UTTAR PRADESH JOURNAL OF ZOOLOGY

43(20): 33-39, 2022
ISSN: 0256-971X (P)

SUCCESS AND FAILURE RATE OF ASSISTED REPRODUCTIVE TECHNOLOGY (ART) TREATMENT WITH DIFFERENT AGE GROUP OF INFERTILE WOMEN IN RAMANATHAPURAM DISTRICT, TAMIL NADU

L. JEYA PRABA [a*], G. VEERA RAJESWARI [a], D. ADDLINE [a], VIJI S. SAKTHI [a] AND BINDU BENNET [a]

[a] Zoology Department and Research Centre, Sarah Tucker College (Autonomous), Affiliated to Manonmaniam Sundaranar University, Tirunelveli - 627007, Tamil Nadu, India.

AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.56557/UPJOZ/2022/v43i203194

Editor(s):
(1) Dr. Ana Cláudia Correia Coelho, University of Trás-os-Montes and Alto Douro, Portugal.
Reviewers:
(1) Osakue O. Nosakhare, Nnamdi Azikiwe University, Nigeria.
(2) K. E. Manga Reddy, India.
(3) Sanjay Badesara, Positron Multispeciality and Cancer Hospital, India.

Received: 14 August 2022
Accepted: 19 October 2022
Published: 27 October 2022

Original Research Article

ABSTRACT

There is a mounting evidence regarding increase in female infertility during the last decades, particularly in developing country is like India. Infertility is a major problem that affect the women at an increased rate every year. The knowledge of infertility has a considerable effect on biological, psychological, and social factors for an individual or a couple. When infertility interferes with the progression as expected, people are forced to look for outside assistance in order to become pregnant. Assisted reproductive technologies can usually be used to help the couple. The present study focuses on infertility, primary involuntary infecundity, and the seeking of fertility treatment in a representative study population of women aged 18-44 years (n=510) living in the study area. The purpose of this study is to investigate and create awareness about the success and failure rate of Assisted Reproductive Technique (ART) among infertile women with support of the private infertility Centre, Ramanathapuram District. Tamil Nadu.

Keywords: Infertility; pregnancy; assisted reproductive technologies; treatment.

1. INTRODUCTION

"Childbearing and rising of children are extremely important events in every human life and are strongly associated with the ultimate goals of completeness, happiness and family integration. Infertility is a global health issue affecting millions of people of reproductive age worldwide. A diagnosis of infertility

**Corresponding author: Email: jayaprabha2009@gmail.com;*

is established when a couple had an inability to conceive after one year of regularly timed (at least 3 times a week) unprotected sexual-intercourse" [1-3]. "Though recent data on infertility globally are lacking, it has been estimated that 48 million couples and 186 million individuals worldwide live with infertility" [4,5].

Infertility is one of the major reasons for divorce among couples [6]. "Research has demonstrated that medical intervention for treatment of infertility causes significant psychological and social stress in one's life" [7]. "Often, misinformation, or insufficient information was available regarding the actual experience of infertility treatment. A lack of information or absence of a diagnosis tends to exacerbate psychological stress and frustration amongst couples" [8]. "In 37% of infertile couples, female infertility was the cause; in 35% of couples, both male and female causes were identified; in 8%, there was male factor infertility" [9] and "the male factor is substantially contributory in about 50% of all cases of infertility" [10]. "Only a few individuals are aware of their own difficulty with infertility until they make an effort to initiate their own family planning. The average length of time to arrive at an infertility diagnosis is longer for women, usually taking about six months, and about one month for men" [11]. "A variety of factors are considered including financial costs" [3], options for treatment [3,12], and treatment prognosis [3,13]. "For women diagnosed with infertility, treatment tends to be costlier and invasive. Less invasive procedures for women include hormone and antibiotic therapies. More invasive, as well as costly treatments include Assisted Reproductive Technologies (ART)" [3].

The present investigation is an attempt to focus the success and the failure rates of infertility treatments include Assisted Reproductive Technologies (ART) Artificial Insemination (AI), Stimulated Cycle, Assisted Hatching, Intrauterine Insemination (IUI) and In Vitro Fertilization-Embryo Transfer (IVF-ET) amongst women with cases of infertility in Ramanathapuram district.

2. MATERIALS AND METHODS

The study was conducted with a support of private specialized fertility centre for ART treatment in Ramanathapuram. This study protocol was approved by ethics committee of the private hospital. Before conducting the interview, the investigator explained the purposes of this study, the risks and the benefits, and the voluntary nature of participation to the couple and their informed consent was obtained. Privacy and confidentiality was ensured and conducted face to face interview about the treatment of Assisted Reproductive Technologies (ART), in fertility clinic to collect the data.

In this study, five hundred and ten primary infertile females were counseled for success, failure and dropout rate of ART treatment based on their age between 18-44 year in assistance with the case report of Private Fertility Centre, Ramanathapuram.. The easy-to-use questionnaire include a section on age of patients, type of infertility, source of ART information, affordability of ART treatment, knowledge on some ART practices and Successive and failure rate of conceiving amongst 510 infertile women. All consenting infertile women were counseled in accordance with the questions on a pre-tested designed case sheet. The details were collected from participant's profiles with support of case study, and process to archival documents, a description of the software used to manage and analyze the data. Infertility is caused by endometriosis, tubal obstruction, hormonal imbalance, PCOD, ovulation issues, and uterine infection etc. Before receiving ART treatment in a hospital, these defects are rectified with hormone injections, medications, vitamin injections, and sperm quality enhancement. ART were taken to encompass all techniques Artificial Insemination (AI), Stimulated Cycle, Assisted Hatching, Intrauterine Insemination (IUI) and In Vitro Fertilization-Embryo Transfer (IVF-ET) that attempt to obtain a pregnancy by manipulating the sperm or/and oocyte outside the body and transferring the gamete or embryo into the uterus.

3. RESULTS

Analysis the data of 510 patients based on their problems, source of financial setup and awareness, they were taken the treatment of IVF, IUI and OI with NC (ovulation induction with natural conception). The observed percentage of successful ART outcomes with different age group of infertile female in the fertility Centre is shown in Table 1, with higher success rates in IVF (75.424), IUI (35.556), and lower success rates in OI with NC 15.652.

The number of cases involved in various ART treatments and dropouts is depicted in Fig. 1. The success (positive) and failure (negative) results of IVF, IUI, and OI with NC according to various age groups are explained in Figs. 2, 3, and 4. Fig. 5 depicts the percentage of success and failure rate of ART among 510 infertile females in the study area.

In this study, based on the collection of data more number of success of conception for female with infertility through IVF, ranging to 75.42% were in the age group between 18-44 year and 35.55. Patients perception of babies conceived through IUI showed

that maximum 7 (15.56%) of the 45 patients between the age group of 21-25. Only 2 patients were dropout their treatments among 510 cases, and also patients were in the age of 31-35 year they were failure to attempt the treatment of OI with NC.

Table 1. Outcome results of art treatment with different age group of infertile female in the study area

Mode of Treatment	Success / Failure	Outcome Results based on Age Group (yr) (Total No. Of Cases 510)							
		≤ 20	21 - 25	26 - 30	31 - 35	36 - 40	Above 40	Total No. Of Cases	%
IVF	Positive	3	22	35	18	10	1	118	**75.424**
	Negative	1	5	8	3	10	2		24.576
IUI	Positive	1	7	6	0	2	0	45	**35.556**
	Negative	1	14	9	5	0	0		64.444
IVM/ OI with NC	Positive	15	33	5	0	1	0	345	**15.652**
	Negative	23	108	107	39	13	1		84.348
Dropouts								2	0.39
Total No. of Positive Results		19	62	46	18	13	1	159	31.18
Total No. of Negative Results		25	127	124	47	23	3	349	68.43

Note: (ART – Assisted Reproductive Technology, IVF – Invitro Fertilization, IUI – Intra Uterine Insemination, IVM/ OI with NC -Ovulation induction with Natural Cycle)

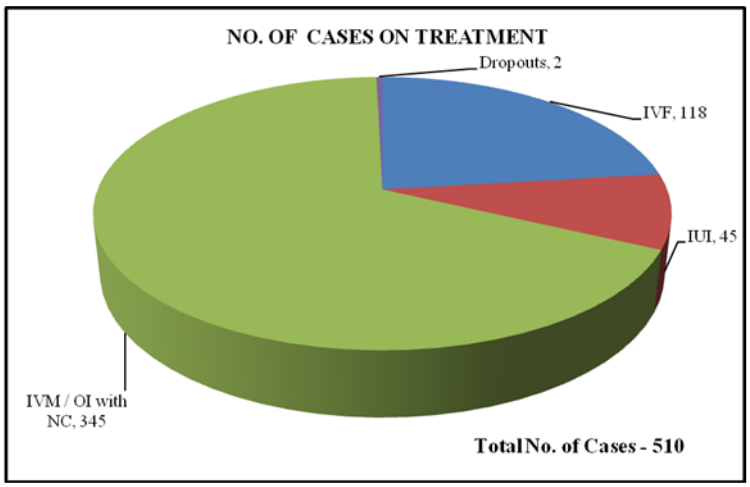

Fig. 1. Number of cases on various treatment of art and dropouts

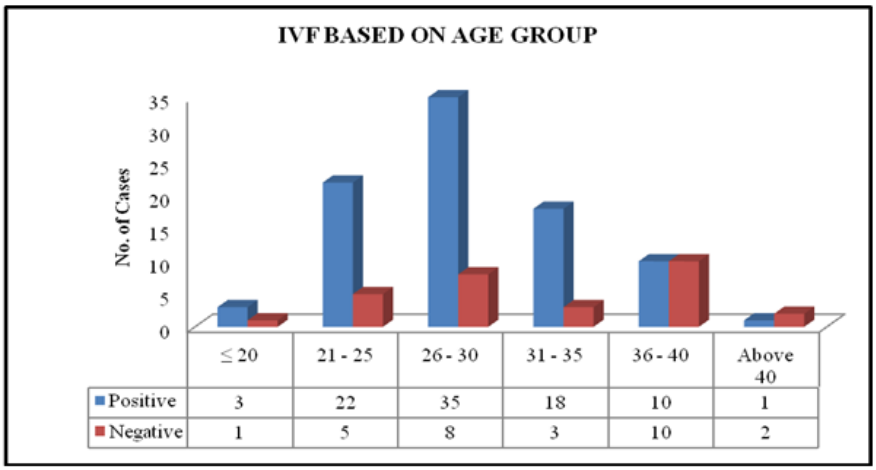

Fig. 2. Positive and negative result of IVF among patients with different age

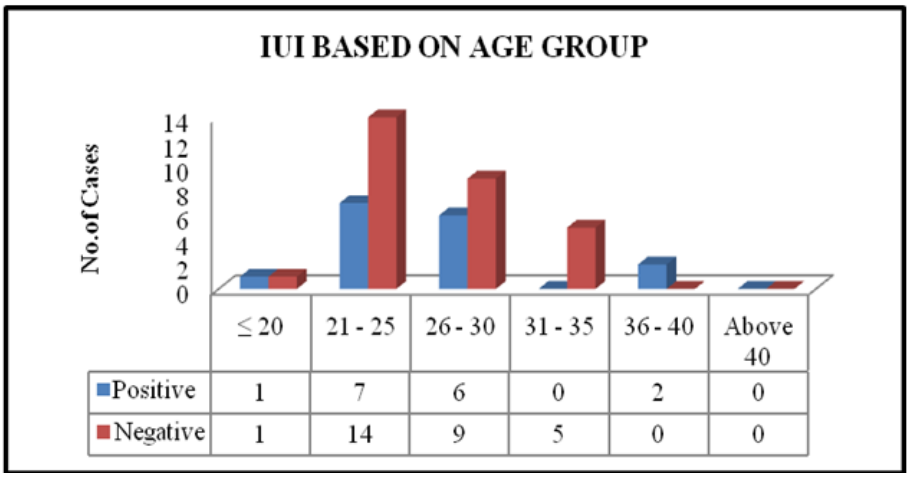

Fig. 3. Positive and negative results Of IUI among cases with different age

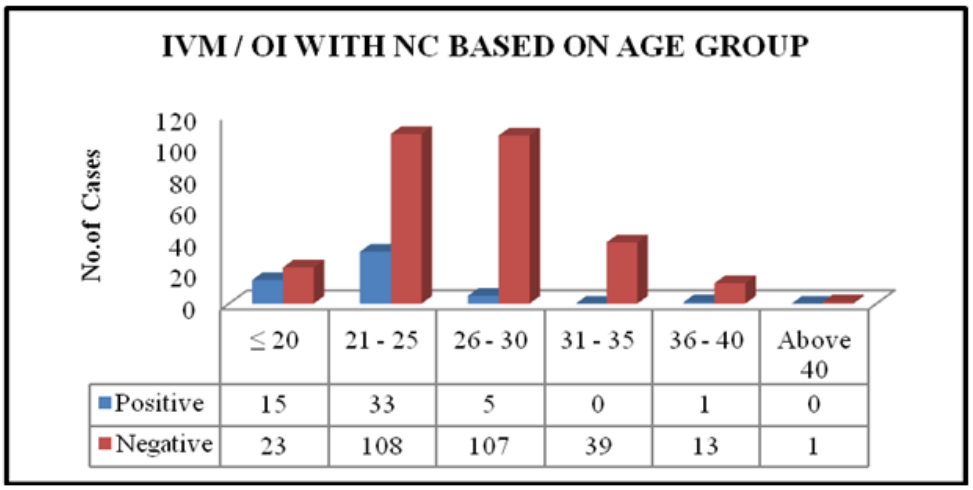

Fig. 4. Positive and negative results of IVM/OI with NC cases with different age

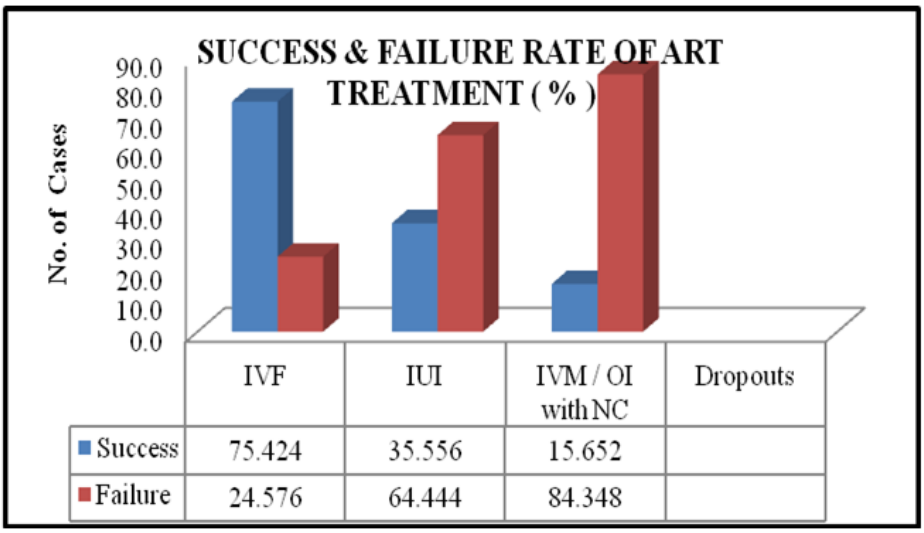

Fig. 5. Success & failure rate of art treatment in infertile female

4. DISCUSSION

"Infertility care is maybe the most neglected and underestimated health care issue in developing countries. For the last few years, the usage of ART services has manifolds and is now accessible as an alternate method for infertile couples in both high- and low-income countries" [14]. "Although the use of ART is still relatively rare as compared to the potential demand, its use has more than doubled over the past decade. Approximately 2.0% of all infants born in the United States every year are conceived using ART" [13].

The International Committee Monitoring Assisted Reproductive Technologies (ICMART's) stated that in 2018 eight million babies had been born worldwide using IVF and other Assisted Reproduction Techniques (ART). *In Vitro* Fertilization (IVF) gives infertile couples a chance at motherhood when women have blocked or nonexistent fallopian tubes or when men have low sperm counts. In the present investigation, out of 510 cases, 118 patients had IVF therapy and 89 women between the ages of 18 and 44 were becoming pregnant. Infertile women between the ages of 26 and 30 had a higher percentage (35), of successful conceptions. "This study showed that 75.424 percent of the women knew that ART could be applied for IVF treatment of female infertility. Similar survey among the general population in Europe and the U.S showed that 90 percent knew of IVF, but less than 25 percent knew about the chances of success" [15].

"The success rates of ART vary depending on patient and treatment factors, including age, infertility diagnosis, number of transferred embryos, procedure type, use of procedures like ICSI, and history of prior pregnancies, miscarriages, and ART cycles" [3,13].

"As women get older, their chances of getting pregnant decline because their eggs' quality is declining. The pregnancy rate per patient was significantly greater for women below the age of 25 compared to women aged 35 to 39. Over the course of a patient's life, pregnancy rates gradually decline" [16].

Todd, [17] revealed that "a woman's age is a major factor in the success of IVF for any couple and for instance, in 2018, the likelihood of conceiving one child with IVF was 37.6% for a woman under the age of 35 using her own eggs, compared to 11% for a woman between the ages of 41 and 42.. With numerous egg transfers, the success rate increases. In 2019, 330,773* ART cycles were completed at 448 reporting clinics in the United States, resulting in 77,998 live births and 83,946 live born infants according to the CDC's 2019 Fertility Success Rates Report".

"The majority of cases of infertility can only be treated with Assisted Reproductive Technologies (ART), which are either unavailable or exceedingly expensive and only available to the fortunate few who can afford them. In this study strongly proved the findings of" Chiware et al. [18], "ART services are not accessible to the majority of infertile couples due to the high cost of treatments in addition to cultural, religious and legal barriers. The statement of affordability was confirmed by many publications from African authors, all of them, stressing the importance of access and quality" [19,20].

The World Collaborative Report on IVF showed that ART was widely used in developed countries, but not in developing countries, who had the greatest need for this technology. Because of financial limitations and a lack of compassion for the misery of infertile couples, funding for fertility therapy has not been widely used in developing nations. Ten tertiary level infertility Centres in Bangladesh reported receiving 16,700 new patients each year, but only 5% of those patients used ART, primarily because of financial difficulties [21]. "Even though more than 98% of the people in Africa cannot afford IVF due to its high cost or lack of IVF Centres, establishing local low cost IVF programmes seems to be a low priority" [22].

According to Mahey et al. [23], little is known about fertility and reproduction: Only 8% of respondents believed that age more than 35 was the largest risk factor for infertility, and 85% were uninformed of the ovulatory stage of the menstrual cycle. Most people also didn't know when to seek treatment for infertility after trying for a baby. Less than half of women were aware of the necessity for donor oocytes and assisted reproductive technology among older women.

By this data most of the patients in this study area choose the treatment of OI with NC by their poor financial support and less awareness of other treatments even though physicians explained about that success rate of IVF and IUI. In this study large number of infertility females were preferred the treatment of ovulation induction with Natural Cycle (OI with NC) 345 due to the lacking of financial support and less awareness about other treatments. This response may be interpreted as uncertainty and ignorance about ART treatment or some of the ART practices may be in collision with their cultural and religious beliefs. Out of 345 patients 33 (9.56%) were success to conceive baby between the age of 21-25. More number of failure attempts in OI with NC treatments 108 (31.30%) among 345 females they

were chosen OI with NC treatment. Similar findings were reported by Brennan (2021), "IUI has low success rate, however it can be successful depending on the couple's age, the woman's age, and the reason for the couple's infertility. Studies have revealed that pregnancy rate for each natural cycle is about 4-5%, and when the cycle is stimulated with fertility drugs, the pregnancy rate is 7-16%. The possible reasons why IUI fails might depend on person to person, their age, egg quality and a number of other factors".

The present study shows 14 failure attempts of 45 patients those who are in the age of 21-25 by the treatment of IUI. According to statistics from the German IVF Registry [24], "the overall pregnancy rates after insemination were 5- 15% and lower than those attained with more intrusive reproductive techniques like IVF or ICSI. In total 510 women had sought fertility treatment, more number of success were achieved by IVF treatment in this study area, the success of IVF depends on several factors including the cause and duration of infertility, ages of partners, and sperm quality. Variations in the IUI procedure such as including ovarian stimulation and using different implantation techniques may influence the outcome. Meticulous lab technique and advanced surgical skills are necessary for a successful program in this study area" [25].

5. CONCLUSION AND RESEARCH RECOMMENDATIONS

This study concludes that IVF is the preferred treatment for female infertility caused by unexplained and different causes, Due to the possibility of converting underperforming cycles to IVF, treatment given within the context of a specialized IVF centre will be more effective and safe. From a cost-benefit perspective, IUI should be a standard option in all assisted conception facilities because to its lower cost per pregnancy and hence better possibility for repeat treatments. A professional IVF centre will provide treatment, which will be The facts reported here make it difficult to justify the common practice of utilizing IVF as the first line of treatment for any patient with unexplained infertility, particularly when down-regulation is involved. Finding the risk factors for infertility in females can be very helpful in preventing it because treatment for infertility is expensive for families, especially in developing countries. Efforts are needed to give awareness of the causes and consequences of this condition. These results underline the importance of infertility as a problem of public health and can be utilized to direct future reproductive health programmes in the study region of Ramanathapuram.

ETHICAL APPROVAL AND CONSENT

The study was conducted with a support of private specialized fertility centre for ART treatment in Ramanathapuram. This study protocol was approved by ethics committee of the private hospital. Before conducting the interview, the investigator explained the purposes of this study, the risks and the benefits, and the voluntary nature of participation to the couple and their informed consent was obtained. Privacy and confidentiality was ensured and conducted face to face interview about the treatment of Assisted Reproductive Technologies (ART), in fertility clinic to collect the data.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Tietz. Textbook of clinical chemistry and molecular diagnostics. 4th ed. Elsevier Saunders Publishers. 2006;2021-7.
2. American Society for Reproductive Medicine. Assisted reproductive technologies: A guide for patients. Parkinson's Disease Foundation; 2012 [cited Jun 11, 2012]. Available:http://asrm.org/uploadedFiles/ASRM_Content/Resources/Patient_Resources/Fact_Sheets_and_Info_Booklets/ART.pdf - 2.12 MB).
3. Gibson DM, Myers JE. Gender and infertility: A relational approach to counseling women. J Couns Dev. 2000;78(4):400-10.
4. The lancet global health; 2022. Infertility-why the silence? Volume 10 Number 6E773-E926. Available from: http://www.thelancet.com/lancetgh Vol.
5. World Health Organization. Infertility. 2022.
6. Afshani SA, Mohammadi SMRG, Khani P, Khosravi A. Role of resilience training on compromising of infertile couples' applicant for divorce: A cross-sectional study. Int J Reprod Biomed. 2020;18(3):193-208.
7. Freeman EW, Boxer AS, Rickels K, Tureck R, Mastrioanni I. Psychological evaluation and support in a program of in-vitro fertilization and embryo transfer. Fertililitysteril. 1985;43:48-53.
8. Daniluk JC. 'If we had it to do over again…' Couples' reflections on their experiences of infertility treatments. Fam J Couns Ther Couples Fam. 2001a;9(2):122-33.

9. Walker MH, Tobler KJ. Female infertility. Treasure Island, (FL): StatPearls Publishing; 2022.
10. Leslie SW, Siref LE, Soon-Sutton TL, Khan MAB. Male infertility. In: Treasure Island, (FL): StatPearls Publishing; 2022. Stat pearls [internet].
11. Meyers M, Diamond R, Kezur D, Scharf C, Weinshel M, Rait DS. An infertility primer for family therapists: I. Medical, social, and psychological dimensions. Fam Process. 1995;34(2):219-29.
12. Burnett JA. Cultural considerations in counselling couples who experience infertility. J Multicultural Couns Dev. 2009;37(3):166-77.
13. Centers for Disease Control and Prevention. Fourth national report on human exposure to environmental chemicals. Atlanta: Centers for Disease Control and Prevention (US); 2009.
14. Arhin SK, Tang R, Hamid A, Dzandu D, Akpetey BK. Knowledge, attitude, and perceptions about in vitro fertilization (IVF) among women of childbearing age in Cape Coast, Ghana. Obstet Gynecol Int. 2022;2022 | Article ID 5129199.
15. The Bertarelli foundation scientific board. Hum Reprod. 2000, Public perception on infertility and its treatment: an international survey;15 no.2:330-34.
16. Schorsch M, Gomez R, Hahn T, Hoelscher-Obermaier J, Seufert R, Skala C. Success rate of inseminations dependent on maternal age? An analysis of 4246 insemination CyclesGeburtshilfe. Geburtshilfe Frauenheilkd. 2013;73(8):808-11.
17. Todd N. Infertility and *in vitro* fertilization, WebMD editorial contributors; 2021. Available from: https://www.webmd.com/infertility-and-reproduction/guide/in-vitro-fertilization.
18. Chiware TM, Vermeulen N, Blondeel K, Farquharson R, Kiarie J, Lundin K et al. IVF and other ART in low- and middle-income countries: a systematic landscape analysis. Hum Reprod Update. 2021;27(2):213-28.
19. Ndegwa SW. Affordable ART in Kenya: the only hope for involuntary childlessness. Facts Views Vis Obgyn. 2016;8(2):128-30. (PMC Free article). Google Scholar.
20. Osei NY. Need for accessible infertility care in Ghana: the patients' voice. Facts Views Vis Obgyn. 2016;8(2):125-7. (PMC Free article). Google Scholar.
21. Fatima P, Ishrat S, Rahman D, Banu J, Deeba F, Begum N et al. Quality and quantity of infertility care in Bangladesh. Mymensingh Med J. 2015;24(1):70-3.
22. Ombelet W, Onofre J. IVF in Africa: what is it all about?. Facts Views Vis Obgyn. 2019;11(1):65-76.
23. Mahey R, Gupta M, Kandpal S, Malhotra N, Vanamail P, Singh N et al. Fertility awareness and knowledge among Indian women attending an infertility clinic: a cross-sectional study. BMC Womens Health. 2018;18(1):Article number: 177.
24. Bühler K. German IVF registry. J Reproduktionsmed Endokrinol. 2013;10;Special Issue 1:29-32.
25. Brennan D, 2021. Infertility and reproduction; what is IUI success? WebMD Editorial Contributors. Available:https://www.webmd.com/infertility-and-reproduction/what-is-iui-success.