



Research article

Ethical issues surrounding the use of assisted reproductive technologies in Ghana: An analysis of the experiences of clients and service providers

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ABSTRACT

Since the advent of Assisted Reproductive Technologies (ART) in Ghana about three decades ago, IVF and ICSI treatments have enabled infertile Ghanaian couples to fulfill their aspirations and dreams of having children. In this extremely pronatalist society, ART has provided relief to many childless couples by reducing, if not eliminating, the shame of childlessness that they would otherwise have to suffer. However, as the provision and utilization of ART continue to increase, so do worries regarding the ethical difficulties surrounding this field of medicine, which challenge cultural ideals and personal desires. The study explores client and service provider experiences with ART in urban Ghana. Observation and in-depth interviews were employed to collect data, and the ethical dimensions of people's experiences relative to Ghanaian cultural and ethical values were analyzed. The results show that the provision of ART services for heterosexual couples in marital unions, the availability of PGT for sickle cell clients, the preference for multiple births emerging from embryo transfers, the lower preference for cryopreservation, the high cost of ART treatment, and the need for regulation of the provision of ART services in Ghana were some of the ethical concerns expressed by both clients and service providers.

1. Introduction

It is estimated that 8%–12% of couples in their reproductive years are infertile [1], which corresponds to 50–80 million people worldwide. Also, lifetime and period prevalence estimates of 12-month infertility were 17.5% and 12.6%, respectively, according to Cox et al. [2]; however, this varied by study population and methodological approach. Prior to 2010, the World Health Organization projected that 48.5 million individuals worldwide experienced infertility, but it is now believed that as many as 186 million people worldwide suffer from infertility [3]. However, there are geographical differences in the frequency and type of infertility, as well as a lack of access to Assisted Reproductive Technology (ART). Most infertility in sub-Saharan Africa is preventable, as it is caused by untreated reproductive tract infections (postpartum infections, post-abortion infections, and sexually transmitted infections) [4]. This has resulted in high infertility rates in this region [5]. Additionally, Dierickx et al. [6] acknowledged that infertility in sub-Saharan Africa is a significant socioeconomic and public health issue. Yet, there is a dearth of studies on the experiences of men with

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infertility, particularly in West Africa.

Ghana is hardly an exception, with a reported 15% infertility rate [7]. In addition, beliefs regarding the causes of infertility vary within the country itself, with perceptions of the causes of infertility ranging within and between different regions and populations in Ghana. Those with a higher degree of education in urban areas are more likely to accept a medical cause, whilst those with a lower level of education in rural areas may be more open to supernaturalism [8]. In a pronatalist country like Ghana, according to Macrotrends [9], Ghana's fertility rate in 2022 would be 3.696 births per woman, a decline of 1.31% from 2021. Infertile men and women face the brunt of society, but due to the patriarchal nature of society, women suffer more [10]. Therefore, infertile Ghanaians seek a cure for their condition, whether through biomedical, traditional, or spiritual means [7].

Ghana received ART almost three decades ago, and the country today has a number of assisted reproductive facilities. However, because most ART is administered by private practitioners, it can be costly. Consequently, only a limited percentage of Ghanaians, often those from the middle class and above, have access to ART. In addition, there is currently no national regulatory framework governing the conduct of these private practitioners that offer fertility services in the form of ART to Ghanaians, resulting in a heterogeneous degree of service delivery.

Due to Africa's proximity to Europe, a significant number of local fertility professionals have received medical training in the field of ART in Europe. ART service providers in Africa frequently apply guidelines formulated by international professional bodies, such as the European Society of Human Reproduction and Embryology (ESHRE), and engage actively in the annual ESHRE conference, which is held in several European cities. As a result, they can stay informed of the most recent ethical principles and best practice guidelines.

The African Network and Registry for Assisted Reproductive Technology (ANARA) connects ART clinics within and across African countries and gathers and disseminates scientific data on ART availability and practice. Membership in the Fertility Society of Ghana (FERSOG) of the African Federation of Fertility Societies (AFFS) is not obligatory, and registering with ANARA is voluntary. This means that non-member clinics can continue to deliver ART according to their own principles and avoid efficient monitoring of their activities. This increases the possibility that international standards may not be followed and raises concerns that service providers may not adhere to ethical norms on the use of ARTs.

In light of these developments, it is uncertain if the services provided by fertility clinics in Ghana contradict Ghanaian society's ethical standards. Are clients of fertility clinics satisfied with the treatments they receive, and do they feel compelled to accept them because they believe they have no choice but to procreate at any cost? In the absence of a national regulatory framework, are service providers ensuring that they do not cause physical or moral harm to their clients, or are monetary gains and societal pressures impacting their service delivery? Despite the legitimacy of these questions, there appears to be insufficient research that could provide appropriate answers. Responding to such questions can aid in the design of interventions and services, as well as the measurement of progress; therefore, the purpose of this study.

2. Understanding ART utilization

Faircloth and Gurtin [11] concluded that reproduction pressures on parents were increasing in Europe. Due to their great cost, only the wealthy can afford ARTs, raising ethical issues. Oliviera et al. [12] also conducted a study that was quite similar to this one, and it examined the current state of ART and fertility preservation in Brazil. According to the results of their study, access to ART and fertility preservation therapies in Brazil is neither simple nor equitable. The high expense of private care makes it unaffordable to the majority of individuals, and although Brazilian law supports the state supply of ART and fertility preservation, state-funded treatments are limited, thereby reinforcing social inequities. Again, the gendered nature of this technology places a disproportionate burden on women in relation to therapeutic procedures. Whitakker et al. [13] also examined the development of small-scale gestational surrogacy practices in Kazakhstan, Ghana, and Laos, which are less well-known. The findings indicate that the factors fueling the trade in these countries were lax or nonexistent legislation, the presence of local IVF expertise, and the emergence of local "repreneurs," which raises ethical concerns once again.

The majority of studies in Ghana on the experiences of women and/or couples using ARTs were qualitative, with little emphasis paid to the ethical considerations surrounding the use of ARTs in this sub-Saharan African country. For example, Asante-Afari et al. [14] highlighted how women who successfully underwent IVF treatments were relieved when society lifted the stigma attached to childlessness. Hiadzi et al. [15] also examined the effect religion plays in the utilization of ARTs. The religious beliefs of Ghanaians are regarded as complementary to the use of ARTs and as a means of coping with treatment triumphs and failures. A few of these studies, however, emphasized some ethical concerns, such as the anxiety, stress, exhaustion, and financial burdens experienced by Ghanaian women undergoing ART treatment [16,17]. Again, Gerrits [18] draws attention to the significant issue of how reproductive travel to Ghana (undertaken by Ghanaians residing in the diaspora) is facilitated by positive treatment success stories, the availability of matching donor material, lower treatment costs, and the circumvention of restrictive regulations in the country of residence. Many more studies are needed to uncover the different ethical difficulties regarding the use of ARTs in Ghana.

A cross-sectional study of frozen and fresh embryo transfer-conceived 0–3-year-old children in Indonesia found no differences in growth and development [19]. The study also concluded that frozen embryo transfer reduced the risk of low birth weight and that all children in both groups developed normally. This discovery is crucial for ART fertility specialists. Marinelli et al. [20] also highlighted ethical issues with assisted reproductive technologies in Italy. One of these is what to do with supernumerary embryos that were not implanted. If not handled properly, this complex topic could harm transnational surrogacy children. The rights of anonymous gamete donors and children to find their biological parents may contradict each other.

3. Materials and methods

3.1. Sampling technique

The current study employed a qualitative approach. This was aimed at giving the researchers a better understanding of the client's participation in the study's experiences, phenomena, and context. Additionally, the service providers were selected from three (3) fertility hospitals in Accra, Ghana, because Accra is home to the majority of fertility facilities in Ghana. Since the majority of these hospitals are frequently quite busy, only those that were available at the time of the study were selected.

The study's participants were chosen from one of the three hospitals used as study locations. This hospital was chosen over the other two because it was the most established of the three. Additionally, the clients were purposefully chosen as they arrived for fertility consultations or during their hospital stay following their treatments. They were purposefully selected since the researchers were looking for specific client traits relevant to the study, therefore the clients who use ART.

The inclusion and exclusion criteria used for the study acknowledged that for inclusion, clients must be married and intending to conceive a child via ART. The service providers must work in a medical facility registered with the Health Facilities Regulatory Agency (HeFRA) of Ghana. In Ghana, having children outside of marriage is frowned upon; hence, singleness is a requirement for exclusion. Those service providers who did not work in a medical facility registered with the Health Facilities Regulatory Agency (HeFRA) of Ghana were excluded.

3.2. Data collection

Using naturalistic observations and in-depth interviews, data was collected from healthcare experts, including one (1) fertility specialist/gynecologist, two (2) clinical embryologists, and two (2) fertility nurses. The naturalistic observation allowed the researchers to examine the spontaneous behavior of participants in their natural settings, and the researchers simply took field notes of what they observed. Observations were conducted in the consulting room and IVF lab of the fertility hospital to enable researchers to better comprehend the procedures involved in fertility care using ARTs. Due to privacy concerns and assurances given by the researcher to the fertility facility on the use of the data collected in connection with field observation, the actual field observations made throughout the study were not reported.

In addition, fifteen (15) ART hospital clients (13 females and 2 couples-i.e., including husbands who were visiting their wives at the time of the interview) were interviewed regarding their expectations of the service providers. The interview took place when these women were hospitalized after a successful embryo transfer. The facility required clients to stay in the hospital for five days after IVF or ICSI to recuperate and boost success. Since they had free time, they were more relaxed and willing to participate in the interviews.

In circumstances when two clients shared a room (because of reduced cost of admission), a separate room was set aside for the interview. The interviews were conducted in English, Twi, and Ewe (a Ghanaian dialect). The interviews conducted in the local languages (Twi and Ewe) were translated and transcribed accurately into English utilizing the back-translation approach. Before the interviews commenced, all participants were provided with information about the study, the intended use of the collected data, and an estimate of the interview duration. All participants were consulted beforehand on the audio recording of the interview. The interview lasted between 45 and 1 h. The in-depth interview recorded the respondents' demographic information and also analyzed the clients' experience with ART. Additionally, the interview analyzed the client's views on ART techniques. Participants were requested to complete an informed consent form upon agreement. Likewise, the confidentiality of personal information was ensured. A few of the clients who returned to the hospital following their ART procedures were interviewed again. This was done in an effort to give the researcher more information that would improve the data they had already collected. Five (5) respondents were re-interviewed once in total.

Accordingly, no personal identity was associated with the interviewed clients. Clients were coded as P1–P15 and the service providers as SP1–SP5. Participants had the right to decline participation in the study without being penalized or having their treatment altered. In addition, gaps uncovered throughout this procedure were addressed by consulting field notes and interview tapes as needed. Peer debriefing and member checks were also employed to confirm the authenticity of the audio files and written interviews. Peer debriefing is the process of collaborating with one or more peers to enhance the validity of research. This peer is unbiased and has nothing to gain or lose from the study. In qualitative research, member checks are an effective approach and procedure used to ensure and demonstrate the validity of the researcher's conclusions by collecting participant input in response to the initial raw data received from them. Importantly, the Institutional Review Board of the Noguchi Memorial Institute for Medical Research at the University of Ghana granted ethical approval (Protocol number: CPN 037/12–13).

3.3. Data analysis

The data was evaluated thematically following Braun and Clarke [21] recommendations. This requires becoming familiar with the data; developing codes; searching, reviewing, and picking out themes; and finally, summarizing the findings. Thematic analysis was used because it does not limit its application to a single research paradigm. NVIVO software version 12 was used to run the codes and categorize the themes and sub-themes that emerged from the clients' interview transcripts. The thematic analysis was performed through a combination of inductive and theoretical coding methods. The inductive and theoretical coding methods were used to help the researchers identify, analyze, and present patterns from the data. For inductive coding, the researchers began by reading through interview transcripts and paying close attention to relevant data issues, which led to the development of descriptive codes. This was

immediately followed by identifying cluster themes whose meanings were interpreted based on the research objectives and further distilled based on the literature reviewed.

By assessing the inter-coder reliability using the Cohen's Kappa statistic in SPSS (version 25), which yielded a value of 0.676, the reliability of the data was validated. This figure is significant since the Kappa result of 0.61–0.80, as determined by McHugh [22], is significant. As a result, the interview transcript raters' agreements are adequate. Similarly, the credibility and reliability of the findings were ensured by contacting five of the participants to confirm the reported results as part of the participant validation method.

4. Findings

4.1. Characteristics of clients accessing ARTs

In all, 15 clients (P) and 5 service providers (SP) participated in the study, as summarized in Table 1.

According to follow-up interviews, the second-oldest patient (57 years old at the time of oocyte donation therapy) was able to become pregnant and gave birth to a healthy child at 29 weeks. Additionally, after receiving donated oocytes, some patients who were 45 years of age or older got pregnant. Moreover, current media reports on the local television news show that older women in Ghana are receiving In Vitro Fertilization (IVF) treatment (Anon, 2022).

4.2. Qualification for IVF

Service providers advised that a couple must be married to be eligible for IVF or Intracytoplasmic Sperm Injection (ICSI) treatment, regardless of whether they will use their own oocytes or donor oocytes. This perspective was believed to represent the general sentiment of Ghanaian society, according to the respondents.

However, there are sometimes exceptions to this rule. As the demand for ART services increases, some providers have disclosed that they evaluate customer requests on a "needs-based" basis, such that marriage is no longer the sole requirement for accessing ART services. Heterosexual couples in stable relationships who wish to have children through ART could also access the service. Examples include unmarried couples in which the male is over 45 years old and has undergone a vasectomy following a previous relationship. This has created a demand for assisted reproductive technology requiring surgical sperm retrieval.

In another instance, a service provider reported that the contrary was occasionally the case. He described a situation in which a Caucasian woman visited his facility to undergo IVF therapy with her Ghanaian normospermic partner. He said:

"Every now and then, such cases are presented here at the facility. Because the beach is close to us, it is common to find tourists in the area. When these tourists come and meet the 'rasta' men around here, they fall in love and some of them desire to have children with them. However, due to their advanced age, they require ARTs to facilitate the process and so they end up coming here (referring to the ART clinic)."- (SP1)

Furthermore, the provision of surrogacy has been suggested as a possible option for single, divorced, or widowed men who want to have children, as indicated by one of the service providers. At present, there are no laws governing surrogacy in Ghana, although legal advice is essential in such instances to ensure both parties understand and comply with contractual agreements signed prior to the procedure.

Table 1
Demographic characteristics of respondents.

Participant No.	Age	Sex	Type of infertility
P1	29	Female	Primary
P2	35	Female	Primary
P3	58	Couple	Primary
P4	32	Female	Primary
P5	43	Female	Primary
P6	32	Female	Primary
P7	36	Female	Primary
P8	47	Female	Primary
P9	42	Female	Primary
P10	45	Female	Secondary
P11	57	Couple	Primary
P12	47	Female	Secondary
P13	37	Female	Secondary
P14	38	Female	Secondary
P15	39	Female	Secondary
Participant No.	Age	Sex	Work experience (years)
SP1	55	Male	17
SP2	44	Female	10
SP3	38	Male	5
SP4	35	Male	6
SP5	34	Female	4

4.3. Reason for ART use and sexual orientation

ART offers a variety of alternatives that couples can choose from based on their own needs. As a result, when offered the choice to lessen the dissonance associated with this artificial mode of conception, some clients who require ART may select techniques that are "less artificial."

For example, some couples prefer to use their own genetic material rather than donor gametes since it guarantees that their offspring will possess the genetic traits of both parents. A female respondent asserts that:

"I will not want to have a child using someone else's eggs. Noo ... (shaking her head) My husband also agrees with me so we got to know that we can do ICSI with my eggs and my husband's sperm (instead of donor-egg IVF as suggested by my previous doctor). That is a much better option for us. That way, we are sure of the child we are going to have. I mean, it will be just as if we conceived the child naturally. We do not want to have any future complications with the child in terms of health or character or ... you can never tell."- (P5)

Such client experiences also highlight the disparity in clinical advice between various fertility hospitals.

All service providers made it abundantly clear that on principle neither surrogacy nor IVF treatments were available to same-sex couples or members of the LGBTQ + community. According to one service provider,

"I will only help heterosexual couples experiencing infertility to achieve their desires. There is no way I will entertain a homosexual couple no matter how much money you are willing to pay. It is not about the money! There are so many people out there who genuinely through no fault of theirs cannot have children without medical assistance. And society will just not let them be. If you choose to be in a union that does not allow you to have children, that is something you have to deal with because you have the option to do otherwise. So personally, I will not entertain such clients. I do not believe they really want to have a child else they would not choose to be in a same-sex relationship."- (SP4)

According to another service provider:

"Apart from it being against my religious beliefs, I believe it is important that children grow up in a stable and socially acceptable environment. And so, I will not be party to creating a home for a child that the Ghanaian does not approve of. It is not healthy for the child and I won't do it. I would not encourage anyone to do so either."- (SP2)

4.4. Third-party reproduction (donor gametes)

Some service providers stipulate that a male sperm donor must be between the ages of 21 and 28. A sperm donor may only obtain reimbursement for their expenditures. An embryologist remarked,

"We (referring to his boss and other team members) do not want to run this as a business. We do not want to encourage young men to use this as means of enriching themselves. If you are fortunate enough to have this God-given gift in abundance, you must be willing to help others with it without making so much money out of that. What we give is therefore just a token for your thoughtfulness and your efforts. After all, if you hadn't come here, you would be wasting it anyway and get nothing out of it. So, something small is better than nothing."- (SP1)

The study's findings show that oocyte donation is a complicated procedure due to the need for oocyte collection. Oocyte donation raises ethical concerns about the optimal quantity of oocytes to harvest at once and the number of times a woman can donate oocytes in a year. According to the study's findings, service providers occasionally harvest up to 50 oocytes for a single collection, putting them at risk for ovarian hyper stimulation syndrome.

4.5. Pre-implantation genetic testing

Pre-implantation genetic testing (PGT), a relatively new form of ART in Ghana, focuses mostly on identifying monogenic diseases such as sickle cell disease (SCD). Additional data gathered from a service provider (SP1) indicate that clients can request PGT for gender selection for purposes of gender balancing in instances where the couples have two or more children of one sex. This service provider (SP1) also reported that female offspring were favored, typically by well-educated, affluent women.

One client (P7) also reported that the untimely death of their daughter as a result of a horrific event triggered their desire for sex selection. This spurred the couple's desire to replace their deceased daughter with another daughter via IVF and PGT for gender.

4.6. Acceptable number of embryos to transfer, cryopreservation, and supernumerary embryos

The number of embryos to be transferred is impacted by female age, along with other criteria such as the number of preimplantation embryos that reach the blastocyst and the health risk to the potential mother and child (ren). According to one service provider,

"looking at the client's age, she does not have much time left to prepare her for another cycle should this one not be successful and we cannot guarantee that all the embryos will be implanted and so it is always better to transfer more so that, in the event that, only one or two are implanted, she is good to go."- (SP3)

The results of the study also show that clients consider the service provider's information and advice based on their authority and expertise as health practitioners. According to one of the participants, for instance,

I love twins ... you see when you dress them up in the same clothes and you are in town with them ... it's so beautiful. So when I started the procedure, I had in mind that I will have twins. But along the line, the doctor said they got some good embryos so he will transfer three. Initially, I was confused but he explained to me that it does not necessarily mean I will have triplets since it depends on how many get implanted. So I went along with his advice. He is a professional and he is very good so I trust his judgement.- (P7)

Some ART hospital clients, such as P2, P5, P13, and P15, were also concerned about whether or not to freeze "extra" genetic material. The idea of cryopreserving "extra" genetic material was identified as being off-putting to some customers.

According to the findings from the study, fresh samples are preferred to frozen-thawed samples, and this is due to issues like making sure the process is as devoid of "artificiality" as is feasible. Some clients, such as P8, P6, and P10, are concerned that any additional ART alterations to the process via freezing would result in children with biological characteristics that differ from what they would expect from a naturally conceived child.

In other instances, patients felt positive about treatments and did not wish to endanger their chances by considering the possibility of requiring additional treatments. According to a participant:

I remember the embryologist telling me that I had a number of good embryos and he was asking if I would want them to be frozen so that I can use them in the future since they will not use all of them now. I found it strange that he should ask me that. I mean why would I even want to jinx the whole process. It's like saying that I am not sure this will work so let us freeze the rest so that if it does not work ... noooo ... I will not need to have another procedure because I am getting my babies now so no need to even ask me about it.- (P2)

The clients (P15, P13, P10, and P5), according to the data gathered, may also choose not to cryopreserve extra gametes if doing so would incur additional expenses or if they are confident the fresh transfer would be successful. However, to lessen the health concerns associated with multiple pregnancies, service providers (SP1 and SP3) recommended the elective transfer of a single IVF embryo (eSET). Since they will not be cryopreserved if eSET is used, there may be viable embryos that would otherwise be allowed to perish.

4.7. High cost, patient expectations, and need for regulation of ART

Since ART is predominantly a private sector service in Ghana, the study shows that clients must guarantee they have sufficient funds to undergo the procedure. At the time of carrying out the study, the cost of assisted reproductive technology (ART) ranges from roughly GHc1600 (USD230) for lower-tech techniques to approximately GHc23000 (USD3056) for IVF with ICSI. There are additional expenses associated with hormonal stimulation prior to the procedure and aftercare. The study further indicates that some clients may seek bank loans, save for a specified period, such as two to three years, or rely on family donations to pay for ART. None of the clients who took part in the study reported that their employer-provided private health insurance covered their use of ART. Due to the required financial investment, this makes the decision to undergo ART treatment a contentious one among spouses. The study also states that an inability to pay for IVF treatment may result in postponement and reliance on natural conception. Nonetheless, if IVF treatment is required, individuals run the danger of a decreased success rate as their gametes age and their bodies' biological clocks continue to tick.

According to the response of one female:

"(exclaims) aah! there is so much money involved when me myself I can do 'gbu gbu gbu' (referring to the act of sexual intercourse) and then I can get my thing".- (P6)

In the past, a client (P1) who was due to undergo IVF treatment according to the findings had it postponed after receiving a phone call from her husband saying,

"... do you know what? I am not going to send the money right now. It will not be long; I'll be back by 6 months' time and we can try it again naturally."- (P1)

After his wife underwent a failed IVF procedure in 2011 that cost him an estimated GHc10,000, P3 made the statement below:

"... I gave up, I gave up, (referring to the possibility of becoming a father). It was not easy to come by that kind of money and I was not sure whether I was ready or even able to make such an investment again but she kept pressing that we should try again. She will just not let it go."- (P3)

A 40-year-old supervisor (P9) learned that her husband's reluctance to get IVF was due to the cost when she noticed he was not cooperating. She said:

"I even told him that, if it is about money, I have got the money to do it."- (P9)

Some clients (P2, P11, P12, and P13), according to the data gathered, believe that IVF treatment entails the automatic implantation of embryos, resulting in pregnancy. In one incident, a patient (P9) claimed that no embryos were transferred into her womb by the doctor. This accusation was based on a failed pregnancy test. Since the doctor had transferred two embryos, she anticipated having twins. In other words, an embryo transfer signifies an automatic pregnancy from the patient's perspective. She concluded that the

doctor had lied about implanting embryos in her uterus.

According to the study, the majority of service providers (SP1, SP2, SP3, and SP4) were also of the opinion that a national regulatory framework for the use of ART was needed. This should streamline the operations of all service providers and eliminate those that violate their clients' rights by adopting unethical strategies in the conduct of their services. In reality, the possibility of unregulated services in the medical field is grounds for alarm.

5. Discussion

This study analyzes ART client and service provider interview data thematically. ART clients' age, marital status, the purpose for using ART, sexual orientation, usage of PGT and third-party reproduction, cryopreservation, and an acceptable number of embryos were discussed. Patient expectation and Ghanaian ART regulation were finally presented.

Age is by far the most influential factor in predicting a woman's fertility [1]. Further study indicates that the most fertile years for women are between the ages of 20 and 24 [23]. Fertility begins to drop around age 30 and accelerates substantially after age 35 [24]. Despite a slower decline in male fertility, men play a greater role in infertility as they age [25]. According to gynecologists, the best time to start a family is before the age of 35 [26].

In Ghana, the primary determinant of the relationship between age and reproductive capacity is the age at marriage. This is because only marriage is deemed suitable for procreation [27]. This surge of Western technologies into Ghana is increasingly interfering with Ghanaians' traditional culture, which permits childbirth exclusively within marriage and frowns upon pregnancy outside of marriage. Although transnational couples (a non-Ghanaian partner and his or her Ghanaian partner) may be more likely to request ART "outside of marriage," this does not diminish the likelihood that the Ghanaian spouse's family will view any ART-conceived offspring as breaking this societal standard.

The possibility of older women conceiving through the use of ART with donated oocytes raises further ethical concerns, not only in the context of Ghana but also in many other cultures. This is because children born to such mothers (and typically older fathers) will have older parents than their peers. During the child's school years, this difference may be felt more. These children run the risk of being ostracized and classified by their peers due to the relatively advanced age of their parents, particularly their mothers.

In addition, because of the challenge to Ghanaian cultural values and their reproduction by third parties, it is acknowledged that traditional Ghanaians may have an ethical concern with the erosion or adulteration of their cultural values. The cosmopolitan nature of the study site, Accra, has resulted in the mixing of cultures to the extent that traditional Ghanaian values regarding the sanctity of childbearing within marriage are being gradually eroded, allowing for a more permissive attitude toward childbearing outside of marriage. Although other factors may be influencing this tendency, the erosion of Ghanaian cultural values surrounding marriage and childbearing poses a challenge to the goal of raising children within a stable marriage to assure their psychological, economic, and social welfare.

In addition, although ART is artificial by nature, clients have the option of choosing as natural a therapy as is feasible based on the severity of their infertility. Rather than adopting a capitalist exploitative strategy in which they provide clients with more expensive but less desirable options (e.g., third-party reproduction, cryopreservation), it is evident that service providers must be aware of their client's desires (e.g., the use of their own gametes in artificial conception) and endeavor to meet them.

Regarding the LGBTQ + community, it remains a minority at present, and heterosexual unions are widely accepted. This viewpoint represents the religious beliefs and socially acceptable sexual orientation of Ghanaian society. Attitudes may alter as recognition of the LGBTQ + community increases. However, Ghana remains a relatively conservative region in this regard. If treatment of the LGBTQ + community were finally to be accepted, third-party reproduction would be required (donor gametes and possibly surrogacy). Currently, if needed, donated gametes are reserved for heterosexual couples.

In Ghana, sperm donors must be 21–28 years old, unlike in the UK, where they can be 18–46 [28]. Males over 40 had higher miscarriage rates, possibly due to sperm DNA fragmentation [29]. A tight age requirement may deter sperm donors. Given that gamete donor payment regulations vary by country, limiting sperm donor payments to their actual expenses may prevent coercion [30]. Ghana has few oocyte donors. The US accounts for almost 25% of global oocyte donation cycles [31]. It has also been acknowledged that there is a lack of understanding of the kinship viewpoints of directly involved individuals in the United States, and this may also be true in Ghana.

Also, regarding communication, it appears that some service providers need to provide clients with more information. Some clients' fears regarding ART procedures, such as cryopreservation causing the offspring to have distinct biological traits and one client's belief that an embryo transfer meant automatic conception, exemplified instances of miscommunication. For less-educated clients, it may be necessary to provide information and consent documents in the local language, or if the clients are illiterate, simply verbal information.

Due to the necessity of obtaining legal consent before every medical procedure, regulated hospitals provide clients with comprehensive information before requesting consent for a procedure. Indeed, informed consent is a fundamental tenet in healthcare that includes the patient's ability to participate in decisions regarding their fertility care, ensuring that the care they get represents their choices and values. In addition, fertility centers should include patient education in the services they offer their clients prior to treatment, and for the general public, the yearly FERSOG conference and quarterly dissemination workshops should include such vital information about ARTs and how they work to enable clients to make informed choices.

When it comes to cryopreservation, the advice of service providers to transfer a single IVF embryo (eSET) is recommended practice. Twins and higher-order births are more likely when many embryos are transferred during IVF. As a result of having multiple children, families may be strained, and parents are more likely to suffer from mental health issues such as anxiety or depression, as well as other physical, emotional, and financial difficulties [32]. eSET reduces the risks of multiple pregnancies, maternal and neonatal

complications, and morbidity [33]. Approximately 2% of Ghanaian newborns are affected by Sickle Cell Disease (SCD), which remains a significant public health burden in Ghana [34]. Therefore, it is difficult to argue against the use of PGT for this monogenic disease. Regarding PGT for gender selection, this could be deemed undesirable unless the selection is made for medical purposes. However, arguments for family balancing could be explored, as it has been reported that couples with primarily female offspring who seek non-medical PGD for male sex selection have greater fluctuation in the female-to-male embryonic ratio [35].

SCD, eSET, and the plethora of ARTs result in a situation where viable embryos may exist that would otherwise be allowed to perish if they were not cryopreserved. Without government support, SCD, eSET, and the variety of ART options are expensive. This currently limits access to ART to those who can afford it. The decision is therefore also influenced by the monetary value placed on live birth. Thus, disputing the right to the reproductive health of infertile Ghanaian couples as stated by the WHO, which states that “reproductive health implies ... People can reproduce and have the ability to decide if, when, and how frequently to do so” [36]. Therefore, as acknowledged by the majority of service providers, a national regulatory framework for the use of ART is necessary. It is believed that this will help streamline the operations of all service providers and eliminate those who violate their clients’ rights by employing unethical service delivery strategies.

There are also strengths and limitations to the study. In a traditional sub-Saharan African country such as Ghana, the study shed light on crucial ethical issues arising from the use of ARTs, which are western technologies. In addition, as far as the authors are concerned, this is the first study conducted in Ghana that examines culturally relevant ethical considerations arising from the use of ARTs. Also, as the current study focused on a single reproductive facility, future studies should also consider examining more fertility centers.

6. Conclusion

This qualitative study explored ethical issues surrounding ARTs based on clients’ and service providers’ experiences in Ghana’s urban areas. Given its relationship to the human right to procreate, ART is a potentially controversial medical field. The provision of ART services for heterosexual couples in marital unions or other socially recognized unions, the availability of PGT for sickle cell clients, the preference for multiple births emerging from embryo transfers, the lower preference for cryopreservation, the high cost of ART treatment, and the need for the regulation of the provision of ART services in the country were some of the ethical concerns expressed by both clients and service providers. Present societal norms are tremendously important and may influence a couple’s desire to end childlessness. With increased regulation of the ART industry in addition to strengthening evidence-based practice, 3rd party funding, patient education, societal engagement, and ongoing ART monitoring, clinicians, couples, and policymakers will hopefully be able to choose ideal treatments based on the likelihood of a live birth, costs, and limitations of the various ART treatments.

Author contribution statement

Rosemond Akpene Hiadzi: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper. Bryan Woodward, Godwin Banafo Akrong: Analyzed and interpreted the data; Wrote the paper.

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Data availability statement

The data that has been used is confidential.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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