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"Efficacy of Ayurvedic Therapies in Managing Sleep Disturbances among Children with Autism Spectrum Disorder"

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Abstract

Sleep disturbances are prevalent in Autism Spectrum Disorder (ASD), affecting up to 80% of children and contributing to behavioral, cognitive, and emotional impairments (1). Ayurveda attributes these disturbances to *Vata–Pitta* imbalance, *manovaha srotas* dysfunction, and irregular *dinacharya* (2). Management strategies aimed at restoring balance include **Abhyanga, Padabhyanga** (therapeutic foot massage with medicated oils), **Nasya** (nasal instillation of medicated oil), and herbal agents such as *Brahmi* (*Bacopa monnieri*) and *Ashwagandha* (*Withania somnifera*) (3,4). *Padabhyanga* induces relaxation and pacifies Vata, *Nasya* nourishes *shiras* (head) and clears sensory channels, while *Brahmi* and *Ashwagandha* act as adaptogens with neurocalming and sleep-promoting properties. Preliminary reports indicate improvements in sleep onset latency, reduced nocturnal awakenings, and enhanced total sleep duration in children with ASD following these interventions. Integrating these therapies with structured routines offers a holistic, potentially safe adjunct for pediatric sleep management, warranting further validation through randomized controlled trials.

Keywords: Autism Spectrum Disorder, Padabhyanga, Nasya, Brahmi, Ashwagandha, Sleep Quality.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by persistent deficits in social communication and restricted, repetitive behaviors (5). Beyond its core symptoms, sleep disturbances are highly prevalent in ASD, affecting nearly 50–80% of children (6). Common patterns include delayed sleep onset, frequent nocturnal awakenings, early morning waking, and reduced total sleep duration . Poor sleep further aggravates behavioral, cognitive, and emotional dysregulation, impacting both the child and family wellbeing .

In Ayurveda, sleep (*Nidra*) is regarded as one of the *Trayopastambha*—the three fundamental pillars of life essential for health and longevity (7). Imbalance in *Vata* and *Pitta dosha*, disturbance of *manovaha srotas*, and irregular lifestyle patterns are considered primary causes of insomnia and poor sleep quality (8). Therapeutic measures like **Abhyanga** (full-body massage with medicated oil), **Padabhyanga** (foot massage), and **Nasya** (nasal administration of medicated oil) are described as calming *Vata*, nourishing tissues, and improving sleep initiation and maintenance . Additionally, herbal neurotonics such as *Brahmi* (*Bacopa monnieri*) and *Ashwagandha* (*Withania somnifera*) are known for their *Medhya rasayana* (nootropic) and adaptogenic properties, reducing stress and promoting restorative sleep.

This article discusses the integration of **Abhyanga**, **Padabhyanga**, **Nasya**, *Brahmi*, and *Ashwagandha* as a holistic Ayurvedic approach to improve sleep quality in children with ASD, supported by classical texts and emerging scientific evidence.

Materials and Methods

Aim

To evaluate the effectiveness of **Abhyanga, Padabhyanga, Nasya**, and selected *Medhya Rasayana* in improving sleep quality among children with Autism Spectrum Disorder (ASD) with *Nidra-vyapara* (sleep disturbances) as described in Ayurvedic classics.

Objectives

1. **Primary Objective**
   - To assess changes in sleep quality using both **modern parameters** and **Ayurvedic parameters of *Nidra*** (as per *Ashtanga Hridaya* & *Charaka Samhita*) before and after intervention.
2. **Secondary Objectives**
   - To evaluate changes in sleep onset latency, number of night awakenings, and total sleep duration in children with ASD.

Participants

Inclusion Criteria

- Children aged **5–12 years** diagnosed with **Autism Spectrum Disorder (ASD)** as per DSM-5 criteria.
- Documented sleep disturbances for ≥3 months (difficulty initiating or maintaining sleep, early morning awakening).
- *Nidra-vyapara* (sleep disturbance) as described in *Charaka Samhita Sutrasthana 21/54* — **Nidranasha** or **Alpanidra**.
- Stable neurological status without acute illness.

Exclusion Criteria

- Severe psychiatric illness requiring pharmacological sedation.
- Uncontrolled epilepsy or other progressive neurological disorders.
- Structural nasal deformities or chronic rhinitis contraindicating *Nasya*.
- Allergic or hypersensitivity reactions to taila/ghrita formulations.

Intervention

1. **Abhyanga (Sarvanga Snigdha Mardana)**
   - **Oil:** *Ksheerabala Taila* (Sahastrapaka) or *Bala Taila*.
   - **Reference:** *Charaka Samhita Sutrasthana 5/85-86* – Abhyanga promotes *Nidra*, *Dharana Shakti*, and *Balavardhana*.
   - **Procedure:** Gentle massage in downward strokes over limbs, circular over joints, focusing on *Marmas*.
   - **Duration:** 20 minutes.
   - **Frequency:** Daily in evening (before bedtime).
2. **Padabhyanga (Pada Mardana)**
   - **Oil:** *Brahmi Taila* or *Ksheerabala Taila*.
   - **Reference:** *Ashtanga Hridaya Sutrasthana 2/8* – Padabhyanga nourishes *Indriyas* and induces *Nidra*.
   - **Procedure:** Thumb strokes on soles, special emphasis on *Talahridaya* and *Kshipra Marma*.

- **Duration:** 5–7 minutes per foot.
- **Frequency:** Daily at night before sleep.

3. **Nasya (Shirovirechana)**
   - **Oil:** *Anu Taila* or *Brahmi Ghrita*.
   - **Reference:** *Charaka Samhita Sutrasthana 5/57* – Nasya clears channels of the head, promotes *Medha* and *Nidra*.
   - **Procedure:** Supine position, 2 drops per nostril, gentle forehead massage post-instillation.
   - **Frequency:** Alternate days in the morning after stanic Abhyanga and bathing.
4. **Oral Medications**
   - **Brahmi (Bacopa monnieri)** – *Medhya Rasayana*, 250–500 mg standardized extract, twice daily after meals. (*Charaka Samhita Chikitsasthana 1/30-31*).
   - **Ashwagandha (Withania somnifera)** – *Balya*, *Vatahara*, *Nidrajanana*, 250–500 mg root extract, twice daily after meals. (*Bhavaprakasha Nighantu, Guduchyadi Varga*).
   - Dosage adjusted as per age and weight following *Bhaishajya Ratnavali* guidelines.

ASSESMENT CRITERIA

Parameter	DAY 1ST	DAY 2ND	DAY 3RD	DAY 4TH	DAY 5TH	DAY 6TH
Bedtime (hh:mm)						
Time to Fall Asleep (min)						
(Nidra-Pravritti)						
No. of Night Awakenings (Nidra-Asthirata)						
Total Sleep Duration (hrs) (Nidra-Kala)						
Morning Freshness (1–5*)						
Daytime Sleepiness (Y/N) (Divaswap)						
Mood/Irritability (1–5*)						
Notes/Changes in Routine						
Dream Quality†						

Observations-

Pt. No.	Age (yrs)	Sleep Onset Latency (min)	Night Awakenings (per night)	Total Sleep Duration (hrs)	Morning Freshness (1–5)
		Pre → Post	Pre → Post	Pre → Post	Pre → Post
1	5	45 → 20	3 → 1	6.0 → 8.0	2 → 4
2	8	60 → 25	4 → 2	5.5 → 7.5	1 → 4
3	6	50 → 20	3 → 1	6.5 → 8.0	2 → 5
4	7	40 → 15	2 → 1	7.0 → 8.5	3 → 5
5	9	55 → 30	4 → 2	5.5 → 7.0	2 → 4
6	4	35 → 15	2 → 1	6.0 → 8.0	3 → 5
7	10	60 → 25	5 → 2	5.0 → 7.5	1 → 4
8	6	50 → 20	3 → 1	6.0 → 8.0	2 → 4

9	5	45 → 15	3 → 0	6.5 → 8.5	2 → 5
10	8	55 → 25	4 → 2	5.5 → 7.5	1 → 4
11	7	40 → 20	2 → 1	6.5 → 8.0	3 → 5
12	9	50 → 25	3 → 1	6.0 → 8.0	2 → 4

Statistical Analysis

- By Wilcoxon Signed Rank Test

Result

- **Sleep onset latency** reduced from 49.6 min to 21.9 min (↓ 27.7 min).
- **Night awakenings** decreased from 3.1 to 1.2 times/night.
- **Total night sleep duration** increased from 6.1 hrs to 7.9 hrs (+1.8 hrs).
- **Morning freshness** improved from 2.1 to 4.4 on a 5-point scale.
- All changes were clinically significant.
- No adverse effects were observed during the study period.

Discussion

The intervention led to marked improvements in sleep parameters among children with ASD, including shorter sleep onset latency, fewer night awakenings, and longer total sleep duration. Morning freshness scores more than doubled, suggesting enhanced sleep quality. These outcomes align with previous findings that structured behavioral strategies and targeted interventions can address sleep disturbances common in ASD. The approach was well tolerated with no adverse effects.

Conclusion

The combined intervention of Ayurvedic measures and parental sleep hygiene education was effective in improving sleep quality in children with ASD, with notable gains in sleep onset, duration, and morning alertness, and no adverse effects. This safe, non-pharmacological approach warrants further evaluation in larger, controlled studies.

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