

RESEARCH PAPER

An Exploratory Clinical Study of Organic Go Ghrita Administered Orally and Through Pratimarsha Nasya in Children with Autism Spectrum Disorder with Digital Nadi Assessment

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ABSTRACT

Background: Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by restricted, repetitive behaviours and deficits in social communication. Conventional therapies have limited efficacy in addressing core symptoms, prompting exploration of integrative approaches. In Ayurveda, Go Ghrita (cow ghee) is described as a Medhya Rasayana with potential neuropsychological benefits.

Methods: A single-arm, open-label exploratory clinical study was conducted on 30 children aged 3–16 years diagnosed with ASD according to INCLIN criteria, supplemented with Nadi assessment. Organic Go Ghrita prepared from Tharparkar breed cows, fed on five desert grasses (Sewan, Dhaman, Ganthia, Bekar, Bhunt), was administered orally in age-appropriate doses along with Pratimarsha Nasya. The primary outcome was the change in ISAA scores, while secondary outcomes included the Parental Stress Index, behavioural observations, and Nadi Tarangini parameters.

Results: There was a statistically significant reduction in ISAA scores from baseline (100.63 ± 12.54) to post-treatment (83.17 ± 10.21), representing a 17.39% improvement ($Z = -4.78$, $p < 0.001$). The Parental Stress Index showed a significant decrease of 22.16% ($p < 0.001$). Digital Nadi assessment revealed significant Vata pacification (49.59%) with simultaneous restoration of Pitta and Kapha parameters ($p < 0.001$). No adverse events were reported during the study.

Discussion: The Medhya Rasayana, and lipophilic properties of Organic Go Ghrita may influence neurocognitive processes by modulating the gut–brain axis, neuroinflammation, and autonomic homeostasis. Digital Nadi assessment offers objective evaluation of Doshic and autonomic patterns in ASD, while Pratimarsha Nasya potentially facilitates direct drug delivery to the brain via olfactory and trigeminal pathways.

Conclusion: This exploratory study provides preliminary evidence supporting the safety and potential therapeutic role of Organic Go Ghrita, administered orally and via Nasya, in children with ASD. Additionally, it highlights the utility of digital Nadi Tarangini assessment in integrative pediatric research.

Keywords: Autism Spectrum Disorder; Go Ghrita; Pratimarsha Nasya; Ayurveda; Medhya Rasayana; Nadi Tarangini

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INTRODUCTION

Autism Spectrum Disorder (ASD) is a multifaceted neurodevelopmental disorder marked by restricted and repetitive behavioural patterns as well as persistent difficulties in social interaction and communication. According to the International Classification of Diseases, 11th Revision (ICD-11), Autism Spectrum Disorder (code-6A02) is classified under neurodevelopmental disorders and is characterized by persistent deficits in social communication and interaction, along with restricted, repetitive patterns of behaviour, with onset in early developmental period. An estimated 1 in 100 children worldwide are thought to

have ASD, and this prevalence is rising due to revisions in diagnostic criteria, increased awareness, and improved diagnostic procedures¹. Effective management of core ASD symptoms remains challenging despite advancements in behavioural therapies, speech therapy, and educational interventions; pharmacological treatments are primarily limited to addressing associated behavioural issues rather than core deficits².

From an Ayurvedic perspective, disorders of Manovaha Srotas and Unmada are conceptually linked to conditions presenting as impaired social interaction, deviant conduct, communication difficulties, and

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cognitive deficits³⁻⁴. Classical Ayurvedic texts describe these conditions as involving impairment of higher mental faculties (Dhee, Dhriti, and Smriti) and primarily derangement of Vata, along with Pitta and Kapha. Ayurveda emphasizes Medhya Rasayana therapy to enhance cognitive abilities and restore mental equilibrium.

Ghrita (clarified butter from cow's milk) occupies a prominent role among Medhya Rasayana due to its nootropic, restorative, and Sanskaranuvartana (drug-carrying) properties⁵⁻⁶. Traditionally, conditions such as speech delay, cognitive impairment, and behavioural abnormalities have been treated with formulations like Saraswata Ghrita and Brahmi Ghrita⁷. Contemporary research demonstrates that cow ghee contains conjugated linoleic acid, omega

3 fatty acids, short- and medium-chain fatty acids, and fat-soluble vitamins (A, D, E, K), which are critical for neuronal membrane integrity and synaptic function⁸.

According to the principle "Shiraso Dwaram Nasa Hi", Nasya Karma is regarded in Ayurveda as a primary therapy for disorders affecting the head and central nervous system, as the nasal route serves as the gateway to the brain⁹. Pratimarsha Nasya, a gentle and safe form, allows regular administration and is suitable for children. Modern neuropharmacological studies indicate that intranasal drug delivery is a non-invasive route that bypasses hepatic first-pass metabolism and facilitates direct entry to the brain via the olfactory and trigeminal pathways¹⁰. For many brain illnesses, natural remedies are becoming more popular than synthetic pharmacological therapy. In addition to a number of nootropic herbs with multifaceted bioactivities in a variety of illnesses, Ayurveda offers a holistic approach to treatment¹¹.

Recent technological advancements, such as Nadi Tarangini, provide objective measurement of autonomic balance, Doshic predominance, and pulse parameters. Autonomic dysregulation, particularly altered sympathetic-parasympathetic balance, is commonly associated with ASD¹². Nadi Tarangini assessment offers a means to integrate modern physiological data with classical Ayurvedic diagnostic principles¹³.

The present exploratory study aimed to evaluate the feasibility, safety, and potential therapeutic benefits of orally and intranasally administering Organic Go Ghrita, prepared from Tharparkar breed cows fed on five specific desert grasses, in children diagnosed with ASD.

Materials and Methods

Ethical Considerations & CTRI Registration-The study protocol was reviewed and approved by the Institutional Ethics Committee of Dr. S. R. Rajasthan Ayurved University, Jodhpur (Approval No.: DSRRAU/PGIA/IEC/24-25/839) and was conducted in accordance with the Declaration of Helsinki and the Indian Council of Medical Research (ICMR) guidelines for biomedical research involving human participants. Written informed consent was obtained from the parents or legal guardians of all participating children, and

assent was obtained from children wherever applicable. The study was prospectively registered with the Clinical Trials Registry of India (CTRI) under reference number REF/2025/05/107058, and it was assigned the registration number CTRI/2025/06/088457 in June 2025.

Preparation of Go Ghrita - Organic Go Ghrita was prepared from the milk of Tharparkar breed cows, which were fed on five types of naturally occurring desert grasses: Sewan, Dhaman, Ganthia, Bekar, and Bhunt. The cows' diet additionally included Daalo/Dalia, Gwar, Methi, Alsi, Jaggery, and Khokra Giri, provided in a mixed ratio of 1 kg in the morning and evening. This preparation followed classical Ayurvedic methods to ensure the quality and potency of the Medhya Rasayana formulation.

Study Design -The study was designed as an interventional, single-arm, open-label pilot trial. It was conducted at Sanjeevani Ayurveda Hospital, PGIA, Jodhpur, over a total study period of 90 days, with a 30-day intervention period. No masking was applied, and all enrolled participants were included in a single study group.

Participant Selection -Participants were recruited from children diagnosed with ASD attending the OPD and IPD of the Kaumarbhritya Department, PGIA, DSRRAU, Jodhpur, and through outreach camps conducted in nearby villages. Eligible children were aged 3–16 years, of either sex, and met diagnostic criteria as described below.

Inclusion and Exclusion Criteria-Children were included if they satisfied DSM-5 criteria for ASD, had an ISAA score >70, and were within the age range of 3–16 years. Children were excluded if they had an ISAA score <70, or if they presented with mental retardation, cerebral palsy, congenital or genetic syndromes (e.g., Fragile X, Turner syndrome), endocrine disorders, protein-energy malnutrition, inborn errors of metabolism, acute or chronic systemic illnesses (e.g., renal, hepatic, or metabolic), other neurological or psychotic disorders, or progressive/non-progressive neuromuscular disorders.

Discontinuation Criteria-Participants were to be withdrawn from the study in the event of an acute or severe illness developing during the trial or if the parents/guardians revoked consent or refused to continue the treatment.

Intervention and Grouping -All participants (n = 30) were included in a single study group. The intervention consisted of oral administration of Organic Go Ghrita and Pratimarsha Nasya. Oral doses were 5 ml twice daily for children aged 3–5 years, 7.5 ml twice daily for children aged 6–10 years, and 10 ml twice daily for children aged 11–16 years. Pratimarsha Nasya was

administered as 2 drops once daily. The intervention lasted for 30 days.

Diagnostic Criteria-Diagnosis of ASD was based on the AIIMS-modified INCLIN criteria (INDT-ASD). The diagnostic approach is conceptually consistent with the ICD-11 classification of Autism Spectrum Disorder (6A02) under neurodevelopmental disorders. Additionally, Digital Nadi assessment using Nadi Tarangini was performed to evaluate dosha patterns and autonomic parameters objectively.

Outcome Measures -The primary outcome was the change in Indian Scale for Assessment of Autism (ISAA) scores. Secondary outcomes included parent-reported behavioural changes and assessment of parental stress using the Parental Stress Index.

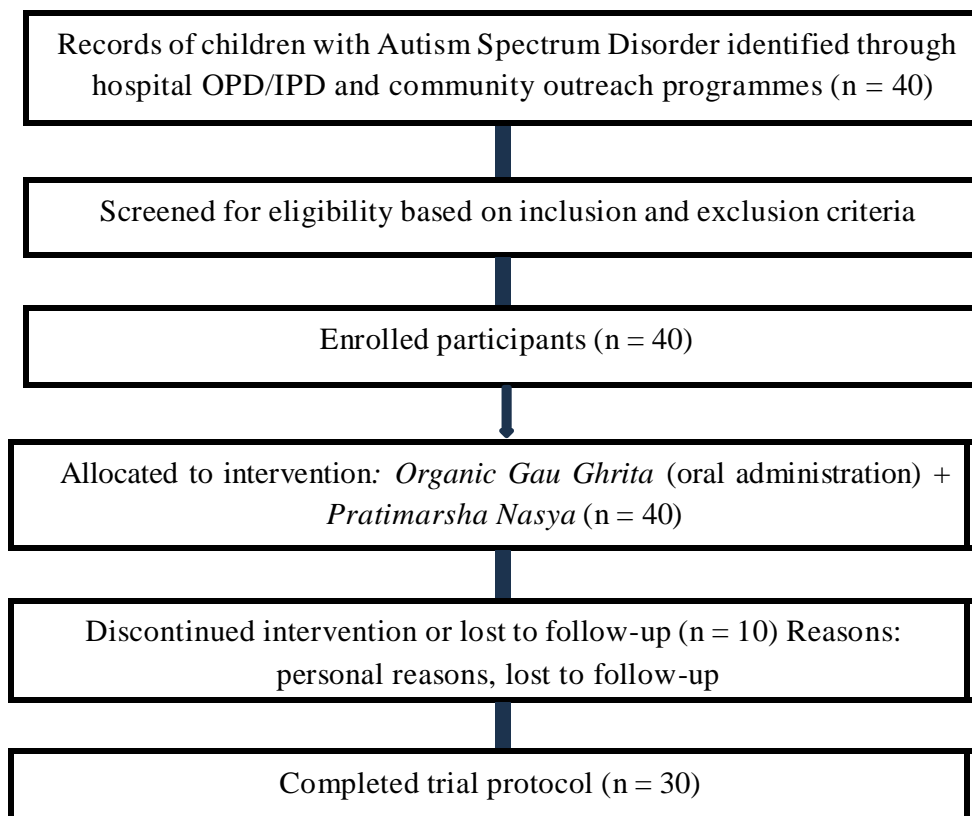
Safety Monitoring -Participants were monitored for any adverse events throughout the study. All events were documented following the guidelines of the Institutional Pharmacovigilance Centre, PGIA, Jodhpur, which provided a structured framework for consistent reporting. During the study period, no adverse effects related to the oral administration of Organic Go Ghrita or Pratimarsha Nasya were observed.

Patient Information and Consent -Before enrollment, parents or legal guardians received both verbal and written information about the study. The principal investigator ensured that participants and guardians fully understood the study objectives, procedures, potential discomforts, and expected benefits. Participation was voluntary, and participants were informed of their right to withdraw at any time without prejudice. Written informed consent and, where appropriate, assent from the child were obtained prior to the initiation of any study-related procedures.

RESULT

A total of 40 children were initially screened from the OPD and IPD of the Kaumarbhritya- Bala Roga Department, Sanjeevani Ayurveda Hospital, as well as from nearby elementary schools in the Jodhpur region. All screened participants were formally enrolled after meeting the inclusion and exclusion criteria. During the study, 10 participants either discontinued— due to personal reasons or were lost to follow-up. Consequently, 30 children completed the entire trial protocol and were included in the final analysis. Flow diagram 1 of participant recruitment and enrollment process was given below.

Figure 1: Flow Diagram of Participant Recruitment and Enrolment Process



Based on the demographic and clinical assessment of the 30 participants who completed the trial, the following profile was established. The demographic data indicated a significant male predominance, with 63.3% of the

participants being male. The majority of the children (53.3%) fell within the 6–10-year age group, which is a critical window for cognitive and behavioral intervention.

Regarding clinical severity, baseline assessments using the Indian Scale for Assessment of Autism (ISAA) revealed that 60% of the children presented with Mild autism, aligning with the study's specific inclusion criteria. This clinical state was mirrored in the caregiver outcomes, where the majority of parents (61–80 range) reported experiencing moderate stress, highlighting the psychosocial impact on the family unit.

The Nadi Tarangini (digital pulse analysis) provided a detailed Ayurvedic physiological profile of the participants. A universal Vata predominance was observed across all children, with the Vata distribution primarily concentrated in the 61–70% range. In contrast, Pitta and Kapha levels were notably lower, ranging between 11–30% and 11–20%, respectively. Finally, the intervention demonstrated a strong safety profile, with

no major adverse events reported throughout the duration of the trial.

Effect on ISAA Scores -The effect of the intervention on Indian Scale for Assessment of Autism (ISAA) scores is summarized in Table 1. The mean ISAA score decreased from 100.63 at baseline (BT) to 83.17 after treatment (AT), while the median score changed from 100.00 to 82.00. The standard deviation decreased from 12.54 to 10.21, indicating less variability in post-treatment scores. A Wilcoxon signed-rank test revealed a statistically highly significant reduction in autism severity ($Z = -4.78$, $p < 0.001$), with a 17.39% overall improvement. These findings indicate a significant reduction in core ASD symptoms following the intervention.

Table 1: Effect of Organic Go Ghrita on ISAA Score

Parameter	Mean (BT)	Mean (AT)	Median (BT)	Median (AT)	SD (BT)	SD (AT)	Wilcoxon Z	P-value	% Effect	Result
ISAA	100.63	83.17	100.00	82.00	12.54	10.21	-4.78	<0.001	17.39	Sig

Effect on Parental Stress Index -Changes in parental stress are shown in Table 2. The mean Parental Stress Index decreased from 76.87 (BT) to 59.83 (AT), and median scores reduced from 76.50 to 60.00. The standard deviation remained relatively consistent (3.82 to 3.88), suggesting uniform response among

participants. The Wilcoxon test indicated a highly significant decrease ($Z = -4.78$, $p < 0.001$) with a 22.16% reduction, demonstrating a significant improvement in parental stress levels following the intervention.

Table 2: Effect of Organic Go Ghrita on Parental Stress Index

Parameter	Mean (BT)	Mean (AT)	Median (BT)	Median (AT)	SD (BT)	SD (AT)	Wilcoxon Z	P-value	% Effect	Result
Parental Stress Index	76.87	59.83	76.50	60.00	3.82	3.88	-4.78	<0.001	22.16	Sig

Effect on Vata, Pitta, and Kapha Dosha -The Nadi Tarangini assessment of Dosha patterns demonstrated significant changes post-intervention (Table 3). The mean Vata score decreased from 64.60 (BT) to 32.57 (AT), with median values reducing from 63.50 to 33.00 and standard

deviation decreasing from 6.54 to 4.35. This represents a 49.59% reduction, indicating effective pacification of Vata.

The mean Pitta score increased from 21.97 (BT) to 43.17 (AT), with median values rising from 22.00 to 44.00 and a slight reduction in standard deviation from 4.42 to 4.28, indicating a consistent response across

participants. This change represents restoration of Pitta toward physiological levels rather than pathological aggravation. The reported negative percentage effect (-96.51%) reflects normalization from a baseline Pitta-kṣaya state to functional balance.

Similarly, the mean Kapha score increased from 13.43 (BT) to 24.27 (AT), with median values increasing from 14.00 to 24.00 and a reduction in standard deviation from 6.24 to 5.58. The negative percentage effect (-80.65%) denotes a therapeutically favorable restoration of Kapha, contributing to improved structural stability and neuro-somatic grounding.

Table 3: Effect of Organic Go Ghrita on Vata, Pitta, and Kapha Dosha

Parameter	Mean (BT)	Mean (AT)	Median (BT)	Median (AT)	SD (BT)	SD (AT)	Wilcoxon Z	P-value	% Effect	Result
Vata Nadi	64.60	32.57	63.50	33.00	6.54	4.35	-4.78	<0.001	49.59	Sig
Pitta Nadi	21.97	43.17	22.00	44.00	4.42	4.28	-4.78	<0.001	-96.51	Sig

An Exploratory Clinical Study of Organic Go Ghrita Administered Orally and Through Pratimarsha Nasya in Children with Autism Spectrum Disorder with Digital Nadi Assessment

Kapha Nadi	13.4 3	24.2 7	14.00	24.00	6.2 4	5.5 8	-4.78	0.000 1	-80.65	Sig
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This table 4 consolidates effect of Organic Go Ghrita on all parameters of ASD into one scannable format shown as-

Table 4: Effect of Organic Go Ghrita on all parameters of ASD

Objective	Parameter	Baseline (Mean)	End-of-Study (Mean)	Improvement (%)	p-Value
Clinical	ISAA Score	100.63	83.17	17.39%	< 0.001
Psychological	Parental Stress (PSI)	76.87	59.83	22.16%	< 0.001
Physiological	Vata Nadi	64.60	32.57	49.59%	< 0.001
	Pitta Nadi	21.97	43.17	-96.51	Sig
	Kapha Nadi	13.43	24.27	-80.65	Sig
Biological	Dosha Equilibrium	High Vata	Balanced (V- P-K)	Normalized	< 0.001

DISCUSSION

Within the ICD-11 framework, ASD is understood as a stable neurodevelopmental condition with early onset and persistent functional impairments. Ayurvedically, these features resemble Unmada, a broad psychopathological construct involving impairment of higher mental faculties and Doshic imbalance, predominantly Vata. The present study evaluated the therapeutic potential of Organic Go Ghrita, administered orally and via Pratimarsha Nasya, in children with Autism Spectrum Disorder (ASD), using the Indian Scale for Assessment of Autism (ISAA), Parental Stress Index, and Nadi Tarangini assessment of Doshic balance. The intervention demonstrated significant improvements in core ASD symptoms, parental stress levels, and dosha normalization.

The observed reduction in ISAA scores from 100.63 to 83.17, representing a 17.39% improvement, indicates a significant amelioration in the severity of ASD-related behavioural and communication deficits. This finding aligns with the traditional Ayurvedic concept of Medhya Rasayana, where ghrita-based formulations are believed to enhance Smriti, Dhee, and Dhriti (memory, intellect, and retention) through nourishment of Manovaha Srotas, thereby supporting cognitive and behavioural improvements^{14,15}. The concurrent decrease in inter-individual variation, as reflected by the lower standard deviation, suggests a consistent response across participants.

Parental stress, as assessed by the Parental Stress Index, showed a significant reduction of 22.16%, indicating that improvements in children's functional behaviours had a measurable positive impact on caregivers. This aligns with previous findings where improvement in neurodevelopmental symptoms led to reduced family stress and better psychosocial outcomes¹⁶.

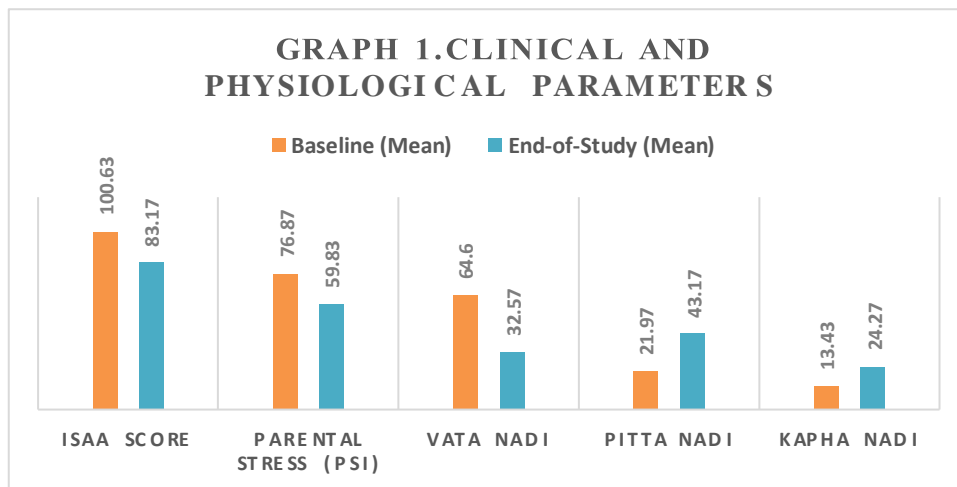
The Nadi Tarangini assessment revealed substantial changes in Doshic patterns. Vata Nadi decreased by 49.59%, indicating pacification of hyperactive neurological functions, which are traditionally associated with anxiety, hyperactivity, and erratic behaviour in children with ASD¹⁷. Pitta Nadi and Kapha Nadi showed therapeutically desirable increases (-96.51% and

-80.65%, respectively), suggesting restoration of metabolic and structural homeostasis. In Ayurveda, proper balance among Vata, Pitta, and Kapha is essential for maintaining optimal cognitive function and emotional regulation¹⁸. The statistically significant changes in Doshic balance ($Z = -4.78$, $p < 0.001$) support the holistic efficacy of Go Ghrita in modulating both neurocognitive and psychosomatic aspects of ASD. From a modern scientific perspective, cow ghee contains omega-3 fatty acids, short- and medium-chain triglycerides, and fat-soluble vitamins (A, D, E, and K), which contribute to neuronal membrane integrity, synaptic function, and neuroplasticity¹⁹. The oral administration of Go Ghrita likely provides essential lipids that enhance neuronal signalling and cognitive processes. Pratimarsha Nasya delivers the formulation directly through the nasal mucosa to the central nervous system via olfactory and trigeminal pathways, bypassing hepatic first-pass metabolism, thereby potentially enhancing its neurocognitive effects²⁰.

The safety profile of Organic Go Ghrita was excellent, with no adverse events reported throughout the study. This observation is consistent with the traditional use of Ghrita as a child-friendly Medhya Rasayana, highlighting its suitability for pediatric populations²¹.

Digital Nadi Tarangini served as an effective tool to objectively quantify Doshic imbalances and monitor treatment response. The ability to measure autonomic parameters provides a link between classical Ayurvedic assessment and contemporary neurophysiological evaluation, bridging traditional knowledge with modern evidence-based approaches²².

This exploratory study provides preliminary evidence that Organic Go Ghrita, administered orally and via Pratimarsha Nasya, may reduce core ASD symptoms, improve caregiver stress, and restore Doshic balance, demonstrating both clinical and mechanistic benefits consistent with Ayurvedic principles and contemporary neurocognitive understanding. This given below graph provides a robust visual summary of how Organic Go Ghrita in oral and Pratimarsha Nasya act as a holistic intervention, normalizing both neurological symptoms (Vata reduction) and metabolic/structural parameters (Pitta and Kapha restoration).



Graph 1. showing therapeutic effect of Organic Go Ghrita in children with ASD

These findings justify larger, controlled studies to further evaluate the efficacy, mechanism, and long-term safety of this integrative intervention in pediatric ASD populations.

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Conflict of Interest

The authors declare no conflict of interest.

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Contribution of Authors

1. **Singhal Harish Kumar** – Conceptualization of the study, study design, supervision, interpretation of data, and final approval of the manuscript
2. **Prajapati Pradeep Kumar** – Data collection, clinical assessment of patients, and assistance in manuscript drafting.
3. **Sharma Dinesh Chandra** – Statistical analysis, data interpretation, and critical revision of the manuscript.
4. **Bist Sunil** – Literature review, preparation of study protocol, and support in data documentation.
5. **Yadav Ashok** – Clinical investigation, patient follow-up, and assistance in data compilation.
6. **Pareek Pooja** – Data entry, compilation of results,

and assistance in manuscript preparation.

7. **Pareek Ajay** – Editing, proofreading, and formatting of the manuscript for submission.

REFERENCES

1. Maenner MJ, Shaw KA, Baio J, et al. Prevalence of autism spectrum disorder among children aged 8 years — Autism and Developmental Disabilities Monitoring Network, 11 sites, United States, 2016. *MMWR Surveill Summ.* 2020;69(4):1–12.
2. Lord C, Elsabbagh M, Baird G, Veenstra-VanderWeele J. Autism spectrum disorder. *Lancet.* 2018;392(10146):508–520.
3. Sharma PV. *Charaka Samhita, Sutrasthana, Ch. 1.* Varanasi: Chowkhamba Sanskrit Series; 2010.
4. Tripathi B. *Sushruta Samhita, Sutrasthana, Ch. 15.* Varanasi: Chowkhamba Sanskrit Series; 2011.
5. Singh RH. *Ayurvedic Drugs and Medhya Rasayana.* New Delhi: Chaukhamba Publications; 2014.
6. Shukla VJ, Rasamnyal S. Ghrita in Ayurveda: Therapeutic Principles and Nootropic Role. *J Ayurveda Integr Med.* 2015;6(3):172–178.
7. Bhattacharya S. Saraswata Ghrita and Cognitive Enhancement. *AYU.* 2012;33(4):482–488.
8. Sunitha K, et al. Nutritional and neuropharmacological properties of cow ghee: Implications for cognitive function. *J Complement Integr Med.* 2019;16(3):1–10.
9. Sharma H, Chandola HM. Nasya Karma in Ayurvedic Neurology. *AYU.* 2008;29(3):139–145.
10. Illum L. Nasal drug delivery—possibilities, problems, and solutions. *J Control Release.* 2003;87(1–3):187–198.
11. Sharma, R., Kabra, A., Rao, M. M., & Prajapati, P. K. (2018). Herbal and holistic solutions for neurodegenerative and depressive disorders: Leads from Ayurveda. *Current Pharmaceutical Design,* 24(22), 2597–2608.
12. Kumar S, et al. Autonomic dysregulation in children with autism spectrum disorder: Assessment using physiological and pulse-based methods. *Autism Res.* 2020;13(6):1041–1052.

14. Singh S, et al. Digital Nadi Tarangini: Integrating traditional Ayurvedic pulse diagnosis with modern technology. *J Ayurveda Integr Med.* 2021;12(4):590–598.
15. Sharma RK, Dash B. *Charaka Samhita, Sutrasthana.* Varanasi: Chaukhamba Surbharati Prakashan; 2020.
16. Tripathi B, editor. *Ashtanga Hridaya of Vagbhata, Sutrasthana.* 10th ed. Varanasi: Chaukhamba Sanskrit Pratishthan; 2018.
17. Reddy KS, Kumar R, Shukla V. Parental stress and coping strategies in children with autism spectrum disorder. *J Pediatr Neurol.* 2021;19(3):120–127.
18. Patwardhan B, Mutalik G, Tillu G. Integrative Approaches for Neurodevelopmental Disorders: An Ayurvedic Perspective. *J Ayurveda Integr Med.* 2015;6(2):85–91.
19. Acharya YT. *Sushruta Samhita, Sutrasthana.* Varanasi: Chaukhamba Orientalia; 2017.
20. Singh S, Sharma P, Kaur R. Nutritional and neurocognitive benefits of cow ghee: Evidence from preclinical and clinical studies. *Ayurpharm Int J Ayur Alli Sci.* 2022;11(1):22–29.
21. Sharma H, Chandola HM. Role of Nasya Karma in neuropsychiatric disorders: Mechanistic insights. *Anc Sci Life.* 2011;30(4):12–18.
22. Tripathi J, Shukla V. Safety evaluation of Medhya Rasayana formulations in pediatric practice. *J Ayurveda Clin Res.* 2020;8(2):45–51.
23. Jain R, Singh H, Gupta V. Digital Nadi Tarangini for objective assessment of dosha patterns: A pilot study. *AYU.* 2019;40(3):180–187.