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## Psychological Features of Infertility

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### ABSTRACT

Infertility is defined as the inability to produce, or give birth to a baby naturally. Generally, specialists define infertility as not being able to get pregnant after trying for at least one year. The relationship between infertility and psychology is very complicated. On the one hand, infertile couples are more likely to experience stress and have a greater risk of experiencing psychological disorders compared to normal and healthy couples. On the other hand, high levels of psychological distress are indicated to increase infertility. Therefore, in this review, the main factors that can lead to increased stress in couples trying to conceive, psychological stress as a cause of infertility, on female and male fertility, including stress and depression.

## 1. Introduction

Fertility can be defined as the ability to conceive and produce offspring.<sup>1</sup> In contrast, infertility is defined as a disorder characterized by the inability to obtain a clinical pregnancy after 12 months of regular sexual intercourse and without contraception. Infertility in women can be classified as primary infertility, which is women who have never been pregnant, and secondary infertility, for women who have been pregnant before.<sup>2</sup>

Infertility problems are estimated to be a concern of approximately 8-12% of the world's population, where cases of secondary infertility are more common than primary infertility.<sup>3</sup> Furthermore, infertility is more common in less developed countries. Men are thought to account for 20-30% of infertility individually, and have a shared responsibility for half of infertility cases.<sup>4</sup>

Several factors that may contribute to the decline

in fertility include conception at an unwanted time, the age of the female partner and diseases that affect fertility.<sup>2</sup> In addition, recent research has also shown that fertility is also affected by the age of the male partner.<sup>5</sup> Infertility may be caused by various diseases that affect fertility, associated only with males (e.g., testicular deficiency), only in women (e.g., polycystic ovary syndrome [PCOS], endometriosis, uterine fibroids, or premature ovarian insufficiency) or disease that may affect both sexes (e.g., systemic disease, infection, hyperprolactinemia, or hypogonadotropic hypogonadism).

Sometimes, it is almost impossible to determine the exact cause of infertility, which is defined as idiopathic infertility. In idiopathic infertility there is a role for mental disorders, such as stress, depression. The relationship between mental disorders and human physiology was first explained and put forward by

Hans Hugo Selye in 1955,<sup>6</sup> who stated that stressors act on targets directly and indirectly through the pituitary and adrenal glands. The first mediator moves from the target area of injury to the anterior pituitary which then releases adrenocorticotrophic hormone (ACTH). ACTH alone, or in coordination with other hormones, increases the adrenal cortex to produce corticoids. Mineralocorticoids increase the proliferative ability and reactivity of connective tissue, thereby increasing the potential of inflammation.<sup>6</sup> The aim of this study was to systematically review the literature to analyze and evaluate the effect of mental disorders, such as stress and depression, on female and male fertility.

## 2. Methods

This systematic description, based on an analysis of the literature accessible in the MEDLINE, Cochrane and PubMed databases, was conducted independently between June 2019 and October 2019. The keywords applied during the title and abstract search were a combination (infertility OR fertility) AND (depression OR stress OR mental disorders OR antidepressants). Abstract presented in English and related to the topic specified during the search. Full text articles are critically reviewed and analyzed in detail.

## 3. Results

A total of 3 561 records were retrieved once duplicates had been removed, and following screening, 743 articles were assessed for eligibility. A final sample of 106 articles published between 1955 and 2019 were chosen for inclusion into the review (Figure 1).

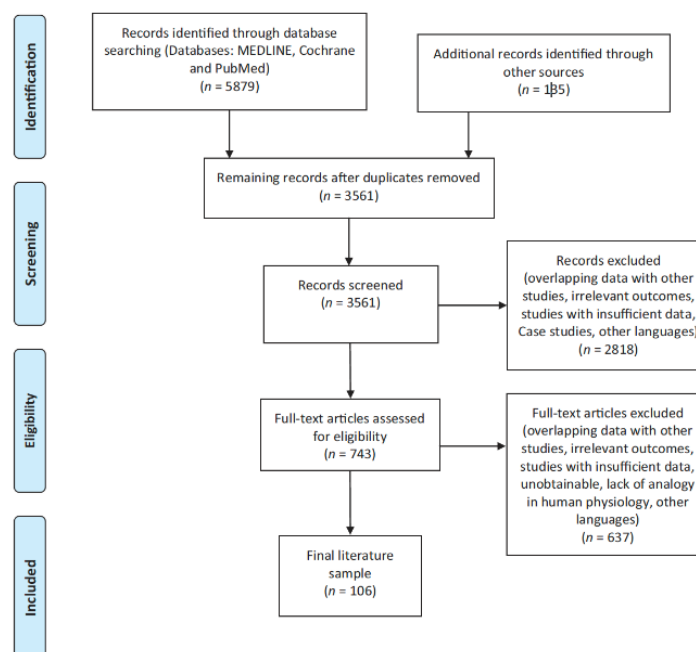


Figure 1. Flowchart of the research recognized in this review

## 4. Discussion

About 350 million people endure from depression globally. Many people affected don't get the right treatment, mostly because of a worldwide deficit of psychiatrists, unsuccessful cure, unsuccessful mental health care system, and stigmatization.<sup>7</sup> Constantly

weeks or even months are required to acquire a response to antidepressant treatment.<sup>8</sup> In addition, adverse effects such as withdrawal syndrome, sexual problems, weight gain, and addiction are common.<sup>9</sup> Accordingly, despite being more effective than placebo (odds ratios [ORs] of 1.15 to 1.55), antidepressants are

associated with lower acceptability (ORs of 0.64 to 0.83).<sup>10</sup>

The problems of stress, depression, and anxiety significantly affect infertile people. A meta-analysis by Fallahzadeh et al.<sup>11</sup> showed that depression scores in infertile women were significantly higher than scores for fertile couples. Furthermore, a study by Crawford et al.<sup>12</sup> indicates that women suffering from depression were less likely to undergo infertility treatment and more likely to be obese or overweight. Since the biblical era, hypotheses have been raised about the connection between anxiety, depression, and infertility. As it is known, infertility may cause stress and depression, but what remains unclear is whether depression, stress, and anxiety affect fertility.<sup>13</sup>

Secretion of gonadotropin-releasing hormone (GnRH) pulses from the hypothalamus excite the pituitary gland to release luteinizing hormone (LH) and follicle-stimulating hormone (FSH).<sup>14</sup> Both the amplitude and frequency of GnRH pulses are important for the proper secretion of gonadotropins. FSH is stimulated by low-frequency pulses, while high-frequency GnRH pulses stimulate LH secretion. Throughout the follicular phase of the menstrual cycle, increased estrogen levels lead to an increased frequency of GnRH pulses. This generates increased LH secretion and ovulation. Many reproductive disorders in women are related to abnormalities in GnRH secretion, and among others, this group includes hyperprolactinemia, hypogonadotropic hypogonadism, and PCOS.<sup>15</sup>

Research using a rat model of depression and menopause found that cortisone, FSH, LH, and ACTH levels were significantly higher in groups subjected to mild stress factors than analogous groups not subjected to mild stress factors.<sup>16</sup> On the other hand, dopamine levels were lower in the stress groups.<sup>16</sup> While this is an interesting observation, similar effects have not been observed in humans. Moreover, the effect of stress on the rat's fertility in this study is unknown; thus, the topic requires further research.

Following a study among women with recurrent miscarriages, as many as 45% showed anxiety, and

the other 37% had depressive symptoms. These results were significantly higher than in women with a low risk of miscarriage.<sup>17</sup> Furthermore, although major depression alone was not associated with poorer results in female non-in Vitro fertilization (IVF) fertility treatments, it lowered the chances of male partners to achieve conception.<sup>18</sup> Meanwhile, the use of antidepressants, particularly non-selective serotonin reuptake inhibitor (SSRI), has been found to increase the risk of first-trimester pregnancy loss.<sup>18</sup>

Stress, depression, and anxiety related to infertility treatment are essential issues. Research involving 842 patients undergoing IVF treatment indicated that 39.4% felt anxious, and 28.5% had depressive symptoms.<sup>19</sup> Another study found a relationship between the duration of infertility and the incidence of depressive symptoms and anxiety, which were most common in patients suffering from infertility for 4–6 years. A prospective cohort study of 72 patients treated with IVF indicates that their salivary cortisol levels were higher than among the general female population. Moreover, a group undergoing IVF treatment for the first time reached the highest level. Therefore, relaxation techniques should be considered, especially during the initial treatment.<sup>20</sup>

Stress, anxiety, depression, and antidepressants used in a patient's treatment can play an important part in infertility treatment. The impact of these factors on ovulation, hormonal balance, miscarriages in women, sperm quality, and ejaculation disorders in men should be considered. Presently in the authors' view, patients' reproductive plans should play a part in determining the most effective therapy while minimizing side effects. It should be noted that infertility may cause many cases of anxiety, stress, or depression. Furthermore, in that situations, successful infertility treatment may have a positive impact on mental health.

## 5. Conclusion

During the present systematic review, an analysis of the literature highlights the negative impact of mental disorders, stress, and depression on male and female fertility. These disorders vary the functioning of endocrine glands and the immune system at both the tissue and cellular level, resulting in reduced fertility.

Despite these associations, it is not fully clear how mental disorders affect fertility and to what extent infertility affects mental health. Further studies are surely required to explain the exact role of mental disorders infertility and their contribution to infertility. Moreover, a comprehensive approach to the diagnosis and treatment of infertility is critically needed, including analysis of the couple's mental state desiring a child, to reduce the number of idiopathic infertility diagnoses.

## 6. References

1. Zegers-Hochschild F, Adamson GD, Dyer S, et al. The international glossary on infertility and fertility care, 2017. *Fertil Steril* 2017; 108: 393–406.
2. Vander Borgh M and Wyns C. Fertility and infertility: definition and epidemiology. *Clin Biochem* 2018; 62: 2–10.
3. Ombelet W, Cooke I, Dyer S, et al. Infertility and the provision of infertility medical services in developing countries. *Hum Reprod Update* 2008; 14: 605–621.
4. Nachtigall RD. International disparities in access to infertility services. *Fertil Steril* . 2006; 85: 871–875.
5. Lotti F and Maggi M. Sexual dysfunction and male infertility. *Nat Rev Urol* 2018; 15: 287–307.
6. Selye H. Stress and disease. *Science* 1955; 122: 625–631.
7. Smith K. Mental health: a world of depression. *Nature* 2014; 515: 181.
8. Machado-Vieira R, Salvadore G, Luckenbaugh DA, et al. Rapid onset of antidepressant action: a new paradigm in the research and treatment of major depressive disorder. *J Clin Psychiatry* 2008; 69: 946–958.
9. Cartwright C, Gibson K, Read J, et al. Long-term antidepressant use: patient perspectives of benefits and adverse effects. *Patient Prefer Adherence* 2016; 10: 1401–1407.
10. Cipriani A, Furukawa TA, Salanti G, et al. Comparative efficacy and acceptability of 21 antidepressant drugs for the acute treatment of adults with major depressive disorder: a systematic review and network meta-analysis. *Lancet* 2018; 391: 1357–1366.
11. Fallahzadeh H, Zareei Mahmood Abadi H, Momayyezi M, et al. The comparison of depression and anxiety between fertile and infertile couples: a meta-analysis study. *Int J Reprod Biomed (Yazd)* 2019; 17: 153–162.
12. Crawford NM, Hoff HS and Mersereau JE. Infertile women who screen positive for depression are less likely to initiate fertility treatments. *Hum Reprod* 2017; 32: 582–587.
13. Rooney KL and Domar AD. The relationship between stress and infertility. *Dialogues Clin Neurosci* 2018; 20: 41–47.
14. Kaiser UB, Conn PM and Chin WW. Studies of gonadotropin-releasing hormone (GnRH) action using GnRH receptor- expressing pituitary cell lines. *Endocr Rev* 1997; 18: 46–70.
15. Tsutsumi R and Webster NJG. GnRH pulsatility, the pituitary response and reproductive dysfunction. *Endocr J* 2009; 56: 729–737.
16. Gu S, Jing L, Li Y, et al. Stress induced hormone and neuromodulator changes in menopausal depressive rats. *Front Psychiatry* 2018; 9: 253.
17. Gao L, Qu J, Wang AY, et al. Anxiety, depression and social support in pregnant women with a history of recurrent miscarriage: a cross-sectional study. *J Reprod Infant Psychol*. Epub ahead of print 14

Aug 2019. DOI: 10.1080/  
02646838.2019.1652730.

18. Evans-Hoeker EA, Eisenberg E, Diamond MP, et al. Major depression, antidepressant use, and male and female fertility. *Fertil Steril* 2018; 109: 879–887.
19. Xu H, Ouyang N, Li R, et al. The effects of anxiety and depression on in vitro fertilization outcomes of infertile Chinese women. *Psychol Health Med* 2017; 22: 37–43.
20. Gdan´ska P, Drozdowicz-Jastrzebska E, Grzechocińska B, et al. Anxiety and depression in women undergoing infertility treatment. *Ginekol Pol* 2017; 88: 109–112.