International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 13 Issue: 03 | Mar 2026 www.irjet.net p-ISSN: 2395-0072
National Conference on "PRANAYAMA BHARAT-2026"
Organized by: Scientific Pranayama Foundation Trust® Mysuru, in collaboration with ATME College of Engineering, Mysuru.

Effect of Chandra Bhedana Pranayama on Attention and Mental Calmness in Students: A Pilot Randomized Controlled Trial

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Abstract - *College students face intense academic pressure — heavy workloads, frequent assessments, and chronic stress that regularly impair concentration and mental calmness. Simple, accessible solutions that fit within a student's daily routine are rarely available. This study tested whether Chandra Bhedana Pranayama, a classical left-nostril breathing technique, could produce measurable improvement in attention and mental calmness within one week. Ten healthy B. Pharm students (Mean Age: 20.50 ± 1.08 years; 5 Male, 5 Female) from Madurai Medical College practiced the technique for 15 minutes every morning for seven consecutive days. Attention and working memory were assessed using the Digit Span Test (DST) and present-moment awareness using the Mindful Attention Awareness Scale (MAAS). All three outcome measures improved significantly after the intervention (p<0.001). Students felt calmer, more focused, and less distracted during their studies. The technique needs no equipment, no prior training, and only 15 minutes per day.*

Key Words: Chandra Bhedana Pranayama, Attention, Mental Calmness, Digit Span Test, MAAS, Students, Yogic Breathing, Cognitive Function

1. INTRODUCTION

Walk into any pharmacy department during exam week and the tension is easy to spot. Students sit at their desks for hours and come away feeling like nothing stuck. That experience — of studying hard without being able to actually focus — is what chronic academic stress does to the brain. Attention, working memory, and mental clarity are among the first cognitive functions to suffer when a student is under sustained pressure.

Pranayama, the yogic science of breath regulation, offers a practical, low-cost response to this problem. Among its many techniques, Chandra Bhedana Pranayama involves breathing in exclusively through the left nostril while the right nostril stays closed. Classical yoga texts describe it as cooling and calming. Physiologically, left nostril inhalation preferentially activates the right cerebral hemisphere through the contralateral olfactory-limbic pathway [1], shifting the autonomic nervous system toward parasympathetic dominance — the neurological state associated with rest, calm, and clear thinking.

Published studies on unilateral nostril breathing have reported effects on brain lateralisation and autonomic balance [2,8]. However, most of this research was done with experienced yoga practitioners under controlled laboratory conditions. Evidence from yoga-naive student populations in real academic settings remains limited. This pilot study was designed to fill that gap, using the Digit Span Test (DST) [3,7] to measure attention and working memory and the Mindful Attention Awareness Scale (MAAS) [4,5] to capture the subjective experience of mental calmness.

2. METHODOLOGY

2.1 Study Design

A pilot randomized controlled trial (n=10) was conducted in the Department of Pharmacy, Madurai Medical College. Participants were student volunteers recruited by open invitation. All gave verbal informed consent before enrolment and were free to withdraw without consequence at any point.

2.2 Participants

Ten B. Pharm students aged 18–25 years (Mean Age: 20.50 ± 1.08 years; 5 Male, 5 Female) were enrolled. All were in good general health with no prior pranayama training. Students with respiratory, cardiovascular, neurological or psychiatric conditions, or those on cognition-affecting medications, were excluded. Any participant missing more than one session was removed from analysis

2.3 Intervention

Participants practiced Chandra Bhedana Pranayama for 15 minutes each morning over 7 consecutive days in a quiet, supervised room. Sitting upright, the right nostril was closed with the right thumb. A slow deep breath was drawn through the left nostril. After a brief natural pause, the left nostril was closed with the ring finger and exhalation was done fully through the right nostril. This completed one cycle, repeated continuously at a comfortable pace throughout each session.

2.4 Assessment Tools

Digit Span Test (DST): A widely used neuropsychological tool measuring auditory attention and working memory. Digit Span Forward (DSF) tests basic attention by repeating number sequences in order; Digit Span Backward (DSB) tests working memory and executive function by repeating them in reverse. Higher scores indicate better performance. The DST is sensitive to short-term cognitive changes [3,7].

Mindful Attention Awareness Scale (MAAS): A validated 15-item questionnaire by Brown & Ryan (2003) measuring present-moment awareness on a 6-point Likert scale (1 = Almost Always to 6 = Almost Never inattentive). Higher scores reflect greater mindful calmness. The MAAS has strong reliability and validity in university student populations [4,5].

2.5 Statistical Analysis

Paired t-tests were used to compare pre- and post-intervention scores. The level of statistical significance was set at $p < 0.05$. All results are expressed as Mean ± Standard Deviation (SD). Statistical analysis was performed using SPSS version 22.0.

3. RESULTS

All ten participants completed the full seven-day intervention without reporting any pain, dizziness, or discomfort at any point. This alone confirms the technique is safe and well-tolerated by students with no prior pranayama experience. Table 2 presents the pre- and post-intervention scores for all three outcome measures.

Table -1: Pre- and Post-Intervention Mean Scores (Mean ± SD)

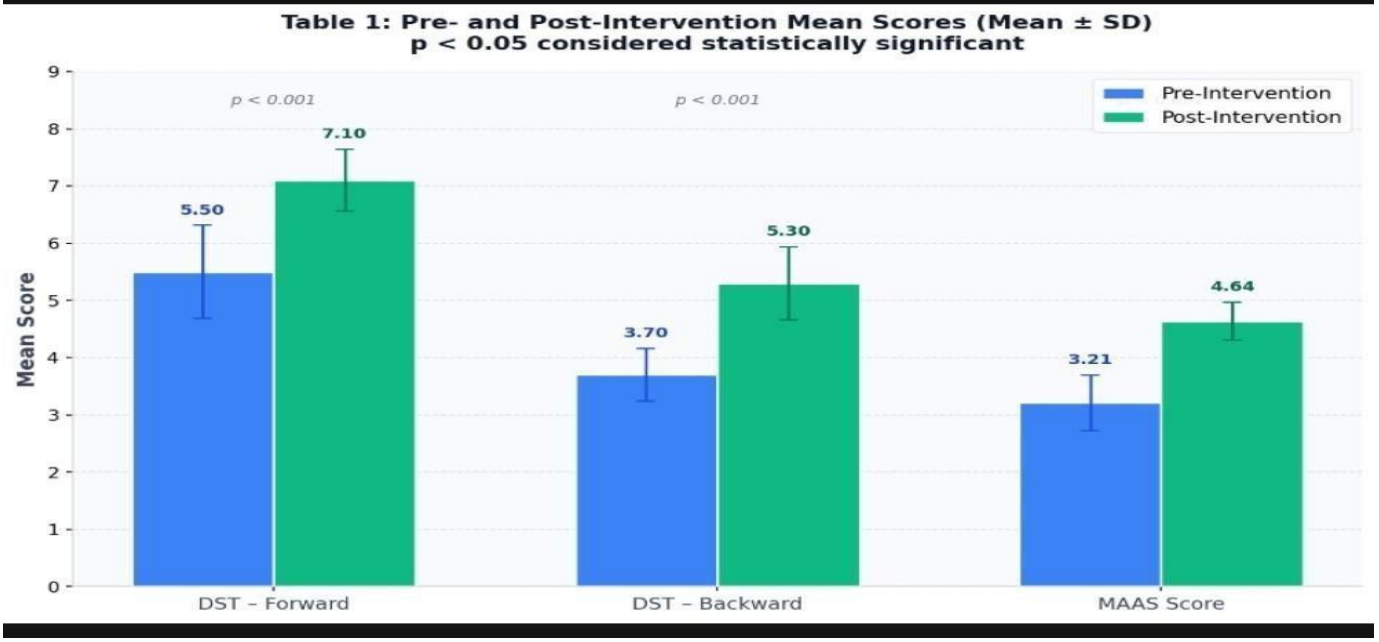
**p < 0.05 considered statistically significant*

Assessment Tool	Pre-Intervention	Post-Intervention	p-value
DST – Forward (DSF)	5.50 ± 0.81	7.10 ± 0.54	**< 0.001***
DST – Backward (DSB)	3.70 ± 0.46	5.30 ± 0.64	**< 0.001***
MAAS Score	3.21 ± 0.48	4.64 ± 0.33	**< 0.001***

DST Forward scores went from 5.50 to 7.10 after the intervention. Students could hold and accurately repeat longer number sequences, reflecting better basic attention and auditory processing. The DST Backward improvement — from 3.70 to 5.30 — was even more telling. This task requires hearing a number sequence, holding it in memory, mentally reversing the order, and then repeating it back. Scoring better here means both working memory and executive function improved. MAAS scores moved from 3.21 to 4.64, showing students felt more present and mentally calm in their everyday activities. Several participants informally mentioned that they noticed less mind-wandering during their own study sessions and felt generally less mentally cluttered by the end of the week

Table 1: Pre- and Post-Intervention Mean Scores (Mean ± SD)

p < 0.05 considered statistically significant



4. DISCUSSION

The results were consistent and clear across all ten participants, none of whom had any prior pranayama experience. That is an important point — it means the benefits are not the product of practised skill or previous exposure. They came purely from one week of 15-minute morning sessions in a regular academic department setting. Left nostril inhalation activates the right cerebral hemisphere through the olfactory-limbic pathway [2], which shifts the autonomic nervous system away from the sympathetically-driven stress response and toward parasympathetic balance — reducing the physiological state that makes sustained attention so difficult for students under academic pressure.

The gains seen in the Digit Span Test are consistent with Sharma et al. (2014) [3], who found that slow pranayama improved working memory in healthy volunteers within a short intervention window. The backward span improvement is worth particular attention. The backward condition simultaneously engages the prefrontal cortex and hippocampus, and improvements here indicate better coordination between the brain's executive and memory networks — not just a surface-level attention gain. Telles et al. (2017) [1] and Joshi & Telles (2008) [8] reported comparable cognitive improvements with left nostril breathing in yoga-naive participants, providing direct comparative support. The MAAS score gains align with Gothe et al. (2017) [5], who found that yoga-based cognitive programmes produced similar mindfulness improvements over similar durations.

This study has limitations that must be acknowledged honestly. The sample size of ten is small. There was no active control group, so a placebo effect cannot be fully ruled out. Future research should include larger samples, active control conditions, longer follow-up periods, and objective physiological measurements such as heart rate variability or EEG recordings. That said, effect sizes across all three outcomes were large, and zero adverse events were recorded across all sessions and all participants.

5. CONCLUSIONS

Seven days of Chandra Bhedana Pranayama significantly improved attention, working memory, and mental calmness in yoga-naive undergraduate students, with $p<0.001$ across all three outcome measures and no adverse effects reported. The technique is safe, free, equipment-independent, and takes only 15 minutes a day — making it a genuinely practical option for any college wellness programme. Larger, well-controlled trials are now needed to confirm these preliminary results and to explore optimal session duration, long-term benefits, and applicability across different student populations.

ACKNOWLEDGEMENT

The authors sincerely thank the management and faculty of JSS Institute of Naturopathy and Yogic Sciences, Coimbatore, and the Department of Pharmacy, Madurai Medical College, for their support and for providing the facilities required for this study. We are grateful to the ten student volunteers whose sincerity and commitment throughout the full seven-day programme made this work possible. Heartfelt thanks to Dr. T. Tamilarasu for his guidance, expert feedback, and patient review at every stage of this research.

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