Journal of Medicine, Nursing & Public Health

Public Knowledge and Perception of Children Born Via In-Vitro Fertilization (IVF) in Western Nigeria: A Systematic Review

Oladipupo Olamide Olasoji

ISSN: 2706-6606

Stratford Peer Reviewed Journals and Book Publishing
Journal of Medicine, Nursing & Public Health
Volume 9||Issue 1 ||Page 1-21|| January|2026|
Email: info@stratfordjournals.org ISSN: 2706-6606

Public Knowledge and Perception of Children Born Via In-Vitro Fertilization (IVF) in Western Nigeria: A Systematic Review

Oladipupo Olamide Olasoji

MA Public Health, NTU, Nottingham City

How to cite this article: **Olasoji, O. O. (2026). Public Knowledge and Perception of Children Born Via In-Vitro Fertilization (IVF) in Western Nigeria: A Systematic Review.** ***Journal of Medicine, Nursing & Public Health*****, 9 (1), 1-21. https://doi.org/10.53819/81018102t5412**

Abstract

Infertility is higher in low and middle income countries potentially influenced by low social determinants of health. Understanding public perceptions of infertility, in-vitro-fertilization (IVF) and IVF babies is crucial to development of effective measures for better reproductive outcomes in Western Nigeria where IVF uptake remain low despite the available of Assisted Reproductive Technologies (ARTs) such as IVF. The study aimed to explore public knowledge and perception of children born through IVF in Western Nigeria. A systematic review was conducted using articles extracted from a search criteria carried out in Google Scholar, African Journals Online (AJOL), Science Direct, Taylor and Francis, and JSTOR databases in additional to search within repositories at The University of Ibadan and Obafemi Awolowo University. Thirteen articles were extracted after application of the inclusion and exclusion criteria as well as the quality audit criteria. Four were qualitative studies, eight quantitative studies and one mixed method study. The reviewed articles involved diverse participant groups, including couples, community members and reproductive health stakeholders. The review established low understanding of infertility with significant religious and cultural influence on causes and management of infertility. Awareness of in-vitro fertilization was moderate, but uptake was limited by high cost of care, complex procedures and antagonistic cultural and religious beliefs such as acceptance of divine influence on fertility status. There was a mixed public perception of children born of IVF, a reflection to the prevalent diverse societal norms, understanding of childbirth as a natural occurrence and social stigma. Significant gaps exist on public view of infertility, IVF and IVF babies due to antagonistic cultural and religious beliefs. Moreover, uptake of IVF services is hindered not only by those cultural and religious beliefs, but also financial ad procedural barriers. Further research is recommended through demographic surveys, to measure population wide view of infertility, IVF and IVF babies in Western Nigeria. Besides, policy and practice measures are recommended to educate the masses with the aim of eradicating the social determinants of health that hinder utilization of IVF and acceptance of IVF babies.

Keywords: *Public knowledge, perception, children, In-Vitro Fertilization (IVF), Nigeria*

1.0 Background of the Study

Inability to conceive after a year or more of regular unprotected sexual intercourse is considered infertility (World Health Organization 2023). It affects approximately 1 in 6 persons worldwide, with 17.5% lifetime prevalence of infertility (95% confidence interval: 15.0, 20.3) and 12.6% period prevalence of infertility (95% confidence interval: 10.7, 14.6) globally. The period prevalence varies from region to region although it is highest in Africa at about 16.4% (World Health Organization 2023) arguably due to variations in cultural, social, and economic determinants of health that influence uptake of Artificial Reproductive Technologies (ARTs) such as In-vitro fertilization (IVF) (Adamson 2009; Okafor *et al*. 2015; Tabernero-Rico, Garcia-Velasco 2019; Arhin *et al*. 2022).

There are increased concerns over the rising rate of infertility globally, owing to lifestyle changes (Liang *et al*. 2021; WHO 2023). Although attainment of health is a human right that is guaranteed universally, infertility contributes to negation of this right, resulting in untold psychological, social and mental anguish for the victims (Braverman *et al*. 2024; Mobeen, Dawood 2023). Unfortunately, marginalised populations are the most affected due to weak health and governance systems that make ART inaccessible (Perritt, Eugene 2021; WHO 2023). Thaddeus and Maine (1994) elaborated the triple delays that impede access to quality healthcare namely, delay in decision making on the part of the client, delays occasioned by location of facilities and means of transportation occasioning delay in reaching the facility, and lastly delays within the facility that prevent provision of quality, prompt services.

Hiadzi *et al*. (2023) and Lazzari *et al*. (2023) agree that artificial reproductive technologies (ART) have increased over time, in an effort to guarantee the right to health for the childless couples. Petrushko *et al*. (2021), recognizes the innovation by Robert Edwards and Patrick Steptoe that gave rise to in-vitro fertilization whereby mature eggs were collected from a woman and fertilized using spermatozoa in the laboratory leading to the first IVF child in 1978. Thereafter, the technology is widespread across the globe and provides the much-needed relief to infertile couples. The WHO quality framework for maternal-newborn health standard eight quality statement commits to the availability such technologies for routine care of women and management of complications while standard seven quality statement commits to the consistent availability of competent and committed healthcare professionals (WHO 2016)

However, there is a challenge in regards to the accessibility of technologies especially the in-vitro fertilization which is not readily available in low- and middle-income countries (Chiware *et al*. 2020). About 1.5% of Africans have access to assisted fertility programs (Ombelet, Onofre 2019). The problems of insufficient legal underpinnings, inadequate health education/awareness programs and inaccessible diagnostic programs exacerbate the challenge (Ombelet, Lopes 2024). The implication is that the financing mechanisms are not affordable to the majority of the public thus technically making it a reserved service for the rich (Njagi *et al*. 2023; Ombelet 2020). The dream of attaining universal access to reproductive and sexual health services as envisaged in the sustainable development goal number three seems elusive (Ombelet, Lopes 2024).

According to Okafor *et al*. (2015), some couples view IVF as a good option, however many others are hesitant about it because there are a lot of misconceptions about IVF in Nigeria and Yorubaland in particular. Olugbenga and Agbede (2021) established the existing myths and misconceptions while Joe-Ikechebelu *et al*. (2023) found that knowledge did not necessary

translate to use of ART and there were feelings about the morality of using unnatural methods of reproduction in addition to the IVF babies being not normal. Women were afraid of their IVF children being segregated and stigmatized by the society (Akande *et al*. 2019). IVF is perceived as a new phenomenon shrouded in secrecy and stigma due to social and cultural encumbrance, norms and values about the natural process of reproduction, ignorance and religious sentiments (Olorunfemi *et al*. 2020; Olorunfemi *et al*. 2021).

"Give me children and let me live ", is a distress call from women in need of treatment and cure from infertility as envisaged in Strategic Development Goal 3 on promotion of wellbeing at all ages and Goal 5 on gender equality and empowerment of women (World Health Organization 2023). The advent of in-vitro fertilization revolutionised reproductive health to the relief of couples struggling with infertility (Ombelet, Onofre 2019). Despite Africa having the highest period infertility prevalence worldwide (World Health Organization 2023), there is limited use and adoption of in-vitro fertilization that can significantly reduce infertility rates (Olugbenga, Agbede 2021; Hiadzi *et al*. 2023; Dewi *et al*. 2023a). Since delivery of the first IVF baby in 1986, many more deliveries have been carried out in Nigeria (Kwaghga, Dewua 2020).

Unfortunately, the country lacks a legal framework to regulate assisted reproductive technologies (ART) (Ayotomiwa, 2020). The onus is on the citizens to discern the usefulness of ART such as IVF, yet, it is estimated that between 14% to 30% of individuals in Nigeria (Dattijo *et al*. 2016; Dattijo *et al*. 2016; Liang *et al*. 2021; Polis *et al*. 2017; Oriji *et al*. 2022) have experienced infertility during their lifetime. Those who encounter infertility in Nigeria often battle with stigma since childbearing is the hallmark of marriages (Fehintola A. O *et al*. 2017; Turner 2020; Chiware *et al*. 2020). The cost of treatment provides an additional burden in addition to straining the relationship among infertile couples (Adamson 2009; Dewi *et al*. 2023b; Njagi *et al*. 2023; Okafor *et al*. 2015; Olorunfemi *et al*. 2021).

In Nigeria, a country with extensive diversity in culture and traditional values, the knowledge, attitudes, and perception of the public on in-vitro fertilization is largely underexplored (Afolabi *et al*. 2017). One set of peer-reviewed publications has shown varying levels of knowledge and attitudes about this society saving procedure depending on whether the research is carried out in a community settings, a hospital setting or a fertility center (Arhin *et al*. 2022; Arhin *et al*. 2022; Joe-Ikechebelu *et al*. 2023; Olugbenga, Agbede 2021). Yet in in Lagos, a capital city in Western Nigeria, there was 27% of gynaecological consultations were cases of infertility (Adegbola, Akindele 2013).

Moreover, most of the studies target the individuals who have encountered the experience of infertility (attending fertility clinics) thereby contributing to a potential bias in understanding the knowledge, attitude and perception among the public. Another set of articles focus on the opinion of separate groups of males or women regarding their knowledge and perception of infertility but fails to link them to the effect on the product of the procedure itself (babies born via IVF). The negative public perception, make it a hidden clinical intervention by some families or a forms of gender-based violence especially the psychological abuse of the woman and her child i.e stigmatization (Arhin *et al*. 2022; Iwelumor *et al*. 2022; M Oche *et al*. 2018; Olugbenga, Agbede 2021; Umar, Adamu 2021). Only a relative handful of studies provided respondent's opinion about children born via In-vitro fertilization methods (Enuku, Timothy 2022; Olorunfemi *et al*. 2020), although none of those studies were based in western Nigeria. The scarcity of information regarding the public knowledge, attitude and perceptions about

children born via in-vitro fertilization is regrettable because it presents an information gap that researchers ought to fill regarding the factors fuelling slow uptake of IVF in Western Nigeria. This study attempts to fill the gap directly by exploring the public knowledge, attitude and perception of children born via IVF in Western Nigeria.

1.1 Research Objectives

i. To synthesize the literature on public perception of infertility in Western Nigeria
ii. To examine the literature on public knowledge of in-vitro-fertilization in Western Nigeria.
iii. To analyse the literature on public perception of children born from in vitro fertilization in Western Nigeria.

1.2 Theoretical Framework

It takes time, effort, and concrete evidence to convince the public to adopt innovations in the healthcare system, even if, they are purely meant for a better way of life and achievement of one's life goals. The theory of diffusion of innovation provides a succinct reflection of the adoption of IVF technology in Western Nigeria. Although IVF is intended to cure infertility among couples and childless women, there has been a slow uptake which can be best explained by the theory of diffusion of innovation. It provides the five adopter categories, but also stipulates factors that influence adoption of an innovation such as the IVF. It argues that people take different timeframes and varying levels of exposure to adopt to a new idea of doing things. Therefore, innovators have a duty to present the innovation in a particular way to minimize resistance and influence adoption at differing periods for each of the five adopter categories (LaMorte 2022).

The first adopter category is called innovators who constitute about 2.5% of the public. The innovators category adopts innovations quickly since they are known risk takers, and they constantly explore new ways of doing things followed by early adopters who are mainly the opinion leaders in a community. The early adopters, who constitute 13.5% of the public, enjoy leadership roles and embrace innovations that are appealing to people through implementation of policies and standard operating procedures in comparison to the early majority who are rarely leaders but still adopt the innovation before the common person. The third group to adopt is the early majority constituting about 34% of the public.

The adopt innovations because they have seen it working with other people through witnessing, success stories and published data driven results (LaMorte 2022). Later, the late majority adopt (34%). They are usually sceptical about any new methods and the only way to win them is by use of information such as showing the number of people who have tried the innovation and were successful. Lastly, the laggards (16%) adopt the innovation. Laggards do not like innovations and will rarely get convinced. They will remain conservative or are the very last persons to agree to the innovation. Use of unorthodox methods such as use of force and instilling fear by use of rules and regulations can make the adopt the new technologies (LaMorte 2022).

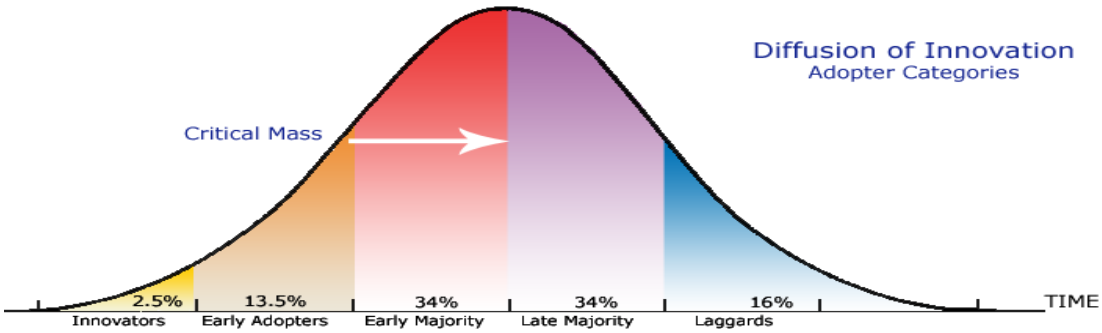

Figure 1: Adopter categories in Diffusion of Innovation Theory

Kaminski (2011)

In addition to the adopter categories, factors such as relative advantage, compatibility of the innovation, its complexity, triability and its observability are critical. The innovation ought to present superior qualities (in terms of effectiveness, better outcomes, and efficiency, among others) than the existing methods for it to be adopted quickly. Failure to possess superior quality lower interest in the innovation and reduce uptake. The compatibility of the innovation to the existing cultures and value systems as well as integration into the exiting protocols and processes in an organization also contribute to quick adoption of the innovation. Innovations that negatively infringe on cultures and people's value systems take longer to adopt (Singer 2016; LaMorte 2022). It also matters whether an innovation is deemed simple or complex in terms of procedures, costs involved and the implications after use. To improve uptake rate, innovators ought to increase accessibility in-terms of costs, availability and easier methods of adopting the innovation without severe financial, health, image and reputation implications. Besides that, the public will be interested with innovations that demonstrate they were tried and worked but also, they have observable outcomes that can be witnessed by the public. The factors influencing adoption of new technologies in the Diffusion of Innovation theory form a basis through which knowledge and public perception of IVF babies in Nigeria can be evaluated (Singer 2016; LaMorte 2022).

The theory is applied in this research to help determine the level of support for IVF babies among the public. The proportion of the public accepting IVF and IVF babies may help determine adopter categories that should be targeted in the next phase. Besides, knowing the stage of adoption will inform recommendations for engaging the hesitant adopter categories through implementation designs that appeal to them. The theory will be useful in the discussion chapter to synthesis whether the public perceive IVF as having a worthy relative advantage and to assess its compatibility to the people's way of life in Western Nigeria. The public perception will be synthesized to understand whether the requirements and process of acquiring IVF babies is simple enough for the people of Western Nigeria to embrace it or not. Thereafter, relevant recommendations will be drafted to propositions of the innovation theory.

2.0 Research Methodology

The methodology is presented in sections.

2.1 Research Design

A systematic research method was applied. A systematic research method involves finding, selecting, appraising and synthesis if the existing evidence on a research topic (Khan *et al*. 2003; Munn *et al*. 2018). The systematic review aimed to explore and synthesize the existing knowledge and perception of the pubic regarding IVF-conceived children in Western Nigeria. A comprehensive insight was provided that can inform healthcare practices, policy development and future research in this topic. To ensure a rigor and transparency (Kolaski *et al*. 2024) in the research process, the study formulated a clear research topic to guide the review process for the purposes of focus and clarity. The study considered the elements that are used in research questions, particularly those in the healthcare sector. Attempts to apply PICOT approach (Population, Intervention, Comparison, Outcome and Time) is not successful since the study topic and approach is qualitative (Abbade *et al*. 2016). The key components of the research topic were the population (The public in Western Nigeria), Intervention (Children born from IVF). However, the outcomes of interest were the perception of infertility, knowledge of IVF and perception of children born through IVF in Western Nigeria.

2.2 Protocol Development

To obtain the required materials, the study developed a protocol beyond the development of the research question to include the specific objectives, inclusion, and exclusion criteria as well as the search methodology (Kitchenham 2004; Kolaski *et al*. 2024). The general aim of the systematic review was to examine the existing literature on the public knowledge and perception of children born via IVF in Western Nigeria. The review provided a body of knowledge on how infertility is perceived, awareness of IVF and how IVF children are perceived by the public in the cultural context in Western Nigeria.

2.3 Inclusion and exclusion criteria

The inclusion criteria included studies assessing public perceptions of children born via IVF and whereby the study was conducted in Western Nigeria or had participants residing in Western Nigeria. The studies ought to be published in English, between January 2000 and May 2024. Additionally, all the study designs, qualitative, quantitative, and mixed method designs were reviewed. However, using the exclusion criteria studies focusing on perspectives of the healthcare professionals as the only study participants and those without sufficient data to inform public knowledge, and perceptions of the public regarding children born from IVF were dropped. Articles that are not freely accessible or incomplete were excluded too same as those that did not meet the quality appraisal criteria as detailed in the data extraction and synthesis section.

2.4 The Search Strategy

The search was conducted in the electronic databases and journals namely African Journals Online (AJOL), Google scholar, Science Direct, Taylor and Francis, and JSTOR using a combination of the keys words. The journals are selected owing to their content in medical and reproductive health articles. In reference to search guidelines by McGowan *et al*. (2016), structured approach to electronic literature search was applied where the first step entailed

translating research question to improve clarity and relevance of search concepts then application of the proper Boolean operators and finally inclusion of applicable synonyms and use of filters.

2.5 Data Extraction and synthesis

The data extraction process entailed using the Microsoft Excel based data extraction form to collect study characteristics such as author, year of publication and the study design, participant demographics, key findings, and relevancy of the study in the current research topic (Siddaway *et al*. 2019). Further analysis involved examining the quality of risk of bias in the studies using the Critical Appraisal Skills Programme (CASP) checklist for qualitative articles (Ma *et al*. 2020) and the AXIS (Appraisal tool for Cross-Sectional Studies) for cross-sectional studies (Downes *et al*. 2016). The Mixed Method Appraisal Tool (MMAT) was suitable for evaluation of the quality and risk of bias in the article that had a mixed methods design (Hong *et al*. 2018).

Data synthesis was conducted using thematic analysis technique that identifies patterns and themes from the reviewed articles before categorising them to generate comprehensive insights. Microsoft Excel software was used for data syntheses. The process consisted of several step starting with data familiarization. In this step, I read the publications making notes and quantitative data tables to gain general understanding on the published information. After that, I did data coding whereby labelled various segments of the findings with a descriptive theme, concept, or patterns. The study did not use deductive coding (predefined categories) because of the risk of bias, instead relying on inductive coding using the framework that examined perception of infertility, knowledge, awareness and understanding of IVF as well as perception towards IVF-conceived children.

Other themes explored included acceptability of IVF babies, perceptions of body and psychological deformities, perceptions of family and parenting dynamics, cultural and religious beliefs, social and community support, emotional and psychological support, access to healthcare services, legal and ethical implications, and recommendations. A thematic analysis followed whereby I identified the recurring patterns, concepts, and themes in the coded data by looking for relationships between themes through examining the similarities and differences. The grouped themes were evaluated to capture specific concepts in reference to inductive analysis guidelines (Dawadi 2020; Saldaña 2021).

A further examination of the data within and across studies strengthen development of the final themes to guarantee reliability, and credibility of the synthesis through an iterative process. I also extract statements that would illustrate key themes and concepts to build a rich analysis of findings. Once the themes were developed, the study identified the overarching patterns emerging across the studies to explore similarities, differences, contradictions, and variations within the data as a way to develop a better understanding of the topic. Finally, developed a conceptual framework organized and demonstrated how the concepts interacted which was also helpful in contextualizing findings with the existing literature.

2.6 Research Philosophy

The study applied pragmatism in this research owing to the inherent belief that research has practical outcomes and should be used to influence decision making. Pragmatism appreciates that individuals make decisions based on their personal analysis of a situation based on perceptions in a real-word setting. In conducting this research, the study considered the

complex nature of the study topic and time limitations to carry out this research, hence the need to use a systematic review methodology. The are children born through IVF in Western Nigeria, a region characterized by mixed culture, multiple religions and diverse beliefs. The phenomenon cannot be wished away, and pragmatism offers an opportunity to address such real-life situations. Pragmatism emphasises on multifaceted approach to problem solving. This approach inspired me to integrate diverse sources of evidence from both qualitative and quantitative articles. A blend of quantifiable data and qualitative variables provide a proper mix of evidence thus improving the quality of research and recommendations. It gives an opportunity to mix data findings with the existing unique cultural, social, and political contexts of Western Nigeria.

3.0 Findings-Relevant Publications

3.1 Article Selection Process

Guidelines from Peer Review of Electronic Strategies (PEER) were applied in target search engines. In google scholar, the use of the search terms "Knowledge," OR "Awareness," "Attitude," OR "Feelings," OR " Acceptability," "Perceptions," OR "Beliefs," OR "Views," OR "Misperceptions," OR "Opinions," OR "Culture," "Public," OR "Men," OR "Women," OR "Community," OR "Couples," OR "Family," "Children-Born," OR "Children born," OR "IVF babies," AND "In-vitro fertilization," OR "In-vitro fertilisation," OR "invitro fertilization," OR "Invitro fertilisation," OR "IVF," AND "Western Nigeria," OR "Ekiti," OR "Ondo," OR "Osun," OR "Oyo," "Ogun," OR "Lagos," generated 5010 articles. Due to high volume of articles that are not specific to the title, I applied advanced search criteria that would be more specific and relevant to the study questions.

In the advanced search criteria page, search outcomes were filtered by the publication date from the year 2000 to 2024 but included both reviews and research articles. The exact phrase was set as 'IVF babies" while the key words were set as Public, Knowledge, Attitude, Acceptability, Awareness and perceptions combined with at least one of the words "Western Nigeria, " Ekiti, Ondo, Ogun, Oyo, Osun or Lagos anywhere in the article thus reducing filtered the articles to 17. The identified articles were downloaded and numbered for the purposes of further orderly screening for inclusion and exclusion criteria.

In African Journals Online (AJOL), application of the search terms "Knowledge," OR "Awareness," "Attitude," OR "Feelings," OR " Acceptability," "Perceptions," OR "Beliefs," OR "Views," OR "Misperceptions," OR "Opinions," OR "Culture," "Public," OR "Men," OR "Women," OR "Community," OR "Couples," OR "Family," "Children-Born," OR "Children born," OR "IVF babies," AND "In-vitro fertilization," OR "In-vitro fertilisation," OR "invitro fertilization," OR "Invitro fertilisation," OR "IVF," AND "Western Nigeria," OR "Ekiti," OR "Ondo," OR "Osun," OR "Oyo," "Ogun," OR "Lagos," generated 13 articles while 554 articles were generated in Taylor & Francis journal. When filtered to open access articles and limited by the year of publication 2000-2024, Taylor and Francis Journal generated 56 research articles which were downloaded for further reviews.

Replication of the above search criteria in JSTOR resulted in over 9,000 outputs which required further filtering by limiting content to journals, population studies, English language, period 2000-2024 and search within the results using the phrase "IVF babies." The outcome was 83 articles that could be accessed and downloaded for further reviews. ScienceDirect requires that

search criteria should not exceed eight terms. I had to use priority terms to generate articles. The priority terms search terms were (Knowledge OR Attitude OR Perceptions OR Public) AND ("IVF babies" OR In-vitro-fertilization) AND (Western Nigeria OR Ekiti Endo Osun Ogun Oyo Lagos) generating 368 results. Further limits to the search including period 2000-2024, selecting both review articles and research articles but limiting to open access articles resulted into generation of 33 articles. A total of 201 articles were gained as follows: 17 in Google Scholar, 12 in African Journals Online, 56 in Taylor and Francis, 83 in JSTOR, 33 in science direct and additional 12 from general Google searches, reference lists and recommendations from colleagues. Article topics were reviewed to drop articles that were not focussed to Western Nigeria and/or any of its regions or those not likely to answer the research questions.

All the seventeen articles in Google scholar were retained, five in AJOL, none in Taylor and Francis, six in JSTOR, two in science direct and all the 12 additional references were retained leading to a total of 42 articles after review of topics. Further analysis of the abstract eliminated sixteen articles as per the exclusion criteria or those that did not meet the inclusion criteria while review of the complete articles eliminated eight more articles that did not answer the proposed research questions. The remaining articles were subjected to the appraisal using the Critical Appraisal Skills Programme (CASP) checklist for qualitative articles (Ma *et al*. 2020) and the Appraisal tool for Cross-Sectional Studies (AXIS) for cross-sectional studies (Downes*et al*. 2016) to ensure they m*et al*l the criteria for quality publications leaving only 13 articles for analysis. Figure 2 provides illustration of the article search and selection process.

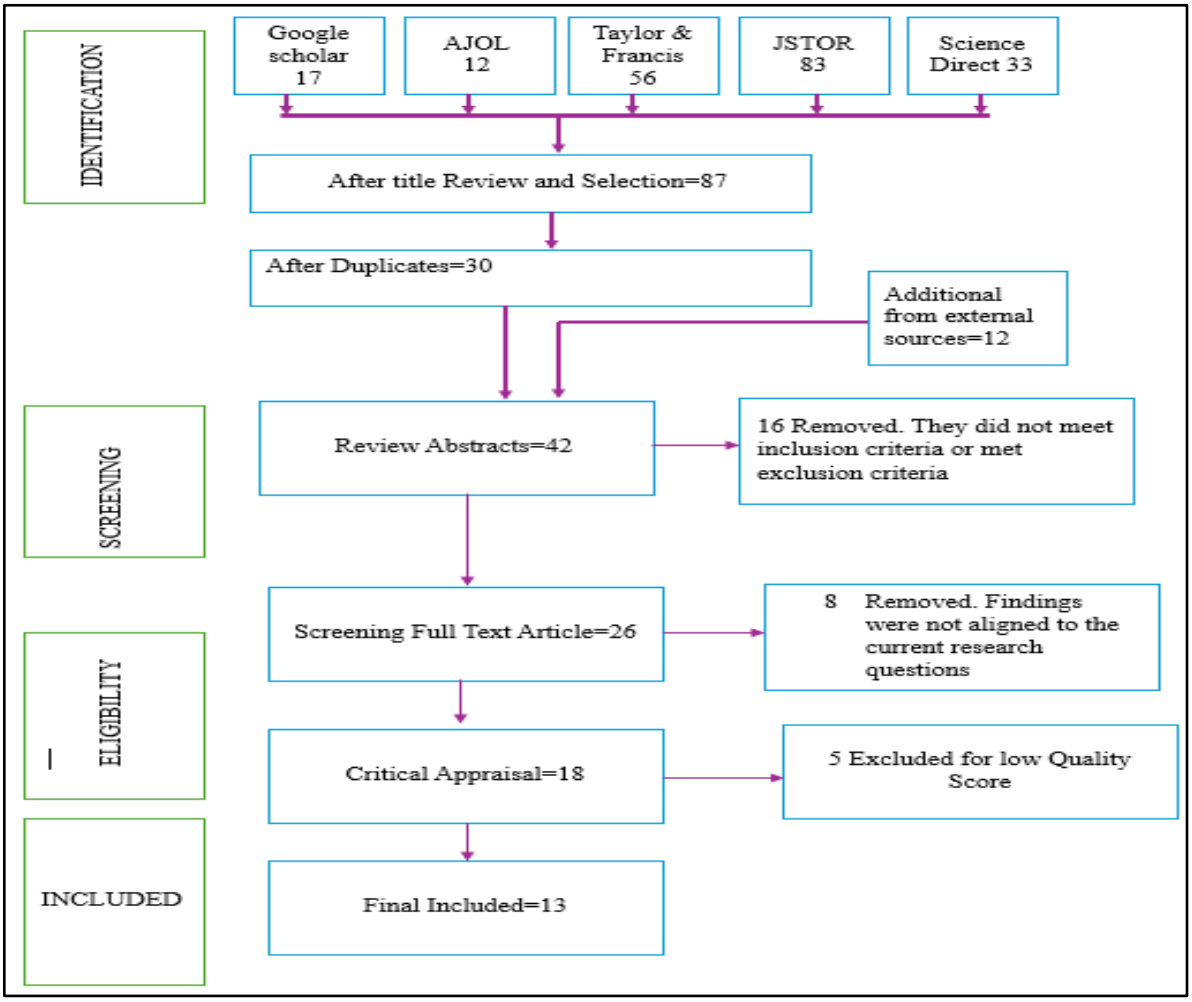

Figure 2: Article Selection Process

3.2 Basic Characteristics of the selected articles

Out of the fourteen articles that were selected for the analysis and reporting, 8(61.5%) of them are quantitative studies while three (23.1%) are qualitative and only 2 (15.4%) was mixed-method research Among the qualitative studies, 2 (66.7%) were published in the last five years with all the three articles published within the last 10 years. Interviews were the most common method of data collection (66.7%) but focussed group discussion also featured (33.3%). Mixed group interviews or focussed group discussion accounted for 33.3% of the target population, married adults (33.3%) and women with history of infertility were also interviewed in a study (33.4%). Table 1 presents details of the qualitative studies.

Table 1: Summary of Qualitative Studies

S. No	Author/ Title	Study Design	Data collection method	Sample population	Study Location
1	Public perceptions on ethics in the practice of assisted reproductive technologies in Nigeria (Bamgbopa *et al*. 2018)	Qualitative	Focused Group Discussion	ART specialists, religious groups, lawyers, sociologists, women's advocacy coalitions, couples with ART experience	Victoria Island, Lagos state, Nigeria
2	Perceived Causes of Infertility: Accounts of Infertile Individuals in Kwara South, Nigeria (Oluwakemi *et al*. 2019)	Qualitative	semi-structured in-depth interviews	Married Adults	Kwara State
3	The Decision-making Pathway and Enablers to the Utilization of Assisted Reproductive Technology in Lagos Metropolis: an interpretive phenomenological study (Ajike *et al*. 2023)	Qualitative (Interpretive phenomenological)	In-depth Interviews	Women with history of infertility	Lagos

Among the eight quantitative articles, 5 (62.5%) were published in last five years with all the articles published in the last ten years. All the articles relied on questionnaires as the preferred mode of data collection whereby 2(25%) were self-administered questionnaires and 2 (25%) were interviewer administered although 4 (50%) did not clarify how the questionnaires were administered. Two studies were (25%) were population-based survey whereby one was conducted in a community setting targeting women of reproductive age and another one was conducted among university students. The rest of the studies happened in a hospital setting (75%) whereby target population was all patients (16.7%), infertile couples (33.3%) and women in fertility clinics (50%). Two mixed methods articles are also presented in table 3 while table 2 presents details of the quantitative studies. More information about the critical appraisal of the research articles can be found in appendix I (qualitative articles), appendix II (quantitative articles) and appendix III (mixed method articles.

Table 2: Summary of Quantitative Studies

	Title	Study Design	Data collection Method	Sample Population	Study Location
1	Determinants of Utilization of Assisted Reproductive Technology Services in Ilorin, Nigeria (Lukman *et al*. 2017)	Quantitative	Questionnaire (survey)	Infertile couples	University of Ilorin Teaching Hospital
2	Acceptability of Artificial Insemination by Donor among Infertile Women Attending the Gynaecological Clinic of the University College Hospital, Ibadan (Obajimi *et al*. 2017)	Quantitative	Self - administered Questionnaire (survey)	Infertile women at Gynaecology clinic	University College Hospital, Ibadan
3	In Vitro Fertilization: Perceptions and Misperceptions among Women of Reproductive Age Group in Sokoto, Nigeria (Oche *et al*. 2018)	Quantitative	Interviewer administered questionnaires	Women of reproductive age group	Wamakko, Sokoto state, Nigeria
4	Attitude and Willingness of Infertile persons towards the uptake of Assisted Reproductive Technology in Ibadan, Nigeria (Akande *et al*. 2019)	Quantitative	Interviewer-administered semi-structured questionnaire	Married Persons	Gynaecological clinic in Ibadan, Nigeria
5	Knowledge and Perception Regarding Infertility among University Students in Ile-Ife: A view through Gender Lens (Atijosan, Ogungbayi 2019)	Quantitative	A questionnaire-based survey	Students	Obafemi Awolowo University and Oduduwa University
6	Awareness and Perception of Assisted Reproductive Techniques among Women Attending Infertility Clinic in Sokoto, North-Western Nigeria (Umar *et al*. 2020)	Quantitative	Semi-structured questionnaire	Women attending infertility clinic	Usmanu Danfodiyo University Teaching Hospital, Sokoto
7	Attitude and Acceptability of Assisted Reproductive Technology among Women in a Tertiary Hospital in	Quantitative	semi-structured questionnaire	Women attending infertility clinic	Usmanu Danfodiyo University Teaching

	Sokoto, Northern Nigeria (Umar, Adamu 2021).				Hospital, Sokoto
8	Knowledge, Attitude and Perception of Assisted Reproductive Technology Among Patients Attending Health Clinics at Babcock University Teaching Hospital Ilishan-Remo Ogun State (Joe-Ikechebelu *et al*. 2023).	Quantitative	structured self-administered questionnaire	Patients attending health clinics	Babcock University Teaching Hospital Ilishan-Remo Ogun State

Table 3: Summary of Mixed Method research articles

1	Infertility and Treatment Seeking Behaviour among Women in Mushin Local Government Area, Lagos State, Nigeria (Kenechi, Oyefara, and Kunnuji 2019)	Mixed methods	Interviewer administered questionnaire In-depth interviews	Women with unmet fertility needs Key informants (traditional/modern fertility care givers)	Mushin, Lagos State, Nigeria
2	Perceived Acceptability of Assisted Reproductive Technology (Art) As Treatment Modality For Infertility In Ijebu Land, Ogun State, Nigeria (Aluko 2014)	Mixed Methods	Structured questionnaire Key Informant Interviews	Household heads ART specialists, traditional birth attendants, religious and opinion leaders	Ijebu, Ogun State, Nigeria

4.0 Analysis of the Findings

The chapter presents analysis of the findings as per the research objectives. The selected articles are analysed forming themes in each of the three research objectives namely the public perception of Infertility and In-vitro-fertilization, level of public knowledge about children born form in-vitro fertilization and the public perception of children born from in-vitro-fertilization. Additional information on development of themes and summary evidence from the reviewed articles is provided in appendix IV.

4.1 Perception of the public about infertility

In this objective, the study sought to determine the public perception of infertility and in-vitro fertilization in Nigeria. Many scholars have attempted to answer it beginning with explanations about public perceptions on the causes of infertility and its definitions. The section provides analysis of findings from the 13 selected articles in an attempt to identify public perception of infertility in Western Nigeria. About 700 heads of households in Ijebu were asked about the possible causes of infertility. Only about 5% of household heads in Ijebu could appropriately define infertility although 50% of the respondents knew someone who had experienced infertility but 36% did not know the causes of infertility (Aluko 2014). Issues attributed to infertility varied among the sampled populations such as promiscuity (16%), previous abortions (19.3%), infections (16.8%) and 11.7% thought it was caused by spiritual matters (Aluko 2014).

The findings are similar to responses documented (Oluwakemi *et al*. 2019) where social behavioural causes such alcoholism, promiscuity, abortions and use of contraceptives are believed to cause infertility. Only about 41% of the respondents felt infertility was curable (Aluko 2014).

Moreover, university students in Ile-Ife felt that infertility was caused by promiscuity (59.7%) and that it was a disease of women (53.2%) only, demonstrating low level of knowledge on the subject of infertility (Atijosan, Ogungbayi 2019), despite them having attained a university-level of education. Men and women perceive infertility differently where majority of men blame women (88%) and absorb their own behaviour and characteristics as possible causes of infertility. Slightly more than half of university students in Ile-Ife (52.2%) felt that infertility is curable and over 92% of men recommended a divorce if the married woman could not reproduce (Atijosan, Ogungbayi 2019).

There are those who believe infertility is caused by curses from the dead ancestors (12.6%), enemies (15.6%) and spiritual attacks (33.3%) (Joe-Ikechebelu *et al*. 2023), a finding that is also documented by Kenechi et.al (2019) where respondents believed infertility was caused by evil spirits (38%) and punishments to a woman (39.3%). The concept of punishment as a cause of infertility is associated religion (Oluwakemi *et al*. 2019) where one of the respondents stated, *"I just believe everything that happens to a man is not without God,"* and another one stated, *"God could have made me infertile because when I was much younger I had girlfriends and two had abortions for me. I believe God is punishing me for those abortions they had."*

However, Kenechi *et al*. (2019) work demonstrated that 59% (majority) of people believed in health based causes of infertility which were further enumerated by Joe-Ikechebelu *et al*. (2023) to include the abnormalities of the sperm (74.4%), sexually transmitted diseases (63.7%), previous abortions (60.7%), Stress (59.6%), lifestyle e.g. cigarette smoking (51.8%) and previous use of the contraceptive devices. Specific conditions such as low sperm count, erectile dysfunction, irregular ovulation and blocked fallopian tubes were mentioned following in-depth interviews by Kenechi *et al*. (2019).

4.2 The level of public knowledge about in-vitro-fertilization

The section provides a review of the selected articles to assess the public awareness of IVF, its effectiveness, the barriers to IVF but also explanations on the factors that either negatively or positively influence perceptions towards infertility and IVF. **Awareness of IVF/ART:** Low knowledge on ART (in general) as an effective method of addressing infertility is reported by Aluko (2014) among women and men although women were more likely to be informed than men. Lukman *et al*. (2017) states that 38.73% of the residents of Western Nigeria are not aware of ART services. Similarly, Umar *et al*. (2020) reports 34.3 percent of women at a fertility clinic were not aware of ART. However, awareness of ART services is highest among infertile couples (87.3%) and they are willing to use (76.2%) or recommend it to friends and relatives (88.4%) (Lukman *et al*. 2017). Besides, educational status is significantly associated with level of awareness on ART (Umar *et al*. 2020).

In Bamgbopa *et al*. (2018) article, stakeholders were invited to review the ethical concerns of artificial reproductive technologies. Although stakeholders appreciated the role of technology to alleviate suffering from infertility, the religious clerics demanded that it should be done only within the confines of marriage as a matter of ethics. Obajimi *et al*. (2017) evaluates the

acceptability of artificial insemination in western Nigeria. Although different from IVF, the study recognized that only two thirds of the respondents were aware of it, signifying general low level of awareness for diverse methods of reproductive technologies. A small proportion of respondents would not accept artificial insemination (57.1%) citing cultural (48.1%) and religious (43.4%) disassociation as the main reasons.

When asked about IVF specifically, Oche *et al*. (2018) documents that 74.2% of the women in reproductive age group at Wamakko in Sokoto have heard about it but slightly fewer people knew the services were available in Nigeria (71.5%). A similar percentage of women who are aware of IVF (72.17%) as reported by Umar *et al*. (2020) whereby women attending fertility clinics were surveyed noting low awareness rate among other methods of ART. Although the proportion significantly changes in Joe-Ikechebelu *et al*. (2023), IVF remains the most known method of ART (37.7%) among patients attending health clinics. The main source of information on IVF among infertile couples is health personnel according to Lukman *et al*. (2017) compared to Obajimi et. Al, 2017, where the main source of information on artificial insemination was news and print media whereby women in reproductive age heard about IVF from mass media (25.5%), friends (22.7%), health professionals (20.4%) and family members (14.4%) and the rest from internet (3/7%) and others (13.4%). Similar findings are documented by Umar *et al*. (2020) who established that the main source of information on ART was TV/Radio (26%), friends (22%), internet (10.6%) and health workers (10.0%) among others.

Moreover, Joe-Ikechebelu *et al*. (2023), finds the top source of information on artificial reproductive services as mass media (35.2%) but also retained other sources quoted by Obajimi *et al*. (2017 and Umar *et al*. (2020) to include health facility (34.6%), friends (16.1%) and family (14.1%). Ajike *et al*. (2023) explored the decisions making pathways that lead to the use of ARTs where they established that there were personal, mutual and inter-personal actors involved. Women were influenced by family, friends and lay-influencers although majority decide to use ARTs on their own (Ajike *et al*. 2023).

Support towards IVF as an effective ART: Home remedies and prayers are regarded as alternative means of addressing infertility compared to IVF (Aluko 2014; Akande *et al*. 2019). A study by Akande *et al*. (2019) involving 202 married persons at a reproductive clinic in Ibadan sought to evaluate how respondents felt about in-vitro-fertilization. The characteristics of the respondents were as follows: 88.6% were women, 54.5% had experienced primary infertility, they practised Islam and Christianity in equal proportions (50%), 55.5% had high level education beyond secondary schooling and their mean age was 34.3 years (SD 6.5). About 30% of the respondents felt they would prefer local herbs and concoctions over Artificial Reproductive Technologies (ART) and 26% of women would not encourage anyone to use ART, with a bigger proportion (50.8%) stating that they could not advise their spouses to use it. Besides, 53.0% said that praying or patiently waiting would be a better option compared to ART while a study by Aluko (2014) established that over 84% of household heads in Ijebu were aware of prayers as the cure for infertility.

In Akande *et al*. (2019), only 42% of the respondents would adopt IVF if it was availed in public hospitals although a majority of the respondents (52%) held negative attitude. But even if it is administered, only about 15% of the respondents felt they were optimistic of a successful procedure. In a PhD thesis by Aluko (2014), it is evident that about 82.7% of the households head did not approve use of the ART despite about 60% of them having tertiary level of

education. However, about 82% of women in reproductive age living in Wamakko, Sokoto, felt that IVF has provided hope for infertile couples (Oche *et al*. 2018) and 78.1% of patients attending health clinics recommended use of ART for such couples (Joe-Ikechebelu *et al*. 2023).

Barriers and facilitators to use of In-vitro-fertilization: Contradiction to religious beliefs was a barrier to use of ART services. About 34.8% of the respondents (Akande *et al*. 2019) felt their religion (Islam or Christianity) was against use of artificial reproductive technologies leading to about 30.1% stating that the reason behind their refusal to adopt ART was because it conflicted with their religious beliefs and faith. Religious constrains limited 36.9% of respondents from taking IVF services (Oche *et al*. 2018). However, Oche *et al*. (2018) finds that women from Islamic faith were more likely utilize IVF (p value 0.004). Almost half of the respondents (47.0 %) refused ART owing to their belief that God would intervene (Akande *et al*. 2019; Oche *et al*. 2018)

While Umar *et al*. (2020) argues that infertility is more prevalent in poor societies, Akande *et al*. (2019) reports that a super majority of (71%) respondents felt the IVF procedures were too expensive beyond their financial capabilities. Similar concerns were highlighted by Aluko (2014) where 35.5% of the respondents decried prohibitive costs of procuring ARTs such as IVF and others were concerned about the time spent in care centres (10.1%) and accessibility of treatment methods in Nigeria (30.6%). Ajike *et al*. (2023) points out high cost of ART services is a hindrance to decision making among infertile women. In Lukman *et al*. (2017), 61.2% blamed the cost of ARTs as the main barriers to their utilization in Western Nigeria while 50.7% of respondents in Joe-Ikechebelu *et al*. (2023) work proposed that governments should take care of ART services. The high cost of ART remains a hindrance to their acceptability (Aluko 2014;Oche *et al*. 2018).

Couples without children are more likely to recommend IVF (Oche *et al*. 2018) as evidenced by the finding that couples with no children formed the highest proportion of women with positive perception towards IVF. Moreover, couples with primary infertility were more likely to prefer IVF more than those with secondary infertility. Akande *et al*. (2019) established that 45% of respondents with history of primary infertility preferred use of the ART compared to about 31% of those with secondary infertility. Higher level of education is associated with favourable view on adoption of ART. In a household survey carried out in Ijebu, 11% of respondents with tertiary education approved use of ART compared to only 5.7% of respondents with lower levels of education (Aluko, 2014). Moreover, the level of IVF awareness (p value 0.0023) and level of IVF perception (p value 0.0001) was significantly associated with willingness to use IVF (Oche *et al*. 2018). Other barriers that were raised included the limitations of spousal involvement or consent for the procedure (27.4%) (Akande *et al*. 2019) and the desire to give birth naturally is common among women of reproductive age as reported by 44.7% of respondents (Oche *et al*. 2018). However, a smaller proportion (24.6%) of respondents attributed their refusal to tedious ART procedures which they felt was likely to cause harm (Akande *et al*. 2019).

4.3 Public perception of children born from in vitro fertilization

The status of the IVF child in the community was subject to socio-cultural interpretations (Joe-Ikechebelu *et al*. 2023; Umar *et al*. 2020; Akande *et al*. 2019). There are those who feel couples fear rejection by the society if they undertake ART and gave birth to assisted fertility babies

(Joe-Ikechebelu *et al*. 2023). The fear of stigmatization of the child was a barrier among 18.8% of the respondents in a study by Akande *et al*. (2019). According to Oche *et al*. (2018) 36% women of reproductive age in Wamakko, Sokoto felt that IVF babies are normal but not natural considering their unusual process of getting born.

The natural vs normal conundrum is also evident in Umar *et al*. (2020) where only 40.86% of women attending fertility clinics said that ART babies in general, are natural and normal. However, there are those who felt IVF babies were natural but not normal while others felt they are normal but not natural (Umar *et al*. 2020) in contrast to findings by Joe-Ikechebelu *et al*. (2023) where a higher percentage 61.5% of public felt babies born via ART were normal. About 24% of respondents in (Akande *et al*. 2019) qualified the nature of abnormality in IVF babies by agreeing that they are likely to have malformations with another 26% of respondents not sure whether they will be deformed or not. Among those not willing to undergo IVF, they reported the fear of deformed babies as one of the reasons (45.9%) (Akande *et al*. 2019).

5.0 Conclusion

The review showed significant gaps in public understanding of infertility, in-vitro-fertilization and perception of children born using IVF in Western Nigeria. The cultural and religious beliefs are to blame but it is clear that awareness is associated with level of education and individual experiences with infertility. While there is moderate awareness of IVF varying across populations, the uptake is hindered by prohibitive costs, complex procedures and antagonism with cultural and religious beliefs. The public perception of IVF children is also mixed with arguments on whether they are natural and normal human beings. Religious clerics approve IVF babies if they only occur within a marriage set up reflecting a deep-seated norms in Western Nigeria. The barriers could be addressed through a multistakeholder involvement approach through education programs, support services and policy reforms that integrate gender and cultural sensitivity to bridge the knowledge gap and promote utilization of of IVF services and acceptance of IVF babies.

6.0 Recommendations

The study recommends a multifaceted research agenda to address the identified gaps in knowledge and practice regarding IVF in Western Nigeria, beginning with the urgent need to conduct population-wide surveys on the prevalence of infertility and public perceptions of infertility, IVF, and IVF babies through established mechanisms such as social demographic health surveys, which would provide comprehensive baseline data that moves beyond the hospital and clinic-based samples that have dominated existing research and would capture the attitudes of the general population including those who have never accessed fertility services. Building on this foundational knowledge, the study calls for rigorous examination of the impact of education programs specifically designed to challenge and transform the socio-cultural and religious factors that currently hinder both IVF uptake and acceptance of IVF babies, with particular emphasis on documenting successful interventions that demonstrate measurable changes in attitudes and behaviors so these evidence-based programs can be replicated across other regions in Nigeria and potentially throughout sub-Saharan Africa where similar cultural and religious barriers exist. Finally, recognizing that knowledge and attitudes alone are insufficient without addressing the prohibitive financial barriers identified by 71% of respondents, the study recommends evaluation research on the impact of including IVF in national health policies and insurance schemes, which would assess whether policy-level

interventions that reduce out-of-pocket costs lead to increased IVF uptake across diverse populations, particularly among lower socioeconomic groups who are currently effectively excluded from accessing these reproductive technologies despite having the highest infertility prevalence rates, thereby contributing to reproductive justice and health equity in the Nigerian context.

REFERENCES

Abbade, L.P. et al*et al*., 2016. Framing of research question using the PICOT format in randomised controlled trials of venous ulcer disease: a protocol for a systematic survey of the literature. BMJ open, 6(11), p.e013175. https://doi.org/10.1136/bmjopen-2016-013175

Adamson, G.D., 2009. Global Cultural and Socioeconomic Factors That Influence Access to Assisted Reproductive Technologies. *Women's Health*, 5(4), pp.351–358. DOI: 10.2217/WHE.09.28.

Akande, S.O., Dipeolu, I.O., Ajuwon, A.J., 2019. Attitude And Willingness of Infertile Persons Towards the Uptake of Assisted Reproductive Technologies in Ibadan, Nigeria. *Annals of Ibadan Postgraduate Medicine*, 17(1), p.51.

Arhin, S.K. et al*et al*., 2022. Knowledge, Attitude, and Perceptions about In Vitro Fertilization (IVF) among Women of Childbearing Age in Cape Coast, Ghana. *Obstetrics and Gynecology International*, 2022, p.5129199. DOI: 10.1155/2022/5129199.

Ayotomiwa, O.J., 2020. *assisted Reproductive Techology: An Urgent Need for an All-Encompassive Legislation in Nigeria*. PhD Thesis. Faculty of Law, Osun State University.

Braverman, A.M. et al*et al*., 2024. Depression, anxiety, quality of life, and infertility: a global lens on the last decade of research. *Fertility and Sterility*, 121(3), pp.379–383. DOI: 10.1016/j.fertnstert.2024.01.013.

Chiware, T.M. et al*et al*., 2020. IVF and other ART in low- and middle-income countries: a systematic landscape analysis. *Human Reproduction Update*, 27(2), pp.213–228. DOI: 10.1093/humupd/dmaa047.

Dattijo, L.M. et al*et al*., 2016. The prevalence and clinical pattern of infertility in Bauchi, northern Nigeria. *Tropical Journal of Obstetrics and Gynaecology*, 33(1), pp.76–85.

Dewi, A.K. et al*et al*., 2023a. The barriers of joining in vitro fertilization programs among infertile couples in developing countries: A scoping review. *Asian Pacific Journal of Reproduction*, 12(4), pp.147–154. https://doi.org/10.4103/2305-0500.380981

Dewi, A.K. et al*et al*., 2023b. The barriers of joining in vitro fertilization programs among infertile couples in developing countries: A scoping review. *Asian Pacific Journal of Reproduction*, 12(4), p.147. DOI: 10.4103/2305-0500.380981.

Enuku, C., Timothy, E., 2022. Assessment Of Knowledge, Religious, Socio-Cultural Issues and Acceptability of In-Vitro Fertilization Among Women in Oredo Local Government Area, Edo State, Nigeria. Yen Med J. 2022;4(4):95–103, 4, pp.95–103.

Fehintola A. O et al*et al*., 2017. Social Meaning and Consequences of Infertility in Ogbomoso,

Nigeria. *Sudan Journal of Medical Sciences (SJMS)*, pp.63–77.DOI: 10.18502/sjms.v12i2.917.

GlobalData Plc, 2024. Literacy Rate in Nigeria (2010 - 2021, %) [online]. *GlobalData*. Available at: https://www.linkedin.com/company/globaldataplc/ [Accessed 12 March 2024].

Hiadzi, R.A., Woodward, B., Akrong, G.B., 2023. Ethical issues surrounding the use of assisted reproductive technologies in Ghana: An analysis of the experiences of clients and service providers. *Heliyon*, 9(2), p.e13767. DOI: 10.1016/j.heliyon.2023.e13767.

Hong, Q.N. et al*et al*., 2018. The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for information*, 34(4), pp.285–291. https://doi.org/10.3233/EFI-180221

Iwelumor, O.S., Jamaludin, S.S.S., Babatunde, K.S., 2022. Social Construction of Female Infertility: A Qualitative Study of Women with Female Factor Infertility Diagnosis [online]. *Journal of International Women's Studies*, 24(1). Available at: https://vc.bridgew.edu/jiws/vol24/iss1/9. [Accessed 11 March 2024]

Joe-Ikechebelu, B. et al*et al*., 2023. Knowledge, Attitude and Perception of Assisted Reproductive Technology Among Patients Attending Health Clinics at Babcock University Teaching Hospital Ilishan-Remo Ogun State. *International Journal Of Scientific Advances*, 4. DOI: 10.51542/ijscia.v4i1.12.

Kaminski, J., 2011. Diffusion of innovation theory [online]. Canadian Journal of Nursing Informatics, 6(2), pp.1–6. Available at: https://cjni.net/journal/?p=1444 [Accessed 28 December 2023].

Khan, K.S. et al*et al*., 2003. Five Steps to Conducting a Systematic Review. *Journal of the Royal Society of Medicine*, 96(3), pp.118–121. DOI: 10.1177/014107680309600304.

Kitchenham, B., 2004. Procedures for performing systematic reviews. *Keele, UK, Keele University*, 33(2004), pp.1–26.

Kolaski, K., Romeiser Logan, L., Ioannidis, J.P.A., 2024. Principles for good scholarship in systematic reviews. *Developmental Medicine & Child Neurology*, 66(4), pp.415–421. DOI: 10.1111/dmcn.15719.

Kwaghga, A.L., Dewua, R.E., 2020. Assisted Reproductive Technologies and Fertility Transition in Nigeria [online]. *Benue Journal of Sociology. Vol. 8 No. 1. PP 60*, 79. Available at: https://www.academia.edu/download/66321517/Assisted_Reproductive_Technologies_and_fertility_Transition_in_Nigeria.pdf [Accessed 14 March 2024].

LaMorte, W.W., 2022. Diffusion of Innovation Theory [online]. Boston University School of Public Health. Available at: https://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories4.html [Accessed 20 December 2023].

Lazzari, E. et al*et al*., 2023. Projecting the Contribution of Assisted Reproductive Technology to Completed Cohort Fertility. *Population Research and Policy Review*, 42(1), p.6. DOI: 10.1007/s11113-023-09765-3.

Liang, S. et al*et al*., 2021. Prevalence and associated factors of infertility among 20–49 year old women in Henan Province, China. *Reproductive Health*, 18(1), p.254. DOI: 10.1186/s12978-021-01298-2.

M Oche, O. et al*et al*., 2018. In vitro fertilization: Perceptions and misperceptions among women of reproductive age group in Sokoto, Nigeria. *Journal of Reproductive Biology and Health*, 6, p.1. DOI: 10.7243/2054-0841-6-1.

Ma, L.-L. et al*et al*., 2020. Methodological quality (risk of bias) assessment tools for primary and secondary medical studies: what are they and which is better? *Military Medical Research*, 7(1), p.7. DOI: 10.1186/s40779-020-00238-8.

McGowan, J. et al*et al*., 2016. PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement. *Journal of Clinical Epidemiology*, 75, pp.40–46. DOI: 10.1016/j.jclinepi.2016.01.021.

Mobeen, T., Dawood, S., 2023. Relationship beliefs, attachment styles and depression among infertile women. *European Journal of Obstetrics & Gynecology and Reproductive Biology: X*, 20, p.100245. DOI: 10.1016/j.eurox.2023.100245.

Munn, Z. et al*et al*., 2018. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), p.143.DOI: 10.1186/s12874-018-0611-x.

Njagi, P. et al*et al*., 2023. Financial costs of assisted reproductive technology for patients in low- and middle-income countries: a systematic review. *Human Reproduction Open*, 2023(2), p.hoad007. DOI: 10.1093/hropen/hoad007.

Okafor, N., Ezeah, P., Udeobasi, O., 2015. Factors Affecting the Use of In-Vitro Fertilization (IVF) among Married Couples in Anambra State, Nigeria. *International Journal of Innovative Research & Develoment*, Volume 4, Issue 9.

Olorunfemi, O. et al*et al*., 2020. Acceptability of Babies Conceived through Assisted Reproductive Technology among Married Women in University of Benin Teaching Hospital, Benin City, Nigeria. *CHRISMED Journal of Health and Research*, 7(3), p.162. DOI: 10.4103/cjhr.cjhr_110_19.

Olorunfemi, O. et al*et al*., 2021. The relationship between religion, culture, cost, ethics, and husband perception with the decision of women's utilization of Assisted reproductive technology as method of infertility management. *Journal of Nursing and Midwifery Sciences*, 8(4), p.268.

Olugbenga, A.A., Agbede, C.O., 2021. Knowledge, Perception, Myths and Health Seeking Behaviour on Infertility Among Men and Women Attending Selected Hospitals in Ogun State, Nigeria. *African Journal of Health, Nursing and Midwifery*, 4(4), pp.86–100. DOI: 10.52589/AJHNM-FFPNCD90.

Ombelet, W., 2020. WHO fact sheet on infertility gives hope to millions of infertile couples worldwide. *Facts, Views & Vision in ObGyn*, 12(4), pp.249–251.

Ombelet, W., Onofre, J., 2019. IVF in Africa: what is it all about? *Facts, Views & Vision in ObGyn*, 11(1), pp.65–76.

Oriji, P.C. et al*et al*., 2022. Pattern of infertility among infertile couples in a tertiary health institution in Bayelsa State, South-South Nigeria. *Int J Sci Rep*, 8(6), pp.136–141. https://doi.org/10.18203/issn.2454-2156.IntJSciRep20221316

Perritt, J., Eugene, N., 2021. Inequity and injustice: recognizing infertility as a reproductive justice issue. *F&S Reports*, 3(2 Suppl), pp.2–4. DOI: 10.1016/j.xfre.2021.08.007.

Petrushko, M., Piniaiev, V., Yurchuk, T., 2021. The history of assisted reproductive technologies: from prohibition to recognition. *History of science and technology*, 11(2), pp.315–328. DOI: 10.32703/2415-7422-2021-11-2-315-328.

Polis, C.B. et al*et al*., 2017. Estimating infertility prevalence in low-to-middle-income countries: an application of a current duration approach to Demographic and Health Survey data. *Human Reproduction*, 32(5), pp.1064–1074.DOI:10.1093/humrep/dex025.

Siddaway, A.P., Wood, A.M., Hedges, L.V., 2019. How to Do a Systematic Review: A Best Practice Guide for Conducting and Reporting Narrative Reviews, Meta-Analyses, and Meta-Syntheses. *Annual Review of Psychology*, 70(1), pp.747–770. DOI: 10.1146/annurev-psych-010418-102803.

Singer, L., 2016. On the Diffusion of Innovations: How New Ideas Spread [online]. Dr. Leif Singer. Available at: https://leif.me/on-the-diffusion-of-innovations-how-new-ideas-spread/ [Accessed 23 December 2023].

Tabernero-Rico, P.M., Garcia-Velasco, J.A., 2019. Observational Study of the Social Determinants of Health in Subfertile versus Nonsubfertile Women. *Journal of Human Reproductive Sciences*, 12(3), pp.240–246. DOI: 10.4103/jhrs.JHRS_20_19.

Turner, I., 2020. The Social Value of Children: A Cross Cultural Examination of Infertility in Japan and Nigeria [online]. Available at: https://hdl.handle.net/2152/84560 [Accessed 14 March 2024].

Umar, A., Adamu, A., 2021. Attitude and acceptability of assisted reproductive technology among women in a tertiary hospital in Sokoto, northern Nigeria. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 10, pp.1770–1775. DOI: 10.18203/2320-1770.ijrcog20211488.

WHO, 2023. Infertility [online]. *WHO*. Available at: https://www.who.int/news-room/fact-sheets/detail/infertility [Accessed 11 March 2024].

World Health Organization, 2023. Infertility prevalence estimates: 1990–2021 [online]. Available at: https://apps.who.int/iris/bitstream/handle/10665/366700/9789240068315-eng.pdf [Accessed 11 March 2024].