

REVIEW

Female Infertility and Treatment Modalities: A Narrative Review

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ABSTRACT

Introduction: Female infertility, a prevalent obstacle to conception, significantly impacts couples worldwide. Approximately 50% of couples seeking medical advice for infertility have issues primarily linked to the female partner, sometimes accompanied by substantial social and psychological burdens. This research examines several elements of female infertility, including its prevalence, lifestyle factors, associated stress, and popular myths. While there are distinct geographical variations, infertility impacts individuals from diverse origins in India.

Methods: To gain a comprehensive understanding of the topic, a literature search was conducted using various databases and keywords related to female infertility, treatment modalities, psychological stress, Assisted Reproductive Technology, cultural myths and lifestyle factors. The search was limited to peer-reviewed articles published in English between 1963 and 2022. Animal model studies were excluded. The inclusion criteria for this review were that the studies examined the association between weight control management and overall healthy aging, were published in peer-reviewed journals, and were written in English. In total, 65 studies were selected for inclusion.

Results: The field of ART poses ethical dilemmas, imposes physical exertion, and incurs substantial costs, whilst offering a sense of optimism. The treatment of female infertility requires a comprehensive approach that integrates sociological, psychological, and medical perspectives.

Conclusion: The mitigation of various consequences of infertility relies on a deeper understanding of cost-effective and effective treatments, as well as improved availability of such treatments.

Keywords: Female infertility, treatment modalities, psychological stress, Assisted Reproductive Technology, cultural myths, lifestyle factors.

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INTRODUCTION

Female infertility is a common reason why it's hard to have children. At least half of all couples who see a doctor about infertility will have a "problem" with the woman. In the past, most of the blame was put on the woman. Only about 5 per cent of couples who needed

help having a baby were thought to have a problem with the man's fertility. Female infertility is a common reason why it's hard to have children. At least half of all couples who see a doctor about infertility will have a "problem" with the woman [1,2]. In the past, most of the blame was put on the woman.

Subfertility, or not being able to have children, is a big social and mental burden for couples. It is thought that female factors cause between 50 and 80% of infertility cases around the world or cannot be explained. Mental health specialists are a part of the treatment process for infertility, and more and more research is showing the importance of their role. This paper focuses on the patient-centered approach, which is the kind of medical care that should be used in every infertility clinic [2]. Before, the counsellor's job was more about handling crises and giving people the information they needed to make decisions. Now, his main job is psychotherapy. In the last 10 years, there has been a rise in the number of scholarly articles about infertility. Scholars are still looking into how much infertility causes mental distress and gathering evidence about how gender affects the experience of infertility. The characteristics of IVF patients and many other aspects of IVF treatment are still being studied in depth. There are also clear signs of new trends. There has been a huge increase in ethnographic research that looks at the social and cultural context of infertility [3]. More research is now being done to find out what the long-term effects of infertility are. There are also signs that more attention is being paid to the study of the two-way relationship between infertility and stress, as well as the evaluation of how well psychological interventions work. Infertility can change a couple's life in big ways, so it's important to improve their reproductive health [4].

Infertility is often seen as a crisis, with the most common effects being mood disorders (like anxiety, depression, and extreme distress) and problems in relationships (stigma, divorce, social isolation, and financial difficulties). During medical treatment, psychological

counselling is needed, and therapeutic interventions (like cognitive-behavioral therapy) have been shown to help people keep their emotional balance and reduce the risk of psychopathology. Research shows that psychological interventions can help reduce stress caused by infertility, anxiety, and depression, as well as improve the quality of life and the relationship between two people [4, 5].

Prevalence of Infertility

In India, infertility is a public health issue that affects people from all walks of life. Many of India's most populous states, such as Maharashtra, Delhi, Himachal Pradesh, and Andhra Pradesh, have seen their fertility rates fall below the national average of 2.1. According to the In-Vitro Fertilization Research Centre, roughly one out of every six couples in cities has difficulty conceiving naturally and requires treatment. Indian women have a high frequency of primary infertility, pelvic inflammatory disease, & sexually transmitted diseases [6-8]. According to the World Health Organizations' records, primary infertility affects between 3.9 and 1.68 percent of Indian women, with 3.7 per cent in Uttar Pradesh, Himachal Pradesh, and Maharashtra, 5 per cent in Andhra Pradesh, and 15 per cent in Kashmir. Primary infertility is more common in some tribes and castes than others in India. Female infertility is a growing concern in today's world due to a variety of factors. Many childless women have a variety of emotional and mental issues [9-15]. Even though the majority of cases are due to unidentified factors, a significant percentage is attributed to female infertility. According to a study conducted by the International Institute of Population Sciences (IIPS), infertility is

increasing at an alarming rate in cities, with 13 to 19 million couples out of 250 million individuals likely to be infertile. It is a serious health issue in the world, with one in every six couples experiencing it, putting a financial strain on the global healthcare business. Every year, 60-80 million couples worldwide struggle with infertility, with India accounting for 15 to 20 million of these, or around 25%. The total primary and secondary infertility rates in South Asia are calculated using women's reproductive ages of 45-49 years and are as follows: 8 per cent in India, 10 per cent in Pakistan, 11 per cent in Sri Lanka, 12 percent in Nepal, and 15 per cent in Bangladesh [16-18].

Lifestyle Factors of Infertility

Lifestyle choices have had a significant impact on overall health and reproductive potential. In fact, a growing body of research suggests that lifestyle factors seriously affect reproductive function. Smoking, for example, has been shown in studies to drastically reduce the chances of conceiving in women. Infertility in both men and women may be exacerbated by smoking [19,20]. Smoking harms the ovaries in women by impacting the follicular micro-environment and changing hormone levels in the luteal phase. Cotinine and cadmium have been found in the follicular fluid of female smokers and their partners, indicating that growing follicles have access to them. Women who smoke have been observed to reach menopause 1-4 years earlier than non-smokers. Furthermore, with the mother's age, the incidence of genetic disorders and spontaneous abortion rises. Finally, cigarette smoke has been shown to reduce sperm count and inhibit sperm motility in males [21-23]. Obesity and underweight have a deleterious impact on reproductive function because they

cause hormonal imbalances and ovulatory failure [20,24]. Other lifestyle factors, such as alcohol and caffeinated drinks consumption, also impact reproductive function. Increased caffeine consumption was shown to lessen the risk of pregnancy in women who were trying to conceive. Caffeine has been associated with greater early follicular E2 levels and has been shown to affect female reproduction by targeting ovulation and corpus luteal function through changes in hormone levels. Caffeine consumption has also been linked to tubal factors and endometriosis, two other reasons for infertility. Moderate alcohol consumption (seven to eight drinks per week) has been linked to lower fertility and a higher risk of spontaneous abortion [25,26].

Synthetic undergarments, which produce static electricity and heat in the male reproductive organ, may also affect spermatogenesis. The lack of scheduled sexual intercourse and less conjugal life witnessed in the IT business and among persons working overseas are other indicators of such problems.

Infertility stress

Anything that poses a threat to our health or well-being is a source of stress. Fertility worries and sexual behaviors are major components of most couples' lives during their childbearing years. If both husband and wife discover they are unable to conceive, the stress of seeking to resolve their infertility issues might be significant. Infertility-related stress is a problematic phenomenon. Infertile women have a wide range of negative feelings [27,28]. They fail to meet the expectations of self, spouse, family, and society, resulting in a wide range of psychological, behavioral, and social consequences. Those who are infertile and are

under stress are more likely to experience anxiety, low self-confidence, sickness, and depression than women who are not. Excessive emotional stress, alone or in combination with changes in eating and nutrition patterns and use, can result in anovulation, a condition that falls short of hypothalamic amenorrhea, which is a type of reproductive illness. One of the contributing factors to infertility is psychological strain [29-33]. Infertile women's stress has far-reaching, harmful consequences throughout their lives. It has had an impact on domains such as social, sexual, and the need for parental attention. If someone inquires about their infertility or talks about their children, the infertile woman feels depressed. In a family connection, the sexual lives of spouses play a crucial role, especially for couples who do not have children. Infertile ladies felt a lot of pressure to procreate and found sex difficult. Infertility makes women feel like full adults, and for some women, children are required to extend their marriage [33].

Infertility and Myth

Infertility has been a topic of discussion since the beginning of time. People blamed infertility on unreasonable beliefs and thoughts, and they followed barbaric rituals. Trobian Islanders had a peculiar society in which they linked pregnancy to spirits rather than physical intercourse and believed that no woman could become pregnant unless her umbilical cords and placentas were buried beneath her house [34,35]. People worshipped lingam and Yoni in ancient Hindu mythology, and a hole in a rock or a clove tree indicated a woman's birth route, and she may boost her fertility by passing through a hole in the trees, a rite that is still practiced in various areas of

the world. To induce conception, women in Siberia were forced to consume spiders and hyena eyes. Fertility fetishes and symbols, such as statues of pregnant women or guys with huge phalluses, were utilized by many societies to increase fertility, and Egyptian women wore fertility emblems as pendants [36]. Human reproduction and sterility were unknown to the ancients. Because of their ignorance of the male and female reproductive cells' contributions to fertilization or the role of sexual intercourse in fertilization, reproduction was thought to be solely a female phenomenon, with the role of the male considered unnecessary, which contributed to the blaming of women when pregnancy failed. Bare and infertile women are mistreated in many cultures, and they are sometimes blamed for witchcraft, abandoned, physically beaten, forced to accept their husband's other wives, and even murdered by their spouses or their family [35]. In some parts of the world, infertile women are referred to as "umazume," a derogatory term in Japanese culture, because the traditional people of Japan believed that the existence of these women would lead all women to perish. Women have been born with the physical, social, and cultural burden of a complex ability to conceive throughout history and cultures. Infertility is a cause of divorce among the Bangangte tribe, resulting in women losing access to property distributed by their husbands. If they refuse to divorce, infertile women receive fewer presents from their spouse, resulting in abandonment in old age with no children to till the land for them. To overcome infertility, Egyptian women undergo a process known as KABSA, which is a type of fertility-producing ritual. In Korea, infertile women are referred to as SUKNYU [21], while Vietnamese women who are unable

to conceive are referred to as "poisonous women" [1,37-42].

Infertile women are considered incomplete, having a curse for some misdeed in Mexican society, and couples undertake traditional healing techniques or rites to ensure pregnancy among Native Americans. People believed that infertility was caused by supernatural forces such as offended witches, wizards, or an elder's curse. Another reason is that a person may be cursed by others or God Himself to be unable to have children in the physical world. Sexual intercourse outside of marriage, which was deemed sinful, was identified as the most important behavioral factor for infertility, and it was mentioned as the most important behavioral factor for infertility [43, 44].

Treatment Modalities

The majority of people who marry expect to have biological children at some point in the future. Most couples do not consider having children to be a question of if, but rather of when. Couples who face a barrier to having a child, which is linked to fertility issues, may experience anxiety and psychological stress. Following that, they may seek out alternate patterns to start a family [45,46]. Nowadays, test tube babies, artificial insemination, and surrogacy arrangements have piqued the public's interest, providing hope and alleviating the tension of most people seeking to deliver a kid. When most women first encounter a personal fertility problem, infertility comes as a shock. Infertility is a sudden and unexpected life issue for which the stigma obscures the true number of infertile couples. There are two categories of women: those who seek therapies to erase stigma and

those who cannot afford the financial burden of treatment due to infertility [29, 47, 48].

Consequences of Infertility

Infertility has a wide range of social, behavioural, and psychological consequences for both parties, particularly women, who experience feelings such as dread, shame, helplessness, isolation, frustration, and worry, which have an impact on their daily lives. Infertile women feel less potent than fertile women, which is one of the most common side effects of infertility. Other negative elements of infertility include sexual relationships when couples regard sex as work rather than a pleasure. When only one partner is affected by infertility, marriages are put under strain [29,49,50]. The desire for a child is triggered not just by birth, but also by the passage of time. Aside from the individual, elements such as:

- Sociocultural factors
- Family dynamics
- Changes in biographical information
- The process of interpersonal interaction between spouses

The development of one's personality enhances an individual's desire for children as an extension of self or personal fulfilment, and children as an enhancement of a parent's identity, as well as a desire to give children what they never had. Infertility has different repercussions in developed and developing countries [50-52]. In developing countries, infertility's private sorrow is translated into a public stigma, which has social and psychological consequences for infertile people. Around 70% of infertile women experience physical abuse from their partners as a result of their infertility. Adult females were not allowed to hold newborns or

participate in the infant naming ceremony since it was believed that their presence would cause the babies' deaths. Infertile women in Andhra Pradesh are made to feel guilty by nasty comments at social functions, resulting in isolation and rejection from society owing to their childlessness. In many cultures, infertility leads to divorce, the loss of financial resources, and the loss of burial rights [53-61].

Treatment

Infertility treatments can be divided into three categories:

1. Fertility-improving medications
2. Surgical procedures
3. A.R.T. (Assistive Reproductive Technology)

Individuals who have had difficulty conceiving despite taking numerous drugs should consider assisted reproductive technology. It comes with its own set of risks and difficulties. It takes a toll on women's bodies, and the drugs prescribed to them have serious negative effects [62, 63]. Multiple births, including triplets, are typical in the majority of cases, as are premature births and low birth weight. Because society has basic beliefs about creation and reproduction, these technologies question our moral and cultural norms. On the one hand, these technologies provide hope for couples, while on the other; they give a range of costly, difficult, and morally troubling treatment options [63, 64]. Women, in particular, experience mental and physical stress as a result of the lengthy treatment process. The availability of technology and accessibility differ, with poor and downstream populations bearing the brunt of the consequences. The cost of such treatment is higher, which will have an impact on the mother's and child's future cost of living because there is a potential that the treatment

may fail, and couples may have to employ technologies like IVF more than twice to conceive, causing economic instability [65].

CONCLUSION

Female infertility is a global health issue with social, psychological, and financial impacts. It requires a multifaceted approach from social, psychological, and medical perspectives. Lifestyle decisions like obesity and smoking affect reproductive health, thus therapy must be altered. Infertility stress can cause depression, anxiety, and social isolation. Cognitive-behavioral therapy is essential for reducing emotional burdens. Treatment approaches with mental health assistance increase the quality of life and results.

Cultural stigmas and misunderstandings about infertility worsen its psychological repercussions, including marital strife and social marginalisation. Community involvement and education are key to reducing stigma and aiding affected persons.

Treatments include medications, surgery, and ART. ART is expensive and physically demanding, but it offers hope. Access to affordable therapies must be enhanced, especially in low-income communities. Ultimately, addressing female infertility requires multiple approaches. Awareness, treatment access, and comprehensive treatment with psychological support are crucial. Future research should improve treatments and understand infertility's long-term effects. A supportive environment will help us manage female infertility and improve couples' and impacted people's lives.

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