Mechanistic Insights and Public Health Perspectives of Ayurvedic Herbal Interventions in Postpartum Depression: A Comprehensive Review

Dr. Devika B. S[1], Dr. Anu Prabha [2]
[1] *Associate Professor, Department of Prasutitantra & Striroga, MES Ayurveda Mahavidyalaya, Ratnagiri, Maharashtra, India*
[2] *Professor, Department of Dravyaguna Vijnana, SAM College of Ayurvedic Sciences and Hospital, Raisen, Madhya Pradesh, India*

Abstract – Postpartum depression is a major maternal mental-health disorder characterized by persistent sadness, emotional instability and impaired mother–infant bonding. Although psychotherapy and antidepressant therapy are effective treatment options, cultural hesitation, limited accessibility of mental-health services and concerns related to breastfeeding frequently restrict their use. Ayurveda describes several *Medhya Dravyas* such as *Ashwagandha*, *Brahmi*, *Shankhapushpi*, *Jatamansi*, *Haridra* and *Kumkuma* that are traditionally recommended to support emotional balance and cognitive functioning. Modern studies confirm that these botanicals modulate biological pathways relevant to postpartum depression, including stress axis regulation, neuroinflammation, oxidative stress, neurotransmitter functioning and neuroplasticity. However, postpartum-specific clinical trials remain limited, and curcumin is the only herb evaluated directly in postpartum depression. This review synthesizes classical Ayurvedic principles, pharmacological profiles, biological mechanisms, clinical findings, safety considerations and public-health implications to evaluate the therapeutic potential of Ayurvedic *Dravyas* in postpartum depression.

Index Terms **- Postpartum depression; Ayurveda; *Dravyas*; *Medhya* herbs; Neuroinflammation; Maternal mental health; Public health integration.**

I. INTRODUCTION

Postpartum depression (PPD) is a serious mental-health condition affecting maternal emotional regulation, physical well-being and the quality of bonding with the newborn. According to the World Health Organization, maternal mental-health disorders contribute significantly to disability in the reproductive age group [1]. Global studies report a PPD prevalence of ten to twenty percent, with higher rates in settings where mental-health resources are limited or culturally underutilized [2–4]. Although psychotherapy and antidepressants are beneficial, many women avoid pharmacological treatment because of concerns about breastfeeding safety, potential adverse effects and cultural stigmas related to mental illness [5].

Ayurveda explains mental health through *Manas* and the qualities *Satva*, *Rajas* and *Tamas*. Increased *Rajas* produces emotional agitation, while increased *Tamas* leads to lethargy and depressive tendencies [6]. These descriptions closely resemble PPD symptoms. Classical postpartum care under *Sutika Paricharya* prescribes structured dietary support, adequate rest, emotional reassurance and the use of herbs to strengthen physical and mental health [7]. The *Sushruta Samhita* describes *Manovikara*, emotional disturbances that arise from physical depletion, which parallels postpartum vulnerability [8]. The *Bhavaprakasha Nighantu* identifies *Medhya Dravyas* that nourish cognition, memory and emotional resilience [9].

Modern research supports the pharmacological potential of botanicals such as *Withania somnifera* (L.) Dunal, *Bacopa monnieri* (L.) Wettst., *Convolvulus pluricaulis* Choisy, *Nardostachys jatamansi* (D. Don) DC., *Curcuma longa* L. and *Crocus sativus* L. These herbs influence stress physiology, neurotransmitters and inflammation [10–15]. Curcumin is the only herb

with a completed randomized trial in postpartum depression [12]. This review examines Ayurvedic, pharmacological and public-health perspectives, to determine whether these *Dravyas* may support maternal mental health.

II. MATERIALS AND METHODS

A structured literature search was conducted using PubMed, Scopus, Web of Science, Google Scholar, Cochrane Library and WHO Global Health Observatory. Terms used included postpartum depression, maternal mental health, Ayurveda, *Dravyas*, Medhya herbs, botanical nomenclature, neuroinflammation, oxidative stress, neuroplasticity, hypothalamic–pituitary–adrenal axis dysregulation, breastfeeding safety and public-health integration.

Inclusion criteria:

- Peer-reviewed studies on selected botanicals
- Experimental studies on depression-related neurobiology
- Clinical studies on mood disorders
- Classical Ayurvedic texts with authenticated editions
- WHO and national guidelines

Exclusion criteria:

- Non-authentic Ayurvedic manuscripts
- Commercial posts without scientific evidence
- Reports lacking methodological clarity

Data were classified into Ayurvedic principles, pharmacology, mechanisms, results, discussion, safety and public-health relevance.

III. AYURVEDIC FOUNDATIONS OF POSTPARTUM MENTAL HEALTH

Ayurveda views mental health as the outcome of balanced interaction between *Manas* and the qualities *Satva*, *Rajas* and *Tamas*. *Satva* represents clarity, calmness and emotional resilience. When *Rajas* increases, irritability, restlessness and heightened emotional sensitivity may occur. Increased *Tamas* results in mental dullness, fatigue, hopelessness and lack of motivation [6]. These qualities closely resemble emotional patterns commonly reported in postpartum depression.

Postpartum physiology in Ayurveda is considered vulnerable due to the physical depletion following childbirth. The classical concept of *Sutika Paricharya* provides a structured regimen involving nourishing diets, warm food, adequate rest, digestive stabilization and emotional support [7]. This comprehensive care aims to restore *Agni* (digestive strength), replenish tissues and maintain mental balance.

The *Sushruta Samhita* describes *Manovikara* as emotional disturbances resulting from strain or physical depletion [8]. This mirrors the postpartum period, during which hormonal shifts, sleep deprivation and physical exhaustion may contribute to emotional instability. The *Bhavaprakasha Nighantu* highlights *Medhya Dravyas* that enhance cognitive functioning, stabilize emotions and strengthen mental resilience [9].

Ayurveda therefore offers a prenatal and postpartum mental-health framework that aligns with current psychological understanding and supports the rationale for evaluating *Dravyas* in postpartum depression.

IV. PHARMACOLOGICAL PROFILES OF KEY *DRAVYAS*

4.1 *Withania somnifera* (L.) Dunal

Also known as *Ashwagandha*, it is a classical *Rasayana*. Modern studies show cortisol reduction, anxiolytic activity and improvement in stress tolerance [10,11]. Neurobiological mechanisms include GABA-mimetic action, antioxidant support and regulation of stress pathways.

4.2 *Bacopa monnieri* (L.) Wettst.

Known as *Brahmi*, it supports memory consolidation, improves cognitive processing and reduces oxidative damage [12]. Anti-inflammatory activity contributes to mood regulation.

4.3 *Convolvulus pluricaulis* Choisy

Traditionally known as *Shankhapushpi*, it exhibits anxiolytic and nootropic properties [13]. Studies show modulation of cholinergic function and antioxidant support.

4.4 *Nardostachys jatamansi* (D. Don) DC.

Known as *Jatamansi*, it improves emotional regulation, reduces oxidative stress and modulates monoamine neurotransmitters [14].

4.5 *Curcuma longa* L. (Curcumin)

Curcumin demonstrates anti-inflammatory, antioxidant and neuroprotective properties. It reduces inflammatory cytokines and improves neurotrophic factors. It is the only herb clinically tested in postpartum depression, with significant improvement in symptoms [12].

4.6 *Crocus sativus* L.

Saffron exhibits antidepressant properties equal to standard antidepressants in several trials [15]. It modulates serotonergic pathways and reduces inflammation.

V. RESULTS

5.1 Neurobiological Evidence

Research identifies altered stress pathways, inflammation, oxidative imbalance, reduced neuroplasticity and neurotransmitter dysregulation in PPD [16–17]. Ayurvedic *Dravyas* show actions relevant to these mechanisms:

- Stress regulation: Withania somnifera (L.) Dunal
- Anti-inflammatory activity: Curcuma longa L.
- Neuroprotection: Bacopa monnieri (L.) Wettst.
- Antioxidant action: Nardostachys jatamansi (D. Don) DC.
- Monoamine modulation: Crocus sativus L.

5.2 Clinical Evidence

- Curcumin improved depressive symptoms in postpartum women [12]
- Saffron improved mood in general depressive disorders [15]
- Other herbs show adult anxiolytic or antidepressant activity but lack postpartum-specific trials

TABLE 1. Summary of Evidence for Ayurvedic *Dravyas*

Herbs	Key Actions	Evidence Type	Relevance
Withania somnifera (L.) Dunal	Stress reduction	Clinical	Anxiety, mood
Bacopa monnieri (L.) Wettst.	Neuroprotection	Clinical	Cognition
Convolvulus pluricaulis Choisy	Anxiety reduction	Preclinical	Emotional balance
Nardostachys jatamansi (D. Don) DC.	MAO modulation	Preclinical	Depression
Curcuma longa L.	Anti-inflammatory	Randomized controlled trial	Postpartum depression
Crocus sativus L.	Antidepressant	Clinical	Mood elevation

VI. DISCUSSION

The review demonstrates substantial conceptual alignment between Ayurvedic theory and modern neurobiology regarding the etiology and management of postpartum depression. Ayurvedic descriptions of disturbed *Rajas* and *Tamas* correspond to emotional instability, irritability, mental fatigue, sadness and cognitive dullness observed in postpartum women. The classical postpartum regimen emphasizes digestive health, nourishment and emotional care, reflecting a comprehensive biopsychosocial model.

Modern evidence strengthens this understanding by showing that the primary biological contributors to postpartum depression include stress-axis dysregulation, inflammatory activation, oxidative stress and neuroplasticity reduction. The botanicals discussed in this review exhibit mechanisms that directly address these biological pathways. *Withania somnifera* (L.) Dunal reduces cortisol and improves stress resilience, which is particularly relevant because postpartum women often experience heightened sensitivity to stress. *Bacopa monnieri* (L.) Wettst. and

Nardostachys jatamansi (D. Don) DC. support cognitive clarity and antioxidant protection, addressing the cognitive fatigue frequently reported in the postpartum period. *Curcuma longa* L. not only reduces inflammation but has also shown measurable improvement in postpartum depressive symptoms through a controlled clinical trial, highlighting its translational therapeutic potential. *Crocus sativus* L. contributes additional antidepressant benefits through serotonergic and neuroprotective actions relevant to mood regulation.

Despite this promise, the current evidence remains insufficient for routine clinical use. The lack of lactation safety data limits direct application because phytochemicals may transfer into breast milk. Furthermore, herbal preparations differ widely in quality, extraction techniques and concentrations of active constituents. These variations can compromise reproducibility and may introduce safety risks. Herb–drug interactions present additional concerns, particularly for women already receiving pharmacological treatment for mood disorders.

From a public-health perspective, the cultural acceptability of Ayurvedic herbs may reduce stigma and improve early help-seeking behaviors among postpartum women. However, any integration into maternal mental-health programs must follow World Health Organization guidelines that emphasize safety monitoring, quality assurance, practitioner training and sustainable sourcing. Clinical research should prioritize postpartum-specific randomized trials, lactation pharmacokinetic studies, standardized formulations and multicenter collaborations.

Overall, Ayurvedic *Dravyas* offer strong mechanistic promise and considerable cultural relevance, yet rigorous scientific validation is essential before broad implementation in postpartum mental-health care.

VII. SAFETY CONSIDERATIONS

Limited data are available regarding breastfeeding safety for most *Dravyas*. Herb–drug interaction risks, inconsistent product quality and possible adulteration necessitate strict quality control [18–19]. WHO guidelines emphasize pharmacovigilance, standardization and evidence-based integration [1].

VIII. PUBLIC-HEALTH IMPLICATIONS

Ayurvedic botanicals may enhance maternal mental-health engagement due to cultural familiarity. Integration must follow WHO principles of safety, training, sustainability and regulation. Partnerships between Ayurvedic experts, obstetricians and mental-health professionals are essential for safe translational use.

IX. CONCLUSION

Ayurvedic *Dravyas* show significant potential for supporting postpartum mental health through mechanisms relevant to the pathophysiology of postpartum depression. Their anti-inflammatory, antioxidant, neuroprotective and stress-modulating properties align closely with known biological disturbances in postpartum women. Curcumin has demonstrated clinical benefit in postpartum depression, providing preliminary clinical evidence for Ayurvedic herbs in this area.

However, the lack of adequate postpartum-specific trials, limited breastfeeding safety data and absence of standardized formulations remain major limitations. Future research should prioritize randomized controlled trials, lactation pharmacokinetic studies, standardized extract development and adverse-event monitoring. Integration into public-health systems must follow WHO guidelines to ensure safe, ethical and responsible use.

In conclusion, Ayurvedic *Dravyas* hold promise as supportive adjuncts in postpartum depression, but their adoption must be guided by strong scientific validation, safety assurance and public-health responsibility.

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