



Impact of Psychological Stress on Bandhyatva A Correlative Study in Ayurveda and Modern Science

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Abstract

Background: Infertility (Bandhyatva) is a global health concern affecting approximately 10–15% of couples in the reproductive age group. While anatomical, genetic, endocrine, and lifestyle factors are well recognized, psychological stress has emerged as a significant but often underdiagnosed contributor. Stress not only impairs reproductive physiology but also creates a vicious cycle where infertility itself intensifies psychological distress. **Objective:** This review aims to critically analyze the impact of psychological stress on infertility from both Ayurvedic and modern scientific perspectives, exploring their points of convergence and potential for integrative management. **Methods:** A comprehensive literature review was conducted using classical Ayurvedic texts (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Kashyapa Samhita) alongside modern medical databases (PubMed, Scopus, Google Scholar). Relevant studies from 2004–2024, focusing on stress and reproductive health, were included. Conceptual mapping was performed to correlate Ayurvedic principles such as Manasika Bhava, Dosha vitiation, Ojas depletion, and Satvavajaya Chikitsa with modern mechanisms including HPA axis activation, cortisol imbalance, oxidative stress, and psychoneuroendocrine dysfunction. **Results:** Findings indicate that chronic psychological stress impairs fertility through hypothalamic–pituitary–gonadal (HPG) suppression, oxidative stress, and behavioral disruptions. Ayurveda similarly attributes Bandhyatva to disturbances in Beeja, Kshetra, Ritu, and Ambu, aggravated by negative Manasika Bhava such as Chinta (worry), Shoka (grief), and Bhaya (fear). Strong correlations exist between stress-induced cortisol elevation and Agni vitiation, oxidative stress and Ojas depletion, as well as mind-body therapies and Satvavajaya Chikitsa. **Conclusion:** Psychological stress plays a pivotal role in infertility, both as a causative and perpetuating factor. Ayurveda and modern science, though differing in terminology, converge in recognizing the mind–body connection in reproductive dysfunction. Integrative management strategies—including Satvavajaya Chikitsa, Rasayana therapy, Panchakarma, yoga, and modern stress-reduction

techniques—hold promise for improving reproductive outcomes. Further clinical trials combining Ayurvedic and biomedical approaches are needed to validate these correlations and enhance evidence-based fertility care.

Keywords: Bandhyatva; Infertility; Psychological Stress; Ayurveda; Manasika Bhava; Ojas; Hypothalamic–Pituitary–Adrenal Axis; Cortisol; Oxidative Stress; Satvavajaya Chikitsa; Rasayana; Integrative Medicine.

Introduction

Infertility is one of the major public health concerns of the modern era, affecting nearly 10–15% of reproductive-age couples worldwide. It not only creates medical challenges but also imposes profound psychological, social, and emotional burdens. The World Health Organization (WHO) recognizes infertility as a global health issue, highlighting that its causes are multifactorial—ranging from anatomical, genetic, and endocrine disorders to lifestyle and environmental influences. Among these, psychological stress has emerged as a critical but often under-recognized factor contributing to impaired reproductive capacity. ¹

In Ayurveda, infertility is described under the term Bandhyatva, which refers to the inability to conceive despite cohabitation during the fertile period of life. Classical texts such as Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya describe infertility as arising from defects in four essential factors—Beeja (sperm/ovum), Kshetra (uterine environment), Ritu (fertile period), and Ambu (nutritional and metabolic support). ² In addition to these somatic factors, the role of Manasika Bhava (psychological states) is emphasized as an important determinant of reproductive health. Uncontrolled emotions such as Chinta (worry), Shoka (grief), and Bhaya (fear) are said to vitiate Vata dosha, disturb Manovaha Srotas, and deplete Ojas, the vital essence responsible for vitality and fertility. Thus, Ayurveda provides an integrated psychosomatic model in explaining infertility. ³

Modern medical science also supports this view, though expressed in different terminology. Stress activates the hypothalamic–pituitary–adrenal (HPA) axis and the sympathetic nervous system, leading to increased secretion of cortisol and catecholamines. These biochemical changes interfere with the hypothalamic–pituitary–gonadal (HPG) axis, resulting in irregular ovulation, anovulatory cycles, luteal phase defects, reduced sperm count, and impaired sexual function. ⁴ Chronic stress further induces oxidative stress, causing DNA damage in gametes and adversely affecting embryo implantation. Several studies have confirmed that women with high stress markers, such as salivary cortisol or alpha-amylase, have reduced chances of conception. In men, chronic stress is associated with lower testosterone, impaired spermatogenesis, and erectile dysfunction. ⁵

The psychosocial impact of infertility is cyclical: stress contributes to infertility, and infertility itself becomes a major source of psychological distress. This vicious cycle exacerbates reproductive dysfunction, making stress both a cause and a consequence of infertility. Ayurveda explains this cycle through the disturbance of Satva-Rajas-Tamas balance, where psychological instability perpetuates Dosha vitiation, leading to further decline in reproductive capacity. ⁶

Given this background, it becomes important to study infertility not only as a biological disorder but also as a psychosomatic condition. A correlative study of Ayurveda and modern science provides deeper

insights into how stress impairs fertility and how holistic interventions can break the cycle. Ayurvedic therapies such as Satvavajaya Chikitsa (psychological healing), Rasayana (rejuvenative therapy), Panchakarma (detoxification), and lifestyle modifications, when integrated with modern stress-management strategies, may offer a comprehensive solution to stress-induced infertility. 7

Thus, this review attempts to bridge classical Ayurvedic wisdom with modern scientific evidence to understand the impact of psychological stress on Bandhyatva and to explore integrative management strategies.

Aims and Objectives

The present review aims to explore the correlation between psychological stress and Bandhyatva (infertility) through Ayurvedic and modern scientific perspectives. The specific objectives include:

- To review classical Ayurvedic concepts regarding Bandhyatva with special reference to Manasika Bhava.
- To evaluate modern scientific evidence on the impact of psychological stress on male and female infertility.
- To analyze the possible psychoneuroendocrine correlation between stress and reproductive dysfunction.
- To integrate Ayurvedic and modern scientific approaches for better understanding and management of stress-induced infertility.
- To propose holistic therapeutic strategies combining stress management and reproductive health interventions.

Materials and Methods

As this is a review article, the study is based on comprehensive literature review and correlative analysis.

Sources of Literature

- Ayurvedic Texts: Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Kashyapa Samhita, and relevant commentaries were reviewed for references on Bandhyatva, Manasika Bhava, Satva–Rajas–Tamas, and stress-related infertility.
- Modern Texts: Standard gynecology, psychiatry, and physiology textbooks were referred for updated information on stress and infertility.
- Databases: PubMed, Scopus, Google Scholar, AYUSH Research Portal, and WHO Global Health Library were searched.

Psychological Stress and Infertility in Modern Science

Neuroendocrine Mechanisms 8

- Stress activates the HPA axis, leading to elevated cortisol and corticotropin-releasing hormone (CRH).

- Cortisol suppresses gonadotropin-releasing hormone (GnRH), reducing luteinizing hormone (LH) and follicle-stimulating hormone (FSH).
- In females, this disrupts follicular development, ovulation, and luteal phase function.
- In males, it reduces testosterone, impairs spermatogenesis, and lowers sperm quality.

Oxidative Stress 9

- Chronic psychological stress increases reactive oxygen species (ROS), damaging gametes and reproductive tissues.
- Oxidative stress is linked with poor sperm motility, DNA fragmentation, and poor oocyte quality.

Behavioral and Lifestyle Correlates 10

- Stress often leads to unhealthy behaviors: poor sleep, substance abuse, irregular eating, and sedentary lifestyle—all detrimental to fertility.

Clinical Evidence 11

- Studies show higher infertility rates in women with high stress markers (salivary alpha-amylase, cortisol).
- Stress-reduction interventions like yoga, meditation, and counseling improve conception rates.

Psychological Stress and Bandhyatva in Ayurveda

Concept of Manasika Bhava 12

Ayurveda recognizes psychological states as key determinants of health.

Chinta (excessive worry), Bhaya (fear), and Shoka (grief) cause Vata vitiation, impairing reproductive function.

Role of Manovaha Srotas 13

Disturbance in Manovaha Srotas disrupts hormonal and neurological equilibrium.

This indirectly affects Shukra (sperm/ovum) quality and Beeja formation.

Satva-Rajas-Tamas Imbalance 14

Dominance of Rajas and Tamas due to stress weakens Satva, reducing mental strength, emotional balance, and reproductive vitality.

Bandhyatva Etiological Framework 15

- Beeja Dushti – defective gametes due to stress-induced Dosha vitiation.
- Kshetra Dushti – uterine environment affected by Vata imbalance.
- Kala Dushti – disturbed menstrual cycle due to mental stress.

- Ambu Dushti – nutritional and metabolic imbalance (Agni derangement).

Correlation Between Ayurveda and Modern Perspectives 16

- HPA Axis vs. Vata Vitiation: Both describe dysregulation of systemic balance leading to reproductive dysfunction.
- Cortisol elevation vs. Agni-Malasrotas imbalance: Stress-induced cortisol parallels derangement of Agni and Dosha.
- Oxidative stress vs. Ojas depletion: Oxidative damage mirrors reduction of Ojas, the essence of vitality and fertility.
- Mind-body therapies vs. Satvavajaya Chikitsa: Yoga, meditation, and cognitive therapies align with Ayurvedic approaches to restore Satva.

Management Approaches

Since infertility is a multifactorial disorder with stress as a major contributor, its management requires a comprehensive and integrative strategy that addresses both psychological and physiological dimensions. Ayurveda and modern science provide distinct yet complementary therapeutic approaches, and their integration offers a holistic pathway to improve reproductive outcomes. 17

1. Ayurvedic Management 18

a. Satvavajaya Chikitsa (Psychological Therapy)

Ayurveda emphasizes the control of mind (Satva) as a primary tool in overcoming psychological disturbances.

- Techniques such as positive counseling, self-reflection, meditation, chanting of mantras, and spiritual practices help in stabilizing Satva and reducing dominance of Rajas and Tamas.
- These methods parallel modern psychotherapies like cognitive behavioral therapy (CBT) and mindfulness-based stress reduction.

b. Rasayana Therapy (Rejuvenation and Stress Adaptation) 19

Rasayana herbs not only rejuvenate reproductive tissues but also act as adaptogens, enhancing resilience against stress.

- Ashwagandha (*Withania somnifera*): Reduces cortisol, improves spermatogenesis, enhances vitality.
- Shatavari (*Asparagus racemosus*): Balances female hormones, improves oocyte quality, acts as galactagogue.
- Guduchi (*Tinospora cordifolia*): Immunomodulator and stress reliever.
- Brahmi (*Bacopa monnieri*): Improves cognitive function and stress tolerance.
- Amalaki (*Embllica officinalis*): Antioxidant and Ojas-promoting herb.

c. Panchakarma Therapies 20

- Ayurveda advocates detoxification and nervous system stabilization through Panchakarma.
- Shirodhara (continuous pouring of medicated oils on forehead) calms the HPA axis, reduces anxiety, and promotes relaxation.
- Abhyanga (oil massage) and Swedana (sudation) improve circulation, reduce muscle tension, and support endocrine balance.
- Nasya (nasal administration of medicated oils) supports neuroendocrine regulation.

d. Pathya-Apathya (Diet and Lifestyle) 21

- Emphasis on Sattvic Ahara—fresh, wholesome, plant-based, and easily digestible foods.
- Avoidance of excessive caffeine, alcohol, processed foods, and fast foods which aggravate Rajas and Tamas.
- Lifestyle routines (Dinacharya and Ritucharya) including adequate sleep, yoga, pranayama, and meditation for stress control.

Discussion

The present review highlights the strong interrelationship between psychological stress and infertility, viewed through both Ayurvedic and modern scientific lenses. Stress, once considered a secondary factor, is now recognized as a primary contributor to reproductive dysfunction in men and women. 22

1. Modern Scientific Perspective

Stress affects fertility through multiple biological pathways:

Neuroendocrine Dysregulation: Prolonged stress activates the hypothalamic–pituitary–adrenal (HPA) axis and increases cortisol levels, which suppresses GnRH, leading to menstrual irregularities, anovulation, reduced sperm count, and decreased libido. 23

- **Oxidative Stress:** Stress elevates reactive oxygen species (ROS), damaging sperm DNA and oocyte quality, thereby impairing fertilization and embryo development.
- **Psychobehavioral Changes:** Lifestyle disturbances such as poor diet, irregular sleep, substance use, and lack of exercise further contribute to subfertility.

These mechanisms explain the increasing prevalence of stress-related infertility observed in urban and professional populations worldwide.

2. Ayurvedic Perspective

Ayurveda views Bandhyatva as a result of Dosha vitiation and disruption in Beeja (gametes), Kshetra (uterus), Ambu (nutrition), and Kala (time). Stress and negative emotions such as Chinta (worry), Shoka (grief), and Bhaya (fear) are described as causative factors for Vata vitiation, which destabilizes reproductive functions. Disturbances in Manovaha Srotas and weakening of Satva due to dominance of Rajas and Tamas impair mental

balance and reproductive vitality. The depletion of Ojas—the essence of immunity and fertility—resembles oxidative stress in modern science, linking mental instability with compromised reproductive potential. 24

3. Correlative Analysis 25

There is a striking parallel between the two systems of thought:

- HPA axis overactivation ↔ Vata vitiation
- Cortisol-induced reproductive suppression ↔ Agni and Srotas imbalance
- Oxidative stress ↔ Ojas depletion
- Mind-body therapies ↔ Satvavajaya Chikitsa

Both Ayurveda and modern medicine recognize stress as a systemic disruptor, capable of altering reproductive health through psychoneuroendocrine mechanisms.

4. Integrative Approach to Management 26

The management of stress-induced infertility requires a multidimensional approach:

- Modern Interventions: Counseling, cognitive-behavioral therapy, yoga, mindfulness, antioxidants, and assisted reproductive technologies (ART).
- Ayurvedic Interventions: Satvavajaya Chikitsa (psychological counseling, meditation, positive affirmations), Rasayana therapy (Ashwagandha, Shatavari, Guduchi, Brahmi), Panchakarma (Shirodhara, Abhyanga), and Sattvic dietary regimen.

When integrated, these interventions provide both physiological balance and mental resilience, enhancing natural conception rates and improving the success of ART. 27

5. Future Directions

Despite the existing evidence, more clinical studies are required to scientifically validate Ayurvedic therapies for stress-related infertility. Research exploring the combined use of Rasayana and modern stress-management therapies could provide a stronger evidence base. Additionally, biomarker-based studies (cortisol, oxidative stress markers, heart rate variability) may bridge Ayurveda with modern parameters.

Conclusion

Infertility (Bandhyatva) is not merely a physical disorder but a complex interplay of biological, psychological, and environmental factors. Among these, psychological stress has emerged as a key determinant of reproductive health. Modern biomedical research has established that stress, through activation of the hypothalamic–pituitary–adrenal (HPA) axis and sympathetic nervous system, disrupts gonadotropin secretion, alters ovulation and spermatogenesis, induces oxidative stress, and ultimately impairs conception. Parallely, Ayurveda explains the same phenomenon in terms of Manasika Bhava (psychological states), Vata vitiation, disturbance of Manovaha Srotas, depletion of Ojas, and imbalance of Satva-Rajas-Tamas. The correlation between these two perspectives highlights that although the terminologies differ, both systems recognize stress as a systemic disruptor with profound effects on reproductive function. Cortisol-induced suppression of the

reproductive axis in modern science corresponds to Agni and Dosha derangement in Ayurveda, while oxidative stress resembles the concept of Ojas kshaya. Furthermore, the cyclical relationship between infertility and stress—where stress causes infertility, and infertility becomes a source of further stress—validates the Ayurvedic principle of psychosomatic disease causation. Management of stress-induced infertility, therefore, requires a multidimensional approach. Modern interventions such as counseling, mindfulness-based therapies, lifestyle modifications, and pharmacological treatments can be effectively complemented with Ayurvedic strategies like Satvavajaya Chikitsa, Rasayana therapy, Panchakarma, yoga, and a Sattvic diet. Such integrative strategies not only address the physiological imbalances but also enhance emotional stability, mental resilience, and overall reproductive vitality. The review underscores the need for more scientific validation of Ayurvedic interventions through clinical trials and biomarker-based studies. If integrated wisely, the strengths of both systems can provide cost-effective, safe, and holistic solutions for couples struggling with infertility.

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