Infertility: Prevalence and Consequences

Article · August 2023

DOI: 10.22192/ijcrcps.2023.

CITATIONS
70

READS
9,015

3 authors:

Emmanuel Ifeanyi Obeagu
Kampala International University (KIU)
1,997 PUBLICATIONS **34,346** CITATIONS
SEE PROFILE

Valerie Esame Njar
22 PUBLICATIONS **300** CITATIONS
SEE PROFILE

Getrude Uzoma Obeagu
Kampala International University (KIU)
620 PUBLICATIONS **16,866** CITATIONS
SEE PROFILE

INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN CHEMISTRY AND PHARMACEUTICAL SCIENCES
(p-ISSN: 2348-5213: e-ISSN: 2348-5221)
www.ijcrcps.com
(A Peer Reviewed, Referred, Indexed and Open Access Journal)
DOI: 10.22192/ijcrcps Coden: IJCROO(USA) Volume 10, Issue 7 - 2023

Review Article

DOI: http://dx.doi.org/10.22192/ijcrcps.2023.10.07.005

Infertility: Prevalence and Consequences

[*]Emmanuel Ifeanyi Obeagu[1], Valerie Esame Njar[2] and Getrude Uzoma Obeagu[3]
[1]Department of Medical Laboratory Science, Kampala International University, Uganda.
[2]Department of Haematology and Blood Transfusion Science, University of Calabar, Nigeria.
[3]Department of Nursing Science, Kampala International University, Uganda.
E-mail: *emmanuelobeagu@yahoo.com*, 0000-0002-4538-0161

Abstract

Globally, infertility is a major health issue. Around 40 million couples actively sought treatment for infertility in 2010, of whom 34 million were in developing nations. There were approximately 48.5 million infertile couples worldwide. The highest rate of infertility is said to be in females. Women's characteristics such as education level, age at marriage, number of abortions, alcohol consumption, underlying disease, and BMI were significantly correlated with these factors, whereas men's characteristics such as occupation, addiction, smoking, and the presence of underlying disease were significantly correlated with these characteristics. based on whether a prior pregnancy was had or not, into primary and secondary categories. The most frequent causes of female infertility are uterine factors, menstrual and ovulation disorders, and ovarian disorders. known causes of male infertility that lower the number of healthy sperm produced. Infertile women may engage in extramarital sex and other high-risk sexual behaviors due to severe social, emotional, and psychological distress, including depression and anxiety, stigma, increased interpersonal violence, domestic violence, and their desperation to become pregnant. The health issues connected to human reproduction, including infertility, are relatively infrequent.

Keywords: infertility, prevalence, consequences, causes

Introduction

Infertility is a significant global health issue. Worldwide, the number of infertile couples was estimated to be 48.5 million in 2010 [1–5]. 34 million of the 40 million couples who are actively looking for infertility treatment, according to estimates, reside in developing nations [6]. Having no children in these circumstances has negative social, emotional, and health effects. In fact, data from numerous studies have revealed higher rates of psychological distress, such as depression and anxiety, among infertile women, with the desire to have a live birth being an

existential concern [7]. Despite this reality, infertility in the developing world is still a poorly researched and ignored subject [8]. Studies in South Asia and the Middle East have shown that infertility can be linked to increased interpersonal violence (IPV) among infertile women, in addition to the associated stigma and emotional distress. Infertile women in sub-Saharan Africa are more likely to engage in high-risk sexual behaviors and experience domestic violence as a result of their desperation to become pregnant [9], which may also push them to engage in extramarital relationships and other risky sexual activities.

Among the most significant gynecological complications is infertility [10]. Infertility is among the most typical reasons women in Uganda, Nigeria, Kenya, and other African nations seek gynecology consultations, in spite of other urgent health and social priorities. A lot of patients, regrettably, seek care outside the traditional, regulated medical community because there aren't enough resources or trained personnel available for them [11].

Infertility is now more common than it was just a few years ago

According to reports, there are between 10% and 15% of infertile couples worldwide [12]. The two regions of the world with the highest rates of infertility are South East Asia and Sub-Saharan Africa [13]. Approximately 10-15% of all couples trying to get pregnant fail and need serious medical assistance each year [14]. With an estimated five million people experiencing infertility in Uganda, it is a significant problem. Since these are primarily managed by private healthcare facilities in urban areas, patients in rural settings have little to no access to care.

According to the prevalence of the condition and the significance attached to it by society, infertility as a public health issue varies significantly across different communities. The percentage of couples that have it is 10%, which is the most common estimate. However, rather than being based on comprehensive community surveys, this figure is either derived from census data, which include a variable percentage of couples who choose to be childless, or from patients in large clinical centers. In fact, it is thought that only about 5% of couples experience involuntary infertility; in some regions, prevalence rates can reach 30% or even 50%. reports [15] cite this.

Women in Uganda currently give birth to an average of 51.4 children. Fertility has dropped from 6.9 children per woman in 2000-01 to the current level. This reveals a drop of 1 in 5 children. Residence and location affect fertility differently. Compared to women in urban areas, who have 4.0 children on average, women in rural areas have an average of 5.9 children. The Karamoja region has the highest fertility with 7 point nine children born to each woman, and the Kampala region has the lowest with 3 point five children. Along with education and financial status, fertility varies. Six point four women with no education have 2 point eight more children than three point six women with at least a secondary education. As the respondent's household* gains in wealth, fertility declines. In contrast to the women who live in the wealthiest households, who have an average of 3.8 children, women in the poorest households have 7.1 children [16]. Despite these fertility rates, a sizable proportion of women are unable to conceive despite their best efforts. However, it is unclear why there has been a decline in fertility rates.

Infertility risk factors

Depending on whether a prior pregnancy was experienced or not, infertility is classified as primary or secondary. Infertility may be caused by male or female factors. Among the most frequent causes of female infertility are uterine factors, menstrual and ovulation disorders, and uterine abnormalities. Factors affecting male infertility are known to decrease the production of sperms with normal morphology and progressive motility [17].

200 infertility cases were reported by Chatfield et al. in a series. from East Africa suffered from secondary infertility, about half of them. 35.8% of the 482 cases of infertility that Moutsinga reported in Gabon were primary. The primary cause of 75–80% of cases in southern Sudan was infertility, according to research [18]. Only a small number of carefully chosen case reports from clinical centers provide any additional information about the relative importance of primary and secondary infertility in Africa.

Vascular conditions like varicocele were the most frequent cause of male infertility (49.4%). Aziospermia (56.4%) and oligozoospermia (24.5%) were the most frequently identified causes, per the findings of the semen analysis. Varicocele was the most prevalent factor in male infertility, according to a prior study, which was supported by the findings of the current investigation. Varicocele raises testicular temperature, causes toxic metabolite reflux into the left kidney, and ultimately lowers sperm parameters, which makes it difficult to conceive. Further research revealed that in men with varicocele who are infertile, a drop in serum testosterone levels causes testicular atrophy (narrowing of the testis), which is followed by disruption of the Leydig cells. In contrast to the results of this study, a 2015 study found that seminal disorders were the main reason for male infertility [17].

Ovulation disorders were the most typical causes of female infertility (57.5%), and PCOS was the most typical cause of non-ovulation disorders (66.2%). Ovulation does not take place in more than 90% of women with PCOS, a hereditary condition. Due to high levels of luteinizing hormone (LH) and low levels of follicular-stimulating hormone (FSH), PCOS causes levels of hormones such as androgens and testosterone to rise, which prevents follicles in these people from maturing eggs. Additionally, type 2 diabetes and insulin resistance are both risk factors for PCOS, which is one of the factors contributing to infertility [17].

When treating secondary infertility, having had an induced abortion in the past was linked to poorer IVF results, particularly when having had more than two surgical abortions in the past, the likelihood of female infertility increased by 0.94 for every abortion [17].

Infertility is influenced by a woman's age at marriage and by her age at conception. Compared to women who were fertile, infertile women were older when they got married [17]. In addition, some studies have shown that ovulation disorders cause infertility in women who married later in life or who have a propensity to put off having children. According to reports, one of the main factors contributing to female infertility is age. Between the ages of 18 and 24, a woman's fertility reaches its peak; after that, it gradually declines until the age of 27, when it suddenly drops off. Around the age of 35, fertility abruptly declines. In other words, as people get older, their ovarian reserves get smaller [17].

Female infertility was also influenced by the education level of the women [17]. due to years spent in school, which delayed the age of the attempt to become pregnant. The study also revealed that alcoholic women had 0 point 78 more chances of having a female infertility factor than women who did not disclose their history of alcohol consumption. The results of the study revealed that endometriosis, infertility, ovulation problems, menstrual dysfunction, and abortion were all more common in alcoholic women. Alcoholism is known to cause early menopause and lower FSH levels [17]. Chronic alcohol use has also been linked to early menopause.

One of the risk factors for infertility was the existence of underlying illnesses, including thyroid disorders. When compared to fertile women, infertile women with endometriosis and autoimmune thyroiditis are more likely to have PCOS or premature ovarian failure. Thyroxine levels in the blood fall in hypothyroidism, while prolactin, thyroid stimulating hormone, and thyrotropin-releasing hormone levels rise. The resulting hyperprolactinemia prevents ovulation because it causes hypothyroidism. On the other hand, in hyperthyroidism, serum TSH levels fall while T4, T3, or both levels rise. In contrast to euthyroid women, women with hyperthyroidism have higher serum levels of the sex hormone binding globulin (SHBG) and estradiol (E2). This increase in serum estradiol levels may cause an increase in SHBG level, an increase in androgen E2 production (including plasma levels of testosterone and androstenedione), an increase in the LH/ FSH ratio, and ovulation failure [17].

Smoking alters a number of sperm characteristics, including concentration, motility, and antioxidant activity. This has an impact on the sperm's normal morphology. According to Caserta et al., there is a significant link between smoking cigarettes and oligospermia in men, progressive motility, and decreased sperm concentration; however, there is no link between smoking cigarettes and sperm morphology. Numerous studies on male smokers revealed that smoking can seriously harm spermatogonia or cause chromosomal damage, which can prevent oocyte fertilization or impede embryo development. This side effect of smoking can cause infertility and lessen a person's ability to become pregnant. A different investigation found that, while sperm count was unaffected, sperm morphology and motility were reduced and progressed, respectively, by smoking and drug addiction [17].

A risk factor for male infertility is an underlying illness. According to a meta-analysis by Glazer et al, infertile men had lower testosterone levels and higher levels of anxiety and stress, which increased their risk of developing cardiovascular disease, diabetes, and death as well as the release of stress hormones. Through the effects of the endocrine control on spermatogenesis or erectile dysfunction, diabetes affects an individual's fertility, resulting in male sexual dysfunction and ultimately infertility. In addition, diabetes is linked to a higher level of sperm DNA damage, which can cause infertility [17].

The majority of cases of infertility are reported to be caused by female factors. Female factor infertility was significantly correlated with variables like a woman's education level, age, the age at marriage, the number of abortions, alcohol consumption, underlying illness, and BMI. Additionally, there was a strong correlation between male factor infertility and men's occupation, addiction, smoking, and presence of underlying disease [17].

The impact of infertility

34 million of the estimated 40 million couples actively seeking infertility treatment are located in developing nations. In these situations, childlessness is accompanied by severe social, emotional, and health consequences. Given that having a live birth is an existential concern, data from numerous studies have revealed higher rates of psychological distress, such as depression and anxiety, among infertile women. Despite this fact, infertility in the developing world is still a poorly researched and ignored subject [19].

Studies conducted in South Asia and the Middle East have shown that infertility can lead to an increase in interpersonal violence (IPV) among infertile women in addition to the stigma and emotional distress that go along with it. Infertile women in sub-Saharan Africa are more likely to engage in high-risk sexual behaviors and experience domestic violence as a result of their desperation to conceive [19]. In fact, numerous studies have found that infertile women in this region are more likely to contract HIV than the general population.

Social repercussions

The majority of traditional cultures place a high value on fertility, particularly as a sign of the marriage's completion and as one manifestation of the couple's social role. Procreation and the marriage system both incorporate intricate webs of social and familial relationships, beliefs, and agreements. For some social transgressions, infertility has been viewed as a punishment. In one tribe in Uganda, it is believed that the marriage will be punished by the woman becoming barren if the bride price is not fairly distributed among the parents' relatives. In the case of infertility or divorce, bride price, dowry, and other types of marriage compensation are frequently modified. The formal systems of attachment to and control by the paternal over maternal family demonstrate the significance of children; for instance, the marriage dowry frequently transfers custody of a child to the husband's family. In many cultures, inability to have children is a recognized reason for divorce, and in some cultures, childlessness is significantly more common among divorced women, whether as a cause or an effect. Barrenness has been perceived as a personal tragedy and humiliation [18].

Although an infectious agent like N. In cases of post-abortal or puerperal sepsis, the underlying or contributing factors may reflect social disorganization. gonorrhoeae or a variety of other organisms. Population shifts from rural to urban areas and widespread migration of contract workers may both be factors in the rise of prostitution, which has been strongly linked to increased risks of gonorrhea and illegal abortion [18].

Consequences for health services

Even with adequate technical and financial resources, the chances of successfully treating the main causes of infertility, such as tubal occlusion, in the infertile woman, are low. Successful surgical therapy necessitates highly skilled personnel and specialized facilities once tubal occlusion has been proven. Despite the fact that 50% of patients in one patient series had tubal patency confirmed after surgery, only 14% of these patients became pregnant, and 50% of these pregnancies ended in spontaneous abortion or ectopic pregnancy, resulting in a final success rate of only 7%. There have also been disappointing outcomes in other places. The outcomes in developed nations are comparable; only highly specialized clinics with the best surgeons have success rates of greater than 20 percent [18].

Only a small portion of health issues pertaining to human reproduction are related to infertility. It may be a result of an infection brought on by unsafe obstetrical procedures or a septic illegal abortion, both of which may have additional effects such as cervicitis, vesiculovaginal fistulas, birth trauma with infant injury, etc. Tubal occlusion is only one of the effects of gonorrhoea; others include partial occlusion with subsequent ectopic pregnancy, ophthalmia neo natorum, and arthritis. Repeated gonorrheal infections in men can cause chronic obstructive changes in the ureter, urethral strictures, and chronic renal disease. A high rate of fetal wastage brought on by syphilis would be a sign of additional serious long-term syphilis-related health issues. When there are high demands for treatment on the healthcare system, infertility becomes a significant social issue. As many as 10% in some parts of Africa. a woman's consultations are for infertility, as are up to 1/4 to 1/2 of gynecological service consultations. A region's social and economic development is also constrained by infertility, which causes some areas to become depopulated [18].

Diagnosis of infertility in epidemiological research

The demographic information, along with a few epidemiological and clinical studies, forms the bulk of the basis for the current estimates of the prevalence of infertility. In sub-Saharan Africa, demographic data have been collected in a variety of ways and with information of varying quality. Techniques have included the traditional census, which involved going to each dwelling unit and gathering data on each person, censuses conducted on samples of the population, censuses conducted by gathering the heads of villages or households, vital event registration, and other administrative records or surveys. Information's form, character, and completeness are frequently influenced by the primary goal for which it was acquired [18].

In general, political or tax-related censuses or household lists do not offer accurate data on infertility. The information's usefulness in defining the issue of infertility is influenced by the questions included in many surveys and the definitions used to classify people's reproductive status. The majority of demographic studies include data on the average number of children per woman by age and marital status. The absence of children can be due to a number of factors, such as childlessness that is chosen, infertility in the couple, inability for the woman to carry a pregnancy to term, or infant mortality [18].

In some surveys, the number of children who are alive today is counted, while in other surveys, the number of live births and stillbirths is recorded. The final one has been applied the most. A few census surveys have recorded the data in terms of the number of pregnancies. Rarely are data that would suggest secondary infertility gathered. In many parts of Africa, inaccurate information is a serious issue with census data [18].

Another issue with surveys and studies in many parts of Africa is the availability of accurate age data. The age of a person has been estimated using a localized calendar of historical events that is then related back to actual years. Another system merely divides adult women into three age groups based on approximate menarche and menopause boundaries: pre-reproductive, reproductive, and post-reproductive. The ages for these latter events, however, will vary greatly based primarily on the woman's health and nutritional status and to a lesser extent on her parity [18].

Only a basic index of primary infertility can be derived from demographic information. In census surveys, women without liveborn children are counted with those who are infertile in the first place but not with those who are infertile in the second place. Despite the limitations of demographic data, developing hypotheses regarding the causes of infertility may benefit from a study of the prevalence rates of childlessness (women who have never given birth to a live child) in various populations and settings [18].

Infertility's ethical implications

A medical, social, and cultural issue that disproportionately affects women in developing nations is infertility. Conventional infertility treatments typically do not give rise to ethical questions. Assisted reproductive technology (ART) has, however, sparked a lot of ethical disagreement, controversy, and discussion [20]. Economics, policies, and the law have an impact on medical ethics, which are based on the moral, religious, and philosophical ideas and principles of the society. The conflict between justice and utility created by this may lead to unequal access to and availability of ART services for the rich and the poor [20]. All ethical deliberations and legal restrictions on ART in various societies are based on the moral status of the embryo. Cross-border ART has been produced as a result. Couples should not be denied access to a necessary ART service because a healthcare provider has a conscience objection. The main factor in determining whether or not to give any of the ART practices any ethical consideration is whether or not they have any ethical obligations to them. There have been countless years of ethical debate about the embryo's moral status in all societies. According to local cultural, religious, and governmental norms, it is subject to philosophical and religious debate and disagreement that varies from one country to the next [20].

Conclusion

There is gender-based suffering associated with infertility, which is a global medical, sociocultural, and economic issue. Infertility is now much more common than it was in the past. According to reports, the prevalence is 10%–15% worldwide. The highest prevalence can be found in countries in South East Asia and Sub-Saharan Africa. The demographic information, along with a few epidemiological and clinical studies, forms the bulk of the basis for the current estimates of the prevalence of infertility. Depending on how common the condition is and how much importance society places on it, infertility as a public health issue varies greatly among different communities.

References

1. Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. PLoS medicine. 2012;9(12):e1001356.
2. Obeagu EI, Bunu UO. Factors that influence unmet need for family planning. International Journal of Current Research in Biology and Medicine. 2023;8(1):23-7.
3. Obeagu EI, Byukusenge C, Obeagu GU. Cervical Cancer: A Review on Young Women. EURASIAN EXPERIMENT JOURNAL OF BIOLOGICAL SCIENCES 2023; 4(1)
4. Obeagu EI, Byukusenge C, Obeagu GU. Cervical Cancer: A Review on Young Women. EURASIAN EXPERIMENT JOURNAL OF BIOLOGICAL SCIENCES 2023; 4(1)
5. Ifeanyi OE, Uzoma OG. A Review on Fibroid and Haptoglobin. Int. J. Curr. Res. Med. Sci. 2018;4(6):38-49.
6. Asemota OA, Klatsky P. Access to infertility care in the developing world: the family promotion gap. InSeminars in reproductive medicine 2015; 33 (01): 017-022). Thieme Medical Publishers.

7. Kudesia R, Muyingo M, Tran N, Shah M, Merkatz I, Klatsky P. Infertility in Uganda: a missed opportunity to improve reproductive knowledge and health. Global Reproductive Health. 2018;3(4):e24.
8. Thoma M, Fledderjohann J, Cox C, Adageba RK. Biological and social aspects of human infertility: a global perspective. InOxford research encyclopedia of global public health 2021 Mar 25.
9. Mbizvo MT, Bassett MT. Reproductive health and AIDS prevention in sub-Saharan Africa: the case for increased male participation. Health policy and planning. 1996;11(1):84-92.
10. Esteves SC, Hamada A, Kondray V, Pitchika A, Agarwal A. What every gynecologist should know about male infertility: an update. Archives of gynecology and obstetrics. 2012;286:217-29.
11. Kassaye KD, Amberbir A, Getachew B, Mussema Y. A historical overview of traditional medicine practices and policy in Ethiopia. Ethiopian Journal of Health Development. 2006;20(2):127-34.
12. Agarwal A, Mulgund A, Hamada A, Chyatte MR. A unique view on male infertility around the globe. Reproductive biology and endocrinology. 2015 Dec;13(1):1-9.
13. Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. PLoS medicine. 2012;9(12):e1001356.
14. Hull MG, Glazener CM, Kelly NJ, Conway DI, Foster PA, Hinton RA, Coulson C, Lambert PA, Watt EM, Desai KM. Population study of causes, treatment, and outcome of infertility. Br Med J (Clin Res Ed). 1985;291(6510):1693-7.
15. Belsey MA. The epidemiology of infertility: a review with particular reference to sub-Saharan Africa. Bulletin of the World Health Organization. 1976;54(3):319.
16. Uganda 2016 Demographic and Health Survey - Key Findings. 2008.www.DHSprogram.com.
17. Moridi A, Roozbeh N, Yaghoobi H, Soltani S, Dashti S, Shahrahmani N, Banaei M. Etiology and risk factors associated with infertility. International Journal of Women's Health and Reproduction Sciences,2019;7(3), 346–353. https://doi.org/10.15296/ijwhr.2019.57
18. Belsey MA. The epidemiology of infertility: a review with particular reference to sub-Saharan Africa. Bulletin of the World Health Organization. 1976;54(3):319.
19. Kudesia, R., Muyingo, M., Tran, N., Shah, M., Merkatz, I., & Klatsky, P. (2018). Infertility in Uganda: a missed opportunity to improve reproductive knowledge and health. Global Reproductive Health, 3(4), e24–e24. https://doi.org/10.1097/grh.0000000000000024
20. Serour GI, Serour AG. Ethical issues in infertility. Best Practice & Research Clinical Obstetrics &Gynaecology, 2017;43, 21–31. https://doi.org/10.1016/J.BPOBGYN.2017.02.008

Access this Article in Online

Website: www.ijcrcps.com

Subject: Medical Sciences

Quick Response Code

DOI: 10.22192/ijcrcps.2023.10.07.005

How to cite this article:
Emmanuel Ifeanyi Obeagu, Valerie Esame Njar and Getrude Uzoma Obeagu. (2023). Infertility: Prevalence and Consequences. Int. J. Curr. Res. Chem. Pharm. Sci. 10(7): 43-50.
DOI: http://dx.doi.org/10.22192/ijcrcps.2023.10.07.005