

# **EFFICACY OF YOGASANA, ANULOM VILOM PRANAYAMA AND MITAHAR PRACTICE ON COGNITIVE FUNCTIONS AMONG YOGA TEACHERS TRAINING COURSE (YTTC) STUDENTS**

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## **Abstract**

**Background:** The present study tries to find out the effect of Yogasana and Anulom Vilom Pranayama and Mitahar (Moderation in diet) on cognitive functions among Yoga teacher training students. **Method:** This study included 125 participants of a 45 days Yoga Teachers Training Course (YTTC) from Lakulish Yoga University, Ahmedabad. Data were gathered using the "Cognition self-assessment rating scale (C-SARS)" A single group pre-test and post-test research design was used. Paired T-test was used for data analysis. **Results:** The mean difference of 6.62 between pre data collections and post data collection shows that mean value is higher for post data collection. The highly significant P value ( $P < 0.0001$ ) and the large  $t=11.1288$  indicate that this difference is statistically significant. The 95% confidence interval of this difference: From 5.45 to 7.80 further confirms this by showing a positive range that does not cross zero. **Conclusion & Findings:** These results support that practice of Yogasan, Pranayama and Moderate diet helps to improve Cognitive functions. This finding is robust and claims that good cognitive function contributes to overall well-being and life satisfaction. It allows individuals to engage fully in life and Yoga can be a great tool to achieve it.

**Keywords:** Yogasana, Anulom Vilom Pranayama, Cognitive functions, Psychology, C-SARS, Yoga teachers training course (YTTC) students.

## **INTRODUCTION**

Yoga is a science of spirituality that greatly contributes to the harmony of the body, mind, and soul. Yoga is typically translated as 'union' which denotes the merger of the human body, mind, and spirit. It has gained popularity from the beginning of time for the sole purpose of highlighting the value of health. The brain functions of attention, cognition, processing of sensory information and visual perception are honed with yogic practices. In addition to its effect of balancing the doshas and strengthening the body, Yoga also has the result of calming the mind, for yoga asanas are performed in a slow, peaceful manner, with a centered mind. This has both an immediate calming effect and long term result of a calm and peaceful countenance. Yoga Asanas increase the circulation of blood to the brain (i.e., they nourish the brain by increasing circulation of blood and oxygen). This helps calm the mind and enhances concentration skills. Memory lapses can also be prevented through yogic practices that enhance the power of recall. Memory is the latent capacity to retain and recall information about past and present incidents, yoga assists in improving memory power through yogic techniques. One can draw upon the immense power of the mind with consistent yogic endeavor. Regular practice of yoga asanas develops the physical and mental capabilities, which improves the Memory. Pranayama is a technique for controlling and modulating breath and meditation, which is a method for achieving a deep state of rest while remaining alert. Hatha Yoga Pradipika (HYP), Gherand Samhita (GS) and Yogattvopanishad (YTU) are very profound 'WE ARE WHAT WE EAT' Diet is an important aspect of our daily life. Life can not be sustained without adequate nourishment. Food has been much insisted upon by the scriptures of Hinduism, as the Physical, Mental and Spiritual. The present time science of food about nourishment has little, if any, knowledge about the contribution of food towards mental culture. It emphasizes merely physical well-being. Yoga teaches us that the cause of disease is due to Under (Ajirnatvam), Over (Atijirnatvam), Wrong (Kujirnatvam) digestion. The major advantages of eating healthy food are that it increases life span, cleanses the mind, and gives you physical vigor. A "Yogic Diet" is a diet that promotes peace

because it modifies one's mental state, makes it possible for them to accept greater spiritual light, and gives them a fuller, happier existence. Concept of Mitahara in Hatha Yoga There are several instructions given by notable seers or sages in their doctrines about taking a reasonable diet along with yoga practice for those who desire for physical, mental and spiritual well-being. Yogic diet has been also called as "Mitahara" (Moderate diet) in hatha yoga scriptures "Eating the sweet, nutritious, and lubricating meal known as Mitahara" In the ancient hatha yogic scripture the sage swatmarama's hatha pradipika has defined the mitahara as „Eating sweet unctuous food offered first to the almighty and not eaten for one's own satisfaction, leaving one quarter of the stomach empty (1-58). Food is not only considered to be responsible for maintaining physical health but also for our good or bad thoughts. That is the reason why, universally in Indian scripture yukta ahara vihara has been recommended.

## LITERATURE REVIEW

### **Yogasana:**

Yogasana contributes to not merely the physical development of the child but has a positive impact on psychosocial and mental development as well. Apart from contributing to physical fitness, yoga also contributes to improving learning, memory and dealing with stress and anxieties in children. (Singh & Singh, 2015). Yoga improves the quality of life and self-esteem. (Deshpande, 2008). Yoga-based interventions have some positive evidence in improving attention, executive functions and memory of cognition, while depression in mental health compared to active control among the elderly (Chobe et al., 2020). Yoga, a physical and contemplative practice, offers the practitioner a unique mind-body exercise experience demonstrating preliminary efficacy in improving cognitive health. The active attentional component of yoga may incur cognitive benefits over and above the habitual bodily movements involved in traditional forms of exercise. A mindful movement practice, yoga enables the practitioner to move slowly and safely into physical postures while concentrating on relaxing the body, breathing fully, and developing awareness of bodily sensations and passing thoughts. In addition, breathing and meditation exercises are practiced to calm and focus the mind and develop greater self-awareness. This focused effort and attentional practice of yoga seems to mimic the conventionally assessed cognitive functions including attention, memory, and higher order executive functions (Voss et al., 2023). Positive impact of yoga on the body: Recent research has begun to explore the cognitive effects of yoga. Previous qualitative studies have shown the subject self-reported positive effects of yoga on depression and anxiety (Froeliger et al., 2012), (Buzsáki, 2015).

### **Pranayama:**

Pranayama are mostly characterized by breath holding at the end of maximum inspiration or maximum expiration and slowing of the respiratory rate. They also bring equipoise between psychic and somatic aspects of bodily functions (Anand et al., 1961). Pranayam which is a yogic breathing technique produces consistent physiological changes and has a sound scientific basis (Udupa et al., 1972). The physiological and psychological benefits of pranayama have been demonstrated in several studies (Yoga, 2018). Benefits have been reported in peripheral nerve function (Malhotra et al., 2002) as well as central neuronal processing (NambiNarayanan et al., 1992). Studies have demonstrated that subjects trained in yoga and pranayam can achieve a state of deep psychosomatic relaxation (undisturbed ability) (Madanmohan et al., 1983). pranayam is an art of control of breathing, a practitioner of Anulom Vilom pranayam not only tries to breathe, but at the same time, tries to keep his/her attention on the act of breathing, leading to concentration. This act of concentration removes his attention from worldly worries and de-stress him/her. This stress free state of mind evokes relaxed responses (Bhargava et al., 1988). In these relaxed states, parasympathetic nerve activity overrides sympathetic nerve activity (Udupa et al., 1975). Anulom Vilom pranayam makes the mind steady and hence less distractible, more acute, pointed, precise, and quick in responding to any stimuli. The intricacies of central and autonomic nervous mechanisms involved in the effects of Anulom Vilom pranayam on visual reaction time needs further more psychophysiological, electrophysiological and neurobiochemical studies.

### **Mitahar:**

Yogic diet which consists of rich sattva quality ingredients boosts energy level and vitality keeping one away from the diseases, it can be totally considered has diet which provides strength, vitality and elevate the inner energies to a whole new level and helps in maintaining physical and mental Well-being (Megalamani et al., 2022). The taste and weight of food in the gross body, the effects and qualities of food in the subtle body and the sanskars of food in the causal body. These three cells affect our Annamaya, Pranamaya and Manomaya cells respectively. The rituals of diet affect our mental institution (Saraswati, 1998). Ancient and classical Literature on yoga provides a golden rule to manhood (Yukta-ahara-vihara etc.), „Moderation in everything is good “and„ Excess of anything is bad “for a healthy life. The„ Yogic Diet “affected not only the body but also the mind. The „Yogic Diet“ upheld health and developed a positive attitude in a person. In this present time a„ Healthy Modern life“ deals with„ Yogic lifeStyle “In which the whole concentration on his diet., A Yogic diet gives good health to the person. The healthy diet changed the both conditions of body and mind,

but opposite this an unhealthy diet affected not only the body but also the mind. The diet is a natural and necessary need of life. A diet has an important place in the lifestyle of a „Health“. A pure and satvika diet also gives peace to the mind with health (Maurya et al., 2001).

## OBJECTIVE OF THE STUDY

The objective of the present research is to examine the impact of Yogasana and Anulom Vilom Pranayama and Mitahar practice on the cognitive function among yoga teachers training participants.

## RESEARCH METHODOLOGY

### Sample

The current study used convenient sampling procedures to choose a sample of 125 participants of Yoga Teachers Training Course's (YTTC) four consecutive batches from Lakulish Yoga University, Ahmedabad.

### Inclusion criteria

The inclusion criteria for this study comprised healthy individuals of any gender and age  $\geq 19$  years who have enrolled for YTTC

### Exclusion criteria

Participants with physical disabilities who have other major medical complications like recently operated upon and pregnant female were excluded from the study. Additionally, individuals with very chronic illness and mental illness were not considered for inclusion.

### INTERVENTION MODULE:

Classical Hathayoga Practice: Here is a general schedule for a four and a half hours yoga class that includes a variety of asanas and Anulom Vilom pranayama with fundamental theory knowledge about Classical Hathayoga. The session is divided into different segments including dynamic asana series, meditative asana practice, pranayama, relaxation break and theory class. Session starts with a signature prayer given by Swami Rajarshi Muni. Which includes stanzas from Vedas and Upanishad. This is required to set an intention for the class. Daily practice includes warm-up and standing poses (50-60 minutes) that provides good amount of exercise to various parts of the body that makes the body more flexible and regulates the flow of the vital life force (*Prana*), seated meditative poses (50-55 minutes) promotes calmness, mental focus and physical stability. These asanas pacify the wandering and wavering mind and bring an inner peace. Prone poses, Supine poses, Supine Twist (40-45 minutes) are also included. Deep breathing practice followed by Anulom Vilom pranayama is practiced for 15-25 minutes. Corpse Pose is practiced for 5-10 minutes. At the end gratitude and closing remarks by practical teachers are done. There is a break for 30 minutes to have some light food. Theory session is conducted for an hour (60 minutes) about the fundamental knowledge of Classical Hathayoga. This schedule provides a comprehensive yoga experience. The timings can be adjusted based on the class duration and level of participants' body type and flexibility, strength, stamina and interest.

### VARIABLES:

#### Independent Variable

Classical Hathayoga includes various yogasana practice and Anulom Vilom pranayama and theory knowledge.

#### Dependent Variable

The cognitive function scale level of Yoga teachers training course (YTTC) participants.

### TOOLS:

The following tool were utilized for data collection:

**“Cognitive Self-assessment Rating Scale (C-SARS)”**: The C-SARS is a questionnaire developed by Dr. Henry A. Nasrallah<sup>1</sup> to get the overview of the cognition related function the of an individual. This scale contains 12 items with 2 questions each.

Cognitive functions evaluated in the C-SARS:

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- Item 1: Attention
- Items 2,3,4, and 5: Memory
- Items 6,7 and 8: Executive functions [decision-making, planning ahead, self-control]
- Item 9: Processing speed of thinking and physical reflexes
- Items 10 and 11: Social Cognition, including empathy, recognizing facial expressions

## PROCEDURE

A study was conducted involving 125 participants who underwent Yoga teachers training program in which there are daily 3 hours practical session of Yogasana and Pranayama and one hour theory session. In practical session, different Asana postures practice and Anulom Vilom pranayama are being taught and in theory session, fundamental knowledge of yoga is delivered. Theory and practical both are based upon the book 'Classical Hathayoga' by Swami Rajarshimuni. On the first day of the program, test was administered using C-SARS questionnaire to assess the baseline emotional intelligence of the participants. After 45 days of training, the same test was conducted again. The results from the initial and final assessments were then compared to evaluate the impact of the yogasana and pranayama training on the participants' emotional intelligence.

## Permission and Consent:

The investigation was conducted with prior approval from the research guide and consent was sought from all individuals to ensure that their participation was voluntary and purely for research reasons.

## Establishing rapport:

Rapport was prepared with participants in small, manageable batches to promote comfort and openness.

## Administering questionnaires:

To assess cognitive functions, participants were administered the Cognitive Self-assessment Rating Scale (C-SARS) by Dr. Henry A. Nasrallah.

## Data Scoring:

After collection, scoring was carried out using the scoring keys supplied in the manuals.

## Pre-test Data Collection

The initial data collection served as a pre-test measure of participants' emotional intelligence level.

## Interventions

Each participant undertook a 45 days intervention that included practice of Yogasana and Anulom Vilom pranayama and Mitahar

## Post-Test Data Collection

Following 45 days intervention, the same questionnaire was completed again to assess post-intervention emotional intelligence level.

## Data Organization

The pre-test and post-test data were organized into an Excel sheet, with variables clearly labeled for analysis.

## DATA ANALYSIS & INTERPRETATION

**Results:** Pre and Post data of Cognitive Self-assessment Rating Scale for YTTC participants are shown in table below.

Table No. 1

Data	N	Mean	SEM	SD	t	Level of significance
Pre	125	19.50	1.07	11.96	11.1288	0.0001
Post	125	12.88	0.74	8.27		

The results from paired t-test indicate a very strong statistical difference between the pre- and post-conditions. Here is a detailed summary:

- **P value:** The two-tailed P value is less than 0.0001.



- **Significance:** This indicates that the difference between the pre- and post-conditions is extremely statistically significant by conventional criteria (typically, a  $P < 0.05$ ).
- **95% confidence interval:** Ranges from 5.45 to 7.80
- **t-statistic (t):** 11.1288.
- **Degrees of freedom (df):** 124.
- **Standard error of the difference:** 0.595.

#### **Interpretation:**

The analysis shows a significant difference between Group One and Group Two, with Group One having a higher mean value. The extremely low P value ( $< 0.0001$ ) and large t-statistic (11.1288) indicate that the difference is statistically significant, meaning it is not likely due to random chance. The confidence interval (5.45 to 7.80) being entirely above zero further confirms that the difference is both statistically and practically meaningful.

In summary, the data provide strong evidence that there is a true difference between Group One and Group Two, with Group One scoring, on average, 6.62 units higher than Group Two. This result is robust and highly statistically significant.

## **CONCLUSION**

Here is a significant improvement in cognitive functions of yoga aspirants after 45 days of Yoga teachers training course. Yoga can be used as a technique to enhance cognitive functions like attention, memory, processing speed of thinking and physical reflex and social cognition. Overall, we found the practice of yoga safe, when practiced under guidance of a trained teacher, and have no side effects. Yoga exercise is recommended to incorporate in daily life to lead a happy, and peaceful life.

## **LIMITATIONS OF THE STUDY**

While the findings are encouraging, the study carries significant limitations as under:

**Sample Size:** The study used a small sample size of 125 participants from Lakulish Yoga University, Ahmedabad, which can be a restriction of the findings' generalizability. Further research aiming at bigger groups is required to corroborate these results.

**Short Duration:** The intervention lasted 45 days. Long-term research is needed to understand the long-term effects of yogasana and pranayama practice on emotional intelligence.

**Control Group:** There is no control group in present study, it is difficult to remove out placebo effects or other external factors that may have influenced the outcomes of the study. To draw more robust conclusions, future study should include a control group.

## **FURTHER SCOPE OF STUDY**

**Further Research:** It encourages further research to explore the mechanisms behind yoga's impact on emotional intelligence and to confirm these findings in different populations and settings.

**Comparative studies:** Comparison of the efficacy of yogasana and pranayama practice on emotional intelligence and other Gym exercises on emotional intelligence.

**Longitudinal studies:** Conduct long-term research to see whether the same benefits can be sustained over time. Assess the need for follow-up.

**Psychophysiological studies:** Investigate the effect of yogasana and pranayama on physical abilities and flexibility as well as other psychological mechanisms.

**Tailored intervention:** Create personalized lists of yogasana and various pranayama for particular health challenges and diseases for individuals and measure the outcomes.

## **CONFLICT OF INTEREST**

The authors declare no conflicts of interest. All co-authors have reviewed and approved the content of the manuscript, and there are no financial interests to disclose. We certify that this submission is original work and is not currently under review by any other publication.

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