the infertile respondents (68.9%) would embrace IVF if highly subsidised by government but 31.1% would not. The major challenges confronting some of the respondents on the acceptance of the technology in this study, and as observed by earlier studies are financial implication of the technology, religious belief, fear of side-effects, loss of hope, and lack of confidence in the technology (Omokanye, *et al.*, 2017; Olugbenga, Adebimpe, Olanrewaju, Babatunde, & Oke, 2014; Fabamwo, & Akinola, 2013; Jegede & Fayemiwo, 2010).

Although a larger percentage (62.9%) of the fertile respondents and the infertile respondents (51.1%) had tertiary education, the majority of both categories of respondents had no adequate knowledge of IVF. This is similar to an earlier study which also observed the low level of awareness of ART among study participants (Illiyasu, Galadanci, Abubakar, Bashir, Nasir, Aliyu, 2013). This also literarily implies that respondents' educational attainment is not a necessary criterion for having knowledge of the modern technology. However, the test of hypothesis for the variables, that is, knowledge and educational attainment of respondents showed significant relationships between these variables as  $p < 0.05$  for both categories of respondents. This is also in line with a previous study which observed similar significant relationship between knowledge and educational attainment of respondents (Olugbenga, Adebimpe, Olanrewaju, Babatunde, & Oke, 2014).

The result from the study showed that some infertile respondents have lost hope of parenthood because they have gone round seeking solution without a positive outcome, thus, have resigned to fate, such respondents also need to be motivated and educated about IVF rather than accepting the problem as destiny and thus continue to face socio-cultural consequences of infertility which may later impact their health status as observed by a previous study (Adeyemi, 2018).

The study also tested knowledge and acceptance of IVF by infertile respondents, income and the acceptance of IVF. All the results of the tested hypothesis showed significant relationships

between all the variables tested as all p-values were less than 0.05 ( $p < 0.05$ ). This, in essence implies the followings:

- i. Educational attainment of respondents has a significant influence on knowledge of IVF
- ii. Knowledge of IVF significantly influences its acceptance
- iii. The income of respondents (infertile) significantly influences the acceptance of IVF

### **Conclusion and Recommendations**

Despite the rising cases of infertility in the society and the introduction of ART to mitigate the consequences on victims, there is a low level of knowledge of ART services among infertile women as well as those considered to be currently fertile in Surulere LGA, Lagos State, hence, low level of utilization of these services remains a huge gap. One of the options of care in ART services is the use of IVF. From this study, a great number of persons that are infertile in the study area have no knowledge of the technology and thus have not embarked on such services. While a majority of the infertile respondents were willing to accept the technology if the government can help to subsidize the treatment, others have been discouraged because other infertility treatment techniques have yielded no positive result.

To improve the acceptance of ART, particularly IVF in Surulere LGA, there is a need for relevant government agencies and non-governmental organizations to institute educational interventions to raise the knowledge of IVF as an option of care available for infertile couples. This will go a long way to reduce the negative consequences of infertility among married couples in Nigeria. The study also recommended that the government should set up highly subsidised units across the country to help sustain the technology in developing countries, particularly, to help the infertile in Surulere LGA, Lagos, Nigeria.

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