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Infertility and Mental Health: A Bidirectional Relationship Deserving Greater Attention in Clinical Care

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Editorial

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Abstract: Remarkable advances in assisted reproductive technologies (ART) over the past four decades have enabled millions of couples worldwide to fulfill their dream of parenthood. The development of in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI), gamete and embryo cryopreservation, preimplantation genetic testing, and other innovative reproductive technologies has dramatically transformed the landscape of infertility treatment. Nevertheless, even in the most advanced fertility centers, treatment success cannot be guaranteed, and many patients endure prolonged therapeutic courses, repeated treatment failures, and considerable uncertainty. This characteristic distinguishes infertility from many other chronic diseases, as patients struggle not only with a medical condition but also with a continuous cycle of hope, anxiety, expectation, and repeated disappointment. Under such circumstances, mental health becomes an essential component of the infertility experience [1].

Keywords: assisted reproductive technologies (ART), in vitro fertilization (IVF), sperm injection (ICSI), reproductive health disorders.

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Editorial

Introduction

Remarkable advances in assisted reproductive technologies (ART) over the past four decades have enabled millions of couples worldwide to fulfill their dream of parenthood. The development of in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI), gamete and embryo cryopreservation, preimplantation genetic testing, and other innovative reproductive technologies has dramatically transformed the landscape of infertility treatment. Nevertheless, even in the most advanced fertility centers, treatment success cannot be guaranteed, and many patients endure prolonged therapeutic courses, repeated treatment failures, and considerable uncertainty. This characteristic distinguishes infertility from many other chronic diseases, as patients struggle not only with a medical condition but also with a continuous cycle of hope, anxiety, expectation, and repeated disappointment. Under such circumstances, mental health becomes an essential component of the infertility experience [1].

Global studies indicate that infertility is among the most prevalent reproductive health disorders worldwide, affecting millions of couples across all continents. Recent estimates suggest that approximately 15–20% of couples experience infertility at some point during their reproductive years. The significance of this issue becomes even more apparent when considering contemporary demographic trends, including delayed marriage, postponed childbearing, unhealthy lifestyle changes, obesity, physical inactivity, environmental pollution, and increasing exposure to endocrine-disrupting chemicals, all of which are believed to contribute to the growing prevalence of infertility. Furthermore, declining semen quality in certain populations, together with the increasing prevalence of polycystic ovary syndrome (PCOS), endometriosis, and metabolic disorders, has further contributed to the global burden of infertility [2].

The importance of infertility extends well beyond the number of individuals affected. International health organizations recognize infertility as a condition that profoundly compromises quality of life. In many countries, particularly those where childbearing carries substantial cultural and social value, infertile couples often encounter social pressure, stigmatization, judgment from family members and society, and even discrimination. Women, in particular, are frequently subjected to greater blame and social pressure than men, even when infertility is attributable to male factors. Such circumstances may lead to diminished self-esteem, strained family relationships, marital conflict, and social isolation. Therefore, infertility should not be regarded solely as a medical condition but also as a major social and public health concern whose consequences extend beyond the individual to affect families and society as a whole [3].

From an economic perspective, infertility also represents a substantial burden. Assisted reproductive treatments are often expensive, and adequate insurance coverage is unavailable in many countries. Couples may be forced to allocate a considerable proportion of their income to treatment or even discontinue therapy because of financial constraints. In addition to direct medical expenses, indirect costs resulting from work absenteeism, reduced productivity, financial stress, and frequent medical visits further increase the overall burden of the disease. Consequently, infertility is increasingly recognized as a chronic condition with significant socioeconomic consequences that requires a comprehensive and integrated healthcare approach. Perhaps no aspect of infertility has been overlooked as much as its psychological burden. For many couples, receiving a diagnosis of infertility represents the loss of one of the most fundamental life aspirations. Initial reactions commonly include shock, denial, anger, sadness, feelings of injustice, and anxiety about the future. These emotional responses closely resemble the stages of grief, as many infertile individuals experience the loss of their anticipated ability to become parents or the loss of the future they had envisioned for themselves. In essence, infertility creates a form of invisible loss that, unlike many other forms of grief, has no clearly defined endpoint and may persist for years [4].

Numerous studies have demonstrated that the prevalence of anxiety and depression is significantly higher among infertile individuals than in the general population. Some investigations have even reported that the psychological distress experienced by certain infertile patients is comparable to that observed in individuals with cancer, cardiovascular disease, or chronic pain. Repeated treatment cycles, prolonged waiting for laboratory results, concerns regarding oocyte or sperm quality, fear of treatment failure, and financial pressures all contribute substantially to this psychological burden. Furthermore, experiencing failure after an IVF cycle is often perceived as a traumatic event that may result in profound disappointment and diminished motivation to continue treatment. The impact of infertility on couples' relationships is equally substantial. Although some couples become emotionally closer while coping with infertility, chronic treatment-related stress may, in many cases, lead to marital conflict, sexual dysfunction, and reduced relationship satisfaction. Sexual intercourse, which is normally a natural expression of emotional intimacy, may gradually become a scheduled and goal-oriented activity, thereby losing much of its emotional significance. In addition, feelings of guilt, self-blame or blaming one's

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partner, and concerns about social judgment may impose further strain on the marital relationship.

For many years, research primarily focused on a single question: can stress cause infertility? However, it has now become evident that such a perspective is overly simplistic. The relationship between mental health and infertility is not linear or unidirectional; rather, it represents a complex and bidirectional interaction. On one hand, infertility can precipitate or exacerbate psychological disorders, while on the other hand, an individual's psychological status may influence treatment experiences, health-related behaviors, and potentially certain aspects of reproductive function [5, 6].

Current evidence suggests that anxiety, depression, and chronic stress may influence reproductive health through multiple biological and behavioral pathways, although the magnitude of these effects varies across studies. More importantly than their direct biological effects, psychological disorders may significantly affect treatment-related behaviors. Individuals suffering from severe anxiety or depression may exhibit poorer adherence to treatment protocols, miss medical appointments, discontinue treatment prematurely, or demonstrate a reduced capacity to cope with repeated treatment failures. Therefore, mental health should be regarded not only as a consequence of infertility but also as an important determinant of the treatment journey [7].

Over the past decade, the concept of patient-centered care has gained increasing importance in reproductive medicine. This approach emphasizes that treatment success should not be measured solely by outcomes such as pregnancy or live birth rates but should also encompass quality of life, patient satisfaction, psychological well-being, and the individual's ability to adapt to the treatment process. Accordingly, mental health should no longer be viewed as a secondary aspect of infertility management but rather as an indispensable component of comprehensive fertility care. The mechanisms underlying the relationship between mental health and infertility are highly complex and multifactorial. One of the principal pathways that has received considerable attention is the hypothalamic-pituitary-adrenal (HPA) axis. Chronic stress may disrupt hormonal homeostasis through sustained elevation of stress hormones, particularly cortisol. Alterations in HPA axis activity may subsequently influence the hypothalamic-pituitary-gonadal (HPG) axis, thereby affecting ovulation, spermatogenesis, and sexual function. Although the clinical significance and magnitude of these effects remain subjects of ongoing debate, numerous studies have confirmed an association between chronic psychological stress and neuroendocrine alterations. Beyond endocrine pathways, the roles of inflammation and the immune system have also attracted increasing attention. Psychological disorders, particularly depression and chronic stress, have been associated with elevated levels of inflammatory biomarkers. Because successful reproduction, embryo implantation, and pregnancy maintenance require finely regulated interactions between the endocrine and immune systems, some investigators propose that chronic inflammation may represent one of the biological links connecting mental health and reproductive function. Although definitive evidence establishing a causal relationship is still lacking, this area has become one of the most active fields of investigation in reproductive medicine.

In addition to biological mechanisms, behavioral factors also play a pivotal role. Individuals suffering from anxiety or depression are more likely to engage in unhealthy behaviors such as cigarette smoking, physical inactivity, sleep disturbances, poor dietary habits, and alcohol consumption. These lifestyle factors may themselves adversely affect reproductive health. Moreover, poor mental health may compromise an individual's ability to make informed decisions, effectively manage treatment-related stress, and maintain motivation throughout prolonged fertility treatment. Therefore, the relationship between mental health and infertility cannot be explained solely by hormonal or biological alterations; rather, it reflects a complex interplay of biological, psychological, behavioral, and social factors that collectively shape both the experience and the outcomes of infertility.

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