

Awareness, Perceived Efficacy, and Utilization of Assisted Reproductive Technologies Among Women Attending Infertility Clinic in a Nigerian Tertiary Health Institution: A Cross-Sectional Study

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Abstract

Background

Infertility is a source of distress for couples considering the high accolade placed on having children in family settings in Nigeria. Assisted reproductive technologies (ARTs) offer a chance of parenthood to couples. However, studies on knowledge of ART abound in Nigeria but no previous studies exist on the extent of utilization of assisted reproductive technologies. This study thus explored the level of awareness, perceived efficacy and utilization of ARTs among women attending infertility Clinic in a Nigerian Tertiary Health Institution.

Methods

This cross-sectional study which utilized a self-administered questionnaire was adopted for this study. The questionnaire contains five sections with section A to E bordering on demographics, awareness, perceived efficacy, utilization, and factors influencing utilization respectively

Results

One hundred and seven women with infertility problems, aged between 26-35 years with a mean age of 31.46 ± 5.72 participated in the study. Sixty-two patients (57.9%) were aware of ARTs while 97 (90.7%) believed that ART cannot address male infertility. Only 27 (25.2%) admitted to have used ART procedures before while 82 patients (76.6%) stated that cost of the procedure was the major hindrance to use.

Conclusions

Awareness of ARTs is average while there is low utilization and perceived efficacy of ART. High cost of the procedure remains the major setback to its utilization

Background

In Nigeria, like in many other countries in Africa perception of marriage and procreation are interwoven and inseparable. This therefore emphasizes the reason for prayers showered on newly married couple to be fruitful in their marriage. It is important to note that not all married couple ends up being fruitful as some were unable to achieve pregnancy over a period of 12 months and are therefore classified as infertile.

Infertility is therefore, the inability of a couple to conceive after regular unprotected sexual intercourse for at least one full year [1, 2]. Infertility being a global health problem is generally quoted as occurring in 8-12% of couples and more prevalent in Sub-Saharan African, with 10–30% of couples affected in Nigeria [3, 4]. Considering the high premium that family place on having children in Nigeria and Africa at large, being unable to get pregnant is associated with a lot of negative treatment such as deprivation, neglect, violence, psychosocial, and other marital problems [5,6,7]. Infertility problem is one of the commonest reasons women seek gynaecological consultation [8, 9, 10, 11]

Infertility can be classified as primary or secondary depending on whether the woman has been pregnant before. The main causes of infertility in men and women can be hormonal, structural or infectious in nature. In most cases, causes of infertility could be unexplained. Also, increasing prevalence of medical disorders such as diabetes, hypertension, and hypothyroidism and lifestyle diseases such as obesity and addictions in the young has also been implicated as the causes of infertility [12]. This is consistent with studies carried out in Nigeria which linked infertility in Nigeria to post-infectious causes such as sexually transmitted infections, puerperal sepsis, and post-abortive infection [13,14]. Treatment of infertility issues can be either by surgical or medical treatment, although, with persistent inability to conceive after these treatments, one could opt for a more advanced procedures called Assisted reproductive technologies (ARTs) [15].

ARTs are group of techniques that employ direct collection and in vitro processing of human gametes, as well as embryo replacement into the uterus, to overcome natural barriers to conception [16]. ART technique offers a chance at parenthood to couples who until recently would have had no hope of having a biologically related child [17, 18]. This novel innovation has today changed the human understanding of reproductive health, especially in the developed world contrary to what obtains in yet to develop countries [19]. Despite this advancement there was found yet a low level of acceptance of ART therapeutic options by infertile couples worldwide more in developing countries with associated misconceptions, myths, ethical and moral aftermath [9, 20, 21]. Studies on perception, awareness and knowledge regarding ARTs therapies abounds in Nigeria with conflicting reports [9, 22, 23, 24, 25, 26]. Despite a high degree of awareness, usage of ART services was poor in a Nigerian study [18]. Since the publication of this report, no study has been conducted to analyze the level of improvement in use, which is the purpose of this research. It is expected that the findings of this study will contribute to literature and also bring to lime light the level of improvement and or utilization of ARTs services based on previous reports emanating from Nigeria. It will also have implications on recommendations to improve awareness campaign on the importance and success rate of ARTs.

Methods

Study design and Participants

A cross-sectional study was conducted between October, 2019 and November, 2020 among women presenting for the first time to the clinic with complaints of inability to conceive and consented to participate in the study. Women were eligible to participate irrespective of their age or duration of complaint. The study was conducted at the Tertiary Health Institution in Enugu, South-Eastern Nigeria. The hospital serves as a major referral facility for the metropolis and its environs. The infertility clinic is run once a week with an average number of 10-15 new clients seen weekly. Convenient sampling method was applied to recruit women for this study.

Instruments

Data collection was through a self-developed pretested 24 item 5-sections questionnaire. Section A; contained 6 items designed to collect socio-demographic information on age, marital status, religion, educational qualification, occupation and number of children. Section B; 4 items assessed the awareness of ARTs. Section C; 2 items assessed the perceived efficacy of ARTs, Section D; 5 items were formulated to determine the utilization of ARTs and Section E; 7 items identified factors affecting the utilization of ARTs. Face and content validations of the instrument was done, and questions rephrased where required. The reliability of the instrument was established through a pretest administered to 11 (10%) women attending infertility clinic in another institution with similar characteristics with the study facility using test-retest statistical method and was analyzed using Cronbach's alpha test which yielded a reliability coefficient of 0.75 confirming instrument as reliable.

Data collection

The data was collected by all authors and two trained research assistants during morning shifts. Before distributing the questionnaire to the women, the researchers informed them about the purpose and relevance of the study. The data collection was to ask the women to fill out a paper-based questionnaire on that spot. Beforehand, administrative permit was obtained from the hospital management, and we worked closely with the nurses working in the clinic to plan and coordinate the data collection and we obtained maximum cooperation. Incentives were not provided for the women to fill out the questionnaires.

Statistical analysis

The participants' socio-demographic, awareness, perceived efficacy and utilization of Assisted Reproductive Technologies (ARTs) were described using descriptive statistic indicators such as frequency, percentage, standard deviation and mean. Two categories of options, "yes" or "No" were entered as response variables based on previous study [27]. Descriptive analysis was done using SPSS software version 24.

Results

Of the 107 women who accurately completed the questionnaires (response rate=95.5%), 56 52.3% (n=56) were between the ages of 26-35 years old and the mean age was 31.46 (SD =5.72) years, 94.4% (n=101) were married, 97.2% (n=104) were Christians, 98.1% (n=105) had formal education with secondary 43.0% (n= 46) and tertiary 37. 4% (n=40) education respectively, 57.9% (n=62) were self-employed, 45.8% (n=49) were childless while 41.1% (n=44) had a child. **(Table 1)**. On the awareness of assisted reproductive technology, out of 90.7% of the participants that have heard of ARTs, 57.9% were aware of what ART services were. Sources of information were majorly health facility (hospital) 55.7%. Majorly accepted ARTs procedure was In-vitro fertilization (IVF) 77.6%, followed by surrogacy, 67.3%, intrauterine insemination (IUI) 52.3% least was Ovulation stimulation 7.5% **(Table 2)**.

On perceived efficacy of ART, majority 90.7% believed ARTs cannot address male infertility, and 82.2% stated ARTs can fail in establishing pregnancy (**Table 3**).

On utilization of ART, 74.8% of the women have never used any ART services, out of 25.2% who used, In vitro- fertilization (IVF) 63% (n= 17) was mainly used, 77.8% (n= 21) had used it once and many 71.0% showed willingness to use and continue the use ARTs for the treatment of infertility if given the opportunity (**Table 4**).

Also, majority of women 76.6% reported cost as the major hindrance to obtaining ART services, followed by fear of possible side effects 68.2%, fear of incompetence on the side of the service providers 57.0%, lack of support from spouse 53.3% and discrimination against children born through ARTs 41.1%. The least factor is religious beliefs regarding use of artificial human fertilization 20.6% (**Table 5**).

Discussion

Making decisions requires a high level of awareness. To be well informed about a fact, one must be appropriately aware. Women attending an infertility clinic in a Nigerian Tertiary Health Institution were asked about their awareness, perceived efficacy, and use of Assisted Reproductive Technologies (ARTs). ARTs had been heard about by 90.7% of the women, while ART services were known by 57.9%. Health personnel were the most common source of information (55.7%). The center though a Tertiary health institution was not long known to treat infertility via ART services. Previously, women with infertility problem who were enlightened travelled as far as Abuja, Port Harcourt just to obtain the services, ART services even though introduced anew in this center are yet to gain popularity as seen in older practicing establishments, couples who today visit this center are yet to come to terms with the services, most of them are yet not regular with the appointments leading to deficiencies in in-depth knowledge. Furthermore, knowing full well that this is a unique field of expertise that necessitates specialized training, health personnel's insufficiency in imparting knowledge to consumers may be insufficient. Despite this, the proportion of awareness observed in this study was also found in a similar study in a state in Nigeria [28] and in Pakistan in which the majority of the study participants showed limited awareness about infertility management, as well as a high level of disbelief and suspicion about ART procedures [29]. In the current study, 85.6% of participants were aware of various ART treatments, with in-vitro fertilization being the most widely recognized option (IVF). In contrast to other techniques of assisted reproduction, IVF involves manually combining an egg with a sperm sample and then transferring it back into the female uterus. In comparison to other methods, it has been considered as the most adaptable and successful [30]. Around 5.4 million kids were born using IVF [31] in 1978 around the world. Similarly, in Benin City Nigeria in 2011, 70.1% and 71.9% of the infertile parents described the offspring from IVF as normal and acceptable [26]. Likewise, a study titled "Experience with a comprehensive University hospital-based infertility program in Nigeria" [32] described IVF as the most acceptable choice of ARTs, widely used in developed countries of the world [33,34]. The interest to use IVF procedure as noted in this present study is not peculiar with Nigeria probably because of the less complexity, the method attracts more acceptances. In the midst of other methods, surrogacy was the second major chosen method thereby disproving the cultural bias or

mindset of our people that a woman, who wants to be a "mother", should deliver her baby through the natural means. Surrogacy as one of the ART procedures lawfully permits a woman to carry pregnancy for another who will become the parent of the child. By implication the result obtained in this study showed that cultural bias of one harboring pregnancy for another did not in any form discourage the choice of accessing this method in this study as one would have expected among Africans [35].

Majority 89.7% knew the procedure could not address male infertility and 80.4% were aware it could fail in establishing pregnancy. This is surprising because male factor infertility contributes either as a single factor or in combination of female causes to bring about more than 40% cases of infertility witnessed wide world [26, 36]. Hence, despite the level of awareness about ART services, awareness of ARTs efficacy was found very low. The high number underrating the efficacy of the procedure illustrates the direct influence that lack of sufficient knowledge and misconceptions can have on one's attitudes [18]. This research should help healthcare professionals to educate the public about ART, so that misunderstandings do not hinder public acceptance of these treatments.

The utilization of ART services was still found to be profoundly low as observed in a study of 3 years ago [33]. 25.2% (n=27) of the women reported to have used IVF once, 14.8% (n=4) twice though majority 71.0% expressed interest to make use of the technology in future if given the opportunity based on the uncompromised benefits. This is similar to a report of study in Ilorin [37] and Benin city [9] in Nigeria where majority of the respondents indicated intention to advise and share information about the existence of ARTs with friends, relatives and neighbours. Similarly reports obtained in Anambra State [22], Sokoto [38], Northern Nigeria [33], Ibadan [39] and more still in Ilorin [18] showed low interest to use of ART services. In Northern part of Nigeria only handful, 7.6% of clients were willing to embrace ART services [42] same also in Ibadan [45] and Ilorin in Nigeria study [18]. Likewise in a study in Iran [15] and Pakistan [29] IVF remains an unfamiliar and an unacceptable option. That notwithstanding ART services currently are generating much interest in many parts of the world with low perception still existing in developing countries where education, poverty and cultural background may have and continued to play great role [9].

High cost of obtaining ART services 76.6% among others was identified as the major barrier to utilization. It is a fact in Nigeria, that government ARTs established centers are only two of the over fourteen In-vitro fertilization and Embryo transfer centers found in the country hence privately-owned ART establishments charge exorbitantly. With the majority of Nigerians living in abysmal poverty and the minimum income for only civil officials set at ₦18,000, which is even unpaid in certain areas, acquiring ART services remains a distant dream for the majority of infertile couples.

Depending on the service facility, an IVF cycle might cost anywhere between ₦500,000 and ₦3,500,000 [40]. According to all indications, many couples struggling with infertility would have wanted for this option but were unable to do so due to financial constraints. No wonder many despite the prohibitive cost of obtaining the services showed positive attitude and willingness to go for the procedure and also promised to recommend the same to others. But dismally in Northern Nigeria [34] very few couples 7.6%

showed willingness to opt for ARTs. Their resilience could be hinged to their culture. In Northern part of the country polygamy is the practice of which a man is entitled to as many as possible number of wives and the woman could decide to abandon the initial married thus the issue of not having a child may not have any stronghold as seen in the Eastern.

Conclusion

This study explored the level of awareness, perceived efficacy and utilization of ARTs among women attending infertility Clinic in a Nigerian Tertiary Health Institution. Our findings showed that average number of women were aware of ARTs and major sources of their information were hospital personnel. IVF was the commonly used. Majority argued the procedures could not address male infertility and many were aware it could fail in establishing pregnancy. Utilization was profoundly low though many expressed willingness to use ART services for treatment of infertility if given the opportunity and to encourage others to do so. Cost was the major barrier in obtaining treatment. Reducing costs of treatment and sensitizing the public about ART services will help overcome myths and misconception surrounding ARTs services. Nevertheless, this study was faced with some limitations such as; the relatively low number of women with fertility problems involved in the study, the exclusion of male in the study and the involvement of only a facility within Southeast Nigeria. Further studies involving more women and men, huge sample size and extended health are suggested.

Declarations

Ethical Approval was obtained from Ethical Committee, University of Nigeria Teaching Hospital. Informed consent was obtained from the women before the study was conducted.

Available of data and Materials

Data and materials are available with the corresponding author and can be released on request.

Competing interests

The authors declare they have no competing interest.

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Authors' information

Paulina Chigwara Chikeme drafted the conceptual framework of this study, drafted the manuscript and analyzed the data while Bekuochi Lilian Arinze collected the data

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Tables

Table 1: Socio-demographic profile of Participants

n = 107

Variables	Options	Frequency	Percentage (%)	Mean \pm S.D
Age in years	19-25	12	11.2	31.46 \pm 5.72
	26-35	56	52.3	
	36-40	21	19.6	
	Above 40 years	17	15.9	
Marital Status	Married	101	94.4	
	Single	2	1.9	
	Divorced	3	2.8	
	Widowed	1	0.9	
Religion	Christianity	104	97.2	
	Islamism	2	1.9	
	Pagan	1	0.9	
	Others	-	-	
Educational qualification	Primary	19	17.8	
	Secondary	46	43.0	
	Tertiary	40	37.4	
	No formal education	2	1.9	
Occupation	Applicant	11	10.3	
	Civil Servant	21	19.6	
	Self employed	62	57.9	
	Housewife	13	12.2	
Number of children	None	49	45.8	
	One	44	41.1	
	Two	12	11.2	

Table 2: Awareness of assisted reproductive technologies (ARTs) among women attending fertility clinic in Enugu State University Teaching Hospital **n= 107**

Variable	Frequency	Percentage (%)
Have you heard of ART?		
YES	97	90.7
NO	10	9.3
If yes, what was your source of information (n= 97)		
Family, relative/friends	32	33.0
hospital	54	55.7
internet	8	8.2
Mass media	3	3.1
What do you understand by assisted reproductive technology?		
A procedure that doctors use in educating infertile couple	9	8.4
A procedure for stimulating ovulation in women	12	11.2
A procedure used to detect cause of infertility in couple	14	13.0
A procedure that involves manipulation of sperm and egg to establish pregnancy as a treatment for infertility	62	57.9
Which of these procedures do you know as assisted reproductive technology?		
Invitro fertilization (IVF)	83	77.6
Gamete intrafallopian transfer	21	19.6
Ovulation stimulation	8	7.5
Zygote intrafallopian transfer	16	15.0
Intrauterine insemination (IUI)	56	52.3
Surrogacy	72	67.3
Cycle tracking	27	25.2

Table 3: Perceived Efficacy of reproductive technologies (ARTs) among women attending fertility clinic in Enugu State University Teaching Hospital n=107

Variables	Frequency	Percentage
Do you think ART can address male infertility?		
Yes	10	9.3
No	97	90.7
Do you think Assisted Reproductive Technologies can fail in establishing pregnancy in clients who use it		
Yes	88	82.2
No	19	17.8

Table 4: Level of utilization of assisted reproductive technologies among women attending fertility clinic in Enugu State Teaching Hospital (ESUTH) n =107

Variables	Frequency	Percentage
Have you ever used any assisted reproductive technology before?		
Yes	27	25.2
No	80	74.8
If yes, which ART procedure did you use? (n=27)		
In vitro fertilization (IVF)	17	63.0
Gamete intrafallopian transfer (GIFT)	1	3.7
Zygote intrafallopian transfer (ZIFT)	1	3.7
Intrauterine Insemination (IUI)	6	22.2
Surrogacy	2	7.4
How many times have you used ART? (n=27)		
Once	21	77.8
Twice	4	14.8
More than twice	2	7.4
Do you have future intention of using ART again? (n=27)		
Yes	18	66.7
No	9	33.3
Would you use assisted reproductive technology for the treatment of infertility if given opportunity?		
Yes	76	71.0
No	31	29.0

Table 5: Factors that affects the utilization of assisted reproductive technologies (ART) among attending fertility clinic in Enugu State Teaching Hospital (ESUTH n= 107

Variables	Yes (%)	No (%)
ART services not affordable	82(76.6)	25(23.4)
Cultural and social stigmatization because ART is thought to be unnatural	37(36.6)	70(65.4)
Religious beliefs which are against artificial human fertilization	22(20.6)	85(79.4)
Fear of incompetence on the side of the service provider	61(57.0)	46(43.0)
Discrimination against children born through ART	44(41.1)	63(58.9)
Fear of possible side effects	73(68.2)	34(31.8)
Lack of support from spouse	57(53.3)	50(46.7)