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**DETERMINANTS OF ASSISTED REPRODUCTIVE TECHNOLOGY (ART)  
UTILIZATION AMONG WOMEN ATTENDING A TERTIARY HEALTH  
INSTITUTION IN BENIN CITY, EDO STATE**

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**Abstract**

**Background:** Infertility is a global public health condition whose impact is more prominent in the developing countries. Scientific improvement and innovations have characterised the field of Assisted Reproductive Technology (ART) over the years, but the utilization of ART has not been fully embraced, especially in the developing world. This study examined the factors that influenced utilization of ART among women in obstetrics, gynaecology and fertility clinics at a tertiary health facility in Benin City, Edo State.

**Method:** The study adopted a cross-sectional descriptive survey design among 820 women attending the Obstetrics, Gynaecology and Fertility Clinics. Sample size of 348 was determined using Cochrane formula based on a previous study and data collected with a self-structured questionnaire. Analysis conducted included frequencies, mean, standard deviation and one sample t-test with a normative value of 2.50.

**Results:** Cost( $t=12.98$ ,  $df=347$ ,  $p=0.00$ ), husband's role( $t=6.62$ ,  $df=347$ ,  $p=0.00$ ) and knowledge of ART ( $t=62.07$ ,  $df=347$ ,  $p=0.00$ ) were significantly related to the utilization of ART.

**Conclusion:** This study has established factors influencing the use of Assisted Reproductive Technology among women. It is recommended that governments be involved through policy and health insurance mandates so as to improve access.

**Keywords:** Assisted Reproductive Technology, Determinants, Health Institution, Utilization, Women

## **Introduction**

Infertility is a global public health issue, particularly in the low resource developing countries. The challenge has been a neglected issue by governments and seemingly justified as a form of population control in a world with high population growth<sup>1</sup>. It is a critical reproductive health disorder that affects both males and females. The incidence of infertility has been on the increase over the last decade, 2010 estimates revealed that 45.0–52.6 million couples worldwide suffer infertility<sup>2</sup>. The global prevalence varies from one region to the other; there is a recorded prevalence range of 10% to 20% in 27 African countries<sup>3</sup>. The prevalence of infertility has been highest in the so-called infertility belt of Africa which includes Nigeria<sup>4</sup>. There are variations in the range of infertility in various institutional-based studies in Nigeria with a prevalence range of 15.7%<sup>5,6</sup> to 32%<sup>7</sup>. In African culture, the primary concern of the family is childbearing which may be an attribute of the pronatalist nature of the society<sup>8</sup>. In Nigeria, children are viewed as essential: they inherit family property, family name and maintain lineage as well as serve as insurance for the care of parents at old age. Infertility results in various social, psychological and economic problems ranging from intimate partner violence, divorce, stigmatisation and poverty<sup>9</sup>. Infertile women are stigmatised, and this may be accompanied by stress to the couple and the extended family.

Medical developments have revealed that most cases of infertility are treatable thus providing an opportunity for patients with infertility to have their own families.

Assisted Reproductive Technologies (ART) use has revolutionised the treatment of infertility over the past three decades. There are various routinely used techniques of achieving success with assisted reproduction with some of the options varying from intracytoplasmic sperm injection (ICSI), pre-implantation genetic diagnosis (PGD), and cryopreservation, intrauterine insemination (IUI), invitro fertilization (IVF), and gamete intra fallopian transfer (GIFT)<sup>10</sup>. The accomplishment of ART in European countries, North America, Asia, Middle East, Australia/New Zealand, and Latin America, is estimated at 55%, 20%, 10%, 6% and 3% respectively<sup>11</sup>. The latest global estimates indicate that over 1.6 million assisted reproductive technology cycles are undertaken each year and that more than 6 million children have been born following assisted reproductive treatment<sup>12</sup>. ART is increasingly gaining ground in Nigeria like other developing countries after an earlier delay occasioned by treatment high implications, lack of adequate facilities and cultural belief that frowned at multiple births<sup>13</sup>. ART in Nigeria is mainly private sector driven and very few clinics are within the public health institutions. Most of the private centres are in collaborative support with foreign Institutions in Europe and United States<sup>14</sup>.

Nonetheless, ART provision worldwide varies from one place to another. Even at that, the acceptance and utilization of ART could depend on many factors. Generally, the method is used in countries where there is cultural and moral acceptability to use the procedure. A higher proportion of Protestants accept the use of

ART<sup>15</sup> compared to people of other faiths. Indeed, various religions have their beliefs which affect their perception of ART. The personal beliefs of couples and the cost of the method also determine usage<sup>16</sup>. In some countries, the government supports the use of ART with the public health insurance scheme; women have a refund of what is spent in procuring the treatment<sup>17</sup>. The nature of the health care system, the availability of high technology services cost and government policies are factors that may influence the use of ART<sup>18</sup>.

There are various perceptions about ART in Nigeria and a sort of secrecy in assessing the facility. The assessment of determinants of utilization of ART as well as the characteristics of the population is of importance for understanding factors influencing the decisions for ART use. A high premium is placed on fertility as many African beliefs and practices are based on continuity of family lineage and inheritance<sup>17</sup>. Motherhood is considered a significant role of women and a respected female identity; therefore, women who cannot perform this role may be stigmatised. ART is considered a measure of relief and a form of assistance to those who have benefited from it and a privilege to those who can access it. Therefore, the objective of the study is to assess the determinants of ART utilization among female patients attending Obstetrics, Gynaecology and Fertility Clinics in a Tertiary Health Facility in Benin City, Nigeria. Thus, the interest is: what are the determinant factors for the utilization of ART among women in a

fertility clinic located in the tertiary health facility and how are they related to knowledge of ART? Findings from this study can enhance the planning of nursing care, monitoring existing maternal and child health programmes. Furthermore, findings will inform interventions to address the needs of couple with infertility.

## **Materials and Methods**

### **Study design, setting & population**

The research design was a descriptive cross-sectional survey. The target population was all female clients aged 25 years and above who attended Obstetrics, Gynecology and Fertility clinics, in a Tertiary Health Facility and were being managed for infertility. Clients with other reproductive health issues were excluded. Effectively, the accessible population was an average of 820 women who were attending the clinics over the period of six consecutive months.

### **Sample size**

The minimum sample size required was determined using the Cochran formula based on a previous similar study in Benin City. Application of the formula gave a value of 323 respondents. In order to provide for attrition during the study, a 10% non-response rate was added, bringing the total sample size to 356. Balloting, which is a Probability sampling technique, was used "Yes" or "No", were written on pieces of paper, wrapped, shuffled thoroughly and put in a container. Clients picking with replacement was used and those who picked "yes" were selected for the study.

### **The instrument**

The tool for data collection was a self-structured questionnaire with closed-ended questions. The questionnaire consisted of two sections. Section A elicits information on demographic information with eight items. Section B was designed with six items on factors influencing utilization of ART. The response options of Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree were used to ensure objectivity.

Face and content validity were established by a fertility nurse, an evaluator and a statistician. Their role was to determine whether the items measured issues of interest as well as the correctness and clarity of the items in the questionnaire. Reliability was determined using ten women from a private fertility centre and a Cronbach Alpha of 0.74 emerged which indicated that the instrument was reliable.

### **Ethical considerations**

Clearance was obtained from the tertiary health institution, written and/or oral consents were obtained from respondents before administration of the questionnaire. Personal information of the respondents was not demanded to maintain confidentiality and anonymity. Information collected was adequately kept to ensure privacy and used for research purpose only.

### **Data analysis**

Statistical Package for Social Sciences (SPSS) version 22 was used in analysing data collected. For purposes of analysis, the responses were transformed as Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, and Strongly Disagree = 1. Descriptive statistics of mean, standard

deviation and one sample t-test using a normative value of 2.50 was applied to determine acceptance of determinants of factors influencing utilization. The t-test was conducted at 0.05 significance level.

### **Results**

The findings in Table 1 show that a total of 348(97.8%) respondents adequately responded to all questionnaire items; this was a good response rate. The age group most represented was 36- 45 years. The mean age is  $36.45 \pm 6.33$ . The majority 316(90.8%) of respondents were married, with 297(85.3%) respondents attaining tertiary education. Among the respondents, 342(98.3%) were adherents of Christianity and 167(48%) had a marriage duration of 5 years and below. Respondents who had no child prior to the study were 129(37.1%).

**Table 1 –Socio-demographic characteristics of respondents**

| <b>Variables</b>                | <b>Attributes</b>             | <b>Frequency<br/>(n=348)</b> | <b>Percentage</b> |
|---------------------------------|-------------------------------|------------------------------|-------------------|
| <b>Age</b>                      | 26 - 35yrs                    | 154                          | 44.3              |
|                                 | 36 - 45yrs                    | 181                          | 52.0              |
|                                 | 46yrs and above               | 13                           | 3.7               |
|                                 | <b>Mean ± SD = 36.45±6.33</b> |                              |                   |
| <b>Marital Status</b>           | Single                        | 30                           | 8.6               |
|                                 | Married                       | 316                          | 90.8              |
|                                 | Widow                         | 2                            | 0.6               |
| <b>Religion</b>                 | Christianity                  | 342                          | 98.3              |
|                                 | Islam                         | 6                            | 1.7               |
| <b>Level of education</b>       | None                          | 5                            | 1.4               |
|                                 | Primary                       | 8                            | 2.3               |
|                                 | Secondary                     | 38                           | 10.9              |
|                                 | Tertiary                      | 297                          | 85.3              |
| <b>Ethnic group</b>             | Bini                          | 124                          | 35.6              |
|                                 | Igbo                          | 59                           | 17.0              |
|                                 | Esan                          | 50                           | 14.4              |
|                                 | Yoruba                        | 28                           | 8.0               |
|                                 | Urhobo                        | 18                           | 5.2               |
|                                 | Owan                          | 17                           | 4.9               |
|                                 | Others                        | 52                           | 14.9              |
|                                 |                               |                              |                   |
| <b>Duration of Marriage</b>     | 0-1yr                         | 90                           | 25.9              |
|                                 | >1 - 5years                   | 167                          | 48.0              |
|                                 | >5 - 10years                  | 70                           | 20.1              |
|                                 | Above 10years                 | 21                           | 6.0               |
| <b>Number of times pregnant</b> | 0                             | 55                           | 15.8              |
|                                 | 1                             | 74                           | 21.2              |
|                                 | 2                             | 96                           | 27.6              |
|                                 | 3                             | 64                           | 18.4              |
|                                 | 4                             | 28                           | 8.0               |
|                                 | 5                             | 21                           | 6.0               |
|                                 | 6-9                           | 10                           | 2.9               |
| <b>Number of Children alive</b> | 0                             | 129                          | 37.1              |
|                                 | 1                             | 90                           | 25.9              |
|                                 | 2                             | 86                           | 24.7              |
|                                 | 3                             | 23                           | 6.6               |
|                                 | 4                             | 14                           | 4.0               |
|                                 | 5                             | 6                            | 1.7               |
|                                 | 6-9                           | 0                            | 0                 |

**Factors influencing the utilization of ART**

Table 2 shows the respondents’ opinion about factors influencing their utilization of ART. The factors with mean values greater than 2.50 were cost, knowledge of ART and husbands’ opinion about ART. The t-values

for adequate knowledge of ART (62.07, df=347, p=.00), cost (12.98, df=347, p=.00) and husband’s opinion of ART (6.62, df=347, p=.00) showed that these were significant factors. All other factors examined including religion, culture, ethics were not significant factors.

**Table 2: Descriptive statistics of factors influencing the utilization of ART indicated by respondents**

| Factors                             | SA            | A             | U            | D             | SD           | Mean | Sd   | t     | Df  | p   |
|-------------------------------------|---------------|---------------|--------------|---------------|--------------|------|------|-------|-----|-----|
| Religion affects the use of ART     | 36<br>(10.3)  | 38<br>(10.9)  | 74<br>(21.3) | 104<br>(29.9) | 96<br>(27.6) | 2.47 | 1.28 | -0.44 | 347 | .33 |
| Culture affects the use of ART      | 28<br>(8.0)   | 32<br>(9.2)   | 66<br>(19.0) | 128<br>(36.8) | 94<br>(27.0) | 2.34 | 1.20 | -2.49 | 347 | .99 |
| The cost will affect the use of ART | 71<br>(20.4)  | 112<br>(32.2) | 77<br>(22.1) | 52<br>(14.9)  | 36<br>(10.3) | 3.37 | 1.25 | 12.98 | 347 | .00 |
| Ethics will not allow me to use ART | 12<br>(3.4)   | 41<br>(11.8)  | 95<br>(27.3) | 110<br>(31.6) | 90<br>(25.9) | 2.35 | 1.09 | -2.57 | 347 | .99 |
| Adequate knowledge of ART           | 247<br>(71.0) | 75<br>(21.6)  | 24<br>(6.9)  | 2 (0.6)       | 0 (0.0)      | 4.63 | 0.64 | 62.07 | 347 | .00 |
| Husbands’ opinion of ART            | 36<br>(10.3)  | 96<br>(27.6)  | 81<br>(23.3) | 81<br>(23.3)  | 55<br>(15.5) | 2.94 | 1.24 | 6.62  | 347 | .00 |

**KEY: SA-Strongly agreed, A-Agree, U-Undecided, D-Disagree, SD-Strongly disagree**

**Discussion**

The mean age of respondents was 36.45 ± 6.33 years, with the majority being within the age group 36-45 years. The result is consistent with findings from other Nigerian studies which revealed that ages of the respondents were within the range of 34.8-

36.1<sup>19,20</sup>. This is in contrast to a study in Iran with respondents of lower ages<sup>21</sup>. Seeking care in the fertility clinic is not always the first point of call of women as delayed conception may be perceived as due to other causes. The majority of women may seek



ART treatment as a last resort because many have various perceptions of causes of infertility which could affect their health-seeking behaviour as they seek help from different pathways<sup>5</sup>.

The study revealed that knowledge of ART is essential in making decisions regarding the treatment. The majority of respondents indicated that knowledge of the procedure is a determinant for the use. A similar study has shown the existence of a substantial relationship between knowledge of ART and utilization<sup>20</sup>. Knowledge of the various methods of treatment and functions had been found to influence acceptance of ART<sup>22</sup>. The majority of the respondents had tertiary education. An earlier study had found that the higher the educational attainment the more the knowledge about ART<sup>23</sup>. Infertility management comprises of counselling, diagnostic procedures and treatments to find solutions to the clients' reproductive problem. Interacting with caregivers may have exposed respondents to sufficient information at the primary care centre to enable an informed decision. The tertiary health institution is a referral centre to various primary and secondary health facilities within and outside the state. Therefore, respondents may have had adequate exposure and information before the referral.

The study showed that the majority of the respondents indicated that cost of ART is an essential determinant of utilization. Globally, the cost of ART determines the usage and the number of cycles as other studies have revealed that the cost of ART affects the use<sup>16,18,20</sup>. In most of the developing countries, most couples with

infertility cannot afford ART as the techniques are expensive and are mostly located in private centres<sup>14</sup>. Poverty is a significant problem in Nigeria, where about 46% are living below the poverty level<sup>24</sup>, thus making it almost impossible for an average Nigerian to access ART. The cost of ART was a major determinant in the study. Most women are economically dependent on their husbands as they therefore lack the autonomy to engage in such a vital and expensive venture.

The view of husbands was seen as a determinant by the respondents. The result is in tandem with other studies where male dominance in decision making was a determinant of intervention seeking behaviour<sup>25,26,27</sup>. Nigeria is a patriarchal society with strict gender roles often adhered to. Cultural values also bestow on the husband right and dignity to take decisions without much consideration for the views of the woman who suffers most in problems of infertility.

### **Conclusion**

Infertility is a globally change experienced by many couples within various age groups. Our study highlights the determinants of ART in a tertiary health institution in Benin City. The findings revealed that knowledge, cost and husbands' view are primary determinants of utilization of ART. Factors that influence the use of ART such as cost, knowledge and husband's cooperation are alterable. The involvement of the Insurance Scheme can be explored as a strategy for increasing public utilization of ART to mitigate the cost factor.

## Recommendations

1. There is a need for government policy and health insurance mandate in the provision of ART to reduce cost and access to ART
2. The establishment of linkages towards global partnership with regards to ART services and supply of equipment to developing countries could be explored to reduce the cost.
3. Women empowerment should also be advocated to enable women make decisions about their reproductive health issues.

## References

- Ombelet W, Goossens J. Global reproductive health – Why do we persist in neglecting the undeniable problem of childlessness in resource-poor countries? *Facts Views & Vision ObstetricsGynaecology*.2017;9(1):1-3.
- Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. *PLoS Medicine*.2012;9: e1001356
- Aziken ME. There shall be none barren in the land: Fulfilling the divine injunction against all odds: The intervention of Assisted Reproductive Technology. 178th Inaugural lecture, University of Benin. 2016.
- Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. *PLoS Med* 2012b; 9:1 –12.
- Panti AA, Sununu YT. The profile of infertility in a Teaching Hospital in North West Nigeria. *Sahel, Medical Journal*.2014,17;(1):7-11.
- Obuna JA, Ndukwe EO, Ugboma HAA, Ejikeme BN, Ugboma EW. Clinical presentation of infertility in an outpatient clinic of a resource poor setting, South East Nigeria. *International Journal of Tropical Disease and health*.2012;(2):123-131.
- Odunvbun WO, Oziga DV, Oyeye, DV, Ojeogwu. CL. Pattern of infertility among infertile couple in a secondary health facility in Delta State, South South Nigeria. *Tropical Journal of Obstetrics and Gynaecology*.2018;35;(3):244-248.
- Mustapha, Z. The Practice of Assisted Human Reproduction Technologies (Arts) in Nigeria: The Unanswered Legal and Ethical Questions, *Journal of Law and Judicial System*.2018;1;(1):40- 50.
- Idang GE. African Culture and Values, *Phronimon*.2015; 16:2.
- Ozturk R, Taner A, Guneri S, Yilmaz B. Another face of violence against women: Infertility. *Pakistan Journal of Medical Science*. 2017,33;(4):909–914.
- Ginar da Silva S. Bertoldi AD, Freitas da Silveira M. Domingues MR, Evenson KR, Silva dos Santos I. Assisted reproductive technology: prevalence and associated factors in Southern Brazil. *Revista de Saude Publica*.2019; 53:13.

- International Committee for Monitoring Assisted Reproductive Technology (ICMART). *Preliminary global Assisted Reproductive Technology (ART) data for 011, European Society of Human Embryology and Reproduction (ESHRE), Annual Scientific meeting, Lisbon Spain. 2015.*
- Ezenwa B, Oseni O, Akintan P, Aligwekwe P, Chukwukelu B, Fashola O, Ogunmokun, A, et al. Higher order multiple births in Nigeria: Experiences, challenges and neonatal outcomes in a private health facility. *Niger Journal of Clinical Practice.* 2017, 20:1439-43.
- Fadare JO, Adeniyi AA. Ethical issues in newer assisted reproductive technologies: A view from Nigeria. *Nigerian Journal of Clinical Practice.* 2015, 18;(7):57-61.
- Sallam HN, Sallam NH. Religious aspects of assisted reproduction. *Facts, Views & Vision in Obstetrics Gynaecology.* 2016, 8;(1): 33-48.
- Präg P, Mills MC. Cultural determinants influence assisted reproduction usage in Europe more than economic and demographic factors. *Human Reproduction.* 2017, 32;(11):2305–2314.
- Mulder CL, Serrano JB, Catsburg LA, Roseboom TJ, Repping S, van Pelt AM, et al. A practical blueprint to systematically study lifelong health consequences of novel medically assisted reproductive treatments. *Human Reproduction.* 2018; 33:784-92.
- Silva SG, Bertoldi AD, Silveira MF, Domingues MR, Evenson KR, Santos IS. Assisted reproductive technology: prevalence and associated factors in Southern Brazil. *Rev Saude Publica.* 2019; 53:13.
- Adesiyan AG, Ameh N, Avidime S, Muazu A. Awareness and perception of Assisted Reproductive Technology practice amongst women with infertility in Northern Nigeria. *Journal of Obstetric Gynaecology.* 2011; 1:144-148.
- Omokanye LO, Olatinwo AO, Durowade KA, Raji HO, Raji ST, Biliaminu SA, et al. Determinants of utilization of assisted reproductive technology services in Ilorin, Nigeria. *Journal of Medical Sociology.* 2017; 31:109-113.
- Afshani SA, Abdoli AM, Hashempour M, Baghbeheshti M, Zolfaghari M. The attitudes of infertile couples towards assisted reproductive techniques in Yazd, Iran: A cross-sectional study in 2014. *International Journal of Reproduction Biomedical (Yazd).* 2016, 14;12: 761–768.
- Osian EA, Afemikhe JA, Olorunfemi O, Eweka, A. Knowledge and perception of Assisted Reproductive Technology among women attending the University of Benin Teaching Hospital, Benin City, Nigeria. *Journal of Nursing and Midwifery Science.* 2019; 6:125-30.
- Pourmasumi S, Mostaghaci M, Sabeti P, Ardian N. Knowledge of Infertile Couples about Assisted Reproductive Technology in Iran. *Science Open Journal Women Health & Gynaecology.* 2016; 3:024†
- World Bank, World Development Indicators Definitive Reference for Measuring Development Progress.

Washington 2012;  
<https://www.worldbank.org/en/news>

- Jegede AS, Fayemiwo AS. Cultural and Ethical Challenges of Assisted Reproductive Technologies in the Management of Infertility among the Yoruba of South western Nigeria. *African Journal of Reproductive Health / La Revue Africaine de la Santé Reproductive*.2010,14;2:115-127
- Ombelet W. Global access to infertility care in developing countries: a case of human rights, equity and social justice. *Facts, Views & Vision in Obstetrics Gynaecology*. 2011,3;(4):257–266.
- Aborigo RA, Reidpath DD, Oduro AR, Allotey P. Male involvement in maternal health: perspectives of opinion leaders. *BMC Pregnancy Childbirth*.2018; 18:3 <https://doi.org/10.1186/s12884-017-1641-9>.