

# "Immediate Effects of swooning breathing technique on Physiological and Cognitive parameters in a Healthy individual: A Single Case Study."

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**Abstract -Background:** Pranayama is a classical breathing technique described in ancient texts like the Hatha Yoga Pradipika. Moorcha Pranayama is believed to calm the mind and influence the autonomic nervous system. Limited scientific evidence exists regarding its immediate effects on physiological parameters and cognitive functions. Therefore, systematic evaluation is required to understand its measurable impact. **Objective:** To assess the immediate effect of Moorcha Pranayama on selected physiological parameters and cognitive functions. **Method:** A single-subject case study design was adopted. One healthy participant was selected after medical screening and informed consent. Baseline measurements of heart rate, blood pressure, respiratory rate, and oxygen saturation, radial pulse and carotid pulse along with cognitive tests, were recorded. The participant then practiced Moorcha Pranayama for 10 minutes under supervision. Immediately after the session, all parameters were reassessed. Pre- and post-intervention values were compared to determine immediate effects. **Result:** Post-intervention analysis demonstrated changes in systolic blood pressure, pulse rate, body temperature, and oxygen saturation, indicating acute autonomic activation. In cognitive performance, with a substantial reduction in Stroop test time and errors, enhanced working memory capacity (digit span increased from 4 to 6), faster reaction time (311 ms to 262 ms), and significant reduction in Trail Making Test completion time (Part B reduced from 104s to 49s). **Conclusion:** Moorcha Pranayama produced immediate and pronounced improvements in cognitive function with concurrent autonomic stimulation, highlighting its potential as a rapid psychophysiological modulation technique

**Key Words:** Moorcha Pranayama; Autonomic Nervous System; Cognitive Function; Executive Function; Working Memory; Reaction Time; Acute Effects.

## 1. INTRODUCTION

Pranayama, a fundamental component of yogic science, involves the conscious regulation of breath to influence physiological and psychological states. Classical yogic texts such as the Hatha Yoga Pradipika describe various pranayama techniques aimed at balancing prana (vital energy) and stabilizing the mind. Among these, Moorcha Pranayama is characterized by controlled inhalation, breath retention, and internal awareness, traditionally believed to induce heightened mental clarity and subtle expansion of consciousness<sup>1,2</sup>.

From a physiological perspective, controlled breathing practices are known to modulate the autonomic nervous system by altering sympathetic and **parasympathetic activity**. Such modulation may influence cardiovascular parameters including blood pressure, pulse rate, oxygen saturation<sup>4</sup>. Additionally, emerging evidence suggests that pranayama practices can positively affect higher cognitive functions such as attention, working memory, processing speed, and executive control<sup>3</sup>.

Despite growing scientific interest in yogic breathing techniques, limited research has specifically examined the immediate psychophysiological effects of Moorcha Pranayama. Understanding its acute impact on both physiological and cognitive parameters is essential for establishing its potential therapeutic relevance. Therefore, the present case study aims to systematically evaluate the immediate effects of 10 minutes of Moorcha Pranayama on selected physiological and cognitive outcomes in a healthy young adult<sup>3</sup>.

### 1.1 Aim and objective:

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To evaluate the immediate effects of Moorcha Pranayama<sup>7</sup> on physiological parameters including blood pressure, pulse rate (radial and carotid), body temperature, and oxygen saturation before and after the intervention of pranayama in a healthy adult.

To evaluate changes in cognitive performance using the Stroop Test, Digit Span Test, Trail Making Test and simple reaction test<sup>2</sup>.

## **2. Materials and Methodology:**

### **2.1 Study Design**

The present study was conducted as a single-subject case study with a pre- and post-intervention assessment design.

### **2.2 Study Setting:**

The study was carried out at JSS Institute of Naturopathy and Yogic Sciences

### **2.3 Participant:**

One healthy male participant (age: 20 years) was selected after medical screening. Written informed consent was obtained prior to participation.

### **2.4 Inclusion Criteria:**

Healthy male individual aged between 18–25 years with no medical history . provide written informed consent. No prior history of cardiovascular, respiratory, neurological, or psychiatric disorders. Not under any medication affecting cardiovascular<sup>4</sup> or cognitive functions. Able to understand and perform Moorcha Pranayama<sup>5</sup> .

### **2.5 Exclusion Criteria:**

History of hypertension, hypotension, cardiac disease, or respiratory disorders. History of syncope, vertigo, or seizure disorders. Recent surgery or acute illness Use of stimulant substances (caffeine, nicotine) immediately prior to assessment. Inability to complete cognitive assessment tests.

### **2.6 INTERVENTION:**

The participant then performed Moorcha Pranayama[ sit in a steady meditative posture, take a deep, smooth breath in, and hold it comfortably. While maintaining this breath retention, consciously withdraw your awareness from all external sounds and distractions, pulling your mind entirely inward. Lock your mental focus and gaze onto the **Ajna Chakra**, the space between the eyebrows, and remain in this state of concentration.]

Continue until you experience a sensation of "fainting" or a total quietening of the mind, allowing your thoughts to dissolve into a state of yogic bliss.

Immediately after the intervention, all physiological and cognitive parameters<sup>3</sup> were reassessed using the same procedures. Pre- and post-intervention values were compared to evaluate immediate effects.

### **2.7 Method of Data Collection:**

Baseline physiological parameters (blood pressure, radial pulse, carotid pulse, body temperature, and SpO<sub>2</sub>) were recorded in multiple readings and averaged. Baseline cognitive assessment<sup>3</sup> included Stroop Test, Digit Span Test, Simple Reaction Time Test, and Trail Making Test<sup>8</sup>.

### **Result:**

Pre- and post-intervention values were taken. The changes in physiological parameter were analyzed by comparing baseline and post-intervention mean values and the cognitive assessment were analysed before and after the intervention. Observed changes were interpreted based on the magnitude and clinical relevance of differences

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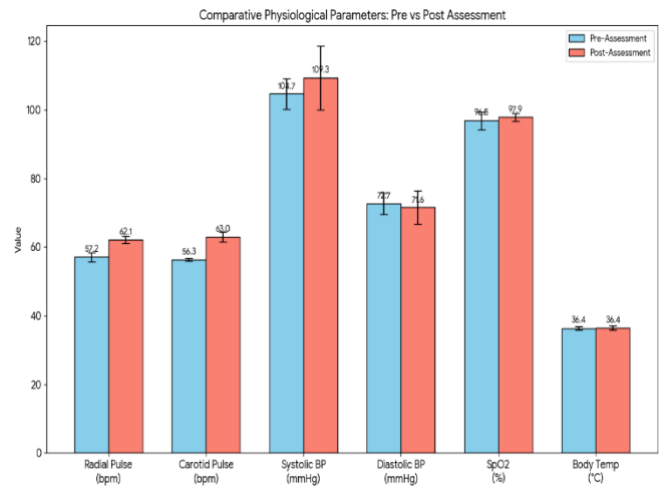
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between pre- and post-intervention measurements.

Marked improvements were observed in cognitive parameters, along with noticeable changes in physiological variables following the intervention( Table 1 and 2).

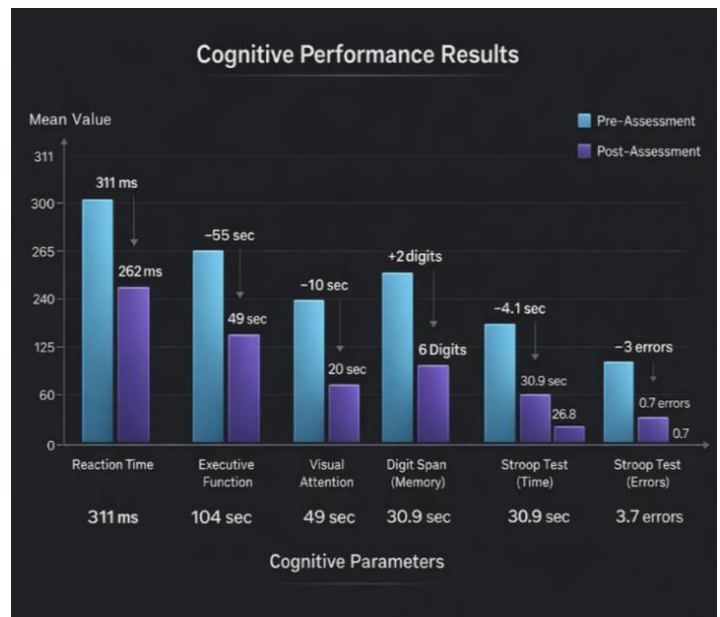
**Table 1: Statistical analysis of physiological changes observed before 15 ,10 ,5 and three readings before and after performing moorcha pranayama**

Parameter	Pre-Assessment (Mean)	Post-Assessment (Mean)	Change (Difference)
Radial Pulse	57.17±1.34 bpm	62.14±1.06bpm	+5.33 bpm
Carotid Pulse	56.33 ±0.47bpm	63.00±1.41 bpm	+7.17 bpm
Systolic BP	104.7 ±4.4mmHg	109.3±9.35 mmHg	+4.67 mmHg
Diastolic BP	72.7 ±3.09mmHg	71.57 ±4.9mmHg	-1.33 mmHg
SpO <sub>2</sub>	96.83±2.67%	97.86±1.06%	+0.84%
Body Temperature	36.35±0.52 °C	36.44±0.58°C	+0.05 °C



**Table 2: Cognitive changes observed before and after intervention.**

Parameter	Pre-Assessment	Post-Assessment	Change (Difference)
Reaction Time	311.33 ms	262.00 ms	-49.33 ms
Trail making test	104.00 s	49.00 sec	-55.00 sec
Visual Attention	30.00 sec	20.00 sec	-10.00 sec
DigiSpan (Memory)	4 digits	6 digits	+2 digits
Stroop Test (Time)	30.93 sec	26.80 sec	-4.13 sec
Stroop Test (Errors)	3.67 errors	0.67 errors	-3.00 errors



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### Discussion:

The present case study explored the immediate psychophysiological effects of 10 minutes of Moorcha Pranayama in a healthy young male adult. The findings revealed mild autonomic modulation and which are non-significant and substantial cognitive enhancement, indicating a dynamic regulatory influence of this breathing technique

Post-intervention increases in systolic blood pressure, pulse rate, body temperature, and oxygen saturation suggest transient sympathetic predominance. Unlike slow calming pranayamas that predominantly enhance parasympathetic tone, Moorcha Pranayama involves controlled inhalation and breath retention (antara kumbhaka), which may temporarily elevate intrathoracic pressure and stimulate cardiovascular and central autonomic **networks**. This acute activation may enhance cerebral perfusion and cortical excitability, thereby facilitating improved cognitive **processing**<sup>9</sup>.

Notably, marked improvements were observed across multiple cognitive domains, including attention (reduced Stroop time and errors), working memory (digit span increased from 4 to 6), processing speed (reaction time reduced), and executive function (substantial reduction in Trail Making Test Part B time). The magnitude of improvement in executive functioning suggests enhanced prefrontal cortical engagement and improved **neural efficiency**<sup>10</sup>.

These findings indicate that Moorcha Pranayama may function as an acute cognitive-modulatory technique producing short-term autonomic stimulation coupled with enhanced higher-order mental performance. However, given the single-subject design, the results should be interpreted cautiously. Larger controlled trials incorporating objective neurophysiological measures are warranted to further elucidate the underlying mechanisms

### 3. CONCLUSIONS

The present case study demonstrates that 10 minutes of Moorcha Pranayama elicited immediate and measurable psychophysiological changes in a healthy young adult.

However, given the single-subject design, the results cannot be generalized. Further controlled studies with larger sample sizes and advanced neurophysiological assessments are necessary to substantiate and elucidate the underlying mechanisms.

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