

**ASSESSMENT OF KNOWLEDGE, PERCEPTIONS AND MYTHS
REGARDING INFERTILITY AMONG SELECTED ADULT
POPULATION IN SOUTH-EASTERN NIGERIA: A CROSS-
SECTIONAL STUDY**

BY

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Abstract

Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse. This research was carried out to discover the knowledge, perception and myths regarding infertility among selected adult population in South-Eastern Nigeria. A structured administered questionnaire was used to obtain the data. The participants within the age range 33-44 were 35%, 45-75 were 30%, 27-32 19% and 18-26 were 16%. The female respondents were 52.5% while males were 47.5%. 70% of the participants were married while 30% were not married. Only 23.5% stated that Infertility is diagnosed usually after one to two years of regular unprotected sex, while 76.5% stated that it is diagnosed either less than twelve months or more than 3 years. This study revealed that 26% said previous use of intrauterine device by females can cause infertility together with 23% who said it is due to use of contraceptive pills used by females. Also some still believe that it is caused by supernatural powers. More so, 52.5% considered IVF unacceptable because of beliefs that its procedure may use foreign egg or sperm. In this study religion and customs continue to play a major role in the practices related to infertility. There is limited knowledge about treatment options coupled with its cultural and religious perspective that is unclear, which resulted in reduced acceptability of assisted reproductive technologies.

Key Words: Assessment, Knowledge, Perceptions, Myths and Infertility.

Introduction

Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse (World Health Organization, 2018; Ugwu, Onwuka & Okezie, 2012). Childbearing is extremely an important events in every human's life and are strongly associated with the ultimate goals of completeness, happiness and family integration. It is widely accepted that human existence reaches completeness through a child and fulfils the individual's need for reproduction. Human fertility, compared with other species of animal kingdom, is unfortunately low (Benagiano, Bastianelli & Farris, 2016; Okonfua & Obi, 009).

The desire to bear children is almost a universal one in Nigeria and most parts of sub-Saharan Africa. While infertility is not a life-threatening condition, its negative, social and mental impact on individuals has been documented. It is mainly women who suffer adverse effects including stigmatization, domestic violence and feelings of low self-esteem (Ajuwon-Owoaje, Falaye, Osinowo, Aimakhu & Adewole, 2017).

Infertility affects millions of people of reproductive age worldwide – and has an impact on their families and communities. Estimates suggest that between 48 million couples and 186 million individuals live with infertility globally (Boivin, Bunting, Collins & Nygren, 2007).

In female reproductive system, infertility may be caused by a range of abnormalities of the uterus, ovaries, fallopian tubes, and the endocrine system, among others while in male reproductive system, infertility is most commonly caused by problems in the absence or low levels of sperm, abnormal shape (morphology), ejection of semen or and movement (motility) of the sperm (WHO, 2018; Omoaregba, James, Lawani, Morakinya, Olotu, 2011).

Infertility can be primary or secondary. Primary infertility is when a pregnancy has never been achieved by a person, and secondary infertility is when at least one prior pregnancy has been achieved (Nwajiaku, Mbachu & Ikeako, 2012).

According to World Health Organisation, (2015) Primary infertility is the term used in reproductive medicine for a woman (couple) who failed to achieve a pregnancy for 1 or 2 years and who has never been pregnant before. Secondary infertility is the term applied to women who meet the criteria for primary infertility but at some time in the past have been pregnant. In reproductive medicine, the term infertility can be used in a descriptive manner to define the situation in women (couples) who are unable to conceive or have a pregnancy leading to live birth, during ≥ 1 year (Neelofar & Tazeen, 2006).

Global infertility prevalence rates are difficult to determine, due to the presence of both male and female factors which complicate any estimate which may only address the woman and an outcome of a pregnancy diagnosis or live birth. One in every four couples in developing countries had been found to be affected by infertility, when an evaluation of responses from women in Demographic and Health Surveys from 1990 was completed in collaboration with World health organisation in 2004. The burden remains high (Daar & Merali, 2002).

Infertility is a source of distress for couples as societal norms and perceived religious dictums may equate infertility with failure on a personal, interpersonal, emotional or social level. Women bear the brunt of these societal perceptions in most of the cases. Psychologically, the infertile woman exhibits significantly higher psychopathology in the form of tension, hostility, anxiety, depression, self-blame and suicidal ideation (Fido, 2004).

In Latin America, strong social stigma attached to infertility and machismo cause women to blame them for infertility, while in Mozambique, infertile women are excluded from certain social activities and traditional ceremonies. Social stigma regarding infertility is especially common across South Asia. For e.g. in Andhra Pradesh, India 70% of women experiencing infertility reported being punished with physical violence for their failure (Daar & Merali, 2002). Women are verbally or physically abused in their own homes, deprived of their inheritance, sent back to their parents, ostracized, looked down upon by society, or even have

their marriage dissolved or terminated if they are unable to conceive (Vanbalen, & Trimboskemper, 1993).

Medical advances have shown that most cases of infertility are treatable. All kinds of assisted reproductive technologies (ART) have been introduced to eliminate infertility problems. ART options include intrauterine insemination (IUI), invitro fertilization (IVF), gamete intra fallopian transfer (GIFT), intracytoplasmic sperm injection (ICSI). These are advanced medical techniques that aid conception in women in order to fulfil the personal and societal ideal of having children. IVF has been used safely and effectively for more than two decades. It is estimated that approximately 3.5 to 5 million children have been born worldwide following ART treatment (Ajayi, 2012).

The Knowledge about infertility is inadequate in many parts of the world. A global survey of almost 17,500 women (mostly of childbearing age) from 10 countries revealed that knowledge regarding fertility and biology of reproduction was poor (Fido, 2004). Many women have little awareness of the period of the month in which they are most fertile and when to seek treatment (Blake, Smith, Bargiacchi, France & Gudex, 1997). In addition to the low level of knowledge, there are a number of misconceptions regarding infertility all over the world. In Tanzania for instance, evil forces are often thought to be the cause of infertility (Gijssels & Mgalla, 2001). In Nigeria, the prevalence of primary infertility is 5% and secondary infertility is 8% (World Health Organization, 2004). The casuses of infertility vary and have been linked to environmental issues, occupational related, genetics, hormonal abnormalities and infectious diseases (Hart, 2016).

Research Methodology

Study Area

Outpatients centre of Federal Medical Centre Owerri Imo State, Nigeria. Federal Medical Centre, Owerri was founded as a colonial dispensary. It was promoted to a District Hospital,

then a General Hospital, before finally becoming a federal medical centre in 1995.¹ Federal Medical Centre Owerri is located along Orlu road, Owerri Imo State. Examples of tertiary care services include cancer management, neurosurgery, cardiac surgery, plastic surgery, treatments for severe burns, advanced neonatology services, palliative, surgical interventions, obstetric and gynaecological services and other complex medical and.

Study Population

Adult population, recruited from the outpatient centre of Federal Medical Centre Owerri.

Research Design

The research design was a cross-sectional survey conducted on a conveniently selected adult population, recruited from the outpatient centre of federal medical centre Owerri. A structured administered questionnaire was used to obtain the data. The questionnaires collected information on the socio-demographic characteristics of the adult outpatients, their knowledge, perception and myths regarding infertility.

Instrument for Data Collection

The instrument for data collection was a pre-tested questionnaire made up of open and closed ended questions which was administered by the researcher. This guaranteed uniformity in the information obtained since the respondents are both literate and illiterate. The closed-ended questions helped to draw concrete conclusions about the respondents while the open-ended allowed researchers to better access the respondents' true feelings on the issue. The questionnaire was developed by considering the objectives of the study which are specific and measurable steps to meet the survey goal, hence, provided a framework for asking the right questions.

Validity and Reliability of the Instrument

The questionnaire was critiqued by the supervisors of the thesis. The validity of the instrument was assured by sending the constructed questionnaire to the supervisors and other

jurors of experts in Public Health in order to give their views on the instrument. The instrument was subjected to face, content, criterion-related and construct validity by these jurors of experts in Public Health. They examined the specific actions and items of the instrument to justify the relevance of the contents in terms of their clarity and appropriateness of the language vis-a-vis the ability to elicit accurate information that enabled the researcher to answer the research questions and test the null hypotheses. To ascertain reliability of the instrument, a pre-test method was used. About, 15-20 of the questionnaire was administered to 15-20 women with infertility at Teaching hospital Orlu, which was not part of the study area. The questionnaire was analysed and any ambiguity noticed in any of the questions was addressed. After two weeks, the questionnaire was administered to other group of women with infertility. This helped to fine-tune the questions. The data collected at both intervals was compared to see if the respondents were consistent. The two scores obtained were used to compute the correlation co-efficient which was interpreted as an estimate of reliability.

Method of Data Analysis

Data was cleaned, entered and analysed using statistical packages for social sciences version 25.0. Frequency and contingency table was used to show the distribution of data. Quantitative data was summarized using mean and standard deviation and qualitative analysis with proportion and percentages. Statistical analysis using Chi-square was done to determine the effect of the different variables. The level of significance was 0.05 levels.

Ethical Consideration

Ethical clearance for the study was obtained from the Ethical Committee of Abia State University Uturu. Permission was also obtained from the Chief Medical Director of Federal medical centre Owerri. Furthermore, verbal informed consent was obtained from the respondents after explaining to them the importance and advantages of the study. The disadvantages of the study were equally explained to them. They were also informed that they can decide not to participate in the study without any consequence. Confidentiality of

history and personal data of the respondents was ensured throughout the study and even beyond

RESULT

Table 1 Socio-demographic Profile of the Respondents

Variables	Frequency (<i>n=400</i>)	Percentage
Age		
18-26	64	16%
27-32	76	19%
33-44	140	35%
45-75	120	30%
Sex		
Male	190	47.5%
Female	210	52.5%
Education Level		
Primary	40	10%
Secondary	160	40%
Tertiary	200	50%
Occupation		
Civil Servant	46	11.5%
Trading	160	40%
Artisan	140	35%
Student	54	13.5%
Marital Status		
Unmarried	120	30%
Married	280	70%

Socio-Demographic Characteristics of the Sample

Out of 420 outpatients approached to participate in this survey. Four hundred individuals agreed to participate. Respondent's ages ranged from 18-26 years had the least 64 (16%), followed by 45-75 with 120 (30%). Those within the age range 27-32 were 76 (19%) while the range 33-44 years had the highest 140 (35%).

A total of 210 (52.5%) were females while 190 (47.5%) were males. Based on educational level of the respondents, those in the tertiary institution were 200 (50%), followed by secondary 160 (40%) while the least were those in primary with 40 (10%). The occupation of the respondents were as follows; trading 160 (40%), artisan 140 (35%), students 54 (13.5%) while civil servants were 46 (11.5%). Majority 280 (70%) of the respondents were married while 120 (30%) were unmarried (table 1).

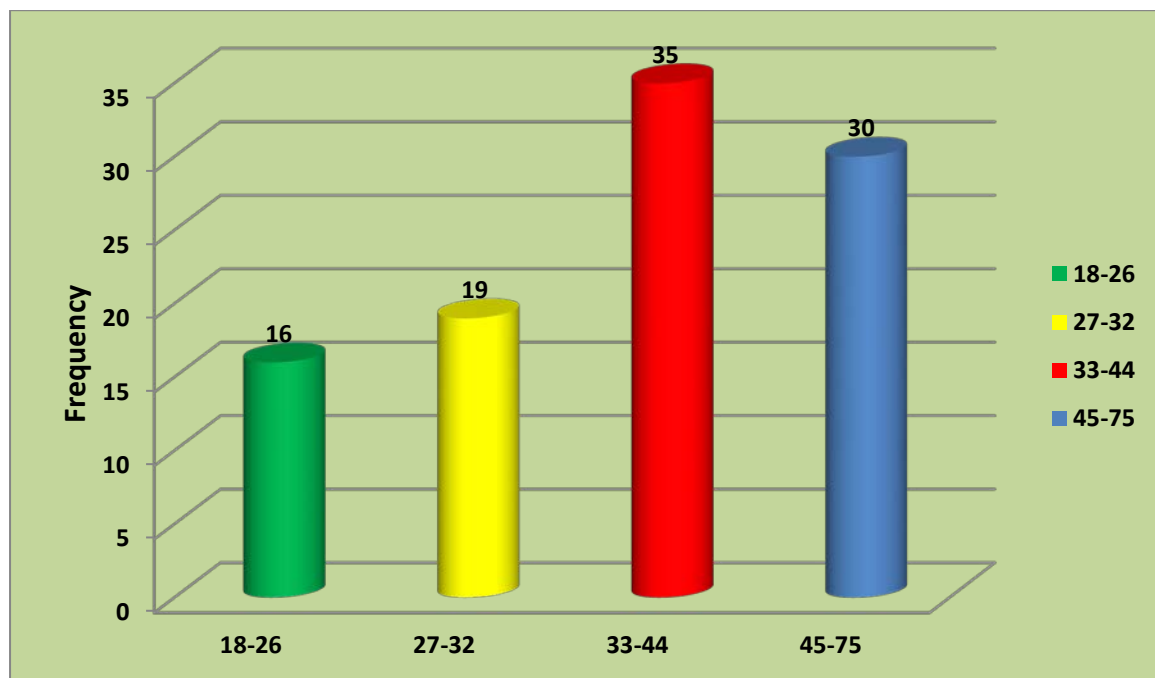


Figure 1: Age range of the respondents

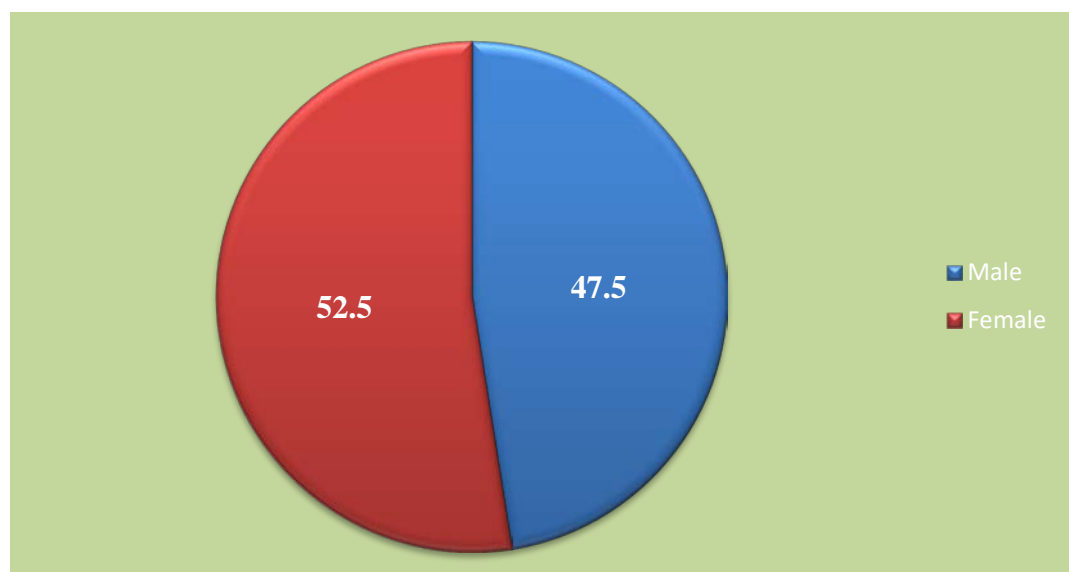


Figure 2: Gender of the respondents

Table 2: Showing Awareness of the Diagnosis of Infertility

Variables	Option	Frequency (<i>n</i> =400)	Percentage
Diagnosis of infertility	Infertility is diagnosed usually after one to two years of regular unprotected sex	94	23.5%
	It is diagnosed either less than twelve months or more than 3 years.	306	76.5%
When is a woman fertile to be pregnant in her circle?	1.Right after menses	170	42.5%
	2.Mid-cycle	152	38%
	3.Before the beginning of her circle	78	25%

Table 2 showed that only 23.5% of the participants correctly recognized that infertility is diagnosed usually after one to two years of regular unprotected sex while majority 76.5% of the respondents believed that it is either less than twelve months or more than 3 years.

When they were asked the best fertile time for a woman, 170 (42.5%) believed that it is right after menses. Only 152 (38%) said mid-circle while 78 (25%) believed it is before the beginning of her circle (table 2).

Table 3: Knowledge of Respondents on Causes of Infertility

Variables	Frequency (<i>n</i> =400)	Percentage
Abnormal menses (ovulatory factors)	22	5.5%
Blocked tubes	34	8.5%
History of Infections of genital tract in females	26	6.5%
History of infections of genital tract in males	24	6%
Smoking	16	4%
Previous use of contraceptive pills by female	92	23%

Variables	Frequency (n=400)	Percentage
Previous use of Intrauterine device by female	104	26%
Supernatural causes	40	10%
Psychological stress	20	5%
Being obese	22	5.5%

Table 3 above showed that, 104 (26%) participants believed that previous use of Intrauterine device by female causes infertility followed by 92 (23%) who stated that previous use of contraceptive pills by female causes infertility. Those who said that supernatural power causes infertility were 40 (10%), 34 (8.5%) believed that blocked tubes causes' infertility. Those who believed that history of infections of genital tract in females causes infertility were 26 (6.5%), history of Infections of genital tract in males were 24 (6%) while those who believed that abnormal menses (ovulatory factors) can lead to infertility were 22 (5.5%). Also those who believed that obesity can lead infertility were 22 (5.5%). The least 16 (4%) were those who believed smoking can cause infertility (table 3).

Table 4: Attitude of the Respondents Regarding Infertility.

Variables	Response	Frequency	Percentage
Do you think infertility is a disease?	Yes	230	57.5%
	No	170	42.5%
Who do you think should be investigated first?	Husband	60	15%
	Wife	120	30%
	Both	220	55%
Do you think infertility should be treated medically?	Yes	374	93.5%
	No	26	6.5%
Do you think that if a couple conceives once they might have problems conceiving again?	Yes	302	74%
	No	98	26%
Whom would you go for treatment? Primary preference?	Gynaecologist	290	72.5%
	Others (Native doctor, Homeopathic)	110	27.5%
Secondary preference?	Gynaecologist	140	35%
	Others (Native doctor, Homeopathic)	260	65%

Statistically, 230 (57.5%) of the respondents were of the opinion that infertility is a disease while 170 (42.5%) believed that infertility is not a disease. Based on the person that should be investigated first, 220 (55%) strongly believe that both should be investigated the same time, followed by 120 (30%) who said women (wife) should be investigated first while 60 (15%) said husband should be investigated first (table 4).

Majority, 374 (93.5%) stated that infertility should be treated medically while 26 (6.5%) said it should not be treated medically. Majority, 302 (74%) stated that if a couple conceives once they might have problems conceiving again while a few 98 (26%) disagreed on that.

The majority 290 (72.5%) chose to initially consult a gynaecologist for the treatment while 110 (27.5%) said it is better to consult native doctor or homeopathic. More so, majority 260 (65%) said native doctor or homeopathic should be consulted if unsuccessful with the gynaecologist while 140 (35%) insisted on going to a gynaecologist.

Table 5: Perceptions about Marital Outcomes and Options for Infertile Couple

Variables	Response	Frequency (n=400)	Percentage
If a female cannot have a baby, do you think this is grounds for divorce?	Yes	110	27.5%
	No	290	72.5%
If a female cannot have children, do you think this is a valid reason for the man to have a second marriage?	Yes	260	65%
	No	140	35%
If a male cannot have children, do you think this is grounds for divorce?	Yes	136	34%
	No	264	66%
If a couple cannot have a child, do you think they should adopt?	Yes	372	93%
	No	28	7%
Who is being blamed for infertility in the society?	Husband	12	3%
	Wife	340	85%
	Both	28	7%
	Neither	20	5%
Do you think it is socially acceptable to have a test-tube baby?	Yes	190	47.5%
	No	210	52.5%
Do you think fertility drugs are socially acceptable?	Yes	360	90.0%
	No	40	10.0%

From the perception about marital status outcomes and options for infertile couple, 290 (72.5%) stated that if a female cannot have a baby, there should no need for divorce while 110 (27.5%) said there is need for divorce. Majority 260 (65%) also supported that if a female cannot have children, that the man can have a second marriage while 140 (35%) disagreed. Also, 264 (66%) participants stated that if a male cannot have children, there are no grounds for divorce while 136 (34%) respondents supported it. More so, majority 372 (93%) stated that if a couple cannot have a child, they should adopt while a few 28 (7%) opposed it.

Meanwhile, 340 (85%) respondents stated that a wife should be blamed for infertility in the society, followed by 28 (7%) respondents who said both are to be blamed. Those who said neither were 20 (5%) while the least were those who said the husband should be blamed. Furthermore, 210 (52.5%) said it is not acceptable to have a test-tube baby while 190 (47.5%) said it is socially acceptable to have test-tube baby. Lastly, 360 (90%) stated that fertility drugs are socially acceptable while 40 (10%) said it is not socially acceptable (table 5).

DISCUSSION

According to our research, 35% of the respondents fall within age 33-44 years, 30% were those within 45-75 years, 19% were within 27-32 years, and 16% were within the age range 18-26. This present study also showed that majority 52.5% of the respondents were female while 47.5% were males.

Advance maternal age historically before the latter 20th century, women were conceiving in their teens and twenties, when age-related abnormalities with the egg were not evident. However, in our modern era, women are delaying child birth until thirties and forties which has led to the discovery of the adverse effect of advanced maternal age on egg function. In fact, female age related infertility is the most common cause of infertility today. For unknown

reasons, as women age, egg numbers decreases at a rapid rate and as aging occurs, quality of egg decreases in her early 30s into her 40s. Hence, a woman is rarely fertile beyond the age of 45.

According to educational level of the outpatients interviewed, 50% had their tertiary education; secondary education was 40% while 10% had primary education. Also based on the occupation of the out patients interviewed, 40% were traders, followed by artisans 35%, students were 13.5% while civil servants were 11.5%. Statistically, majority 70% were married while 30% were unmarried. This is also in line with the studies of Obuna, Ndukwe, Ugboma, Ejikeme & Ugboma, 2012).

The results of this study indicate that knowledge about infertility is limited in the study population. For instance, 26% of the participants were misinformed that use of IUCD and OCPs 23% may lead to infertility. Those who also believed that supernatural powers can lead to infertility were many 10%. This is consistent with the studies of Sule, Erigbali & Eruom, 2008).

The lack of knowledge about infertility was clearly demonstrated through this study. This lack of knowledge explains why such a strong stigma is attached to infertility in the society. The results of this study are similar to that of a large global survey conducted during the World Fertility Awareness Month (2006) on approximately 17,500 individuals, which revealed that the knowledge regarding fertility and biology of reproduction was lacking throughout the world (Adashi, Cohen, Hamberger, Jones, Kretser, Lunenfeld, Rosenwaks & Van Steirteghem, 2000).

The limited knowledge was also confirmed where few participants knew how infertility is diagnosed after at least one to two years of regular unprotected sex. This may subsequently hinder the couples on when to start seeking for treatment, which should not be delayed.

In addition to proper knowledge about infertility, it is also crucial to know the most fertile period for a woman when she is trying to conceive. One of the surprising results found in this study was that only 38% of the participants correctly identified mid-cycle as the most fertile period during the female's menstrual cycle. The lack of accurate information on the fertile time in the cycle may lead to improper timings of sexual intercourse, hence, possibly delaying the pregnancy. This is consistent with the studies of Sumera Ali, Raafay Sophie, Ayesha Imam, Faisal Khan, Syed Ali, Annum Shaikh & Syed Farid-ul-Hasnain (2001) which confirmed that only 46% of the participants correctly identified mid-cycle as the most fertile period during the female's menstrual cycle.

This study also confirmed that 10% believe in supernatural powers as causes of infertility, and the less educated participants were more likely to attribute the causes of infertility to an evil supernatural power. In fact, these findings were confirmed by another study which was conducted amongst the Kuwaiti infertile women. It was discovered in that study that the uneducated group attributed the causes of their infertility to supernatural causes such as evil spirits, witchcraft and God's retribution, while the educated group held nutrition, marital and psychosexual factors responsible for their infertility (Fido. 2004).

In this study it was discovered that women are to be blamed in infertility cases with 85%, both 7%, neither 5%, while men were 3%. In this part of the world, it is usually the woman who is being blamed for infertility as a reaction to a couple without children, which was confirmed through the study. Another study conducted by Sami, (2006), in Pakistan revealed that 69% of the secondarily infertile women reported being blamed for infertility often by in-laws, followed by husbands (38%) (Sami, 2006). She further reported that one third of the women were blamed to be unlucky not only to the husbands but also to the entire family. The unnecessary blame on a woman can potentially affect her self-esteem and become socially crippling for her.

This issue led to asking the respondents their views on divorce and husbands' remarrying in case of infertility. It was disturbing to discover that people believe husbands should be allowed to remarry and have a second wife in case he is not able to conceive with the previous wife. According to Christian doctrine and culture infertility is not a ground for divorce for either the male or the female. Yet this study showed that people were still in favour of divorce. This also corresponds with the studies of Sumera Ali, Raafay Sophie, Ayesha Imam, Faisal Khan, Syed Ali, Annum Shaikh & Syed Farid-ul-Hasnain (2001).

This study revealed that the majority 65% of individuals would prefer alternative treatment options, if unsuccessful with the orthodox medicine. Also, more than half 52.5% of the respondents considered a "test tube baby" an unacceptable option, despite its acceptability by religious. Another significant finding regarding perception of infertility was subjects' beliefs in the evil forces and supernatural powers as a cause of infertility, which correlated with their education level.

In this study religion and customs continue to play a major role in the practices related to infertility. Due to lack of knowledge on treatment option for infertility, such as IVF, is very low because it is an advanced option with limited availability in Nigeria. Amongst the respondents who knew about it, 52.5% considered it unacceptable because of beliefs that its procedure may use foreign egg or sperm. This study also revealed that there is also misinformation with regards to IVF.

Conclusion

Infertility is a common problem affecting approximately one-fifth of the population. We found that the knowledge about infertility is limited amongst the participants coupled with a lot of misconceptions, such as people's beliefs that IUCD and OCPs can cause infertility. Moreover, the populace still believe in supernatural powers as a cause of infertility and seek

treatment from homeopathic and native doctors. IVF should also be a popular option for couples in case they are not satisfied with allopathic medicine. There is limited knowledge about treatment options coupled with its cultural and religious perspective that is unclear, which resulted in reduced acceptability of assisted reproductive technologies.

Recommendations

- There should be global epidemiological and etiological research on infertility.
- Developing guidelines on the prevention, diagnosis and treatment of male and female infertility, as part of the global norms and standards of quality care related to fertility care. Availability and health system capacity to deliver fertility care globally.
- Providing country-level technical support to member states to develop or strengthen implementation of national fertility policies and services.
- Provision of high-quality services for family-planning, including fertility care services.
- Adequate knowledge is required so that infertile couples can seek medical care in a timely manner and prevalent myths and misconceptions. This can be done through the media via numerous health shows, which are popular amongst people. Television will be the best way to target the less educated, who not only have a poor knowledge base but also are more willing to accept the alternative causes of infertility and more likely to seek alternative treatments.
- They general public should be oriented on medical approach for infertility and permits IVF as a treatment option, as long as no third-party donation is involved.

REFERENCES

Adashi, E.Y., Cohen, J., Hamberger, L., Jones, H.W., Kretser , D.M., Lunenfeld, B., Rosenwaks, Z., & Van Steirteghem, A.(2000). Public perception on infertility and its treatment: an international survey, the Bertarelli Foundation Scientific Board. Human Reproduction; 15 (2): 330-334.

- Ajayi, R.A. (2012). Focus on IVF Business in Nigeria. *Market place Africa*. CNN, 2012.
- Ajuwon, A., J.Owoaje, E., Falaye, F., Osinowo, K., Aimakhu, C., & Adewole, I.F, (2017). Infertility; Training Manual on Sexual Reproductive Health and Rights and HIV Prevention for Medical Students in Nigeria, College of Medicine University of Ibadan, Nigeria. Pg. 107-115.
- Blake, D., Smith, D., Bargiacchi, A., France, M., & Gudex, G (1997). Fertility awareness in women attending a fertility clinic. *The Australian and New Zealand journal of obstetrics & gynaecology*; 37 (3): 350-352.
- Boivin, J., Bunting, L., Collins, J.A., & Nygren, K.G. (2007). International Estimates of infertility Prevalence and treatment seeking: Potential need and demand for infertility medical care. *Health Reproduction Update*, 22: 1506-1512.
- Daar, A., & Merali, Z. (2002). Infertility and social suffering: the case of ART in developing countries. *Current Practices and Controversies in Assisted Reproduction*. Edited by: Vayena ERP, Griffin D. 2002, Geneva: World Health Organization.
- Fido, A. (2004). Emotional distress in infertile women in Kuwait. *International Journal Fertility Women*; 49 (1): 24-28.
- Gijsels, M., Mgalla, Z, L. (2001). 'No child to send': context and consequences of female infertility in northwest tanzania. *Women and Infertility in Sub-Saharan Africa: A Multi-Disciplinary Perspective*. Edited by: *Boerma Journal*; 203-222.
- Neelofar, S., & Tazeen, S. (2006). The cultural politics of gender for infertile women in Karachi, Pakistan. *Gender Studies Conference*. 2006, South Africa.
- Nwajiaku, L.A., Mbachu, I.I., & Ikeako, L. (2012). Prevalence, clinical pattern and major causes of male infertility in Nnewi, South East Nigeria: A five year review. *African medicine Journal*; 3(2):16–19.
- Obuna, J.A., Ndukwe, H.A., Ugboma, A., Ejikeme, B.N., & Ugboma, E.W. (2012). Clinical presentation of infertility in an outpatient clinic of a resource poor setting South-East Nigeria. *International Journal Tropical Disease Health*; 2(2):123–131.
- Okonfua, F.E., & Obi, H. (2009). Specialized versus conventional treatment of infertility in Africa; time for a pragmatic approach. *African Journal Reproductive Health*; 13(1):9–15.

- Omoaregba, J.O., James, B.O., Lawani, A.O., Morakinya, O., & Olotu, O.S.(2011). Psychosocial characteristics of female infertility in a tertiary health institution in Nigeria. *Annual African Medicine*; 10(1):19–24.
- Sule, J.O., Erigbali, P., & Eruom, L. (2008). Prevalence of Infertility in women in a Southwestern Nigerian Community. *African Journal of Biomedical Research*; 11:225–227.
- Sumera Ali, Raafay Sophie, Ayesha Imam, Faisal Khan, Syed Ali, Annum Shaikh & Syed Farid-ul-Hasnain (2001). Knowledge, perceptions and myths regarding infertility among selected adult population in Pakistan: a cross-sectional study *Biomedical Public Health*; 11(8):760 -768.
- Ugwu, E.O., Onwuka, C.I., & Okezie, O.A. (2012). Pattern and outcome of infertility in Enugu: the need to improve diagnostic facilities and approaches to management. *Niger Journal Medicine*; 21(2):180–184.
- Vanbalen, F., & Trimboskemper, T.C.M. (1993). Long-Term Infertile Couples - a Study of Their Well-Being. *Journal Psychosomatic Obstetrics Gynaecology*; 14: 53-60.
- World Health Organization (WHO). International Classification of Diseases, 11th Revision (ICD-11) Geneva: WHO 2018.