

Stress, Sleep, and Menstrual Health in Ayurveda: An Integrative Review of Traditional Perspectives and Scientific Evidence

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Abstract—Stress and sleep disturbances are increasingly recognized as important contributors to menstrual health problems, including cycle irregularity, dysmenorrhea, premenstrual symptoms, and altered menstrual flow. Ayurveda describes a close relationship among psychological well-being, sleep (*Nidra*), digestion and metabolism (*Agni*), and reproductive function (*Artava*). Disturbance of the *doshas*, particularly *Vata* and *Pitta*, may affect *Apana Vata* and disrupt normal menstruation. Ayurvedic management uses an individualized combination of dietary regulation, daily routines, yoga, meditation, sleep-promoting practices, and medicinal herbs. Ashwagandha (*Withania somnifera*), Shatavari (*Asparagus racemosus*), Brahmi (*Bacopa monnieri*), Jatamansi (*Nardostachys jatamansi*), and Tagara (*Valeriana wallichii*) are traditionally used to support stress adaptation, sleep quality, and reproductive well-being. Emerging evidence suggests that selected herbs may exert adaptogenic, anxiolytic, antioxidant, anti-inflammatory, and neuroendocrine-modulating effects. However, direct clinical evidence connecting Ayurvedic interventions with simultaneous improvements in stress, sleep, and menstrual outcomes remains limited. Variability in formulations, small samples, and inadequate safety reporting further restrict firm conclusions. Well-designed clinical studies are therefore required to evaluate standardized interventions, clarify mechanisms, and establish their safety and effectiveness in menstrual healthcare..

Index Terms—Ayurveda; stress; sleep; menstrual health; menstruation; dysmenorrhea; premenstrual syndrome; Ashwagandha; Shatavari; adaptogens.

I. INTRODUCTION

Menstrual health is an important component of women's physical, psychological, and reproductive

well-being. A healthy menstrual cycle depends on coordinated activity among the hypothalamus, pituitary gland, ovaries, uterus, and associated endocrine and metabolic pathways. Disturbances in this regulation may manifest as irregular menstruation, dysmenorrhea, altered menstrual flow, premenstrual symptoms, or amenorrhea. Although structural and endocrine disorders are important causes of menstrual dysfunction, lifestyle factors—particularly psychological stress and inadequate sleep—may also influence the timing, duration, and subjective experience of menstruation.

Psychological stress activates the hypothalamic–pituitary–adrenal axis and alters cortisol secretion. Prolonged or intense activation of this stress-response system may interfere with hypothalamic–pituitary–gonadal signaling, affecting gonadotropin release, ovarian steroid production, ovulation, and menstrual regularity. Studies among women of reproductive age have reported associations between higher perceived stress and menstrual irregularity, premenstrual symptoms, dysmenorrhea, and changes in menstrual flow.¹ These effects may be intensified by unhealthy dietary practices, reduced physical activity, emotional distress, and inadequate recovery.

Sleep is another important regulator of neuroendocrine, metabolic, and emotional health. Sleep duration and quality are influenced by circadian rhythms as well as changes in ovarian hormones across the menstrual cycle. Conversely, sleep restriction, irregular sleep timing, and insomnia may affect stress reactivity, pain sensitivity, glucose metabolism, appetite regulation, and hormonal balance.² Women experiencing premenstrual or menstrual symptoms may have difficulty initiating or maintaining sleep,

while poor sleep can increase fatigue, irritability, anxiety, and the perceived severity of menstrual pain. The relationship among sleep, stress, and menstruation is therefore likely to be bidirectional rather than a simple cause-and-effect pathway.

Ayurveda presents a holistic framework in which mental health, sleep, digestion, daily routine, and reproductive function are closely connected. Health is understood as a state of equilibrium among the three regulatory principles—*Vata*, *Pitta*, and *Kapha*—together with balanced digestive and metabolic activity (*Agni*), properly nourished tissues (*Dhatus*), and unobstructed physiological channels (*Srotas*).³ Menstruation is represented by the concept of *Artava*, while *Apana Vata* is regarded as particularly important for the downward movement and timely elimination of menstrual blood. Disturbance of *Apana Vata* may contribute to painful, delayed, irregular, or obstructed menstruation.

Sleep, described as *Nidra*, is considered one of the fundamental supports of life in Ayurveda. Adequate sleep is associated with strength, nourishment, emotional stability, reproductive capacity, and longevity, whereas disturbed sleep is linked with fatigue, impaired concentration, weakness, and disequilibrium. From an Ayurvedic perspective, increased *Vata* may be associated with restlessness, anxiety, pain, and insomnia, while aggravated *Pitta* may contribute to irritability, disturbed sleep, heat-related symptoms, and excessive menstrual flow. Increased *Kapha*, together with impaired metabolic function, may be associated with heaviness, lethargy, excessive sleep, and metabolic disturbances. These interpretations are traditional concepts and should not be considered direct equivalents of modern biomedical diagnoses.

Ayurvedic management of stress, sleep disturbance, and menstrual complaints is individualized according to constitution, symptoms, digestive strength, age, and reproductive stage. Treatment may combine dietary modification, regulation of sleep and daily routine, yoga, breathing exercises, meditation, oil massage, and medicinal plants. Ashwagandha (*Withania somnifera*) is traditionally used as a rejuvenative and adaptogenic herb for stress, fatigue, anxiety, and sleep disturbance. Randomized clinical studies of standardized Ashwagandha extracts have reported possible improvements in perceived stress, anxiety, and sleep quality.⁴ However, differences in extracts,

doses, treatment duration, and study populations limit the generalization of these findings.

Shatavari (*Asparagus racemosus*) is traditionally regarded as a major female reproductive rejuvenative. It is used to support menstrual health, reproductive function, lactation, and the menopausal transition. Its proposed antioxidant, anti-inflammatory, adaptogenic, and hormone-modulating activities may be relevant to stress-associated reproductive disturbances, although its mechanisms and clinical effectiveness remain incompletely established.⁵ Brahmi (*Bacopa monnieri*), Jatamansi (*Nardostachys jatamansi*), and Tagara (*Valeriana wallichii*) are also traditionally employed for mental calmness and sleep, while Ashoka (*Saraca asoca*) and Lodhra (*Symplocos racemosa*) are more directly associated with menstrual and uterine complaints.

Despite longstanding traditional use, direct clinical evidence evaluating the simultaneous effects of Ayurvedic interventions on stress, sleep, and menstrual outcomes remains limited. Existing studies frequently examine a single symptom or herb and are often restricted by small samples, brief follow-up, variable formulations, and incomplete safety reporting. Herbal products may also vary in botanical identity, purity, chemical composition, and contaminant content. Some Ayurvedic preparations have been associated with potentially toxic levels of lead, mercury, or arsenic, emphasizing the need for authenticated ingredients and rigorous quality control.⁶

A critical review of this interconnected field is therefore warranted. The present review examines the relationship among psychological stress, sleep disturbance, and menstrual health from Ayurvedic and contemporary biomedical perspectives. It also evaluates relevant lifestyle approaches and medicinal herbs, summarizes possible mechanisms and available evidence, and identifies safety concerns and priorities for future clinical research.

II. DETAILED REVIEW

Relationship Among Stress, Sleep, and Menstrual Health

Menstrual health is influenced by interactions among the reproductive, endocrine, nervous, metabolic, and immune systems. Psychological stress and sleep disturbances may disrupt these interactions,

contributing to menstrual irregularity, dysmenorrhea, premenstrual symptoms, altered menstrual flow, and impaired quality of life. Menstrual symptoms can also worsen stress and sleep quality, producing a self-reinforcing cycle.

The effects of stress and sleep vary among individuals. Age, nutritional status, body weight, physical activity, occupation, emotional health, medication use, and underlying gynecological or endocrine disorders can modify these relationships. Consequently, menstrual disturbances should not automatically be attributed to stress or inadequate sleep without appropriate clinical assessment.

Physiological Effects of Stress on Menstruation

Stress activates the sympathetic nervous system and hypothalamic–pituitary–adrenal axis, increasing the release of stress hormones such as cortisol. Short-term activation supports adaptation to immediate challenges. However, prolonged or repeated stress may disturb communication between the hypothalamus, pituitary gland, and ovaries.

Altered neuroendocrine signaling can influence the release of gonadotropin-releasing hormone, follicle-stimulating hormone, and luteinizing hormone. This may affect follicular development, ovulation, corpus luteum function, and ovarian production of estrogen and progesterone. Clinically, these changes may appear as delayed menstruation, shortened or prolonged cycles, anovulation, or temporary amenorrhea.

Stress may also increase muscle tension, pain sensitivity, inflammatory activity, and emotional reactivity. These effects can intensify menstrual cramps, headaches, gastrointestinal discomfort, fatigue, and premenstrual mood symptoms. Behavioral responses to stress—including irregular eating, reduced exercise, stimulant use, and disrupted sleep—may further affect menstrual health.

Sleep and the Menstrual Cycle

Sleep is essential for neuroendocrine regulation, energy metabolism, immune function, emotional processing, and tissue recovery. The menstrual cycle may affect sleep through changes in estrogen, progesterone, body temperature, pain sensitivity, and mood.

Some women report poorer sleep during the late luteal and menstrual phases. Premenstrual anxiety,

irritability, breast tenderness, abdominal discomfort, headaches, and menstrual cramps may delay sleep onset or cause nighttime awakenings. An increase in core body temperature during the luteal phase may also reduce sleep comfort in susceptible individuals.

Conversely, insufficient or irregular sleep can influence cortisol rhythms, insulin sensitivity, appetite, emotional regulation, and pain perception. These changes may aggravate menstrual symptoms or contribute indirectly to cycle disturbances. Night-shift work, rotating schedules, frequent travel, and excessive nighttime screen exposure can disrupt circadian rhythms and interfere with stable sleep–wake patterns.

Bidirectional Cycle of Symptoms

Stress, sleep disturbance, and menstrual symptoms frequently reinforce one another. Psychological stress can impair sleep, while sleep loss reduces coping capacity and increases emotional reactivity. Poor sleep may lower the pain threshold, making menstrual cramps feel more severe. Severe menstrual pain or premenstrual mood changes may then cause further sleep disruption and anticipatory anxiety.

This interaction may be particularly significant in premenstrual syndrome and premenstrual dysphoric disorder. Symptoms such as irritability, depressed mood, anxiety, fatigue, food cravings, and insomnia can occur together and interfere with daily functioning. A management strategy that focuses on only one symptom may therefore be less effective than an approach addressing sleep, stress, pain, diet, and emotional health together.

Ayurvedic Understanding of Menstrual Health

Ayurveda views health as a state of balance among *Vata*, *Pitta*, and *Kapha*, together with balanced digestive and metabolic activity, well-nourished tissues, normal elimination, and mental well-being. Menstrual blood is described through the concept of *Artava*, and its regular formation and elimination are considered indicators of reproductive health.

Apana Vata, a functional subdivision of *Vata*, governs downward-moving physiological activities, including menstruation, urination, defecation, ovulation, and childbirth. Disturbance of *Apana Vata* is traditionally associated with delayed, painful, irregular, or obstructed menstruation. Because *Vata* is also linked with movement, nervous activity, and instability,

mental stress, excessive travel, irregular routines, fasting, and sleep deprivation are considered capable of aggravating it.

Pitta is associated with heat, transformation, and metabolic activity. Aggravated *Pitta* may be traditionally linked with irritability, heat sensations, inflammatory symptoms, and excessive or early menstrual bleeding. *Kapha* provides stability, lubrication, structure, and nourishment. Disturbed *Kapha* may be associated with heaviness, lethargy, excessive sleep, fluid retention, and metabolic imbalance.

These concepts form a traditional explanatory model and should not be treated as direct substitutes for biomedical diagnoses.

Nidra in Ayurveda

Nidra, or sleep, is considered one of the principal supports of health in Ayurveda. Appropriate sleep is believed to promote strength, nourishment, happiness, fertility, knowledge, and longevity. Inadequate, excessive, or poorly timed sleep is considered capable of disturbing physical and psychological balance.

Difficulty falling asleep, light sleep, frequent awakenings, and early waking are commonly interpreted as features of aggravated *Vata*. Sleep disturbed by heat, irritability, vivid dreams, or nighttime awakening may be associated with *Pitta*. Excessive sleep, daytime drowsiness, and difficulty waking may be linked with increased *Kapha*.

Ayurvedic sleep management emphasizes regular timing, an appropriate evening meal, reduced stimulation, mental relaxation, and a calm sleeping environment. Daytime sleep is considered appropriate only under particular conditions, such as exhaustion, illness, extreme heat, or specific physiological needs. Habitual daytime sleeping may be discouraged when it contributes to heaviness, impaired digestion, or disrupted nighttime sleep.

Mental Health and the Three Gunas

Ayurveda also describes mental functioning through the qualities of *Sattva*, *Rajas*, and *Tamas*. *Sattva* represents clarity, balance, and emotional stability. *Rajas* is associated with activity, restlessness, desire, and agitation, whereas *Tamas* is associated with inertia, dullness, and withdrawal.

Chronic stress may increase *Rajas*, resulting in worry, irritability, mental overactivity, and difficulty sleeping.

Prolonged exhaustion may contribute to *Tamas*, manifesting as low motivation, excessive sleep, or emotional withdrawal. Ayurvedic mental healthcare aims to strengthen *Sattva* through appropriate diet, ethical conduct, supportive relationships, meditation, self-awareness, and stable daily routines.

Role of Agni, Diet, and Metabolic Health

Agni refers broadly to digestion and metabolism. Irregular meals, overeating, fasting, unsuitable food combinations, emotional eating, and late-night meals are believed to disturb *Agni*. Poor digestion may contribute to the formation of *Ama*, a traditional concept describing improperly processed metabolic material.

Dietary habits can affect stress, sleep, and menstruation through both Ayurvedic and biomedical pathways. Inadequate energy intake, iron deficiency, rapid weight loss, obesity, excessive caffeine, and unstable blood glucose may influence menstrual regularity, fatigue, mood, and sleep. Ayurveda generally favors fresh, digestible, appropriately prepared food consumed at regular times.

Dietary recommendations should be individualized. Warm, cooked foods and healthy fats may be emphasized in *Vata*-dominant patterns, while excessively spicy and heating foods may be reduced in *Pitta*-associated complaints. Heavy, oily, or excessively sweet foods may be moderated when *Kapha* and metabolic imbalance predominate. Restrictive diets should be avoided unless medically indicated.

Ayurvedic Daily Routine

A stable daily routine, or *Dinacharya*, is central to Ayurvedic stress and sleep management. Regular waking, meals, physical activity, work, relaxation, and bedtime may help stabilize behavioral and circadian rhythms. Consistency can be especially valuable for individuals whose stress is associated with unpredictable schedules.

Morning light exposure, moderate exercise, adequate hydration, and regular meals may support daytime alertness and nighttime sleep. Evening routines should reduce mental and sensory stimulation. Intense work, emotional discussions, large meals, caffeine, and prolonged screen use close to bedtime may worsen sleep in susceptible individuals.

Yoga and Breathing Practices

Yoga may support menstrual health by combining physical movement, breathing regulation, relaxation, and attention training. Gentle postures can reduce muscular tension and may improve comfort during the premenstrual and menstrual phases. Restorative practices may be more suitable when pain, fatigue, or heavy bleeding is present.

Slow breathing practices can reduce physiological arousal and promote relaxation. Techniques emphasizing comfortable diaphragmatic breathing and prolonged exhalation may be helpful before sleep. Strong breath-retention practices or vigorous yoga should be avoided when they cause dizziness, discomfort, or symptom aggravation.

Yoga should be adapted to the individual. Severe pelvic pain, pregnancy, recent surgery, significant anemia, or musculoskeletal disease may require professional modification.

Meditation and Stress Reduction

Meditation and mindfulness practices may improve awareness of emotional and physical responses to stress. Regular practice can reduce rumination, support emotional regulation, and improve the ability to disengage from stimulating thoughts before sleep.

Brief daily practice may be more sustainable than occasional prolonged sessions. Guided relaxation, body scanning, mantra repetition, and quiet breathing can be incorporated into evening routines. These practices should complement professional mental healthcare when anxiety, depression, trauma, or severe premenstrual mood symptoms are present.

Abhyanga and External Therapies

Abhyanga, or oil massage, is traditionally used to calm *Vata*, reduce muscular tension, and promote relaxation. Gentle self-massage with comfortably warm oil may be included in a bedtime or stress-management routine. Scalp and foot massage are commonly associated with relaxation and sleep support.

External therapies may improve comfort but should not be presented as treatments for underlying endocrine or gynecological disease. Oils should be avoided on irritated or infected skin, and care is needed to prevent falls on slippery surfaces.

Ashwagandha

Ashwagandha (*Withania somnifera*) is traditionally classified as a rejuvenative and strength-promoting herb. It is commonly used for stress, fatigue, anxiety, poor sleep, and reduced vitality. Its withanolides and other constituents have been investigated for adaptogenic, anti-inflammatory, antioxidant, and neuroendocrine activities.

By supporting stress adaptation and sleep, Ashwagandha may indirectly benefit women whose menstrual symptoms worsen during periods of psychological strain. However, evidence that it directly regulates menstruation is limited. Product-specific effects, variable extract composition, and inconsistent doses make broad recommendations difficult.

Ashwagandha may cause gastrointestinal discomfort, drowsiness, headache, or allergic reactions. It may interact with sedatives, thyroid medicines, immunosuppressants, antidiabetic drugs, and antihypertensive medicines. It is generally inappropriate for unsupervised use during pregnancy.

Shatavari

Shatavari (*Asparagus racemosus*) is a prominent female reproductive rejuvenative in Ayurveda. It is traditionally used to support reproductive tissues, menstrual health, lactation, fertility, and the menopausal transition. Its roots contain steroidal saponins, flavonoids, polysaccharides, and antioxidant compounds.

Shatavari may be relevant when stress-related menstrual symptoms occur together with fatigue, dryness, or reproductive weakness. Proposed actions include antioxidant, anti-inflammatory, adaptogenic, immunomodulatory, and possible hormone-related effects. Direct clinical evidence remains limited, and hormone-sensitive conditions require caution until safety is better established.

Brahmi

Brahmi (*Bacopa monnieri*) is traditionally associated with memory, concentration, mental calmness, and resilience. It contains bacosides and other compounds investigated for antioxidant and neuroprotective effects.

Brahmi may be considered when stress, mental overactivity, or poor concentration accompanies sleep disturbance. Its role in menstrual health is indirect and

is primarily related to psychological well-being. Possible adverse effects include nausea, abdominal discomfort, increased bowel movements, and interactions with certain medicines.

Jatamansi

Jatamansi (*Nardostachys jatamansi*) is traditionally used to calm the mind and support sleep. It may be included in formulations for restlessness, anxiety, emotional disturbance, and insomnia.

Although experimental findings suggest sedative, antioxidant, and neuroprotective activity, high-quality clinical evidence is limited. The conservation status and sustainable sourcing of Jatamansi are also important because excessive wild harvesting threatens natural populations.

Tagara

Tagara (*Valeriana wallichii*) is used traditionally for insomnia, nervousness, and restlessness. Its effects may involve sedative and calming mechanisms. It is sometimes included in compound formulations rather than used alone.

Tagara may cause drowsiness and should not be combined indiscriminately with alcohol, sedatives, or sleep medicines. Driving or operating machinery should be avoided if sedation occurs. Evidence regarding long-term use and reproductive safety is inadequate.

Ashoka and Lodhra

Ashoka (*Saraca asoca*) and Lodhra (*Symplocos racemosa*) are more directly associated with menstrual and uterine complaints. Ashoka is traditionally used for excessive bleeding, painful menstruation, and cycle disturbances. Lodhra is valued for its astringent properties and is used for abnormal uterine bleeding and vaginal discharge.

These herbs may be selected when menstrual symptoms are prominent, while stress- and sleep-supportive interventions address contributing psychological factors. However, abnormal bleeding may indicate fibroids, endocrine disorders, pregnancy complications, bleeding disorders, or malignancy. Herbal products should not delay diagnostic evaluation.

Menstrual Pain and Premenstrual Symptoms

Menstrual pain involves uterine contractions, inflammatory mediators, and individual differences in pain sensitivity. Stress and sleep deprivation may heighten pain perception and reduce coping ability. An integrative approach may combine medical evaluation, appropriate analgesia, heat application, moderate movement, sleep improvement, relaxation, and individualized Ayurvedic support.

Premenstrual symptoms may include irritability, anxiety, depressed mood, food cravings, breast tenderness, bloating, headache, and disturbed sleep. Symptom tracking across at least two cycles can help determine whether symptoms follow a consistent premenstrual pattern. Severe mood symptoms, suicidal thoughts, or major functional impairment require prompt professional assessment.

Polycystic Ovary Syndrome

Polycystic ovary syndrome may involve irregular ovulation, androgen excess, insulin resistance, weight changes, acne, and psychological distress. Stress and inadequate sleep may worsen metabolic dysfunction and quality of life but are not the sole causes of the disorder.

Ayurvedic management may focus on daily routine, diet, physical activity, stress regulation, and selected herbs. Such approaches may complement but should not replace metabolic screening, menstrual protection, fertility management, or other evidence-based care. Individualized treatment is essential because symptoms and health risks vary widely.

Safety and Clinical Considerations

Herbal products are biologically active and may produce adverse effects or interactions. Safety depends on botanical identity, plant part, extraction method, dose, duration, manufacturing quality, and patient characteristics. Contamination, adulteration, and undeclared metals are important concerns in inadequately regulated products.

Extra caution is necessary during pregnancy, breastfeeding, fertility treatment, and in people with liver, kidney, thyroid, autoimmune, bleeding, or hormone-sensitive conditions. Herbs should not replace evaluation of persistent insomnia, amenorrhea, severe pain, or abnormal bleeding.

Clinical assessment is especially important when menstrual bleeding is very heavy, occurs after

menopause, follows a positive pregnancy test, or is accompanied by fainting, severe weakness, fever, or intense pelvic pain.

Limitations of Current Evidence

Many investigations of Ayurvedic interventions are limited by small samples, short treatment periods, inadequate controls, and variable outcome measures. Differences in formulations and chemical composition also make studies difficult to compare.

Research commonly evaluates stress, sleep, or menstrual symptoms separately, even though these problems frequently coexist. Future trials should measure all three domains, use standardized preparations, document adverse events, and include sufficient follow-up. Studies should also distinguish improvements in symptoms from treatment of underlying gynecological disease.

III. DISCUSSION

This review highlights a complex and bidirectional relationship among psychological stress, sleep disturbances, and menstrual health. Stress may alter hypothalamic–pituitary–adrenal and hypothalamic–pituitary–ovarian signaling, while inadequate sleep can influence cortisol rhythms, pain sensitivity, metabolism, and emotional regulation. Menstrual pain and premenstrual symptoms may, in turn, interfere with sleep and increase psychological distress. These interactions suggest that menstrual complaints should be assessed within a broader biopsychosocial context rather than treated as isolated reproductive symptoms. The Ayurvedic concepts of *Dosha*, *Artava*, *Apana Vata*, *Agni*, and *Nidra* provide a traditional framework for understanding these interconnected processes. Disturbance of *Vata*, particularly *Apana Vata*, is traditionally associated with painful, delayed, irregular, or obstructed menstruation. Increased *Pitta* may be associated with irritability, heat, inflammation, and excessive menstrual flow, whereas disturbed *Kapha* may be linked with heaviness, lethargy, excessive sleep, and metabolic dysfunction. These concepts do not directly correspond to modern physiological mechanisms, but they encourage individualized assessment of menstrual symptoms alongside sleep, digestion, lifestyle, and mental well-being.

The relationship between lifestyle and menstrual or pelvic pain is clinically important. Poor sleep, psychological distress, physical inactivity, and unhealthy dietary patterns may increase pain severity or reduce an individual's ability to cope with recurring symptoms. However, available research on the independent and combined effects of these lifestyle factors remains inconclusive. A review of lifestyle factors in women with pelvic pain found that stress and poor sleep may contribute to pain persistence, but the supporting studies were limited in number and generally of low methodological quality.⁷ This indicates that lifestyle modification is promising as supportive care, although it should not be presented as a substitute for appropriate diagnosis and treatment.

Yoga, breathing practices, meditation, and a regular daily routine represent important nonpharmacological components of the Ayurvedic approach. Yoga may reduce muscular tension, improve body awareness, regulate stress responses, and support sleep. A meta-analysis of randomized trials reported a favorable effect of yoga on menstrual pain in primary dysmenorrhea.⁸ Nevertheless, the included studies involved relatively few participants and differed in the postures, frequency, duration, and supervision of yoga practice. Better-standardized trials are needed to identify which practices are effective, feasible, and safe for different menstrual conditions.

Ashwagandha is particularly relevant to the stress component of the stress–sleep–menstrual relationship. Its traditional adaptogenic use is supported by emerging clinical evidence showing reductions in perceived stress, anxiety, and cortisol concentrations. A systematic review and meta-analysis of randomized trials reported beneficial effects of Ashwagandha formulations on stress and anxiety outcomes, although mild-to-moderate adverse events occurred and long-term safety remained uncertain.⁹ The available evidence does not establish that Ashwagandha directly corrects menstrual irregularity. Any menstrual benefit may be indirect and mediated through improvements in stress, sleep, or general well-being.

Shatavari may have a more direct traditional association with female reproductive health. Its antioxidant, anti-inflammatory, adaptogenic, and possible hormone-modulating activities could be relevant to women whose menstrual symptoms are worsened by stress or reproductive transition. However, the current evidence is insufficient to

determine whether Shatavari improves clinically diagnosed menstrual disorders. Studies should distinguish general symptom relief from measurable changes in ovulation, cycle regularity, menstrual blood loss, endocrine markers, or reproductive outcomes.

Brahmi, Jatamansi, and Tagara are traditionally used to calm mental activity and promote sleep. Their inclusion in Ayurvedic formulations may be appropriate where restlessness, anxiety, or insomnia is prominent. Nevertheless, evidence for their effects on menstrual outcomes is sparse. Improvements in sleep or emotional well-being should not automatically be interpreted as correction of an underlying gynecological disorder. Future studies should measure stress, sleep, and menstrual outcomes simultaneously to determine whether changes in one domain are associated with meaningful improvements in the others.

Ashoka and Lodhra are traditionally more specific to menstrual and uterine complaints. Their astringent, anti-inflammatory, analgesic, and possible uterine-modulating properties may support their traditional use in excessive bleeding, dysmenorrhea, and abnormal discharge. Most supporting findings, however, come from preclinical or traditional-use evidence. Heavy menstrual bleeding may be caused by fibroids, adenomyosis, endocrine dysfunction, pregnancy complications, coagulation disorders, or malignancy. Ayurvedic treatment should therefore be considered only after appropriate evaluation of persistent or severe symptoms.

The individualized nature of Ayurveda is both a strength and a challenge. Considering constitution, digestive function, mental state, sleep pattern, menstrual characteristics, and lifestyle may support patient-centered care. However, individualized polyherbal formulations make clinical research difficult because the ingredients, doses, and accompanying interventions may vary between participants. Future studies should preserve the principles of individualized care while clearly documenting diagnostic criteria, herbal composition, dose, duration, co-interventions, and treatment adherence.

Safety is a major consideration when Ayurvedic herbs are used for menstrual or sleep-related complaints. Herbal products may cause sedation, gastrointestinal effects, allergic reactions, liver injury, endocrine changes, or interactions with prescribed medicines.

Ashwagandha may interact with sedatives, thyroid medicines, immunosuppressants, and drugs used for diabetes or hypertension. Tagara and other sedating herbs may produce additive effects when combined with alcohol or sleep medicines. Hormone-sensitive conditions also require caution when herbs possess possible estrogenic activity.

Quality control presents an additional concern. Botanical substitution, inconsistent extraction, contamination, and inadequate labeling can alter both effectiveness and safety. Some Ayurvedic preparations have been found to contain potentially toxic levels of lead, mercury, or arsenic. The National Center for Complementary and Integrative Health warns that certain Ayurvedic products may contain these metals in toxic amounts.¹⁰ Analytical studies of commercial products have similarly demonstrated the presence of heavy metals, emphasizing the importance of authenticated raw materials, good manufacturing practices, contaminant testing, and transparent labeling.¹¹

Pregnant and breastfeeding women require particular caution because reproductive and developmental safety data are unavailable for many Ayurvedic herbs. Products that affect uterine activity, hormone signaling, coagulation, glucose, blood pressure, or the central nervous system may present additional risks. Limited evidence of harm should not be interpreted as proof of safety. Herbal treatment during pregnancy, lactation, or fertility therapy should be undertaken only with qualified professional supervision.

The existing evidence base is limited by small sample sizes, short follow-up periods, heterogeneous preparations, inconsistent diagnostic criteria, and inadequate adverse-event reporting. Many studies assess only subjective outcomes and do not include objective measures such as menstrual-cycle tracking, quantified blood loss, sleep monitoring, cortisol concentrations, or reproductive hormone profiles. Publication bias and commercial sponsorship may also influence the available literature.

Future research should use authenticated and chemically characterized preparations, sufficiently powered samples, appropriate control groups, and validated outcome measures. Prospective studies should evaluate whether reducing stress and improving sleep result in measurable changes in menstrual regularity, pain, blood loss, and quality of life. Factorial or multimodal trials could help

distinguish the contributions of herbs, yoga, meditation, sleep hygiene, diet, and daily routine. Long-term follow-up and systematic pharmacovigilance are also essential.

Overall, Ayurveda offers a valuable integrative framework for addressing the overlapping influences of stress, sleep, and lifestyle on menstrual well-being. Its greatest potential may lie in complementing conventional care through individualized lifestyle regulation, stress management, sleep support, and carefully selected herbal interventions. However, these approaches should not delay investigation of severe pain, persistent irregularity, amenorrhea, heavy bleeding, infertility, or postmenopausal bleeding. Responsible integration requires evidence-based assessment, standardized products, qualified supervision, and clear recognition of the limitations of current research.

IV. CONCLUSION

Stress, sleep, and menstrual health are closely interconnected through neuroendocrine, metabolic, inflammatory, behavioral, and psychological pathways. Ayurveda provides a holistic framework that connects these domains through the concepts of *Dosha*, *Artava*, *Apana Vata*, *Agni*, *Nidra*, and mental balance.

Regular daily routines, adequate sleep, appropriate nutrition, yoga, breathing practices, meditation, and selected medicinal herbs may provide complementary support. Ashwagandha, Shatavari, Brahmi, Jatamansi, Tagara, Ashoka, and Lodhra are traditionally relevant, but their roles differ and clinical evidence remains incomplete.

Ayurvedic approaches should be integrated responsibly with modern diagnostic assessment, standardized products, safety monitoring, and qualified supervision. Well-designed clinical research is needed to determine whether combined Ayurvedic interventions can produce meaningful and sustained improvements in stress, sleep quality, and menstrual health.

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