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RESEARCH ARTICLE

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## IMMEDIATE PRACTICE EFFECT OF VRIKSHASANA ON NEUROCOGNITIVE COMPONENTS: A PILOT STUDY

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### ABSTRACT

**Background:** Yoga is the most popular complementary health approach practiced by. It is an ancient mind and body practice with origins in Indian philosophy. Yoga combines physical postures, rhythmic breathing and meditation to offer the practitioners unique holistic mind-body knowledge. While the health benefits of physical exercise are well established, in recent years, the active attentional component of breathing and meditation practice has gathered interest among exercise neuroscientists. **Aim of the study:** The aim of the present study was to observe the immediate practice effect of Vrikshasana on neurocognitive components. **Methods:** To perform the standing pose asana, Vrikshasana, the subject was taken total 3 minutes time. In these 3 minutes, the subject was taken 30 seconds for initial to final position of the asana, one minute holding of the asana, 30 seconds was taken for releasing and back to the initial position and another one minute was taken for relaxing or rest. The subject was performed 10 repetitions of this Vrikshasana. Hence, total 30 minutes was training session of this study. To collect the data CNS Vital Sign software was used. Graphical representation was used to observe the immediate effect. **Results:** The present study showed that some variables were increased and some variables were decreased after 30 minutes Vrikshasana practice. Here neurocognition index, visual memory, complex attention, cognitive flexibility, executive function, social acuity and simple attentions were increased whereas; verbal memory, psychomotor speed, reaction time, processing speed and motor speed were decreased. **Conclusion:** On the basis of the result it may be concluded that selected neurocognitive components are increased after immediate practice of Vrikshasana.

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## INTRODUCTION

In the modern context, yoga has been broadly understood as a set of principles and practices designed to promote health and well-being through the integration of body, breath, and mind (Hayes, 2010). Vrikshasana is also known as a penance posture as it infuses a deep contemplative meditation effect and self-discipline in its practitioner. Many scientific studies have promoted yoga for its therapeutic value in reducing stress and anxiety and for improving autonomic functions (Sengupta, 2012) and considering it as an effective and supportive adjunct to mitigate some medical conditions (Büssing et al., 2012). Yoga is associated with improved cognition and cardiac functioning in healthy older, adults and subjects with cognitive and cardiac deficiencies. Yoga is a very traditional practice, it is considered more as a science than just philosophy or religion. Yoga believes that every human being exists in this world in not just one (physical dimension) but five dimensions; pranamaya kosha (vital body), vijanamaya kosha (intellectual body), manomaya kosha (psychic body), annamaya kosha (physical body) and anandamaya

kosha (causal body). They altogether aim at bringing about a balance in all aspects. Vrikshasana or the tree pose is a common standing Yoga asana. It has various benefits for the brain, immunity, spine, and stability. Vrikshasana is a single-leg standing posture that stretches the entire body and improves the body and the breath for balance, attention, and concentration. Symbolically, as a "Penance Posture," many holy men chose this for their practice of deep contemplation and self-discipline (Kishore DM, 2023). Neurocognitive is a term used to describe cognitive functions closely linked to the function of particular areas, neural pathways or cortical network system in the brain. Therefore it also related to neuropsychology and cognitive neuroscience. Neurocognitive abilities are the brain-mind skills needed to initiate any task from the simplest to the most complex, decreases with advancing age. There are thirteen components of neurocognition. These are neurocognition index, composite memory, verbal memory, visual memory, psychomotor speed, reaction time, complex attention, cognitive flexibility, processing speed, executive function, social acuity, simple attention, and motor speed respectively.

**Aim of the study:** The aim of the present study was to observe the immediate practice effect of Vrikshasana on neurocognitive components.

## MATERIALS AND METHODS

**Selection of Subjects:** To achieve the aim of the study, one (01) male Indian college going student was taken conveniently as subjects for this study. The subject was selected from the department of Physical Education and Sports Sciences, Visva-Bharati of West Bengal. The age of the subject was 22 years. The subject was given the willingness certificate to give the test.

**Criteria measure:** To measure the neurocognitive components, the researcher used the CNS Vital Sign software which was developed in Canada and marketed by Canadian company in India. CNS Vital Sign software distributorship was taken by the Gunjan Human Karigar Pvt. Ltd., New Delhi (email: humankarigar@gmail.com and website: www.humankarigar.com). The tests were taken in one day at the evening time (5-6 pm). To perform the standing pose asana, Vrikshasana, the subject was taken total 3 minutes time. In these 3 minutes, the subject was taken 30 seconds for initial to final position of the asana, one minute holding of the asana, 30 seconds was taken for releasing and back to the initial position and one minute was taken for relaxing and rest. The subject was performed 10 repetitions of this Vrikshasana. Hence, total 30 minutes was training session of this study.

**Statistical Techniques:** To observe the immediate effect of Vrikshasana on neurocognitive components the graphical representation was used.

## RESULTS AND FINDINGS

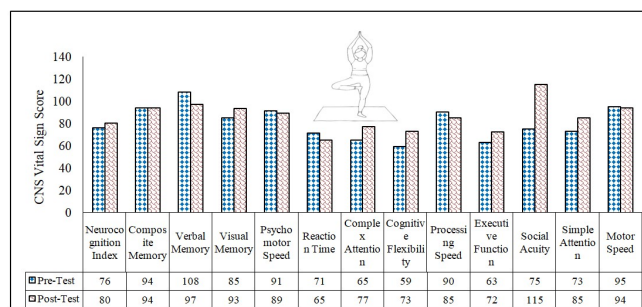
The findings pertaining of neurocognitive components on Vrikshasana of the subject has been presented in Table 1.

**Table 1. Pre-Test and Post-Test Data of CNS Vital Sign on Vrikshasana of the Subject**

CNS Domains	Pre-Test Data	Post-Test Data
Neurocognition Index	76	80
Composite Memory	94	94
Verbal Memory	108	97
Visual Memory	85	93
Psychomotor Speed	91	89
Reaction Time*	71	65
Complex Attention*	65	77
Cognitive Flexibility	59	73
Processing Speed	90	85
Executive Function	63	72
Social Acuity	75	115
Simple Attention	73	85
Motor Speed	95	94

An \* denotes that "lower is better", otherwise higher scores are better

Table 1 showed that the pre-test and post-test data of neurocognition index was 76 and 80, whereas the composite memory was 94. Pre-test and post-test data of verbal memory, visual memory, psychomotor speed, reaction time, complex attention, cognitive flexibility, processing speed, executive function, social acuity, simple attention and motor speed was 108 & 97, 85 & 93, 91 & 89, 71 & 65, 65 & 77, 59 & 73, 90 & 85, 63 & 72, 75 & 115, 73 & 85 and 95 & 94 respectively. Figure 1 indicated that some selected components of CNS Vital sign such as neurocognition index, visual memory, complex attention, cognitive flexibility, executive function, social acuity and simple attention were increase from pre-test to post-test. On the other hand, verbal memory, psychomotor speed, reaction time, processing speed and motor speed were decrease from pre-test to post-test.



**Figure 1. Graphical Representation of CNS Sign on Vikshasana**

**Table 2. Result of the Figure**

Increase	Decrease
Neurocognition Index	Verbal Memory
Visual Memory	Psychomotor Speed
Complex Attention	Reaction Time
Cognitive Flexibility	Processing Speed
Executive Function	Motor Speed
Social Acuity	
Simple Attention	

The practice of Vrikshasana involves stretching of arms, back, and entire body while folding one of the legs and both hands with their pressed palms placed at the sternum. The pose stretches the entire body as well as improves body balance, attention, and concentration level because the involvement of the central nervous system (CNS) (Greendale et al., 2012; Kumari et al., 2018). Practice of Vrikshasana could activate two receptors namely vestibular apparatus in the inner ear and pacinian corpuscles present in the skin with their related sensory motor and other cortical areas. Also it should activate lower brain or Cerebellum for coordination and body awareness. The Pons and Medulla areas are also involved for monitoring, the breathing awareness. Together, these activations may develop more concentration because many parts of the brain are involved Vrikshasana type of balance yogasana.

## CONCLUSION

On the basis of the result it may be concluded that selected neurocognitive components are increased after immediate practice of Vrikshasana.

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