INFORMATICS JOURNALS

Short Review

Journal of Natural Remedies
DOI: 10.18311/jnr/2026/53039

eISSN: 2320-3358 | Vol 26(2), 2026 | pp. 375-388

Phytotherapeutics Neuroregulation through *Nasyam and Shirodhara*: A Short Review

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Abstract

Background: Psychosomatic disorders arise from complex interactions between psychological stressors and dysregulation of neuroendocrine and autonomic systems, while conventional treatments often provide only symptomatic relief with limited long-term benefit. *Ayurveda* offers mind-body interventions such as *Shirodhara* and *Nasyam*, traditionally used for stress-related and psychosomatic conditions. **Aim:** This review evaluates the potential role of these therapies in the management of psychosomatic disorders. **Methodology**: A targeted literature search was conducted across PubMed, Scopus, Web of Science, and Google Scholar to identify experimental and clinical studies examining the effects of *Shirodhara* and *Nasyam* on stress, emotional regulation, autonomic function, and psychosomatic outcomes. Studies were assessed for methodological quality and relevance of outcome measures. **Results:** Current evidence suggests that *Shirodhara* is associated with relaxation responses and modulation of autonomic activity, particularly through enhanced parasympathetic dominance. *Nasyam* appears to influence central nervous system processes related to emotional regulation and cognitive function. Studies reporting the combined use of *Shirodhara* and *Nasyam* indicate potential synergistic benefits in restoring psychophysiological balance. However, significant heterogeneity in study design, treatment protocols, sample size, and outcome measures limits the strength of these findings. **Conclusion:** *Shirodhara* and *Nasyam* provide complementary benefits in the management of psychosomatic disorders. Nonetheless, robust evidence is limited, and further well-designed randomised controlled trials employing standardised interventions and objective biomarkers are required to confirm their clinical efficacy and underlying mechanisms.

Major Finding: Parasympathetic activity increases, reducing stress reactions, *Nasyam* and *Shirodhara* encourages relaxation. In the central nervous system, *Nasyam* promotes emotional and cognitive regulation. To validate their effectiveness in psychosomatic disorders, however, more robust data from carefully planned randomized controlled trials is needed.

Keywords: *Ayurvedic* Concept, Clinical Trials, *Nasyam*, Psychosomatic Disorders, *Shirodhara*, Stress, Traditional Medicine

(Article Chronicle: Article Received on: 07.11.2025; Revised on: 23.01.2026; Accepted on: 11.02.2026)

Abbreviations: 5-HT – Serotonin (5-Hydroxytryptamine); ACh – Acetylcholine; AChE – Acetylcholinesterase; ACS – American College of Sports Medicine; ACT – Acceptance and Commitment Therapy; AYUSH – Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy; BBB – Blood-Brain Barrier; BDNF – Brain-Derived Neurotrophic Factor;

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CBT – Cognitive Behavioural Therapy; CNS – Central Nervous System; CRP – C-Reactive Protein; DA – Dopamine; DHEA – Dehydroepiandrosterone; DSM – Diagnostic and Statistical Manual of Mental Disorders; EEG – Electroencephalography; EMDR – Eye Movement Desensitisation and Reprocessing; fMRI – Functional Magnetic Resonance Imaging; GABA – Gamma-Aminobutyric Acid; GAD – Generalized Anxiety Disorder; GAD-7 – Generalized Anxiety Disorder-7 Scale; HAM-A – Hamilton Anxiety Rating Scale; HPA Axis – Hypothalamic-Pituitary-Adrenal Axis; HRV – Heart Rate Variability; IBS – Irritable Bowel Syndrome; MAO – Monoamine Oxidase; MBCT – Mindfulness-Based Cognitive Therapy; PSQI – Pittsburgh Sleep Quality Index; PSS – Perceived Stress Scale; RCT – Randomized Controlled Trial; SNRI – Serotonin-Norepinephrine Reuptake Inhibitor; SSRI – Selective Serotonin Reuptake Inhibitor; TCM – Traditional Chinese Medicine; TMS – Transcranial Magnetic Stimulation; VNS – Vagus Nerve Stimulation; WHO – World Health Organisation.

1. Introduction

Psychosomatic disorders are conditions in which psychological factors such as stress, anxiety, and depression substantially influence the onset, progression, or severity of physical symptoms. In the absence of clear organic pathology, they often manifest as chronic pain, gastrointestinal disturbances, fatigue, or other somatic complaints[1,2]. Recent revisions in the Diagnostic and Statistical Manual of mental disorders (DSM) reflect an improved understanding of the multifactorial nature of somatic symptom-related disorders and have enhanced their classification[3,4]. Psychological distress is common in chronic medical conditions and is associated with reduced quality of life, greater functional impairment, increased healthcare utilisation, and higher mortality. Mental health disorders are also linked to adverse cardiovascular outcomes, including increased mortality and major cardiac events in coronary heart disease[5-7]. Recognised by the World Health Assembly as leading global causes of disability, anxiety and depression are increasingly prevalent, particularly among patients with chronic digestive and stress-related disorders, underscoring the need for integrative therapeutic approaches[8]. From a biological standpoint, neuroendocrine, autonomic, and immune pathways are how chronic stress manifests itself. Elevated corticosteroid levels and prolonged Hypothalamic-Pituitary-Adrenal (HPA) axis activation can impair immunity and increase psychosomatic vulnerability[9,10].

Psychogenesis and holism provide the conceptual foundation for psychosomatic medicine, which emphasises the interdependent relationship between the mind and body in both health and illness[11]. Despite this knowledge, there is still a lack of mechanistic and translational research in psychosomatic medicine, especially when it comes to affordable, culturally sensitive, and non-pharmacological interventions[12].

Ayurvedic therapies provide a comprehensive framework for treating psychosomatic imbalance. By removing accumulated toxins (Ama) and reestablishing physiological regulatory processes, *panchakarma*-based interventions seek to restore systemic equilibrium. *Shirodhara* and *Nasyam* are two of these that have drawn more attention due to their possible function in neuropsychological regulation. While *Shirodhara*, which involves applying medicated oil to the forehead continuously, has been linked to relaxation responses and the modulation of stress-related pathways, *Nasyam*, which involves administering herbal oils intranasally, is traditionally used for head and mind disorders, and there is growing evidence that it can help with cognitive and stress-related symptoms[13-17]. This review critically integrates mechanistic theories, phytopharmacological data, and available clinical findings about *Shirodhara* and *Nasyam* in the context of psychosomatic disorders, in contrast to earlier narrative descriptions. The review attempts to clarify existing evidence, identify knowledge gaps, and highlight directions for future standardised and biomarker-driven clinical research by combining traditional *Ayurvedic* concepts with modern neurobiological perspectives.

1.1 Methodology Selection Database

In order to investigate the possible neurobiological mechanisms behind the effects of *Nasyam* and *Shirodhara* in psychosomatic disorders, this review used a literature survey approach. PubMed, Scopus, Web of Science, ScienceDirect, Google Scholar, and the AYUSH Research Portal were among the biomedical and conventional medicine databases where a thorough literature search was carried out. Predefined keyword combinations, including "*Nasyam*," "*Shirodhara*," "*Ayurveda*," "psychosomatic disorders," "stress," "neurobiology," "autonomic nervous system," and "hypothalamic pituitary adrenal axis," were used to conduct searches.

Eligible studies reporting physiological or neurobiological outcomes were screened, relevant endpoints extracted, and findings thematically synthesised across autonomic and neuroendocrine domains, with methodological quality and limitations critically assessed.

2. *Ayurvedic* Concept of *Nasaya*

According to the *Ayurvedic* literature, *Nasyam Karma* uses the notion of "*Nasa hi shiraso dwaram*," which states that the nose is the gateway to the head, to administer medicines through the nose[18]. Here's a shorter version. *Nasyam* treats neurodegenerative and psychoneurotic disorders, enhancing memory, clarity, and mental health[19]. *Nasyam Karma* is a particular kind of *Panchakarma* therapy utilised in *Ayurveda* that involves administering herbal preparations *via* the nasal route. These preparations are typically oils, powders, or decoctions. Here's a shorter version. Studies show this route bypasses the blood-brain barrier for rapid drug delivery to neurons[20,21]. In line with *Ayurvedic Vata* theory on disturbed brain signals and muscle control, nasal administration enables lipid-soluble oils to cross the blood-brain barrier and affect the limbic system and hypothalamus to modulate mood and cognition[22, 23].

2.1 Types of *Nasaya*

2.1.1 Pratimarsha Nasyam

Pratimarsha Nasyam provides users with a gentle procedure which they perform daily by inserting small doses of medicated oil or juice through their nostrils. Everyday users employ this technique to maintain overall health while treating dryness along with headaches and sinus congestion and initial neurological disorders[24]. The practice known as *Nitya karma* occurs daily. The gentle and non-invasive qualities of *Pratimarsha Nasyam* enable both elderly and disabled patients to safely use this treatment for extended periods. The traditional teachings prescribe *Pratimarsha Nasyam* treatment with between two and six drops per nostril that patients use once or twice daily at their preferred morning time[25]. This remedy provides nasal mucosa lubrication and restores equilibrium between *Vata* and *Kapha* doshas in the *Urdhwajatrugata* before enhancing olfactory strength and improving local circulation. Regular *Pratimarsha Nasyam* treatment has demonstrated positive effects on mucociliary clearance and nasal inflammation reduction alongside enhanced neurocognitive function[26,27].

2.1.2 Shodhana Nasyam

Shodhana Nasyam functions as a specialised treatment method which employs concentrated medicines at elevated levels to purify the head area. This advanced form of *Nasyam* serves the treatment needs of patients with persistent and severe head ailments which include *Ardita*, *Pakshaghata*, migraine, and chronic sinusitis along with conditions that involve *Vata* and *Kapha* imbalances[28]. The administration of this treatment occurs while a trained medical professional observes its effects closely by utilising various therapeutic approaches such as *Snehana* and *Swedana* to optimise medication absorption[29].

2.1.3 Brimhana Nasyam

In *Ayurveda*, there is a particular nasal treatment used for disorders that arise from an aggravated *Vata* dosha, named *Brimhana Nasyam*. The procedure is meant to nourish (*Brimhana*) and energise (*Balya*) the upper parts of the body[30]. Vata pathology, unlike other disorders, which are catabolic and degenerative for *Majja Dhatu* (nervous tissue) and the *Urdhva Jatru* region (head and neck), is considered specially for long-term neurological and degenerative disorders such as Parkinsonism, cervical spondylosis, *Pakshaghata* (hemiplegia), and *Ardita* (facial palsy)[31,32]. *Dashamoola* together with *Bala* (*Sida cordifolia*), *Ashwagandha* (*Withania somnifera*) being neuroprotective herbs and *Rasayana* (rejuvenating) herbs, are used in *Brimhana Nasyam* infusions prepared into oils, ghee, milk, and meat soups. These herbs are famous for enhancing neuro-regeneration, calming down inflammation in the brain, and enhancing muscle power and coordination[33-35]. *Ayurvedic* sciences have placed a lot of emphasis on nasal therapies for humans because it is thought that this area provides direct access to the *Shiras* (head/brain), the central nervous system, as well as the *prana vaha srotas* and *Majja Dhatu*. These lipid-based drugs are believed to affect cerebral blood flow, neuroendocrine signalling, and oxidative stress parameters after being administered by travelling via neural and paraneural pathways across the olfactory mucosa to the brain[36,37].

2.1.4 Shamana Nasyam

Shamana Nasyam, or *Palliative Nasyam*, is a *Nasyam Karma* variant aimed at soothing overactive *Doshas*, particularly *Vata* and *Pitta*, in conditions localised above the collarbone (Urdh Unlike *Brimhana Nasyam*, which is nourishing and strengthening, *Shamana Nasyam* mainly works by regulating biological functions and reducing swelling, helping to ease immediate discomfort and balance bodily energies[38,39].

This treatment includes using tiny quantities of certain medicatedoils, herbal infusions (*Kashaya*), or herbal extracts (*Swarasa*) crafted from herbs that balance amongthe frequently used herbs and mixtures in *Shamana Nasyam* are *Brahmi* (*Bacopa monnieri*), *Yashtimadhu* (*Glycyrrhiza glabra*)[40]. *Shamana Nasyam* may be advised for a variety of ailments, including but not limited to *Shirashoola* (headache), *Karna roga* (ear disorders), *Akshi roga* (ocular disorders), *Tandra* (lethargy), *Ardita* (facial palsy), *Pakshaghat* (hemiplegia), *Anidra* (insomnia), anxiety, and epileptic disorders (*Apasmara*). *Shamana Nasyam* may be given after preparatory techniques (*Purvakarma*), including *Swedana* and *Mridu Snehana*, which open the nasal passages and release *doshas*, producing optimal absorption. *Shamana Nasyam* interacts with the central nervous system *via* the cribriform plate through the olfactory and trigeminal neural pathways, impacting neuroendocrine function, inflammation, and oxidative stress[41-44]. The medicated oils used in *Shamana Nasyam* possess antioxidant, neuroprotective, anxiolytic, and anti-inflammatory properties that alleviate the symptoms of neurological and psychosomatic disorders[45]. For instance, in a clinical study, *Brahmi Ghrita Nasyam* showed a marked improvement in cognitive function and a significant reduction in anxiety scores in patients with generalised anxiety disorder and mild cognitive impairment. Similarly, *Ksheerabala Taila Nasyam* was assessed to treat neuromuscular disorders and demonstrated efficacy through reducing pain and stiffness in cervical spondylosis and facial palsy[46].

3. *Ayurvedic* Concept of *Shirodhara*

Shirodhara is an ancient *Ayurvedic* therapy that involves the continuous pouring of a warm liquid, typically herbal oil, medicated milk, or buttermilk, over the forehead (*Shira* - head, *Dhara* - flow) in a rhythmic manner. It is a classical mind-body relaxation technique that has been traditionally employed for the management of various psychosomatic, neurological, and psychiatric disorders in *Ayurveda*[47]. Rooted in the principles of *Tridosha* balance (*Vata, Pitta*, and *Kapha*), *Shirodhara* is primarily indicated for the pacification of aggravated *Vata* and *Pitta* doshas, which are believed to be responsible for mental agitation, stress, anxiety, insomnia, and other nervous system disturbances[48]. *Shirodhara*, by stimulating

the *Agnya Chakra* (the energy centre located between the eyebrows), is thought to modulate neuroendocrine pathways, bringing about a state of mental calmness and enhanced psychological resilience[49]. The continuous flow of warm oil is believed to calm the hypothalamus, helping to regulate the autonomic nervous system and reduce sympathetic overactivity[50]. Recent neurobiological and behavioural research has validated these old statements. It has been shown that *shirodhara* massage modulates stress by notably lowering serum levels of cortisol[51]. Heart rate variety is also enhanced, indicating increased parasympathetic activity. *Shirodhara* has also been used as a complement to treat illnesses like high blood

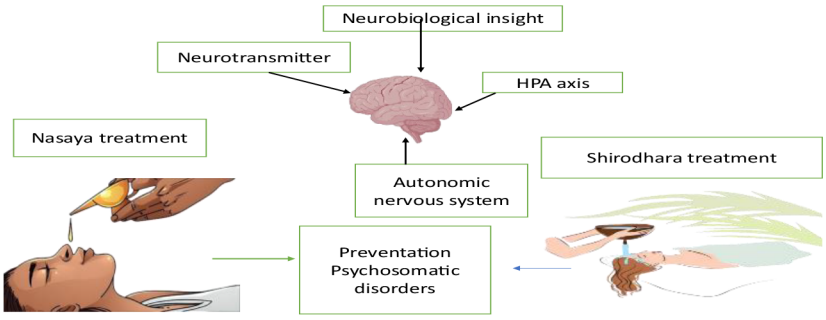


Figure 1. *Ayurvedic* treatment of psychosomatic disorders through *Nasaya* and *Shirodhara*[53].

pressure anxiety disorders, sleeplessness, and despair[52]. Based on the individual's *Prakriti* (constitution) and the type of ailment, a certain liquid is chosen for *Shirodhara*. *Ksheera Dhara*, for example, is frequently prescribed for a variety of *Pitta*-related maladies, while *Takra Dhara*, which uses medicated buttermilk, is advised for skin disorders and mental health conditions associated with Pitta imbalance[53]. *Shirodhara* is gaining increasing recognition in modern integrative medicine for its potential psychoneuroimmunological benefits and is now being incorporated into wellness and mental health management programs worldwide (Figure 1)[54].

4. Modern Correlates and Mechanistic Basis

In recent years, *Nasyam* has gained recognition outside of conventional frameworks as an intranasal drug delivery technique that allows direct access to the brain through the olfactory pathway, avoiding the blood-brain barrier and promoting quick neuromodulator effects. Evidence that lipophilic and water-soluble herbal preparations (like *Brahmi* and *Anu Taila*) (Table 1) can modulate important neurotransmitters like dopamine and serotonin supports this. Intranasal essential oil studies have also shown that olfactory-induced changes in neuroendocrine and autonomic parameters can also have similar mechanisms[55]. *Shirodhara* uses unique autonomic and neurophysiological processes in the meantime. Standardised procedures that involve applying warm oil to the forehead have produced parasympathetic dominance, as shown by marked increases in heart rate variability and decreases in blood pressure and respiration rate. At the same time, EEG alpha rhythm markers associated with relaxation states are enhanced[56]. Additionally, clinical data from the last six years demonstrate that *Shirodhara* consistently lowers cortisol levels and restores sleep architecture, and functional brain imaging studies (fMRI, EEG) validate its calming effects by demonstrating increased prefrontal-limbic connectivity and attenuated sympathetic, which are like patterns seen in meditative states[57,58]. An open-label study in healthy volunteers showed that standardised *Shirodhara* significantly reduced respiratory rate, heart rate, and diastolic blood pressure while increasing EEG alpha activity, indicating relaxation and enhanced parasympathetic tone. Clinical observations and case studies have further reported reductions in serum cortisol and DHEA, along with improved mood and blood pressure control[69]. In patient populations, including breast cancer survivors, controlled trials using *Jatamansi Taila Shirodhara* demonstrated reductions in psychological distress and improvements in quality of life, suggesting benefits extending beyond simple relaxation[70]. While available studies offer preliminary human evidence of physiological and psychological benefits, their interpretation is limited by small samples, open-label designs, heterogeneous methods, and scarce placebo controls. Mechanistic insights, especially regarding neurotransmission and brain connectivity, remain tentative. Well-designed controlled human trials using objective biomarkers such as cortisol, EEG, HRV, and neuroimaging are essential to validate mechanisms and clarify the effects of *Nasyam* and *Shirodhara* in psychosomatic and stress-related disorders[71].

5. Clinical Trials Efficacy and Evidence of *Nasaya* and *Shirodhara*

Ayurvedic therapies such as *Nasyam* (nasal administration of medicated oils) and *Shirodhara* have long been used to manage neurological and psychological disorders. These interventions are believed to influence the central nervous system by bypassing the blood-brain barrier and acting through olfactory and trigeminal pathways. Clinical evidence suggests that *Nasyam* may reduce anxiety, migraine symptoms, and sleep disturbances[78]. A randomised controlled trial using *Anu Taila Nasyam* in patients with generalised anxiety disorder demonstrated significant reductions in GAD-7 scores, indicating potential anxiolytic effects possibly mediated through GABAergic and serotonergic modulation. Similarly, *Brahmi Ghita*, *Nasyam* has been associated with reduced migraine frequency, duration, and severity, consistent with its proposed neuroprotective and vasodilatory properties[79,80]. These findings are further supported by case reports. An *Ayurvedic* case study reported marked improvement in migraine symptoms following *Anu taila*, Nasya, demonstrating clinical benefit despite the limited sample size. In addition, *Ksheerabala Taila Nasyam*, known for its calming and *Vata*-pacifying effects, has been associated with improved sleep

Table 1. Some herbal botanicals show evidence-based neurotransmitter modulations

Si. No.	Herbal Medicines	Botanical Name	Plant Part	Bioactive Constituents	Mechanism	Level of Evidence	References
1	*Brahmi*	*B. monnieri*	Whole plant	Bacosides A/B	↑ 5-HT, ↑ ACh, ↓ DA depletion	Clinical and Preclinical	[59]
2	*Shankhapushpi*	*C. pluricaulis*	Whole plant	Shankhpushpine, Scopoletin	GABA-A agonist, anxiolytic, ↑ ACh via AChE inhibition	Preclinical	[60]
3	Indian pennywort	*Centella asiatica*	Whole plant	Asiaticoside, Madecassoside	Memory enhancement; AChE inhibition	Clinical and Preclinical	[61]
4	*Ashwagandha*	*W. somnifera*	Roots	Withanolides	↑ GABA, ↓ cortisol, anxiolytic	Clinical	[62]
5	*Centella* and *Brahmi combo*	*C. asiatica, B. monnieri*	Leaves	Asiaticosides, Bacosides	Synergistic nootropic, ↑ cerebral blood flow	Clinical	[63]
6	Rosemary	*Rosmarinus officinalis*	Leaves	1,8-Cineole, α-Pinene	↑ ACh, AChE inhibition; cognitive enhancement	Preclinical	[64]
7	Lavender	*Lavandula angustifolia*	Flowers	Linalool, Linalyl acetate	↑ GABAergic activity; anxiolytic	Clinical and Preclinical	[65]
8	Frankincense	*B. sacra*	Resin	Boswellic acids	AChE inhibition	Preclinical	[66]
9	*Vacha*	*Acorus calamus*	Rhizome	β-Asarone	↑ ACh, ↑ DA; memory enhancement	Preclinical	[67]
10	Turmeric	*Curcuma longa*	Rhizome	Curcumin	↓ AChE; antioxidant	Clinical and Preclinical	[68]
11	*Jatamansi*	*N. jatamansi*	Roots	Valeranone, Jatamansone	Sedative; ↑ DA and 5-HT	Clinical	[69]
12	*Kava*	*Piper methysticum*	Roots	Kavalactones	↑ GABA	Clinical	[70]
13	Wild rue	*Peganum harmala*	Seeds	Beta-carbolines	MAO-A/B inhibition → ↑ 5-HT, ↑ DA	Preclinical	[71]
14	Peppermint	*Mentha piperita*	Leaves	Menthol, Menthone	↑ DA	Preclinical	[72]
15	Sage	*Salvia officinalis*	Leaves	Rosmarinic acid, Thujone	AChE inhibition	Preclinical	[73]
16	Sandalwood oil	*Santalum paniculatum*	Wood	Santalols, Sesquiterpenes	Neuroprotective	Preclinical	[74]
17	Clove	*Eugenia caryophyllus*	Flower buds	Eugenol	Modulates GABA and glutamate	Preclinical	[75]
18	Lemongrass	*Cymbopogon flexuosus*	Leaves	Citral, Geraniol	↑ GABAergic activity; anxiolytic; mood stabilising	Preclinical	[76]
19	Cinnamon	*Cinnamomum zeylanicum*	Bark	Cinnamaldehyde	↑ DA, ↑ 5-HT	Preclinical	[77]

efficiency and higher Pittsburgh Sleep Quality Index (PSQI) scores[81]. *Shirodhara* has also shown therapeutic potential in managing sleep disturbances, stress, anxiety, and depression[82]. Randomised controlled trials using *Brahmi and Jatamansi oils* reported significant reductions in salivary cortisol levels, along with improvements in Hamilton Anxiety Rating Scale (HAM-A) and Perceived Stress Scale (PSS) scores, reflecting decreased psychological and physiological stress[83]. Case reports further support these findings, showing that *Shirodhara*, alone or combined with therapies such as *Nasya*, behavioural interventions, *Yoga Nidra*, or *Abhyanga*, can improve insomnia, reduce anxiety, and enhance overall well-being[84]. Despite these

positive observations, the evidence is limited by small sample sizes, variable methodologies, short follow-up periods, and a lack of standardised formulations and protocols, which reduce reproducibility and generalisability. Placebo-controlled trials are scarce, and many outcomes rely on subjective measures, increasing potential bias. Mechanistic validation using EEG, HRV, fMRI, or biochemical markers remains insufficient[85]. Consequently, while *Nasyam* and *Shirodhara* show therapeutic promise for psychosomatic and stress-related disorders, rigorous multicentre randomised controlled trials with standardised interventions and objective neurophysiological assessments are needed to establish efficacy, clarify mechanisms, and support integration into modern clinical practice[86].

5.1 Combined Protocols and Holistic Management in Psychosomatic Disorders

Nasyam, a key therapeutic intervention in *Ayurveda*, involves the instillation of medicated oils, powders, or decoctions into the nasal passages, thereby providing direct access to the Central Nervous System (CNS) through the olfactory and trigeminal pathways. This intranasal route bypasses the blood-brain barrier, allowing active herbal constituents to exert rapid neuromodulator effects[86]. Among the widely used *Nasyam* formulations, *Brahmi Taila* and *Anu Taila* have demonstrated efficacy in modulating key neurotransmitters such as dopamine, serotonin, and Gamma-Aminobutyric Acid (GABA), which play critical roles in the pathophysiology of anxiety, insomnia, and cognitive dysfunction[87,88]. Through its neurochemical effects, *Nasyam* therapy has been shown in both clinical and experimental studies to significantly improve working memory, emotional regulation, and stress tolerance[89]. *Shirodhara*, the continuous application of warm medicated oil over the forehead (*Ajna Chakra*), exerts therapeutic effects by regulating the autonomic nervous system and the Hypothalamic-Pituitary-Adrenal (HPA) axis, thereby promoting parasympathetic dominance, deep relaxation, and neuroendocrine balance[90]. Neuroimaging studies indicate that *Shirodhara* enhances cortical activity linked to emotional regulation and cognitive clarity while reducing hyperactivity in limbic regions associated with stress[91]. Randomised controlled trials further support its role in psychosomatic disorders through reductions in cortisol levels, normalisation of heart rate variability, and decreased anxiety[92]. *Medhya Rasayana* herbs, including *C. asiatica*, *W. somnifera*, *B. monnieri*, and *Convolvulus pluricaulis*, provide neuroprotective and anxiolytic benefits by supporting cognitive and emotional functions[93,94]. *B. monnieri* enhances neurogenesis and synaptic plasticity, leading to improvements in memory and attention[95], while *Ashwagandha* exhibits adaptogenic effects through HPA axis modulation and GABAergic activity, alleviating anxiety and depressive symptoms[96,97]. Clinical studies report improved cognition, sleep quality, and emotional well-being with standardised *Medhya* formulations, either alone or as adjuncts to other *Ayurvedic* therapies[98,99]. An integrative regimen combining *Shirodhara*, *Nasyam*, *Medhya Rasayana*, yoga practices, and a sattvic, seasonally adapted diet supports autonomic regulation, gut-brain axis balance, and psychological resilience. *Panchakarma* therapies further contribute by detoxifying, restoring *doshic* balance, and improving neurophysiological and psychosocial outcomes in chronic psychosomatic disorders[100-106].

5.2 Advanced Conventional Treatments of Psychosomatic Disorders

Pharmacotherapy continues to play a vital role in the treatment of psychosomatic disorders. Selective Serotonin Reuptake Inhibitors (SSRIs), including escitalopram and sertraline, are widely used to alleviate anxiety, depressive symptoms, and associated somatic distress through modulation of serotonergic signalling[107,108]. Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs), such as duloxetine and venlafaxine, are especially effective in individuals presenting with concurrent chronic pain and mood disorders due to their combined influence on affective regulation and nociceptive processing[109]. In cases unresponsive to first-line treatments, atypical antipsychotics like quetiapine and aripiprazole may be employed to manage pronounced anxiety, somatic fixation, and emotional instability[110]. Gabapentin, including pregabalin and gabapentin, also provide benefit in chronic pain conditions such as fibromyalgia by attenuating neuronal hyperexcitability[111].

Psychotherapeutic interventions remain foundational to psychosomatic management. Cognitive Behavioural Therapy (CBT) is regarded as the standard approach for restructuring maladaptive thought patterns and reducing symptom amplification[112]. Newer modalities, including Mindfulness-Based Cognitive Therapy (MBCT) and Acceptance and Commitment Therapy (ACT), foster psychological flexibility by integrating mindfulness practices with values-based coping strategies[113,114]. Trauma-focused therapies, such as Eye Movement Desensitisation and Reprocessing (EMDR) and somatic experiencing, are particularly effective in patients whose psychosomatic symptoms are linked to unresolved trauma or adverse life events[115]. Neuromodulation approaches are increasingly recognised as effective adjunctive treatments. Transcranial Magnetic Stimulation (TMS) has demonstrated benefits in treatment-resistant depression and select chronic pain conditions, while Vagus Nerve Stimulation (VNS) shows promise by modulating autonomic and inflammatory pathways[116,117]. Neurofeedback therapy further supports symptom management by enabling real-time regulation of dysfunctional neural activity associated with anxiety and somatisation[118]. Complementary and integrative therapies, including yoga and meditation, contribute to autonomic balance and stress mitigation[119]. Nutritional psychiatry highlights the importance of the gut-brain axis, with anti-inflammatory diets, omega-3 fatty acids, and probiotics supporting improvements in mood and somatic symptoms[120]. Additionally, digital health innovations such as telepsychiatry, internet-delivered CBT, virtual reality-based interventions, and wearable biofeedback technologies have expanded accessibility to care and enabled continuous monitoring of stress-related physiological responses[121-123]. Recent advances in precision medicine, incorporating genetic and microbiome analyses, are refining personalised treatment approaches. Genetic polymorphisms, including 5-HTTLPR, may influence therapeutic outcomes, while psychobiotics targeting gut-brain communication show potential in managing conditions such as irritable bowel syndrome and chronic fatigue[124,125]. Multidisciplinary care models that integrate medical, psychological, and rehabilitative expertise are increasingly recognised as essential for addressing the complex biopsychosocial dimensions of psychosomatic disorders[126,127].

6. Some Other Traditional Approaches Prevention of Psychosomatic Disorders

6.1 Acupuncture Therapy

The underlying principle of acupuncture involves the insertion of fine needles at specific anatomical points known as acupoints, which are believed to regulate the flow of Qi (vital energy) through channels called meridians. In the context of modern medicine, acupuncture is understood to exert its therapeutic effects through the modulation of the nervous system, neuroendocrine pathways, and immune responses[128]. By stimulating peripheral nerves, acupuncture can influence central nervous system activity, promoting the release of neurotransmitters such as serotonin, dopamine, Gamma-Aminobutyric acid (GABA), and endorphins, which play critical roles in mood regulation, pain perception, and stress responses[129,130]. A growing body of evidence supports the efficacy of acupuncture in the treatment of several psychosomatic conditions. Acupuncture reduces anxiety by increasing parasympathetic activity, decreasing cortisol, and modifying the HPA axis[131]. According to RCTs, acupuncture relieves anxiety just as well as medication while having fewer adverse effects[132]. Either by itself or in combination with antidepressants, acupuncture reduces depression by modulating monoamines[133]. Psychosomatic disorders like fibromyalgia, chronic tiredness, IBS, and tension headaches can be effectively treated with acupuncture. Meta-analyses show acupuncture relieves fibromyalgia pain, fatigue, and dysfunction by activating pain inhibition and reducing inflammation[134]. By modulating the gut-brain axis, acupuncture reduces IBS pain and controls gut motility and autonomic function[135]. The neurobiological mechanisms underlying acupuncture's effects in psychosomatic disorders are increasingly understood through modern research. Functional MRI studies demonstrate that acupuncture modulates activity in brain regions associated with emotion regulation, including the amygdala, hippocampus,

anterior cingulate cortex, and prefrontal cortex[136]. Additionally, acupuncture has been shown to exert anti-inflammatory effects by modulating cytokine profiles and influencing the vagus nerve, a key pathway in the neuroimmune interface[137]. These findings support the use of acupuncture in conditions where neuroinflammation and autonomic dysfunction are central pathophysiological features. One of the major advantages of acupuncture in psychosomatic disorders is its favourable safety profile. Compared to pharmacological treatments, acupuncture is associated with fewer side effects, which makes it particularly suitable for individuals who are sensitive to medications or those seeking non-pharmacological interventions[138].

6.2 Traditional Chinese Medicine Contribution in Psychosomatic Disorders

Traditional Chinese Medicine (TCM) has emerged as a valuable integrative approach in the management of psychosomatic disorders, offering a holistic perspective that addresses both psychological and physical dimensions of illness. Rooted in ancient philosophies of balance between Yin and Yang and the smooth flow of Qi (vital energy) through meridians, TCM views emotional distress as directly linked to physical health, where specific emotional states such as anger, worry, sadness, and fear are associated with corresponding organ systems like the Liver, Spleen, Heart, and Kidneys[139]. This mind-body framework aligns closely with modern psychoneuroimmunology and biopsychosocial models of health. Among the key TCM therapies, acupuncture has gained substantial evidence for its effectiveness in treating anxiety, depression, chronic pain, and functional somatic syndromes by modulating neurotransmitter activity, autonomic balance, and Hypothalamic-Pituitary-Adrenal (HPA) axis regulation[140,141]. Chinese herbal medicine, using individualised formulations such as *Bupleurum, Uncaria*, and *Angelica*, has shown neuroprotective, anti-inflammatory, and adaptogenic effects, proving beneficial in mood disorders and stress-related somatic complaints[142,143]. Additionally, movement-based therapies like Qigong and Tai Chi have demonstrated effectiveness in reducing psychological distress, enhancing autonomic regulation, and improving chronic musculoskeletal pain[144,145]. TCM dietary therapy, which uses food as medicine to nourish organ systems and restore balance, complements these interventions by supporting mental well-being through gut health and anti-inflammatory effects[146,147].

7. Challenges and Future Direction of *Nasaya* and *Shirodhara*

Nasyam and *Shirodhara* show promise in treating psychosomatic disorders, but their broader clinical acceptance is limited by challenges such as the lack of standardisation in oils, formulations, and procedures, leading to inconsistent efficacy across studies[148,149]. It is challenging to evaluate these treatments beyond placebo effects due to a lack of thorough placebo-controlled trials. The lack of inert placebos for oil-based therapies is a major challenge for high-quality RCTs[150,151]. To confirm the effectiveness of *Shirodhara* and *Nasyam,* multicenter RCTs with larger, more varied samples are required[152]. To Integrating fMRI, HRV, and EEG as neurobiological markers is crucial to elucidating processes. It is crucial to integrate fMRI, HRV, and EEG as neurobiological markers in order to elucidate mechanisms[153,154].

8. Conclusion

Nasyam and *Shirodhara* may improve emotional regulation and stress resilience by modulating neurotransmitter systems and the Hypothalamic-Pituitary-Adrenal (HPA) axis. Preliminary evidence suggests they can alleviate psychosomatic symptoms and enhance overall health and quality of life. However, non-standardised protocols and a lack of placebo-controlled trials currently limit their broader clinical application. Future research should concentrate on creating standardised herbal formulations, conducting well-designed multicentre randomised controlled trials, and using cutting-edge neurophysiological and imaging tests like fMRI, HRV, and EEG to clarify underlying mechanisms in order to establish solid scientific evidence. By strengthening this body of evidence, *Ayurvedic* interventions could be incorporated into contemporary clinical practice, promoting a patient-centred, holistic, and evidence-based approach to the treatment of psychosomatic disorders.

9. Acknowledgement

We appreciate SRM Modinagar College of Pharmacy for its assistance and collaboration.

10. References

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Author Contribution

Prangya Paramita Pati conceptualised the study, contributed to the literature review, and drafted the initial manuscript. Puja Saha assisted with data collection, literature screening, and manuscript editing. Sandip Chatterjee contributed to study design, critical revision of the manuscript, and intellectual content. Siddhant Krishna supported data interpretation, methodological refinement, and reference management. Dolly Rani contributed to manuscript review, formatting, and final approval. All authors have read and agreed to the published version of the manuscript.