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ORIGINAL ARTICLE

Enhancing Childhood Development with Vedic Manas Yoga: A School-Based Intervention Study

Acharya Balkrishna [a,b], Upasana Agarwal [a,*], Arvind Rana [c], Devika Balagopalan [d], Ajit Sharma [e], Shubhangi Shrivastava [a], Vedpriya Arya [a,b]

[a] Patanjali Herbal Research Division, Patanjali Research Foundation, Haridwar-249404, Uttarakhand, India
[b] Department of Applied and Allied Sciences, University of Patanjali, Haridwar-249404, Uttarakhand, India
[c] Divya Yog Mandir Trust, Patanjali Yogpeeth, Haridwar-249404, Uttarakhand, India
[d] Department of Rasashastra, Patanjali Ayurveda College, Haridwar-249404, Uttarakhand, India
[e] College of Horticulture and Forestry, Neri, Hamirpur-177001, Himachal Pradesh, India

ABSTRACT

In today's world, with rapid technological growth and rising mental health concerns among youth, there's an urgent need to reconnect with holistic practices that promote overall well-being. Vedic Manas Yoga offers a comprehensive approach through activities like Sun gazing, Yajna, breathing exercises, meditation, yogic practices, sound frequencies, laughter, and brain exercises to stimulate the brain and pineal gland. However, there's limited research on replicating these benefits in school environments. This study explores the effects of integrating Vedic Manas Yoga into a school curriculum for children aged 5 to 11.

The study involved 169 participants, with a majority of 77.5% female and 22.5% male, and an average age of 9.7 years. Two questionnaires were administered before and after the intervention to assess the program's impact on cognitive abilities and personality traits.

Results showed a significant 52% increase in cognition ($p < 0.001$), a reduction in neurotic tendencies, and an improvement in agreeableness and conscientiousness ($p < 0.05$). Extraversion and openness showed minimal changes.

In conclusion, the Vedic Manas Yoga intervention effectively promoted cognitive enhancement, emotional stability, and cooperative behavior, highlighting its value in holistic child development.

Keywords: Vedic Manas Yoga, Brain, Cognition, Personality traits, Children

1. Introduction

Yoga and meditation, when practiced regularly, lead to structural and functional changes throughout the brain and enhance overall healthy brain activity.[15,20] Research indicates that yoga and meditation significantly influence brain functions and can be utilized as therapeutic interventions for treating chronic depression, enhancing learning and memory, and addressing cognitive decline.[6] Additionally, yoga and meditation have been shown to positively impact stress-related disorders like anxiety and depression by promoting positive functional changes in participants and significantly altering their brain wave activity.[18] The research indicates that prolonged engagement in meditation is correlated with increased overall gray matter volume and specific enlargement in various right hemispheric cortical and subcortical brain regions linked to sustained attention, self-control, compassion, and interoceptive perception.[16]

The Vedic Manas Yoga program is systematically structured to stimulate the brain primarily using techniques derived from Vedic and Yogic methodologies. This course aims to awaken the dormant function of the brain and promote the overall well-being of children. This program includes Sun gazing,

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* Corresponding author:
E-mail address: upasana.agarwal@patanjali.res.in (U. Agarwal).

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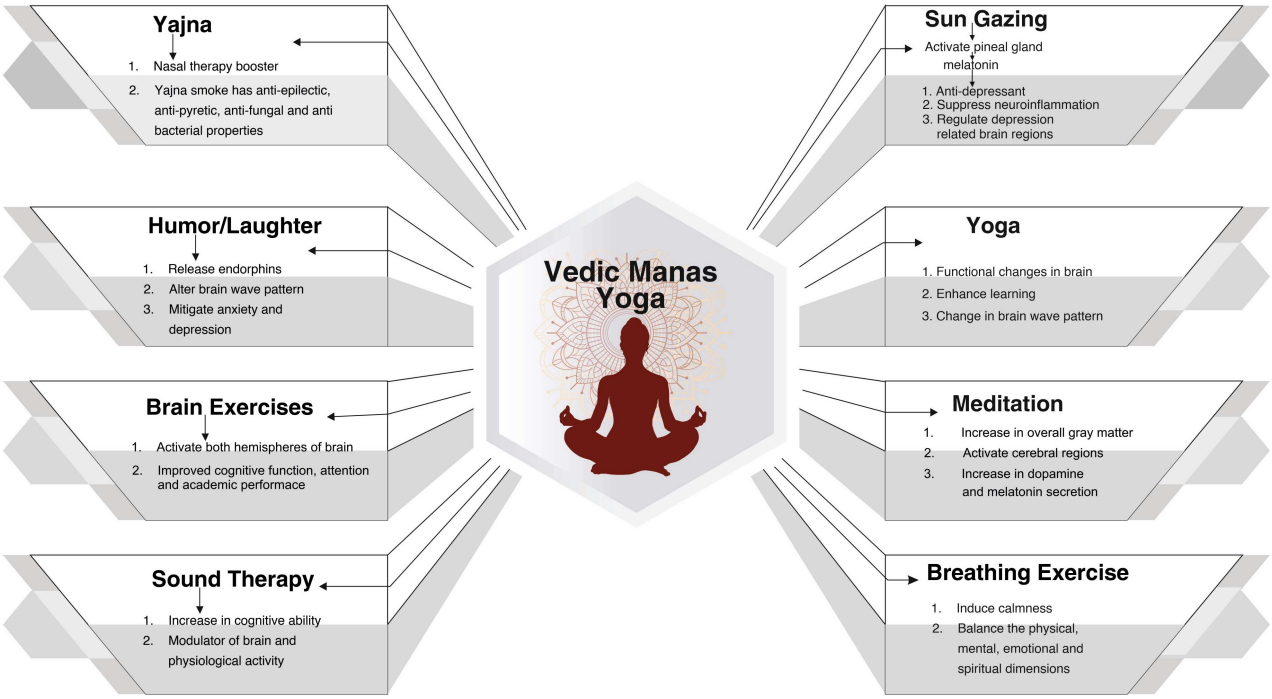

Fig. 1. Different components of Vedic Manas Yoga.

Yajna, breathing exercises, Meditation, Yogic exercises, Sound Frequencies, Humor, or Laughter, Brain exercises, etc., to activate the brain so that its full potential can be realized (Fig. 1).

Several studies have reported that the level of sunlight exposure impacts the functionality of the pineal gland in the brain, subsequently influencing the production of melatonin in the human body.[3,7,17,24] Melatonin has antidepressant effects stemming from its suppression of inflammation, impacting neuroinflammation, neurotoxicity, and depression-related brain regions.[34] Yajna therapy is beneficial in alleviating anxiety through the inhalation of herbal fumes, contributing to the maintenance of overall psychological well-being.[13] The therapeutic smoke from Yajna has demonstrated notable anti-epileptic, antipyretic, antifungal, and antibacterial properties, effectively eradicating pathogenic microorganisms in humans.[9] It has been reported that vaporized medicines and herbs can enter the human body as a gas through the nose, lungs, and skin pores emphasizing the nose as the optimal route for treating brain and head-related diseases.[1,26,31] The samagri (ingredients) used in Yajna include herbs like *Bacopa monnieri, Convolvulus pluricaulis, Acorus calamus, Lavandula stoechas, Celastrus paniculatus, Withania somnifera, Inula racemose, Achyranthes aspera, Nardostachys jatamansi, Cinnamomum camphora* which are reported to have several remedial effects including anti-epileptic effect.[5]

A study examining sound's influence on cognition and memory among students of varying academic performance found that listening to music improved cognitive ability, particularly memory, as evidenced by enhanced performance in color memory tests and reduced response times.[37] A review of sound interventions further suggests that music serves as an efficacious modulator of brain and physiological activities, exerting a favorable influence on mood regulation, autonomic responses, cognitive processes, and neuronal well-being.[30] It has been documented that engaging in laughter for 5–10 minutes can trigger the release of endorphins, serotonin, and melatonin.[12,36] Similarly, assessing brain wave patterns before and following a two-hour session of laughter yoga revealed a 40% augmentation in alpha waves, linked to relaxation, and beta waves, associated with alertness, sleep, and emotional states.[4] Brain Gym exercises consist of a systematic workout that incorporates movements of the head, eyes, and crossing motions of the limbs, aimed at activating both hemispheres of the brain and is associated with improved cognitive ability attention and academic performance in several studies.[2,21,22]

While the impact of these activities has been individually explored, no studies have yet integrated all of them collectively. A comprehensive study was conducted to assess the impact of integrating multiple methodologies (Vedic Manas Yoga) on

Table 1. Inclusion and exclusion criteria for the study total sample size: 169 participants.

Inclusion Criteria	Exclusion Criteria
Age: 5–11 years	Individuals whose parents/guardians did not give consent to participate
Gender: Male/Female	Individuals having a chronic disease
Individuals without any physical disability	

the developmental trajectories of children. The findings shed light on the nuanced interactions between methodological integration and child development, providing insights for educational and psychological interventions. This study investigates the collective influence of various aforementioned methodological approaches on the cognitive, behavioral, and psychological faculties of children, spanning diverse age groups, genders, and educational backgrounds.

2. Methodology

2.1. Participants

This study primarily receives 210 applicants (both boys and girls) belonging to different age groups from different schools of Uttar Pradesh (28°51'5"N 78°23'11"E) and Uttarakhand (N 29° 54'5.526", E 77° 59'46.8528") states of India to participate in the program. The inclusion and exclusion criteria (Table 1) have been set up by the expert committee which then applied to the applications from the participants. After screening a total of 169 participants were selected for the study.

2.2. Questionnaire

Two different questionnaires were administered to children aged 5–11 years. The first questionnaire utilized was the Digit Symbol Substitution Test (DSST), designed to assess alterations in cognitive ability before and after the program.[33] The second questionnaire employed was the Pictorial Personality Traits Questionnaire for Children (PPTQ-C), comprising 15 items aimed at evaluating changes in behavioral and psychological domains, including extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness, both pre- and post-program.[23]

2.3. Ethical reporting

This study was conducted according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for observational studies, and a flow chart of the study is given in (Fig. 2).[11]

2.4. Ethical consideration of the study

The observational study was carried out in conformity with the ethical standards outlined in the Helsinki Declaration (1964).[14] Before filling out the surveys, the informed consent to participate was taken from the parents/guardians of applicants. There were no crucial questions in the questionnaire, and data confidentiality was preserved.

2.5. Vedic Manas Yoga intervention

The group of experienced experts in different approaches of Vedic Manas Yoga used to guide the subjects in various activities for the activation of the pineal gland and brain for three days. The session began with sun gazing for 10 seconds just after sunrise which is followed by Yajna. The subjects were then guided to perform yogic postures like Rabbit pose, Eagle pose, Camel pose, Headstand, etc. Breathing techniques like Bhramari Pranayama, Nadi Sodhana Pranayama, and Kapalabhati Pranayama were taught to promote stress reduction, emotional regulation and pineal gland activation. Additionally, brain exercises were employed to stimulate cognitive function, mental clarity, and centering of the brain. Sound therapy, utilizing specific sounds and chants, and laughter therapy, involving laughter exercises and meditation techniques like guided meditation and visualization were facilitated by experts to encourage brain and pineal gland activation. The participants were also encouraged to remain hydrated throughout the sessions.

3. Results

3.1. DSST score analysis

The investigation assessed the impact of the Vedic Manas Yoga intervention on children aged between 5 to 11 years (n = 169; 77.5% female, 22.5% male; mean age 9.7 years), utilizing the DSST and PPTQ-C questionnaire to evaluate various psychological parameters. Statistical analysis was conducted comparing pre- and post-intervention data.

The digit substitution test conducted on children aged between 5–11 years revealed insightful

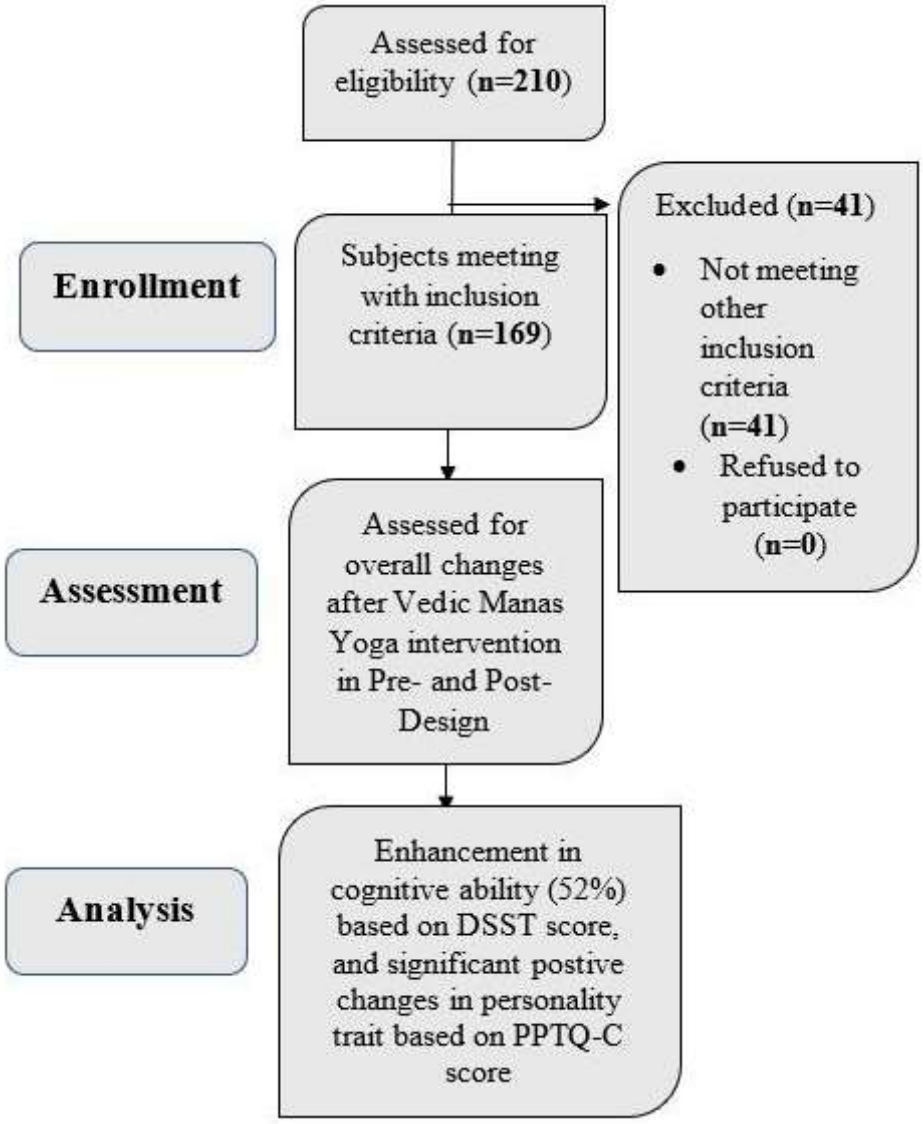

Fig. 2. A flowchart of this observational study according to STROBE guidelines.

statistics (Fig. 3). Before intervention, the mean score was approximately 41.90 with a standard deviation of around 23.10. This suggests a wide variability in the initial cognitive performance of the participants. After the intervention, there was a notable performance improvement, with the mean score increasing to about 63.70, accompanied by a standard deviation of approximately 24.57. This indicates that the mean of the children's cognitive abilities increased by 52% after intervention. However, despite the improvement, it's worth noting that there was still considerable variability in the post-intervention scores, as evidenced by the relatively high standard deviation.

Moreover, the result of the z-test for two samples revealed that the calculated z-value (7.99) is well beyond the critical values for both one-tail and two-tail tests. The extremely small p-values ($p < 0.001$ for one-tail and $p < 0.001$ for two-tail) indicate strong evidence against the null hypothesis. Therefore, the null hypothesis is rejected, and it is concluded that there is a statistically significant difference between the means of the two samples before and after the intervention.

3.2. PPTQ-C analysis

The analysis of personality traits was conducted using both McNemar's test and chi-square test for PPTQ-C, with statistical significance determined at $p < 0.05$. The PPTQ-C questionnaire assesses five key personality traits—extraversion, neuroticism, openness, agreeableness, and conscientiousness—through

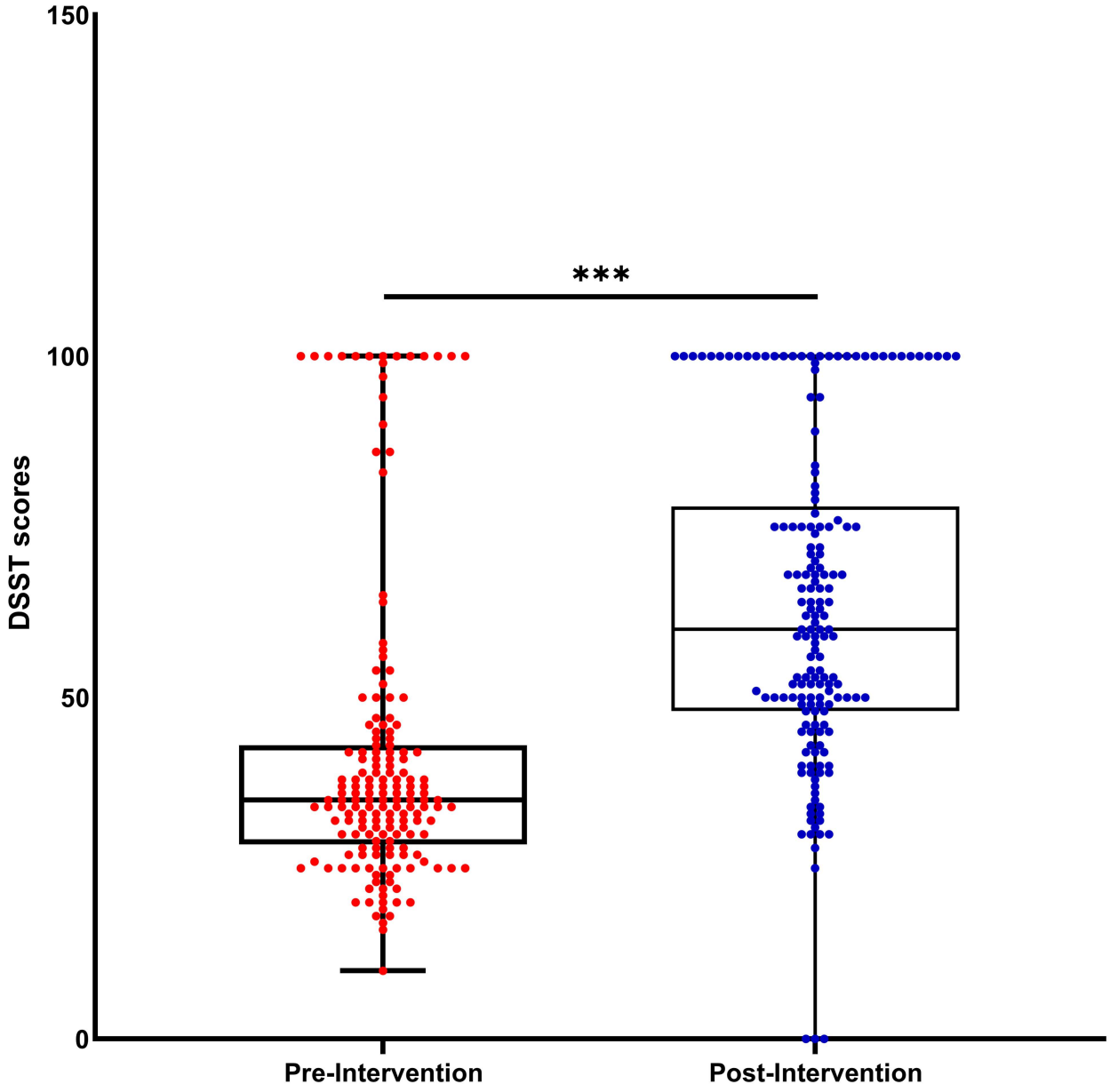

Fig. 3. DSST scores for children aged 5–11 years; ***$p < 0.001$.

15 questions, with three questions dedicated to evaluating each trait (Table 2). The impact of intervention yielded the following results in these traits:

3.2.1. *Neuroticism*

The analysis revealed significant changes in neurotic tendencies, particularly in response to the item "When something goes wrong," as indicated by both the Mcnemar's test and chi-square test results. McNemar's test demonstrated a substantial decrease in neurotic behaviors post-program, suggesting improved emotional regulation and resilience among participants ($p < 0.001$)). This finding is confirmed by the chi-square test, which also produced consistently significant results ($p < 0.01$) further confirming the notable enhancement in emotional stability following the intervention.

3.2.2. *Agreeableness*

The analysis indicated significant improvements in cooperative behaviors, particularly in response to items like "When I am asked to do housework" ($p < 0.001$) and "My bedroom is" ($p < 0.01$). These results suggest enhanced agreeableness and a greater sense of responsibility following the intervention. The corresponding chi-square test results further

Table 2. PPTQ-C analysis by McNemar's test and chi-square test.

S.No	Trait	z-Test	P-Value	Chi-square	P value
	Extraversion				
1	I usually play	–1.178	0.239	1.870	0.393
2	When other children play	–0.556	0.578	1.939	0.379
3	When someone jokes	–0.317	0.751	1.108	0.775
	Neuroticism				
4	When I go to school	–0.444	0.657	1.928	0.381
5	When something goes wrong	**–3.799**	**0.000**	**9.987**	**0.007**
6	Usually	–0.557	0.578	0.410	0.815
	Openness to experience				
7	When I see birds flying	–0.633	0.527	0.769	0.681
8	When I am on a trip, I mostly enjoy	–0.139	0.889	0.882	0.644
9	Learning new things	–0.299	0.765	0.600	0.741
	Agreeableness				
10	When I am asked to do housework	**–3.209**	**0.001**	**5.851**	**0.054**
11	My bedroom is	**–3.027**	**0.002**	**6.698**	**0.035**
12	When I got money	–0.112	0.910	1.682	0.431
	Conscientiousness				
13	When a classmate needs something	**–2.441**	**0.015**	4.757	0.093
14	When I see that I can help somebody	–1.52	0.129	1.950	0.377
15	When I have something new	**–1.908**	**0.056**	2.213	0.331

support these findings, showing statistically significant changes with $p < 0.05$, confirming the positive impact of the program on cooperative and organized behaviors.

3.2.3. Conscientiousness

The analysis demonstrated significant improvements in cooperative behaviors, as seen in the item "When a classmate needs something" ($p < 0.01$) and marginal difference in item "When I have something new" ($p < 0.05$), reflecting a marked increase in agreeableness and a stronger sense of responsibility among participants post-intervention. The corresponding chi-square test results do not validate it further. This difference in the McNemar's-test and chi-square test indicates that subtle, continuous behavioral changes may be missed when data is categorized, despite improvements being detected by the McNemar's test.

3.2.4. Extraversion and openness to experience

For both traits, neither the z-test nor the chi-square test demonstrated significant changes across the evaluated items. The results suggest that the program did not meaningfully alter behaviors related to social engagement or openness to novel experiences.

4. Discussion

The results from the current study provided strong evidence for the effectiveness of the Vedic Manas Yoga intervention in enhancing cognitive and psychological functioning among children aged 5–11 years. The analysis of the Digit Symbol Substitution Test (DSST) revealed a significant improvement in cognitive performance post-intervention, with the mean score increasing by 52%. This substantial gain in cognitive ability by Vedic Manas Yoga in enhancing executive functions, including attention, processing speed, and working memory is due to its multiple activities and agrees with previous studies done on the impact of yoga on school-going children.[27,29,32] Despite this improvement, the considerable variability in post-intervention scores, as indicated by the high standard deviation, suggests that while many participants benefited, the extent of cognitive enhancement varied among individuals. This variability could be attributed to factors such as individual differences in baseline cognitive abilities, the extent of engagement with the intervention, and other environmental influences. The statistical significance of these findings is further supported by McNemar's test results, where the calculated z-value (7.99) far exceeded the critical thresholds for both one-tail and two-tail tests. The extremely low p-values ($p < 0.001$) provided compelling evidence against the null hypothesis, indicating a meaningful difference between pre- and post-intervention cognitive scores. These results emphasized the efficacy of the Vedic Manas Yoga program in promoting cognitive development among young children.

The analysis of personality traits using the PPTQ-C assessment revealed differential impacts of the intervention across various psychological domains. Significant positive changes were observed in neuroticism and agreeableness which again aligns with previous studies.[19,25] Earlier studies have also reported

different components of Vedic Manas Yoga like humor, yoga, and meditation regulate neuroticism.[8,28,35] The reduction in neurotic tendencies, as evidenced by both McNemar's test and chi-square test results, indicated improved emotional stability and resilience in participants.[10] This improvement in emotional stability may be attributed to the mindfulness and self-regulation aspects of the Vedic Manas Yoga practice, which promoted better management of stress and emotional reactions. Similarly, the enhancement in agreeableness, particularly in cooperative behaviors like performing housework and maintaining personal spaces, suggested that the program promoted social and interpersonal growth in the children.

The mixed results for conscientiousness reflect a more complex picture. While some improvements were noted in behaviors associated with conscientiousness, such as helping classmates and maintaining personal spaces, other aspects did not show significant changes. The discrepancy between McNemar's test and chi-square results suggested that the program's effects on conscientiousness may be subtle and context-dependent. This variation could be due to differences in how individuals internalize and express conscientious behaviors or the program's specific focus areas. Further research is needed to explore these nuances, potentially through more detailed assessments or by integrating additional interventions aimed specifically at enhancing conscientiousness. Investigating the interplay between conscientiousness and other traits, such as emotional regulation or social behavior, could also provide insights into how these traits interact and influence overall developmental outcomes.

The lack of significant changes in extraversion and openness to experience indicated that Vedic Manas Yoga may have a limited impact on traits related to social engagement and curiosity-driven exploration. This finding aligns with the nature of the Vedic Manas Yoga program, which emphasizes introspection and emotional regulation rather than outward social interactions or exploration. The absence of significant effects on extraversion and openness suggested that the intervention may be less effective at influencing traits related to external behaviors and interests. Future studies could investigate whether integrating components that specifically address social skills or novel experiences might yield different results. Additionally, exploring other intervention approaches that focus on enhancing these traits could provide a thorough understanding of how different approaches influence personality development.

The results of this study have important implications for educational and psychological interventions aimed at children. The demonstrated benefits of Vedic Manas Yoga in enhancing cognitive and emotional functioning suggested that similar programs could be valuable tools in promoting overall child development. However, the lack of a control group is one of the major limitations of the study. Schools and educational programs might consider integrating such interventions into their curricula to support cognitive and emotional growth. Future research should aim to replicate these findings across diverse populations and settings including control groups to validate the generalizability of the results. Longitudinal studies could provide insights into the long-term effects of Vedic Manas Yoga on cognitive and psychological development. Moreover, exploring the mechanisms underlying the observed changes, such as the role of specific yoga practices or the impact of different activities of the program, could enhance our understanding of how such interventions work.

5. Conclusion

The findings of this study highlight the efficacy of the Vedic Manas Yoga intervention in significantly enhancing cognitive abilities and positively influencing key personality traits in children aged 5–11 years. The substantial improvement in DSST scores highlights the program's multiple activities' role in boosting cognitive processing, attention, and memory. Furthermore, the observed reductions in neurotic tendencies and the increase in cooperative behaviors suggest that the intervention promotes emotional stability and social responsibility. Although the impact on traits such as extraversion and openness to experience was limited, the overall results demonstrate that Vedic Manas Yoga offers a valuable holistic approach to nurturing both cognitive and psychological development in young children. These findings suggest that integrating similar yoga-based programs into educational and developmental settings could be advantageous for promoting holistic child development. Future research should explore the long-term effects of this intervention and examine its adaptability across diverse educational settings and age groups to further enhance its application and effectiveness.

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