



The Role of Stress in Infertility and Stress Intervention Methods: A Review Study

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Abstract:

Infertility is a life crisis affecting patients globally. Infertile patients experience significant emotional distress following their diagnosis. The risks of stress, depression, anxiety, and distress are high for infertile individuals. The hypothesis that stress can impair fertility has been proposed for centuries. This raises the question: Does infertility cause stress, or does stress cause infertility? To find relevant articles, keywords were searched in Science Direct and Pubmed databases. Research articles published from 2009 to 2023 were reviewed. Findings revealed that stress can directly and indirectly affect reproductive hormones and endocrine glands involved in reproduction, contributing to infertility. Stress leads to decreased sperm quality in men and affects both men and women's perceptions of pregnancy, causing psychological distress. Stress also influences the treatment process for infertile individuals, and treatment failures lead to stress, resulting in treatment avoidance. Supportive, community-based, and psychological interventions, such as cognitive-behavioral therapy, can help reduce stress in infertile individuals. Due to the severe impact of infertility on women's lives, increasing access to infertility treatments, counseling for women and their families, and community education to raise awareness about infertility and address infertility norms are necessary.

Keywords: stress; infertility

Introduction:

Infertility is defined as the failure to conceive after one year of regular, unprotected intercourse (Stellar et al., 2016). The World Health Organization reports that one in every six individuals globally is affected by infertility. According to the latest WHO report, approximately 17.5% of the adult population experiences infertility (Yilmaz et al., 2020). WHO estimates that between 1990 and 2021, around 48 million couples and 186 million people worldwide faced infertility issues, with no continent or country faring significantly better (Njagi et al., 2023). Childbearing is considered an important goal in many societies (Akyuz et al., 2013). Infertility often results in significant distress for couples, affecting individuals in diverse cultures worldwide (Yu et al., 2014). In many cultures, couples are expected to expand and continue their family lineage (Wischmann & Thorn, 2013). This leads infertility to be perceived as an inability to meet the social expectations in cultures where childbearing is considered a significant norm. Infertile women often report more negative emotions, pressure, and emotional reactions compared to men when these expectations are unmet (Cheng et al., 2018). Stress related to infertility can arise from multiple sources, such as personal, marital, social stress, and financial burdens (Casu et al., 2019; Katz et al., 2011).

Chronic stress in infertility can lead to additional complications, including anxiety, depression, and post-traumatic stress disorder. Physiological manifestations may result from psychological distress and stress. Cortisol, a hormone released from the adrenal glands in response to the hypothalamic-pituitary-adrenal axis, contributes to maintaining this acute and chronic stress in the body (Miller et al., 2019).

Infertility-related experiences are accompanied by specific forms of stress and psychological distress, including loss of control and self-esteem, marital conflicts, social stigma, fear of childlessness, and discomfort caused by infertility treatments (Greil et al., 2011; Yamanaka-Altenstein et al., 2022).

The relationship between stress and infertility has been debated for years. Women with infertility report higher levels of anxiety and depression, so it is clear that infertility causes stress. However, it remains unclear whether stress causes infertility. Therefore, this study investigates the relationship between stress and infertility and intervention methods for stress.

Methodology:

To find relevant articles, keywords were searched in Science Direct and Pubmed databases. Research articles published from 2009 to 2023 were reviewed. The article search concluded on January 25, 2024. To select the relevant articles, the titles obtained through the search engine were reviewed based on the predefined keywords, and after reviewing the titles, 21 articles were chosen. After summarizing the studies, only those articles that examined both stress and infertility were reviewed, narrowing the number to 15 articles. Data was extracted and summarized from the collected documents.

Findings:

Stress and Infertility:

1. Effect of Stress on Reproductive Hormones:

Psychosocial factors, including stress, can be linked to infertility and can impact reproductive functioning (Gleason et al., 2020). Stress is defined as an external environmental factor (e.g., an event or experience) that affects an individual's ability to adapt, thus triggering a physiological stress response. The hypothalamic-pituitary-adrenal (HPA) axis, which is activated in times of acute and chronic stress, has a close relationship with the hypothalamic-pituitary-gonadal (HPG) axis, which regulates reproductive function. Disruption of the HPA axis can lead to dysfunction in several areas and fertility failure (Cohen et al., 2015). Given the various hormones involved in successful conception, each may impact fertility. Activation of the HPA axis stimulates the release of corticotropin-releasing hormone (CRH), which directly and indirectly affects other reproductive hormones through cortisol and adrenocorticotrophic hormone (Nakamura et al., 2008).

2. Stress and Endocrine Glands:

The second major endocrine system, the sympathetic-adrenal medullary (SAM) system, releases catecholamines such as norepinephrine and epinephrine in response to acute stress, and they may remain activated during chronic stress (Schenker et al., 1992). Excessive levels of cortisol and catecholamines can negatively impact ovarian function during fertilization and affect ovulation, menstruation, implantation, and pregnancy success (Magiakou et al., 1997).

3. Effect of Stress on Sperm Quality and Infertility:

Stress also affects male fertility and sperm quality. Psychological stress is associated with a reduction in sperm concentration and

progressive motility, along with an increase in abnormal sperm count. Psychological stress also affects sexual performance and is involved in conditions such as chronic prostatitis/chronic pelvic pain syndrome (Geller et al., 2020).

Conclusion:

Stress can directly and indirectly influence reproductive hormones and endocrine glands involved in reproduction, contributing to infertility. It reduces sperm quality in men and affects both men and women's perceptions of pregnancy, leading to psychological distress. Furthermore, stress affects the treatment process for infertile individuals, and treatment failures contribute to stress, resulting in avoidance of continued treatment. Community-based support, psychological treatments, and cognitive-behavioral therapy can reduce stress in infertile individuals. Given the significant impact of infertility on women's lives, enhancing access to infertility treatments, counseling for women and their families, and community education to raise awareness of infertility and address societal norms regarding infertility are necessary.

Limitations and Recommendations:

This study, by focusing solely on the role of stress in infertility, may have limitations. Future research could explore the role of other psychological factors involved in infertility. Additionally, there has been limited research on the application of psychological treatments for infertile individuals. Future studies should explore the use of other therapies, such as paradoxical therapy (PTC), for managing stress and anxiety in infertile individuals.

Conflict of Interest:

There are no conflicts of interest between the authors of the article.

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