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Knowledge and Perceptions of Assisted Reproductive Technology Among Fertility Clinic Attendees: A Cross-Sectional Study at a Specialist Fertility Centre in Kumasi, Ghana

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ABSTRACT

Background: Infertility can greatly affect social well-being where parenthood is tied to social status. Although assisted reproductive technology (ART) is an established clinical option, awareness and perceptions of its use in Ghana may be influenced by socio-demographic, economic, cultural, and religious factors.
Objectives: This study assessed knowledge and perceptions of ART, information sources, and whether respondents perceived religion or culture as hindering ART use among fertility-clinic attendees in Kumasi, Ghana.
Materials and Methods: A cross-sectional survey was conducted among 145 adults attending a specialist fertility centre, selected by purposive-then-convenience sampling. Data were collected from September to December 2024 using a structured questionnaire and analysed using descriptive statistics.
Results: Most had tertiary education (79.3%) and were professionals (55.2%). Health facilities (41.4%) and digital platforms (37.9%) were the leading information sources. Severe stigmatising beliefs were generally rejected: 58.6% did not regard ART-conceived children as cognitively impaired and 69.0% as defective. However, 62.1% agreed that religion or culture can hinder ART use. Concern about ART-related risks was more mixed, with 44.8% considering fetal malformation not at all or only slightly likely. Knowledge items were incompletely answered; 13.8% did not respond to the item on alternative birth options.
Conclusion: Health facilities and digital platforms were important information sources, and severe stigmatising beliefs were generally rejected. However, 62.1% perceived religion or culture as a potential barrier, which remains relevant in fertility-care decision-making. Culturally sensitive counselling and reproductive-health education may support informed decisions about ART.

Keywords: Assisted reproductive technology; Infertility; Knowledge; Perception; Cultural barriers; Ghana.

INTRODUCTION

Infertility, defined as the failure to achieve pregnancy after twelve months of regular unprotected intercourse, affects a large number of couples worldwide and is associated with considerable emotional and social distress.[1] The burden is especially pronounced in sub-Saharan Africa, where childbearing is central to social identity and involuntary childlessness frequently attracts stigma.[2] In many Ghanaian communities, infertility is interpreted through religious and spiritual frameworks, and affected couples may experience blame, marital instability, and social exclusion.[3]

Assisted reproductive technology (ART), including in vitro fertilisation (IVF), provides an effective medical route to parenthood, and its global utilisation has expanded steadily over recent decades.[4] In Ghana, specialist fertility services have gradually developed, although access remains constrained by high out-of-pocket costs and limited insurance coverage.[5,6] Uptake may further reflect religious beliefs and cultural expectations surrounding natural procreation.[7]

Existing evidence from sub-Saharan Africa suggests that public knowledge of ART is often limited and that misconceptions about safety and child outcomes are common.[8] Studies in Ghana have reported variable awareness and persistent beliefs linking ART to abnormal offspring,[9] and similar findings have emerged from neighbouring countries.[10] Qualitative research has highlighted the emotional complexity of the ART journey for Ghanaian women.[11] Health-behaviour frameworks such as the Health Belief Model further suggest that perceived benefits and barriers are associated with engagement with reproductive technologies.[12]

Despite growing service availability, evidence on how prospective users in Ghana understand and perceive ART, and how cultural and religious beliefs relate to those perceptions, remains limited, particularly among those actively seeking fertility care. This study therefore assessed the knowledge and perceptions of ART, the sources of ART information, and the perceived cultural and religious barriers to ART, among individuals attending a specialist fertility centre in Kumasi, Ghana. The specific objectives were to describe respondents' knowledge and awareness of ART and their sources of information, to assess perceptions of the health and developmental risks associated with ART, and to describe respondents' perceptions of whether religion or culture may hinder ART use.

MATERIALS AND METHODS

Study design and setting. This was a descriptive, quantitative, cross-sectional survey conducted at a specialist fertility centre in Kumasi, the capital of the Ashanti Region of Ghana. The facility is a privately owned specialist reproductive-health centre that operates continuously and offers infertility evaluation, counselling, and ART procedures, including IVF, and therefore serves a concentrated population of individuals seeking treatment for involuntary childlessness. Data were collected from September to December 2024. The study is reported with reference to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement for cross-sectional studies.

Study population and eligibility. The study population comprised adults attending the centre for infertility-related care during the study period. Eligible participants were aged 20–50 years, attending for fertility consultation, diagnostic testing, or ART treatment, and willing to provide written informed consent. Individuals were excluded if they were critically ill or otherwise unable to complete the questionnaire on the day of data collection, had cognitive or psychiatric impairment precluding valid responses, or declined to participate.

Sample size and sampling. The sample size was calculated using Yamane's formula for

finite populations [13] at a 95% confidence level and a 5% margin of error, based on an estimated 240 eligible attendees during the study period, giving a target of 150. Although Yamane's formula was used to determine the target sample, the non-probability sampling procedure limits the interpretation of the nominal margin of error. A purposive-then-convenience approach was used: working with reception and nursing staff, the researcher purposively identified adults scheduled for fertility consultations, diagnostic testing, or ART cycles on each data-collection day, excluding patients attending for general outpatient services; eligible attendees were then approached by convenience in the private waiting areas and enrolled after consent. In total, 150 questionnaires were administered and collected, of which five were excluded during data cleaning owing to incomplete responses, yielding 145 questionnaires for analysis.

Data-collection instrument and procedure. Data were collected using a structured, self-administered questionnaire comprising five sections: (A) socio-demographic characteristics; (B) knowledge and awareness of fertility and ART; (C) knowledge of general fertility and attitudes towards ART; (D) perceptions of ART; and (E) factors relating to ART use. Items were closed-ended, using multiple-choice, dichotomous, and Likert-scale formats. The researcher was available to provide neutral clarification on request, and completed questionnaires were checked on site for omissions. The instrument was pre-tested with 20 couples (40 individuals) attending a government hospital in the same region with a comparable socio-demographic profile; minor modifications were made to improve clarity, and pre-test participants were not included in the main study. The pre-test assessed the clarity and appropriateness of items; formal reliability testing, such as internal-consistency estimation, was not undertaken.

Ethical considerations. The study adhered to recognised ethical standards for research involving human participants. Verbal permission to conduct the study at the facility was obtained from the hospital management in August 2024. Participation was voluntary, no personally identifiable information was collected, respondents were assigned unique identifiers, and data were used solely for research. Details of ethical clearance and informed consent are provided under the corresponding declarations.

Statistical Analysis

Data were coded and entered into Microsoft Excel 2021 and analysed using IBM SPSS Statistics, version 27.0 (IBM Corp., Armonk, NY, USA). Socio-demographic characteristics and Likert-scale responses were summarised using frequencies and percentages. For items with missing responses, the number of non-responses was reported and percentages were calculated relative to the total sample (N = 145). The analysis was descriptive throughout; no inferential testing, correlation analysis, or multivariable modelling was undertaken, and no adjustment for confounders was performed.

RESULTS

Socio-demographic characteristics. Of the 145 respondents, 85 (58.6%) were male and 60 (41.4%) female (Table 1). Most were aged 31-40 years (65, 44.8%), had attained tertiary education (115, 79.3%), and were employed as professionals (80, 55.2%). Regarding relationship status, 65 (44.8%) were married and cohabiting, while 45 (31.0%) reported being single. Five respondents did not report employment status, and five did not report marital status.

Table 1. Socio-demographic characteristics of respondents (N = 145)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	85	58.6
Female	60	41.4
Age (years)		
20–30	45	31.0
31–40	65	44.8
41–50	35	24.1
Educational level		
Tertiary	115	79.3
High school	30	20.7
Employment status		
Professional	80	55.2
Civil service	30	20.7
Self-employed	25	17.2
Unemployed	5	3.4
No response	5	3.4
Marital status		
Married and cohabiting	65	44.8
Single	45	31.0
Married but not cohabiting	25	17.2
Divorced	5	3.4
No response	5	3.4

Percentages are of the total sample (N = 145). "No response" rows indicate missing answers for the corresponding variable.

Knowledge and sources of information about ART. Health facilities were the most frequently reported source of ART information (60, 41.4%), followed by digital platforms including social media (30, 20.7%) and the internet (25, 17.2%), which together accounted for 37.9%; family and friends (16, 11.0%) and school (14, 9.7%) contributed less (Table 2). For the item on knowledge of alternative birth options, 20 respondents (13.8%) did not answer; among those who responded, answers spanned the range of knowledge levels.

Table 2. Main reported source of information about ART (N = 145)

Source of information	Frequency (n)	Percentage (%)
Health facility	60	41.4
Social media	30	20.7
Internet	25	17.2
Family and friends	16	11.0
School	14	9.7

Percentages are of the total sample (N = 145). ART, assisted reproductive technology.

Perceptions of health and developmental risks. Respondents expressed moderate concern about general health problems and multiple gestations in ART-conceived children but largely rejected severe stigmatising beliefs (Table 3). Specifically, 85 respondents (58.6%) considered it not at all or only slightly likely that ART-conceived children are cognitively impaired, and 100 (69.0%) rejected the notion that such children are defective. Concern about

fetal malformation was mixed, with 65 (44.8%) selecting the two lowest categories.

Table 3. Respondents' perceptions of health and developmental risks of ART-conceived children (N = 145)

Variable	Frequency (n)	Percentage (%)
ART-conceived children may have health problems		
Not at all	15	10.3
Slightly	10	6.9
Moderately	45	31.0
Considerably	35	24.1
Extremely	20	13.8
No response	20	13.8
ART may cause fetal malformation		
Not at all	30	20.7
Slightly	35	24.1
Moderately	40	27.6
Considerably	15	10.3
Extremely	15	10.3
No response	10	6.9
ART may result in multiple gestation		
Not at all	25	17.2
Slightly	20	13.8
Moderately	45	31.0
Considerably	35	24.1
Extremely	10	6.9
No response	10	6.9
ART-conceived children are cognitively impaired		
Not at all	55	37.9
Slightly	30	20.7
Moderately	25	17.2
Considerably	10	6.9
Extremely	5	3.4
No response	20	13.8
ART-conceived children may be defective		
Not at all	60	41.4
Slightly	40	27.6
Moderately	25	17.2
Considerably	5	3.4
Extremely	5	3.4
No response	10	6.9

Percentages are of the total sample (N = 145); the "No response" row indicates missing answers for each item. ART, assisted reproductive technology.

Perceived cultural and religious barriers. A majority of respondents perceived religion or culture as a potential barrier to ART use. Overall, 65 respondents (44.8%) strongly agreed and 25 (17.2%) agreed that religion or culture can hinder ART use, giving a combined proportion of 62.1%.

DISCUSSION

The study population was predominantly well educated and professionally employed, a profile consistent with evidence that ART users in low- and middle-income settings are drawn disproportionately from higher socio-economic strata. [6,7] Because ART is

capital-intensive and rarely covered by health insurance in these settings, treatment is largely financed out of pocket.[14] The low proportion of unemployed respondents (3.4%) is consistent with this pattern. Income was not measured or analysed in the present study; the respondents' education and occupational profiles may indicate relatively greater socio-economic advantage, although this was not directly assessed.

Health facilities and digital platforms were the most commonly reported sources of ART information among respondents. This finding indicates that clinical and online sources may play an important role in exposure to ART-related information among people seeking fertility care. Similar patterns have been reported in higher-income settings, where education and access to health information are associated with greater ART awareness and more positive attitudes.[15,16] The prominence of health facilities as an information source echoes evidence that specialist clinics contribute substantially to ART awareness.[6] Nevertheless, a notable proportion did not answer the knowledge item, and formal schooling was reported as a source by only a minority. Access to information does not guarantee accurate or in-depth understanding.[17]

Respondents expressed realistic concerns about general complications and multiple gestations, consistent with reports that prospective ART users worry about treatment risks and efficacy.[18] At the same time, respondents generally rejected severe stigmatising beliefs that ART-conceived children are cognitively impaired or defective. The respondents' educational profile may partly explain this pattern, although the study did not directly test this relationship, and similar patterns have been reported in knowledge-attitude studies elsewhere.[19,20] The finding that 62.1% of respondents agreed that religion or culture can hinder ART use indicates that these considerations remain relevant even among this predominantly well-educated group, in keeping with evidence on the role of religion and social expectation in Ghanaian reproductive decision-making.[3,7]

Strengths and limitations. A strength of the study is its focus on individuals actively seeking fertility care, a group that is directly relevant to ART service delivery but seldom surveyed. Several limitations should be noted. First, the study was conducted at a single private fertility facility using a purposive-then-convenience (non-probability) sampling procedure; generalisation should therefore be limited to individuals attending the study facility during the study period, and the nominal 5% margin of error implied by Yamane's formula does not strictly apply. Second, the analysis is wholly descriptive; no associations between variables were tested, so the findings describe the distribution of responses rather than relationships among them. Third, as a cross-sectional design, the study cannot establish causation, and actual ART uptake was not measured. Fourth, although the questionnaire was pre-tested for clarity and appropriateness, its construct validity and internal consistency were not formally evaluated, and knowledge was captured through individual items rather than a validated composite score, so the findings should not be read as a graded measure of ART knowledge. Finally, several items had missing responses, and self-reported data are subject to social-desirability and recall bias.

CONCLUSION

Among fertility-clinic attendees at a specialist fertility centre in Kumasi, health facilities and digital platforms were important sources of ART information, while severe stigmatising beliefs about ART-conceived children were generally rejected. However, 62.1% of respondents believed that religion or culture could hinder ART use, indicating that these considerations remain important in fertility-care decision-making. Culturally sensitive counselling and reproductive-health

education may therefore help prospective users make informed decisions about ART. Previous evidence of financial barriers to ART access in Ghana also suggests that affordability warrants attention, although this was not directly assessed in the present study. Larger, multicentre studies that include direct measures of ART uptake are needed to confirm and extend these findings.

Informed Consent

Written informed consent was obtained from all participants prior to data collection. Participants were informed of the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time without any effect on their clinical care.

Authors' Contributions

FAD: Conceptualisation, Methodology, Investigation, Data curation, Formal analysis, Project administration, Writing – original draft. JKB: Supervision, Validation, Writing – review & editing. BAG: Conceptualisation, Methodology, Validation, Supervision, Writing – review & editing. All authors read and approved the final manuscript.

Declaration

Ethical Approval: Ethical clearance was obtained from the institutional research ethics committee (reference number REC-007-05-23), dated 1 June 2024. The study was granted an exemption on the basis that the survey presented no more than minimal risk. The study was conducted in accordance with recognised ethical standards for research involving human participants.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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