



## **PREVALENCE AND KNOWLEDGE OF IN-VITRO FERTILIZATION MESSAGES ON SOCIAL MEDIA IN NIGERIA: A REVIEW OF LITERATURE**

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### **ABSTRACT**

*Infertility is on the increase in Nigeria as its prevalence is estimated to 30%. Studies showed that the fertility age of the woman is bench marked between 15-44 years. However, some women may not have children within this age frame due to various factors. In the same vein scholars have established that about 30% of married couples in sub-Saharan Africa battle infertility as male partners constitute about 50% of the cases. One third of infertility cases have occurred as low sperm count, erectile issues, ejaculation challenges, diabetes, genetic problems, inflamed testes and problems with the tubes carrying sperm in men. However in Nigeria, 10% to 30% of couples are affected by infertility. In the bid to foster social and cultural interaction, society expect couples, especially the woman to have children within 12months of having unprotected sexual intercourse without considering the alternative child bearing options they can explore to achieve the goal of parenting. These alternative options include but not limited to in-vitro fertilization (IVF), surrogacy and pre-implantation genetic testing (PGT). In light of the aforementioned, this study sought to identify the prevalence and knowledge of in-vitro fertilization messages on social media in Nigeria. Following an extensive review of existing literature, the study thereby concludes that limited research is being done in this regard and interdisciplinary researchers may conduct further studies in this field using different variables and other forms of assisted reproductive technology.*

**Keywords:** *Prevalence, Knowledge, In-vitro fertilization messages, social media, Nigeria*

### **INTRODUCTION**

Infertility is a leading reproductive health issue across the globe which has not excluded Africa and Nigeria, where the ability of a woman to reproduce

children within one year after marriage is regarded as the basis for social and cultural interaction. The World Health Organization (W.H.O) defined infertility as an ailment which affects the reproductive system thus preventing a woman from getting pregnant after one year of regular unprotected sex (Malgorzata, Anna, Bogdan, & Dorota, 2019).

In the view of World Health Organization (W.H.O), health transcends the mere absence of infirmities and ailments. It is the total state of physical, mental and social well-being. Infertility is a major problem that can jeopardize the physical, mental and sociological wellbeing of affected couples thereby, posing the society at risk of various vices such as establishment of baby factories and kidnapping.

Scholars have established that 70 million couples suffer infertility worldwide as its prevalence differs from country to country however in sub-Saharan Africa region, infertility cases in Gambia takes about 9%, in Northwestern Ethiopia 21% of infertility cases were recorded while 12% of infertility cases was discovered among women and 16% of the same issue was revealed among men in Ghana (Chimbatata & Maliba, 2016). The views of Bangbopa, Okonta, Ajayi, Ogbeche, Igbokwe and Onwuzurigbo (2018) discovered that aside from the health concerns of infertility, its prevalence is estimated to 16% or more in sub-Saharan Africa. However in Nigeria, “10% to 30% of couples are affected by infertility compared to 5% to 8% of couples battling infertility worldwide”. About 30% of married couples in sub-Saharan Africa battle infertility as male partners constitute about 50% of the infertility cases as this challenges the notion that infertility is predominantly a feminine problem (Durosinlorun, et al., 2019).

In Africa, bearing children is considered a cultural obligation and failure to produce them is considered a cultural shortcoming for which married couples are often stigmatized. In the past, traditional African societies measured a man’s wealth and power by the amount of children (especially sons he has) and the worth of a woman depended on the number of children (especially sons) she birthed. This shows the economic and social benefits of having children as they serve both social and psychological needs (Akande, Ajuwon, & Dipeolu, 2019).

Infertility is largely regarded as a condition predominant in women. However, one third of infertility cases have occurred due to low sperm count and erectile issues, ejaculation challenges, diabetes, genetic problems, inflamed testes and problems with the tubes carrying sperm in men (Almas

& Shaik, 2016). In a situation where couples are unable to produce children within one year of marriage, families, friends, colleagues and neighbors become worried and eye brows are being raised to question the background of the woman involved and her lifestyle choices before marriage, forgetting that scientifically it takes both the male and the female partners to achieve a clinical pregnancy.

Figures from the National Bureau of Statistics shows that in 2015, the fertility rate stood at 5 births per woman while 2016 witnessed an increment in fertility rate by 6 births per woman which means that the average Nigerian woman will have children throughout their childbearing age (National Bureau of Statistics, 2017). The question that comes to mind is that what happens to the women who do not fall within this category and are constantly pressured to produce children within the specific time frame as stipulated by the society?

According to a study conducted in 2015 by Nordica Fertility Centre, in Lagos, Nigeria, “intrauterine adhesions were the leading abnormality (30%) among 1,115 infertile women who had hysteroscopy. The top three predisposing factors identified were; previous open myomectomy (45%), previous dilation and curettage for unwanted pregnancy or miscarriage (33%), and previous cesarean section (8%)”. With the above predisposing factors and experiences of these women, the questions that come to mind is can these women still achieve clinical pregnancy? What other options can they explore to achieve their goal of parenthood? What is their knowledge of assisted reproductive technology? What is the prevalence of messages on assisted reproductive technology on social media? Where can they access these information to proffer solutions to their infertility problem?

Assisted Reproductive Technology (ART) is the aggregate of treatments including the management of ovaries and/or embryos offered to couples dealing with infertility. Some examples of assisted reproductive technologies (ARTs) include gamete intra-fallopian transfer (GIFT), in-vitro fertilization (IVF), pronuclear stage tubal transfer (PROST), tubal embryo transfer (TET), surrogacy and zygote intra-fallopian transfer (ZIFT) (American Society for Reproductive Medicine, 2018). The focal point of the study is to identify the prevalence and knowledge of in-vitro fertilization messages on social media in Nigeria and factors surrounding the acceptance and rejection of the procedure.

The word in-vitro, originates from Latin which translates to “in glass” in English. The word was borne out of the fact that initial biological trials which involved growing tissues outside their natural origin/habitat were done inside laboratory glasses like test tubes, beakers and petri-dishes. In contemporary times, in-vitro encompasses all biological procedures carried out to cultivate an organism outside its natural host organism. It is different from vivo procedure in which the cultivated tissue stays within its natural host living organism (Badger-Emeka, 2013).

In-Vitro Fertilization is an assisted reproductive technique where the sperm of a male and the eggs of a female are fertilized in a laboratory using a petri-dish. (American Society for Reproductive Medicine, 2018). After fertilization has occurred, the resulting embryo is transferred to the female uterus as pregnancy. In the view of Ajayi, Biobaoku, Oyetunji, Aikhuele and Bamgboye (2017) in-vitro fertilization involves many complex procedures which are used in the treatment of infertility or genetic challenges leading to difficulties in conception.

The first in-vitro fertilization (IVF) procedure in Africa was led by the team of Dayo Ashiru and Giwa Osagie at the Lagos University Teaching Hospital (LUTH), Idi-Araba, Lagos state, the Western region of Nigeria on March 17, 1989 (Ikechebelu, Ikechebelu, & Okafor, 2017). Similarly, the Eastern region of Nigeria specifically in Anambra State witnessed the first in-vitro fertilization birth on August 6<sup>th</sup>, 2011 at Life Specialist Hospital, Nnewi which was achieved by Joseph Ikechebelu’s team. Since the birth of baby Joseph (Anambra state’s first IVF birth) in 2011, more than 70 babies have been born through IVF in this center(Ikechebelu, Ikechebelu, & Okafor, 2017).

With the aforementioned from literature on in-vitro fertilization, the question to ask is what is the prevalence and knowledge of in-vitro fertilization messages on social media in Nigeria? Okafor, Ikechebelu and Ikechebelu (2017) disclosed that 3.2% of their respondents whom are married couples in Anambra State affirmed that the mass media was their source of information on the subject of in-vitro fertilization while 3.1% of the respondents also disclosed that the internet was their source of information on the subject matter. In the same vein, Edward, Adamolekun and Oguntuase (2020) revealed in their study that 30% of their respondents whom are women of childbearing age in Akure Local government, Ondo State affirmed that their knowledge of in-vitro fertilization was from social media.

However, the social media platform they used in accessing in-vitro fertilization messages was not specified hence, this study sought to identify the gap in knowledge from literature and provide answers to the yarning question of what is the prevalence and knowledge of in-vitro fertilization messages on social media. Similarly, this study sought to investigate extant literature on the prevalence of in-vitro fertilization procedure on social media.

### **Social Media and In-Vitro Fertilization Messages**

Social media has improved communication through the use of ideas, personal messages and contents disseminated on platforms such as Instagram, Twitter, Facebook and YouTube as a result of its prompt interactivity with its audience compared to the traditional media that lack prompt feedback medium but depend on social media for feedback from target audience (Pentescu, Cetina, & Orzan, 2015).

Similarly, the findings of Blakemore, Bayer, Smith and Grifo (2020) revealed that patients progressively use social media to obtain and interact with health information which is crucial to understand the fertility messages on social media as the understanding of these messages will aid patients' interaction with disseminated health messages. The study further revealed that five hundred and thirty-seven (537) social media accounts were analyzed to obtain the findings of interactivity of respondents. 278 accounts were from Twitter while 259 accounts were from Instagram. 32% of the fertility contents were from Instagram which the posts were based on primary stories on infertility while 24% of the contents accounted for inspirational support for persons dealing with infertility. Thirty nine accounts which was represented as 13% were from fertility influencers which was characterized with indicators of posts greater than 50 posts per month on Twitter and posts greater than 10 posts per month Instagram.

In Nigeria, reports obtained from the study of Omokanye, Olatinwo, Durowade, Raji, Biliaminu and Salaudeen (2017) among infertile couples in Ilorin disclosed that 87% of respondents are aware of the procedure of in-vitro fertilization as 21% confirmed that the mass media was their source of information and 10% affirmed in the positive to using the internet in sourcing for information about assisted reproductive technology thereby aiding their decision making process in achieving their goal of parenthood. The authors further revealed that 75% of their participants established that

they are aware of some friends and families whom have accepted the option of in-vitro fertilization despite its high financial implications as this hereby challenges the socio-cultural barrier couples are faced with while battling infertility.

In a cross-sectional survey conducted in Ibadan to identify the attitude and willingness of infertile persons towards the uptake of assisted reproductive technologies, Akande, Dipeolu and Ajuwon (2019) disclosed that 55% of their respondents whom are females affirmed to uptake in-vitro fertilization procedure, however, the authors did not reveal their respondents' source of information on the subject matter. Interestingly, the discovery of these authors further revealed that 60% of their participants are artisans and traders whom are gainfully employed as blue collar workers source more for information on in-vitro fertilization as compared to the 32% white collar job participants whom are accounted for as civil servants and staff of formal environment. This also challenges the societal disparity of infertility being a problem for persons in higher cadre of white collar jobs.

The findings of Adesiyun, Ameh, Avidime and Muazu (2011) among women with infertility in Northern Nigeria revealed that 4% of their respondents obtain information of in-vitro fertilization from the mass media however, the medium of their information was not specified.

### **Prevalence of In-vitro fertilization messages on social media**

Okafor, Ikechebelu and Ikechebelu (2017) disclosed that 3.2% of their respondents whom are married couples in Anambra State affirmed that the mass media was their source of information on the subject of in-vitro fertilization being a treatment for persons battling infertility while 3.1% of the respondents also disclosed that the internet was their source of information on the subject matter.

The findings of Sormunen, Karlgren, Aanesen, Fossum and Westerbotn (2020) revealed that 87% respondents of their study used Facebook as their source of information on the subject of in-vitro fertilization while 1% acknowledged that Instagram played a significant role in sourcing for messages of infertility and reproductive health. The researchers discovered that over 60% of the respondents affirmed in the positive to use social media to discuss the issue of infertility while 39% of the respondents responded to the timely usage of social media as once a week as they devote between one to three hours of their time to the messages of infertility. The respondents



also affirmed that they write one to five posts per week however, the contrary side of the study showed that advice provided for persons dealing with infertility were not evidence based hence the need to provide evidence based support for persons in this category. Furthermore, the researchers revealed that through social media women could obtain detailed understanding surrounding their infertility issues which they find difficult to understand in the physical compared to the masculine gender whom are difficult to contact in conducting reproductive research.

Folasade, Opeyemi, and Oladapo (2014) found that 38% of female patrons of fertility centers in Ibadan, South West Nigeria are receptive to surrogacy as remedy for their infertility issues and they would prefer strangers as their surrogate rather than a relation known to them. The goal of their investigation was to address the acceptability of assisted reproductive technologies offered to female patrons of fertility services offered by University College Hospital in Ibadan, South West Nigeria. The study addressed the problem of surrogacy not forming a public discourse in Nigeria as the findings further revealed that studies have not documented the prevalence of surrogacy in Nigeria, although the authors assert that surrogacy forms part of the assisted reproductive technique offered to infertile couples in the country. In light of the aforementioned, the gap identified from literature shows that research has not identified surrogacy as a prevalent method of assisted reproductive technology in Nigeria.

### **Knowledge of In-vitro fertilization messages on social media**

Knowledge is derived from raw data that is processed into information, yet it has detailed content due to its importance of proffering solutions to problems, aiding any selection of choices when faced with complex choices. In the bid to understand the research constructs, there should be a clear definition and indicators of these constructs which are prevalence and knowledge of in-vitro fertilization messages as a treatment modality.

Edward, Adamolekun and Oguntuase (2020) revealed in their study that 30% of their respondents whom are women of childbearing age in Akure Local government, Ondo State affirmed that their knowledge of in-vitro fertilization was from social media. However, the social media platform they used in accessing in-vitro fertilization messages was not specified.

The discovery of Małgorzata, Anna, Bogdan and Dorota (2019) revealed that women are more opened to the use of in-vitro fertilization as a treatment

modality compared to men whom are rather comfortable not to have children than subject themselves to the use of assisted reproductive technology. The authors further disclosed that 4.9% of their respondents whom were women accepted the use of in-vitro fertilization to achieve their live long dream of parenting however, the study did not unveil the medium of information the respondents used in accessing messages of in-vitro fertilization.

Omurtag, Jimenez, Ratts, Odem and Cooper (2012) revealed that three hundred and eighty four (384) members of Society for Assisted Reproductive Technology (SART) represented by 96% have websites linked to their social media platforms to offer emotional support for persons dealing with infertility while 5% of posts on these website involved patients requesting information which involves their health. The study further revealed that Facebook, Twitter and blogs are the prominent platforms most clinics link their websites to.

Berend (2010) in an ethnographic study addressed the use of internet as a means of communication in the understanding of pregnancy loss and assisted reproduction among surrogate mothers. The study concluded with the result of internet being an effective source of communication for users of assisted reproductive technology while the study failed to identify the statistics of surrogate miscarriage and still births.

In light of the aforementioned, the concept of social media as a channel of communication is used in disseminating in-vitro fertilization messages thereby aiding persons offered the option make informed decisions on their sojourn to parenthood.

### **Theoretical Perspective**

The theoretical review section of this study discusses the tenets and applications of the relevant theories which the research is anchored upon. Communication scholars and health communicators have validated the assertions of perception studies by making sense out of their experiences where the media is used as a tool for explaining complex variables like cultural expectations, past experiences, psychological disposition and societal interactions (Corner & Hawthorn, 1980). The selectivity theory which focuses on perception studies as well as the uses and gratification theories which focuses on the gain in which media audience obtain from the media usage were selected as a result of their assertions, there relevance to the study and they are discussed below.



### **Selectivity theory**

This theory was coined out from perception theory by Melvin Defleur and Leon Festinger in 1970 because perception hinges on intricate variables like mental disposition, previous experiences, societal interactions as well as cultural norms, values and expectations. These factors merge with linguistic limitations and narrow experience to influence the process of selective perception. The process includes, selective exposure, attention, perception and retention (Babatunde, 1998).

The selectivity theory approach to health communication was propounded as a result of perception studies under the minimally powerful media theories which the findings led to the selectivity process that is broken down into four (4) stages which include selective exposure, selective attention, selective perception and selective retention (Babatunde, 1998). Baran and Davis (2012) argued the claims of Babatunde (1998) that attitude-change researchers studied three (3) forms which are exposure, retention and perception. Baring in mind that these forms have been widely criticized and it should be carefully interpreted.

Selective exposure refers to individual tendency to access the media messages which are in resonance with one's interest, attitudes and beliefs and the contrasting inclination to avoid those that hold the potential to create cognitive dissonance (Baran & Davis, 2012).

It is simply natural that human beings search for information that gratifies their belief, interests and opinion on topical issues concerning them and disregard those that are contrary to their views hence the selective exposure in the medium of communication these audience subscribe to either radio, television, print and social media as long as the medium serve the purpose of selection. After the exposure to media messages by the audience, the process of attention begin to set in because messages from the media is transient especially radio, the audience begin to give ultimate attention to the message that is being disseminated that they do not miss the juice of the message which is peculiar to their attitudes and preexisting beliefs which the media is ready to confirm for them.

In relation to focus of this study, social media is the selected medium of communication, Instagram, Facebook and YouTube were the selected platforms which the audience are exposed to as a result of avalanche information disseminated on the selected platforms. The eyes helps the audience to process the information faster to the brain as they are searching

for social media messages that are targeted to the practice of assisted reproduction methods specifically messages on in-vitro fertilization (IVF) as all attention is directed to the search as their immediate information need have to be met.

Selective retention refers to the manner through which individuals recall information which are in consonance with their pre-existing outlooks and interests over a long period of time. It is believed that people easily recall messages that they consider meaningful irrespective of the time frame (Baran & Davis, 2012). In the bid of searching for messages on assisted reproductive technologies specifically in-vitro fertilization on social media, gradually the audience begins to recall messages they have seen either through pictures or video content on any social media platform they have been exposed to over time then rob minds with their partners, caregivers, families, friends and colleagues on the message of in-vitro fertilization as a child bearing option for persons and couples whom have been offered the option which puts an end to the vices of patronizing baby factories, kidnapping and psychological trauma on the path of the couples.

Selective perception deals with the idea that people will alter the meaning of messages so they become consistent with preexisting attitudes and beliefs (Baran & Davis, 2012). The media exposure, attention and retention the audience have encountered in the search for in-vitro fertilization messages thereby form the basis of how couples view the option which could either be positive or negative in attitudinal change of adopting in-vitro fertilization as a treatment modality for couples whom have been offered the option or there is a positive or negative attitudinal change in the use of the selected social media platform the audience have been exposed to over the period of time in reinforcing their preexisting attitude and belief of in-vitro fertilization (IVF).

### **Knowledge gap theory**

This theory was initially propounded in 1970 by University of Minnesota scholars Tichenor, Donohue and Olien. The theory was founded on the belief that societal information acquisition is uneven. This is because the materially comfortable members of the society have greater access to media and information than their counterparts with limited material resources (Baran & Davis, 2012). This reality leads to disparity of information between two sets of people: one group comprises the educated that are knowledgeable about

a wide array of issues due to their exposure to avalanche social media messages and availability of information. A different group comprises of people within the lower economic class whom are partly defined by their low educational qualifications, little knowledge of public affairs, a disconnection from latest news and developments as well a lack of concern about their lack of knowledge.

Increased gap in knowledge can exist between the rich and the poor a result of various factors which their media exposure has a role to play between both parties. In the bid to improve people's life with information, the mass media might not always work the way it is planned such that their exposure and understanding of the message will differ from one another. The mass media could increase the gap in knowledge and information between the upper and lower classes.

The first knowledge-gap theorists identified five factors which create the gap in knowledge between the rich and the poor. These factors are better education, higher communication skills, reading, understanding and ability to recall information. Another reason for propounding the theory is that affluent people have greater reservoir of knowledge which allows them to recall information at a rate faster than people with low income. Furthermore, high-income earners possess arrays of more relevant social contexts to draw from in their social interactions. This gives them an edge over their low-income counterparts in societal interactions. The deduction is that structure of the mass media offers greater benefits to people with high socioeconomic status (University Of Twente, 2020).

Relating the crux of this theory to the research subject, there is a knowledge gap between persons in the upper class and the lower class on the subject of in-vitro fertilization as a treatment modality of infertility and family planning which happens due to the differences in their exposure to available information on the subject matter. The differences in individual knowledge of assisted reproductive technology can be attributed to the peer and/or pressure groups they belong to, environmental and socio-economic factors. From the tenets of the theory, it shows that persons in the upper class, dwelling in the urban areas with available information and sources of information on the subject of in-vitro fertilization can accept, retain and adopt the option in their sojourn to becoming parents.

### **Uses and Gratification theory**

The theory was is the product of the intellectual effort of Elihu Katz, Jay Blumler, and Michael Gurevitch in the 1970s. The development of the theory

is a reaction to the media-centered approach of traditional media research which inherently portrayed the media audience as passive. The founders of the uses and gratification theory pushed the audience to the center of media research describing them (the audience) as active users of the mass media. Uses and gratification theory focuses on how media audiences use the media to satisfy their needs. In addition to explaining how the audience use the media to satisfy their individual and collective needs, the theory also seeks to uncover the benefits and disadvantages of media use by individuals (Littlejohn & Foss, 2009).

In the perception of the uses and gratifications paradigm, media consumers are influential in the production and consumption of media messages. This influence hinges on the powers of the audience to choose, perceive, interpret, retain and recall media messages according to individual and collective needs, beliefs, knowledge, attitudes and desires of the audience (Babatunde, 1998). Agenda setting theory has shifted attention from the production and dissemination of media messages by media organizations to the reception and consumption of same by the active audience. It has also shifted attention away from media effects and redirected same to patterns of consumption as well as the reasons for consumptions and contexts under which media consumption takes place.

In relating the tenets of this theory to the research subject, persons or couples offered the option of in-vitro fertilization (IVF) who selectively use social media messages to broaden their knowledge of in-vitro fertilization gets gratification such as how IVF is used as a method of family planning, treatment modality for infertility, cost of funding in-vitro fertilization, other people whom have gone through the process, the difference between the in-vitro fertilization and other assisted reproductive technology and ultimately have a change in attitude on the subject matter which could either be positive or negative. Uses and gratification theory is considered relevant to the study as the gratification which the audience receive from their selected social media platform is messages on in-vitro fertilization which in turn broaden their knowledge and ultimately shape their attitude towards the subject matter.

### **Conclusions and Recommendations**

The study concludes that the prevalence and knowledge of in-vitro fertilization messages on social media across the globe is dominant however, limited studies are done in this regard by reproductive healthcare givers especially communication scholars. Therefore, researchers in Nigeria are

beckoned upon to look in this direction and ultimately fill this gap of knowledge. In the same vein, interdisciplinary researchers can look in the direction of other variables and similar types of assisted reproductive technology such as surrogacy and pre-implantation genetic testing (PGT).

## References

- Adesiyun, G. A., Ameh, N., Avidime, S., & Muazu, A. (2011). Awareness and Perception of assisted reproductive technology practice amongst women with infertility in Northern Nigeria. *Open Journal of Obstetrics and Gynecology*, 144-1148.
- Ajayi, A., Ajayi, V., Biobaku, O., Oyetunji, I., Aikhuele, H., & Bamgboye, M. A. (2017). Awareness, knowledge and perception of in-vitro fertilization among final-year medical students in South-West Nigeria . *International Journal of Pregnancy and Child Birth*, 5-12.
- Akande, S. O., Ajuwon, A. J., & Dipeolu, I. O. (2019). Attitude and Willingness of Infertile Persons Towards The uptake of Assisted Reproductive Technologies In Ibadan, Nigeria. *Annals of Ibadan Postgraduate Medicine*, Vol.17, 51-58.
- Akande, S., Dipeolu, I., & Ajuwon, A. (2019). Attitude and willingness of Infertile Persons towards the uptake of assisted reproductive technologies in Ibadan, Nigeria. *Annals of Ibadan Postgraduate Medicine*, 51-58.
- Almas, S. N., & Shaik, L. A. (2016). Assisted Reproductive Technology (ART) is a solution for Infertility. *Journal Of Pharmacy*, 34-38.
- American Society for Reproductive Medicine. (2018). *Assisted Reproductive Technology: A Guide for Patients*. Retrieved from American Society for Reproductive Medicine: <https://www.reproductivefacts.org/globalassets/rtf/news-and-publications/bookletsfact-sheets/english-fact-sheets-and-info-booklets/art-booklet2.pdf>
- Babatunde, F. (1998). *Theories Of Mass Communication*. Ibadan: Stirling-Horden Publishers (Nig) Ltd.
- Badger-Emeka, L. (2013, January). *In-vitro Fertilisation*. Retrieved from Research Gate: [https://www.researchgate.net/publication/290393768\\_In-vitro\\_Fertilisation](https://www.researchgate.net/publication/290393768_In-vitro_Fertilisation)
- Bamgboya, K., Okonta, P., Ajayi, R., Ogbeche, R., Igbokwe, C., & Onwuzurigbo, K. (2018). Public perceptions on ethics in the practice of assisted reproductive technologies in Nigeria. *Global Reproductive Health*.
- Baran, J. S., & Davis, K. D. (2012). *Mass Communication Theory Foundations, Ferment, and Future*. Wadsworth, Cengage Learning.
- Chimbatata, N. B., & Maliba, C. (2016). Infertility in Sub-Saharan Africa: A Woman's Issue for How Long? A Qualitative Review of Literature. *Open Journal of Social Sciences* , 96-102.
- Corner, J., & Hawthorn, J. (1980). *Communication Studies: An Introductory Reader*. London: Edward Arnold.
- Durosiniyorun, M. A., Adze, J., Bature, S., Abubakar, A., Mohammed, C., Taingson, M., & Airede, L. (2019). Use and pattern of previous care received by infertile Nigerian women. *Fertility Research and Practice*.
- Edward, I. M., Adamolekun, M. M., & Oguntuase, B. V. (2020). Knowledge and Perception of In-vitro-Fertilization among women of childbearing age in Akure South Local Government. *African Journal of Health, Nursing and Midwifery*, 1-12.
- Ikechebelu, I. J., Ikechebelu, N. N., & Okafor, I. N. (2017). Perceptions of Infertility and In Vitro Fertilization Treatment among Married Couples in Anambra State, Nigeria. *African Journal of Reproductive Health*, 55-66.

- Littlejohn, S. A., & Foss, K. A. (2009). *Encyclopedia of Communication Theory*. California: SAGE Publications, Inc.
- Malgorzata, N., Anna, B., Bogdan, O., & Dorota, D.-K. (2019). Gender Differences in the Experience of Infertility Concerning Polish Couples: Preliminary Research. *International Journal of Environmental Research and Public Health*, pp:1-10.
- National Bureau of Statistics. (2017). *Demographic Statistics Bulletin*. National Bureau of Statistics.
- Okafor, N. I., Ikechebelu-Joe, N. N., & Ikechebelu, J. I. (2017). Perceptions of Infertility and In Vitro Fertilization Treatment among Married Couples in Anambra State, Nigeria. *African Journal of Reproductive Health*, 55-66.
- Omokanye, L. O., Olatinwo, A. O., Durowade, K. A., Raji, S. T., Biliaminu, S. A., & Salaudeen, G. A. (2017). Assisted reproductive technology: Perceptions among infertile couples in Ilorin, Nigeria. *Saudi Journal for Health Sciences*, 14-18.
- Omurtag, K., Jimenez, P. T., Ratts, V., Odem, R., & Cooper, A. R. (2012). The ART of social networking: how SART member clinics are connecting with patients online. *American Society for Reproductive Medicine*, 88-94.
- Pentescu, A., Cetina, L., & Orzan, G. (2015). Social Media's Impact on Healthcare Services. *Procedia Economics and Finance*, 646 – 651.
- Sormunen, T., Karlgren, K., Aanesen, A., Fossum, B., & Westerbotn, M. (2020). The role of social media for persons affected by Infertility. *BMC Women's Health*, 2-8.
- University Of Twente. (2020, May Sunday). *University Of Twente*. Retrieved from University Of Twente, High Tech Human Touch: <https://www.utwente.nl/en/bms/communication-theories/>