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THE IMPACT OF INFERTILITY: A HOLISTIC EXAMINATION OF PHYSICAL, EMOTIONAL, AND SOCIAL EFFECTS ON COUPLES

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ABSTRACT

Infertility is a widespread global concern impacting millions of couples, posing challenges in achieving pregnancy despite regular unprotected intercourse. This study delves into the intricate repercussions of infertility on individuals and couples, spanning physical, emotional, and social realms. Female infertility stems from various factors like age, physiological dysfunctions, and lifestyle choices, while male-specific issues revolve around sperm quality and quantity. Psychological ramifications of infertility are profound, with a higher prevalence of depression observed among infertile individuals compared to fertile counterparts. Quality of life assessments highlight significant correlations with educational levels, economic status, age, duration of infertility, and marital duration. Patient-reported outcome measures like the FertiQoL and Fertility Problem Inventory provide valuable insights into assessing infertility-related quality of life. Addressing depression, fatigue, and marital intimacy emerges as pivotal strategies to enhance the overall well-being of infertile individuals. This review underscores the imperative of adopting a holistic approach to comprehend and tackle the multifaceted challenges posed by infertility.

KEYWORDS: *Infertility, quality of life, psychological impact, reproductive health, sociodemographic factors*

KEY SUMMARY POINTS

- Global Impact: Infertility has a widespread impact globally, affecting individuals physically, socially, and psychologically.
- Quality of Life: Infertility significantly influences the quality of life of individuals, with factors such as education level and duration of infertility playing key roles.
- Psychological Well-being: Infertility can lead to psychological distress, particularly impacting women's mental health and social functioning.
- Healthcare Strategies: Effective management of infertility includes addressing issues like depression, fatigue, and marital intimacy to enhance overall well-being.
- Research Gaps: Despite progress, there are still gaps in understanding infertility, such as the reliability of measurement tools, indicating the need for further research
- Research Gaps: While progress has been made in understanding infertility's impact, there are still gaps in areas like test-retest reliability of measurement tools.
- Global Trends: Changes in semen parameters over time in different regions emphasize the importance of monitoring reproductive health and addressing infertility.
- Social Stigma: Infertility can lead to societal stigma and challenges in relationships, underscoring the need for holistic support for affected individuals.
- Multidimensional Impact: Infertility affects various aspects of life, including relationships, physical health, and emotional well-being, necessitating comprehensive care approaches

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INTRODUCTION

Sub-Saharan African cultures place a high value on fertility, making childlessness a socially unacceptable and devastating experience. This region also has a high prevalence of infertility, particularly due to blocked fallopian tubes[1]. Infertility is the inability to achieve a clinical pregnancy after around 1 year of regular unprotected sexual intercourse. It is a widespread issue, affecting approximately 13% of women and 10% of men globally[2]. Infertility, also referred to as infecundity or sterility, is the condition of being unable to contribute to reproduction as defined by demographers[3]. Infertility can lead to psychological trauma, social stigma, disgrace, exclusion, abuse, and even marriage breakdown. It also reduces women's quality of life, increases the risk of sexually transmitted diseases, and can lead to multiple sexual partners and sexual dysfunction[4]. The social stigma and marital strain caused by infertility can lead to breakups, polygamy, and infidelity[1]. The issue of infertility is a significant concern for Africans because it often leads to social stigma and isolation. In many African countries, a woman's ability to bear children is crucial for a successful marriage[4]. Infertility is the inability to conceive after 12 months of unprotected regular intercourse, affecting the male or female reproductive system[3]. In sub-Saharan Africa, a study revealed significant disparities in infertility rates among women aged 20-44. For instance, countries such as Togo and Rwanda had infertility rates of less than 10% after marriage, while others like Cameroon and Central African Republic had higher rates[5]. Despite the growing availability of Assisted Reproductive Technologies (ART) as a treatment for infertility, particularly in low- and middle-income countries where infertility remains a significant public health concern, there is a paucity of empirical research on the coping strategies employed by women undergoing ART[6]. Developing countries exhibit a wider range of infertility prevalence (3.5–16.7%) compared to developed countries (6.9–9.3%). Notably, sub-Saharan African regions report even higher rates, reaching 30–40%. The impact of infertility on women's lives in resource-limited settings has become a critical concern in reproductive health discussions. In some societies, childlessness due to infertility significantly challenges infertile couples, and in many regions, infertility carries a broader societal stigma, impacting not only the couple or woman but also the entire family[7]. The research by Piva et al. suggests that understanding the potential impact of infertility on an individual's sexuality could be beneficial in preparing couples entering infertility treatment. Studies have found a high prevalence of sexual dysfunctions among women diagnosed with infertility, ranging from 26% to as high as 61.7%, and that women experiencing infertility are more likely to face sexual disorders compared to their male counterparts[8]. This study aimed to provide a comprehensive review of the multifaceted impact of infertility on individuals, couples, and families - examining the prevalence of psychological issues and sexual difficulties experienced by infertile couples, investigating how infertility affects perceptions, lifestyles, and sexual satisfaction within the family and couple, and evaluating the impact of infertility treatments on the intimacy and interpersonal relationships of the couple, with the overarching goal of gaining a deeper understanding of the wide-ranging psychosocial and relational consequences that infertility can have.

METHODOLOGY

The authors conducted a comprehensive search across major medical databases, including PubMed, Medline, Ovid, Embase, and the Cochrane database, to identify literature on the causes, impact, and management of infertility. The search focused on cross-sectional studies, reviews, trials and other study designs examining the psychological, social, and societal implications of infertility, as well as various treatments, therapies, and strategies for infertility management. We initially found 100 articles through our search. After applying the pre-determined inclusion criteria, we selected 37 articles for the final analysis. These articles discussed various topics related to infertility, including its potential causes and the significant impact it has on couples and the wider community.

Risk Factors of Infertility

A Canadian study explored how assisted reproductive technologies (AHR) affect childbirth. While infertility itself might raise pregnancy and birth complication risks, AHR techniques were linked to a slightly increased chance of specific birth defects[9]. Obese women face challenges in infertility treatment, requiring higher doses and experiencing lower success rates. Pregnancy risks include hypertensive disorders and gestational diabetes. Debate exists on restricting treatment based on BMI, though weight loss benefits are inconclusive[10]. The study examined the connection between HIV and infertility caused by blocked fallopian tubes. Researchers studied over 200 women with tubal infertility, finding most had previously been pregnant (secondary infertility) and a higher HIV rate (13.5%) compared to the general population. Blockages were more common in both tubes (67.2%) and further down the tubes (84.1%), with HIV-positive women more likely to have this specific type of blockage. These findings suggest a possible link between HIV and a particular kind of tubal blockage that contributes to infertility[1]. In a study conducted in Mumbai's slums with a sample size of 74, it was found that women experiencing infertility had elevated levels of anxiety and depression. The majority (85%) had undergone testing for infertility. Factors such as overall health, duration of marriage, and methods of coping seemed to have an impact on their mental well-being, underscoring the importance of culturally tailored interventions to address the difficulties faced by this marginalized group[11]. Even for couples who conceive naturally without assisted methods, infertility itself seems to be a risk factor for complications during pregnancy and delivery, as well as for problems with the baby after birth. There's also a slightly higher chance of specific birth defects in babies conceived through assisted reproduction, but the overall risk is still very low[9].

Male Infertility

The condition of male infertility is complex and greatly affected by genetic factors. It is crucial to conduct karyotyping and Y

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chromosome microdeletion analyses to diagnose moderate to severe cases of low sperm count and absence of sperm. Genetic screening provides important information for diagnosing and predicting specific male infertility conditions. In some cases, whole exome sequencing is a valuable tool for this purpose[15]. Infertility impacts 10-15% of couples, with male factors contributing to the underlying cause in approximately half of these cases. While significant progress has been made in understanding male infertility, a substantial portion of cases remain idiopathic, suggesting that genetic factors may play a role in these unexplained cases[16]. 46, XX male syndrome is an uncommon genetic factor leading to male infertility, usually caused by the translocation of the sex-determining region Y (SRY) from the Y chromosome. Individuals with this condition are consistently infertile due to the lack of azoospermia factors essential for sperm production. Furthermore, other abnormalities of the Y chromosome, including mosaicism and structural variations, can also result in male infertility, emphasizing the importance of genetic counseling[17]. Mutations in the CCDC157 gene have been linked to oligoasthenoteratospermia (OAT), a common factor in male infertility. When CCDC157 is absent in mice, it results in OAT-like characteristics, including abnormalities in sperm function and structure. The use of a traditional Chinese medicine improved fertility in both a patient and mice with one copy of the gene, indicating possible therapeutic uses[18]. The symptoms of male infertility may manifest in various combinations, including low sperm count (oligozoospermia), decreased sperm motility (asthenozoospermia), and abnormal sperm shape (teratozoospermia). These conditions, whether on their own or combined (e.g., oligoasthenoteratozoospermia), can lead to male infertility. Male infertility can have various causes, such as medical conditions like varicocele and drug-related issues, as well as genetic factors like Y chromosome microdeletions and other genetic abnormalities. Studies indicate that TAF7L is a gene that can cause oligoasthenoteratozoospermia (OAT). Damaging mutations in TAF7L can interfere with the process of converting histones to protamines, which is important for proper chromatin compaction in the sperm head[19].

Female Infertility

Infertility affects 8-12% of couples and can be due to male or female problems. Female fertility declines with age and some medical conditions. Male factors include low sperm count and testicular issues[20]. The study found a positive association between Dietary Inflammatory Index (DII) scores and infertility in 3496 US adults aged 18-45 using NHANES data. Analysis showed that higher DII scores correlated with infertility, and subgroup analysis by age and race revealed significant differences. The study also indicated a nonlinear relationship between DII scores and infertility, suggesting potential benefits of anti-inflammatory diets[21]. Female infertility can be caused by problems with ovulation, fallopian tubes, pelvic adhesions, endometriosis, and unexplained factors. A comprehensive study on infertility prevalence in 190 countries revealed that in 2010, primary infertility affected 1.9% and secondary infertility affected 0.5% of women aged 20 to 44[2].

Spontaneous Pregnancy and Subfertility: A Timely Perspective

Between 1990 and 2010, research conducted in 190 countries discovered that there were 48.5 million couples who were unable to conceive. Out of this number, 19.2 million experienced challenges with primary infertility, while 29.3 million struggled with secondary infertility. It is worth noting that developed countries tended to have higher rates of primary infertility, while secondary infertility was more common in developing nations[8]. The primary determinant of an individual's chances of spontaneous pregnancy is the duration of unsuccessful attempts to conceive, which indicates the level of subfertility. Around 80% of pregnancies occur within the first six menstrual cycles with regular intercourse during the fertile period. Utilizing timed intercourse during this fertile window has been shown to increase the likelihood of natural conception. Among the remaining 20% of couples who do not conceive, approximately half will achieve spontaneous pregnancy within the subsequent six cycles. Following 12 unsuccessful cycles, around 10% of couples are classified as infertile, yet their chances of spontaneous live birth within the next 36 months are nearly 55%. After 48 months, 5% of couples are considered definitively infertile, with an extremely low probability of achieving spontaneous pregnancy[22].

Factors that could impact the natural fertility of couples

Several primary factors influence the spontaneous probability of conception, including the length of time without conception, the age of the female partner, and infertility related to diseases. Other factors, such as declining semen quality over time, exposure to endocrine-disrupting chemicals, and consanguinity, may also impact the chances of conception[20]. The study found that tubal blockage was the most common pathology detected through hysterosalpingography in infertile women in Uganda, Africa. Specifically, complete tubal blockage was observed in 75% of patients, with proximal tubal blockage in 15.9% and distal tubal occlusion or hydrosalpinx in 60.9% of cases[1]. Infertility can be caused by issues with the female partner, the male partner, or a combination of both. In women, reproductive problems can stem from conditions affecting the normal function of reproductive organs (genital causes), other health issues (extragenital causes), or psychological factors[8]. Infertility is a multifaceted issue, with a range of common medical conditions affecting female fertility, such as premature ovarian failure, polycystic ovary syndrome, endometriosis, uterine fibroids, and endometrial polyps. Additionally, factors related to lifestyle, including diet and chronic inflammation, have become increasingly significant in recent years. The diets of many people today can trigger an inflammatory response in the body, further contributing to fertility challenges[21]. Genetic factors are crucial in male infertility. Diverse pathogenic genes suggest genetic heterogeneity, where abnormal sperm can have different genetic causes. Identifying more pathogenic genes is vital for genetic analysis of male infertility, as sex chromosomes significantly

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impact fertility[19]. Obesity, prevalent in women of reproductive age, impacts fertility and pregnancy outcomes[10].

Sexual Dysfunction

Sexual response is complex and influenced by biology, emotions, and situations. Different models exist to explain this, like Masters & Johnson's linear model or Perelman's "tipping point" idea. Measuring sexual problems is difficult due to varying definitions and methods used[23]. The study examined the prevalence and duration of various sexual difficulties among women. On average, 64% of women with any sexual difficulty reported issues with desire, 35% with orgasm, 31% with arousal, and 26% experienced sexual pain. Among those whose difficulties lasted for one month or more, 62-89% continued for several months, and 25-28% endured for six months or longer. However, only 21-67% of women with these difficulties felt distressed by them, suggesting that not all sexual difficulties are necessarily distressing. These findings underscore the variability in both the prevalence and duration of different sexual difficulties among women[24]. Infertility can result from issues in men, women, or both. Women may experience challenges due to factors affecting their reproductive organs, health conditions, or psychological aspects. In men, infertility can stem from problems in sperm production, transportation, or difficulties with erection and ejaculation. Both partners may contribute to infertility, with a percentage of cases remaining unexplained. Infertility takes an emotional toll, impacting individuals' feelings and causing stress during diagnosis and treatment. It can also affect self-image, self-esteem, and sexual intimacy, as the focus on conception may overshadow spontaneity and eroticism in sexual encounters[8]. The study highlights that decreased sexual desire may be attributed to specific psychosocial factors, such as abuse, stress, or psychological dynamics, rather than solely to conditions like hypoactive sexual desire disorder (HSDD) or female sexual arousal disorder (FSAD). In such cases, psychotherapeutic interventions may be more beneficial than medical treatment. Sexual dysfunction secondary to medical, psychiatric, or substance-related factors should be addressed directly, as they would exclude a diagnosis of HSDD or FSAD. Current treatment approaches for sexual desire or arousal disorders can be broadly categorized into hormonal and non-hormonal interventions, including hormone replacement, androgen supplementation, and the use of selective estrogen receptor modulators[23]. The study suggests that routine laboratory evaluation for female sexual dysfunction (FSD) is not necessary unless a specific medical condition is suspected. Endogenous androgen levels are not independent predictors of sexual function in women. Instead, simple interventions like addressing stress and providing education about average sexual practices can be helpful. According to a 2009 survey, the most common frequency of sexual intercourse in women over 25 is a few times per month to weekly, and frequency decreases with age and is higher in partnered women[25].

The Table Summarizes Studies Conducted on the impact of infertility

Study	Intervention	Participants	Outcomes	Key findings	References
Observational (cross-sectional)	Identify the key factors that determine self-esteem and the level of disease acceptance in infertile patients.	456 infertile patients (235 women & 221 men) from infertile couples	Self-esteem and Acceptance of Infertility	* Self-esteem & acceptance are higher in men than women. * Overall self-esteem: 30.50 (15 ± 30) points. * Overall acceptance: 32.4 (8 ± 40) points. * Men scored higher on both (Self-esteem: 31.00, Acceptance: 33.12) vs. Women (Self-esteem: 30.04, Acceptance: 31.80). * Sociodemographic factors (age, education) influenced scores. * Clinical factors did not influence scores.	[30]
Observational (cross-sectional)	Investigate the psychological effects of infertility on mental health in Pakistani men, focusing on fear of intimacy and its impact on neuropsychological impairment	120 infertile male patients from various healthcare settings in Punjab, Pakistan.	* Fear of intimacy *Neuropsychological impairment * Quality of life (QoL) * Mental toughness * Emotional problems * Learning problems * Sensory and motor problems * Concentration	*Fear of intimacy has a significant impact on neuropsychological impairment, with a moderate positive correlation ($r = 0.40$, $p < 0.001$). Additionally, fear of intimacy is linked to emotional problems ($r = 0.48$, $p < 0.01$), learning difficulties ($r = 0.33$, $p < 0.01$), sensory and motor issues ($r = 0.55$, $p < 0.01$), concentration problems ($r = 0.21$, $p < 0.01$), mental and physical coordination problems ($r = 0.37$, $p < 0.01$), and depression ($r = 0.22$, $p < 0.01$). However, fear of intimacy does not significantly impact quality of life (QoL) ($r = -0.25$, $p > 0.05$). Conversely, there is a negative correlation between neuropsychological impairment and QoL ($r = -0.52$, $p < 0.01$).	[29]

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			problems * Depression	Additionally, the association between fear of intimacy and neuropsychological impairment is impacted by QoL, and mental resilience acts as a moderator in this association	
Institutional-based cross-sectional	Investigate the prevalence and risk factors of infertility in Ethiopian women	441 Women attended three government hospitals in Addis Ababa	Overall infertility prevalence, primary vs. secondary infertility, factors associated with infertility	* Infertility prevalence was 27.6%, higher than the WHO's global estimate. * Primary infertility (14.4%) and secondary infertility (13.2%) were identified. * Risk factors for infertility included: * Shorter marriage duration (<5 years) * Fallopian tube blockage * Irregular sexual intercourse * Multiple lifetime sexual partners * History of multiple abortions (>3) * Partner's current alcohol consumption	[3]
Prospective observational study	Identify the prevalence of tubal abnormalities and HIV infection among women with tubal infertility	207 women diagnosed with tubal infertility over a 4-year period	Tubal abnormalities (hysterosalpingography results), HIV infection status	*Most women (84.1%) had secondary infertility (previously pregnant). * Average patient age was 36.2 years (range 21-48). * Nearly half (49.3%) had a history of induced abortion. * Bilateral tubal blockages were found in 67.2% of women. * Distal tubal blockages (fallopian tube end) were more common (84.1%) than proximal blockages (closer to the uterus, 15.9%). * 13.5% of the women were HIV positive. * Distal tubal blockages with fluid buildup (hydrosalpinx) were more frequent in HIV-positive women.	[1]
Retrospective analysis of existing data	Analyze trends in semen parameters of men attending fertility clinics in Nigeria and South Africa between 2010 and 2019.	17,292 men from fertility clinics in Nigeria and South Africa	Semen parameters: ejaculate volume, sperm concentration, progressive motility, total progressively motile sperm count (TPMSC), total sperm count, and normal sperm morphology	* Significant decline in semen quality observed between 2010 and 2019 in both countries. * Ejaculate volume and normal sperm morphology showed the greatest decrease (over 50% reduction). * Nigeria exhibited a steeper decline in progressive motility, TPMSC, and sperm morphology compared to South Africa. * Age was negatively correlated with sperm quality in Nigeria (morphology, motility, TPMSC). * South African men had generally better semen quality than Nigerians.	[31]
A systematic review and meta-analysis	To investigate the association between Antisperm antibodies (ASA) and basic semen parameters in infertile men	Data from 8 studies involving a total of 238 infertile men with ASA and 929 infertile men without ASA (controls).	Semen parameters: sperm concentration, motility, liquefaction time, volume, viability, progressive motility, normal morphology, abnormal morphology	*ASA-positive men had significantly lower sperm concentration and total motility (a+b) compared to controls. * ASA-positive men had a longer semen liquefaction time compared to controls. * No significant differences were found in semen volume, viability, progressive motility, normal morphology, or abnormal morphology between ASA-positive and negative men.	[32]

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Observational (cross-sectional for community, retrospective for clinic)	To compare the types and causes of infertility in a community-based sample vs. a clinic-based sample	* Community sample: 66 infertile couples. * Clinic sample: 112 couples seeking infertility care.	Type of infertility (primary vs. secondary), cause of infertility (female-factor, male-factor, combined, unexplained)	* Similar distribution of primary (37.1%) and secondary infertility (62.9%) in both community and clinic samples. * Female-factor infertility was most common (65.9% of couples). * Male-only factor infertility was less frequent (6.8%). * Combined-factor infertility affected 15.2% of couples. * Unexplained infertility was found in 12.1% of couples. * The types and causes of infertility appeared similar between community and clinic samples, suggesting the clinic population represents the broader infertile population. * Tubal factor infertility was the most common cause.	[33]
Hospital-based cross-sectional study	Conducted to determine the Quality of Life (QoL) and associated factors among infertile women attending the infertility clinic at Mnazi Mmoja Hospital in Zanzibar	340 infertile women attending the infertility clinic at Mnazi Mmoja Hospital in Zanzibar.	The primary outcome was the QoL of infertile women, as measured by the FertiQoL tool. The factors associated with QoL were also assessed	* The overall QoL of infertile women at the Mnazi Mmoja infertility clinic was 70.6 ± 10.0 on a scale of 0 to 100. * QoL increased significantly with higher educational level ($p = 0.009$). * Women with female individual causes or both individual and partner causes of infertility had significantly lower QoL scores compared to those with male partner causes (B = -5.07, 95% CI: -7.78, -2.35; B = -4.95, 95% CI: -7.77, -2.12, respectively). * Women experiencing secondary infertility had an average QoL score that was 4.50 points lower (95% CI: 2.30, 6.70) compared to those with primary infertility. Additionally, a longer duration of infertility was linked to a decrease in QoL (B = -0.04, 95% CI: -0.07, -0.01).	[13]
Descriptive cross-sectional	Investigate the quality of life (QoL) of infertile women and factors that influence it.	320 infertile women from a teaching hospital and private infertility centers in Sari, Iran	Quality of life (QoL) score and its seven dimensions: * Psychological effects * Sexual life * Family and social effects * Infertility-related concerns * Physical effects * Adaptive approaches * Factors	* The overall mean QoL score was 65.68 ± 8.91%. The highest scores were observed in the adaptive approach (70.48 ± 15.02%), psychological (67.88 ± 12.06%), and family and social (64.63 ± 10.76%) dimensions, while the lowest score was in the sexual life dimension (40.12 ± 14.28%). The analysis of multiple linear regression revealed that several factors were significantly associated with the quality of life of infertile women. These factors included the higher education level of both women (B = 2.57, $p < 0.001$) and their spouses (B = 1.56, $p = 0.046$), improved economic status (B = 1.64, $p < 0.001$), younger age of women (B = -0.62, $p < 0.001$) and their spouses (B = -0.65, $p < 0.001$), as well as a shorter duration of infertility (B = -0.36, $p = 0.024$) and marriage (B = -0.39, $p = 0.022$).	[12]

Psychological Impacts

The systematic review examined the psychometric validity of the FertiQoL tool, the prevailing measure employed to assess the impact of infertility on quality of life (QoL). The review included 53 studies that reported satisfactory reliability (α = 0.43 - 0.92) and validity for the overall scale and its subscales. The FertiQoL

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demonstrates robust psychometric properties, supporting its use in assessing QoL among individuals with various infertility etiologies across different cultural contexts[26]. A total of 78 patient-reported outcome (PRO) measures were used in research on female infertility in this thorough examination. The FertiQoL and Fertility Problem Inventory (FPI) were determined to have strong evidence supporting their content validity, psychometric strength, and linguistic validation. However, there are still areas for improvement in the reliability of FertiQoL and understanding the significance of clinical changes, while the usefulness of FPI is limited by its lack of a specified recall period[27].

Infertility stands as a pervasive challenge, impacting approximately 48 million couples worldwide who grapple with the inability to achieve a clinical pregnancy following 12 months or more of consistent, unprotected sexual intercourse. This struggle is influenced by an array of factors, encompassing age, physiological disorders, and lifestyle choices, which can contribute to female infertility. The research underscores the profound psychological repercussions of infertility, manifesting in diminished quality of life, compromised psychological well-being, and impaired social interactions for affected individuals or couples. Moreover, studies suggest that women often bear a disproportionately heavy burden, experiencing heightened effects on their mental health, social engagement, and emotional stability compared to their partners. This multifaceted impact underscores the critical importance of comprehensive support and intervention strategies tailored to address the complex emotional and social needs of individuals and couples navigating infertility challenges[27]. From 2006 to 2010, research indicated 72 to 186 million globally experienced infertility, where couples struggle to conceive after a year of unprotected intercourse. Despite its substantial impact, infertility's social, physical, and psychological consequences received limited attention over 15 years[26]. Infertility can emerge from female-specific, male-specific, or a blend of factors. Female-specific causes may encompass endometriosis, diminished ovarian reserve, and polycystic ovarian syndrome, while male-specific issues might relate to sperm quality, quantity, or medical conditions[26]. Infertility treatments carry a heightened risk of depression, with a prior history of depression serving as a known risk factor for postpartum depression. Infertile women are at greater risk of experiencing depressive symptoms compared to their fertile counterparts, and the infertility journey can prompt these women to prioritize their infertile identity over other personal identities[28]. The study explored the connection between fear of intimacy, neuropsychological impairment, and quality of life in 120 infertile Pakistani men. The results showed a strong positive relationship between fear of intimacy and neuropsychological impairment, which negatively affected the men's quality of life. The impact of fear of intimacy on neuropsychological functioning was partly due to its adverse influence on overall quality of life. These findings emphasize the intricate interplay of psychological, cognitive, and relational factors in male infertility[29].

Quality of life

This cross-sectional study examined the quality of life (QoL) of infertile women referred to a teaching hospital and private infertility centers in Sari, Iran, using the Quality-of-Life Questionnaire for Infertile Women (Table 1). The findings highlight the multidimensional impact of infertility on women's QoL and emphasize the importance of addressing various sociodemographic, economic, and relationship factors when developing strategies to improve the well-being of this population[12]. The study conducted at Mnazi Mmoja Hospital in Zanzibar examined the quality of life (QoL) of infertile women and related factors. Higher education was linked to better QoL, while female-factor/combined infertility, secondary infertility, and longer infertility duration were associated with poorer QoL. The findings suggest that underlying causes, type of infertility, and duration can significantly impact women's overall well-being. Identifying these associated factors can help inform targeted interventions and support services to address the specific needs of infertile women facing complex or long-standing infertility challenges[13]. The researchers surveyed 140 infertile women at three infertility clinics in Jeonju, Korea. The participants completed self-report questionnaires on fatigue, depression, anxiety, marital intimacy, and fertility-related quality of life (QoL). The analysis showed that there was a significant negative correlation between the women's infertility-related QoL and fatigue ($r = -0.42$, $p < 0.001$) and depression ($r = -0.56$, $p < 0.001$), but a positive correlation with marital intimacy ($r = 0.30$, $p < 0.001$). Additionally, multiple regression analysis indicated that depression ($\beta = -0.44$, $p < 0.001$), fatigue ($\beta = -0.27$, $p < 0.001$), and the husband's attitude towards infertility treatment ($\beta = -0.19$, $p = 0.007$) were significant predictors of infertility-related QoL, explaining 40.5% of the variance. These findings suggest that healthcare providers should address depression and fatigue in infertile women and consider the influence of the husband's attitudes to improve the overall quality of life for this population[14].

Intravaginal Insemination

The study evaluated the use of intravaginal insemination (IVI) for infertility treatment in 208 couples with sexual dysfunction, finding a 40.3% pregnancy rate among the 144 couples who underwent IVI. The authors propose IVI as a simple, noninvasive, and inexpensive option for couples with specific criteria, such as younger husband age and shorter infertility duration, before considering assisted reproductive technology[34]. Similarly, a study evaluated the use of intravaginal insemination (IVI) as a fertility treatment for 55 couples with unconsummated marriages, often due to vaginismus or erectile dysfunction. The pregnancy rates were 69%, 43%, and 25% for age groups 20-33, 33-36, and over 36 years, respectively, highlighting IVI as a simple and effective option[35]. The effectiveness of intravaginal insemination (IVI) and intrauterine insemination (IUI) in facilitating pregnancy for couples with a male partner who has a spinal cord injury was examined in this research. Out of 82 couples, 37.8% achieved pregnancy, with a 37.8% pregnancy rate for IVI and 24.6% for IUI. The researchers conclude that IVI and

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IUI should be considered as reasonable options for this patient population before moving on to more advanced assisted reproductive technologies[36]. The study examined the use of various sperm retrieval techniques, such as penile vibratory stimulation (PVS) and electroejaculation (EEJ), as well as the outcomes of intrauterine insemination (IUI) for couples where the male partner had a spinal cord injury. The results indicate that these methods, including PVS, EEJ, and IUI, should be considered as reasonable options for this patient population, as they demonstrated favorable success rates and total motile sperm yields, despite some healthcare providers not currently offering these treatments[37].

CONCLUSION

Infertility has significant negative impacts on individuals, couples, and societies globally, leading to psychological trauma, social stigma, marital strain, and feelings of isolation. The emotional burden of infertility affects self-image, self-esteem, and sexual intimacy, diminishing spontaneity and eroticism in relationships. Furthermore, infertility can result in social exclusion, abuse, and marital breakdown, intensifying the distress experienced by those affected. These challenges underscore the critical importance of addressing infertility and its repercussions on a worldwide level. In the future, research efforts should concentrate on developing strategies to reduce infertility rates worldwide. This involves enhancing access to reproductive healthcare, increasing awareness about fertility issues, enacting supportive policies for reproductive health, and investigating preventive measures like lifestyle interventions and environmental factors. By giving priority to these research areas, we can strive to decrease the incidence of infertility, improve outcomes for individuals impacted by infertility, and enhance overall well-being and reproductive health on a global scale.

Author Contribution

NSABIMA and NIYONKURU collaborated on the development of the study design and initial draft. Hilaire and NININAHAZWE subsequently reviewed the manuscript, with all authors working together on further revisions. Before submission, all authors carefully reviewed and endorsed the final manuscript.

Competing Interests

The authors have no conflicts of interest to declare.

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