

7.5.2c Records with measurable indicators on the impact amongst students through the ticked interventions by the department

The aim of the University of Patanjali is not only to educate the students but also to cultivate in them the vast ancient and scientific knowledge of yoga, *yajna* and *ayurveda*.

Following are the evidences which indicate the impact of different aspects of yoga on cognitive functions, self-esteem, overall stress, aggression etc. amongst youth within and outside the university campus:



EFFECTS OF TWO YOGA BREATHING TECHNIQUES ON MEASURES OF ATTENTION AND AROUSAL

Thesis submitted for the award of

Doctor of Philosophy (Yoga Science)

To the University of Patanjali

By

Sachin Kumar Sharma

Under the guidance of

Shirley Telles, M.B.B.S., Ph.D. (Neurophysiology)

Director, Patanjali Research Foundation &

Professor, University of Patanjali, Haridwar, India



UNIVERSITY OF PATANJALI

Established by Uttarakhand State Legislature under the University of Patanjali Act no. 4,
year 06 Haridwar-249405, Uttarakhand, India

Year 2021



ABSTRACT

Introduction

Cognitive processes are facilitated by attention. However, paying attention or focusing is associated with sympathetic activation which in turn leads to poor performance in cognitive function tasks. Also, increased sympathetic activity increases the risk of cardiovascular diseases (e.g., hypertension). Hence there is a need of intervention which can be useful to improve attention without sympathetic activation.

Yoga is a mind body practice which includes specific poses (*asanas*), regulated breathing techniques (*pranayamas*), meditation and certain philosophical principles. The practice of yoga gives considerable importance to breath regulation (known as *pranayamas*) for improving attention. An ancient yoga text says, “When the movement of air (breath) is irregular, the mind also is unsteady, but when the breath is still, so is the mind, and life is prolonged, hence one should regulate the breath” (*Hatha Yoga Pradipika*, Chapter 2: Verse 2). Another ancient yoga text mentions that the practice of *pranayama* develops ability to direct attention (*Yoga Sutra*, Chapter 2: Aphorism 53).

With this background there have been attempts to assess the effectiveness of specific yoga breathing techniques in (i) improving attention and (ii) modulation of autonomic nervous system. For example, voluntarily regulated yoga breathing techniques such as (I) alternate nostril yoga breathing (*anulom-vilom pranayama*) and (II) bumble bee yoga breathing (*bhramari pranayama*) can (i) improve attention and (ii) shift cardiac autonomic balance towards parasympathetic dominance. However, the studies were limited by the fact that in none of the studies measures of attention and autonomic balance were assessed simultaneously. This is of



importance to know whether any of the yoga breathing technique may be useful to improve attention without sympathetic activation.

With this background aim of the present study was to see (1) the effects of two yoga breathing techniques on (i) attention, (ii) autonomic balance, and (iii) state anxiety and (2) whether the voluntarily regulated breathing techniques can improve attention without increasing sympathetic activity during an attention task.

Materials & Methods

Participants

Thirty healthy male yoga practitioners aged between 20 and 37 years (group average age \pm SD; 24.17 \pm 4.51), who had at least six months of experience of practicing yoga, were recruited from a nearby yoga and ayurveda center. A required sample size ($n = 19$) was obtained from a previous study assessing the effect of alternate nostril yoga breathing on P300 event related potential in healthy male volunteers. The participants were included if they were having (i) normal health status [which was checked orally by asking them whether (a) they were having or experiencing any illness (e.g., high body temperature or cough as example) and (b) they were taking any medication], (ii) aged between 20 and 45 years, and (iii) regular practitioner of yoga with at least 6 months experience of yoga practice and (iv) having willingness to take part in the study (i.e., readiness to come to the laboratory which is located at least 1 km from their place of residence on four different days). The participants were excluded if they were having (i) any cognitive deficits which was checked from their ability to discriminate between two auditory stimuli of different frequency (i.e., 1000 Hz and 2000 Hz), (ii) hearing impairment which was determined by their ability to hear and discriminate the auditory stimuli of the two different frequencies



delivered at 80 dB SPL, (iii) specific conditions which are contraindicated for particular yoga breathing techniques (*pranayamas*) used in the study [e.g., (a) deviation of nasal septum in case of alternate nostril yoga breathing (*anulom-vilom pranayama*) as the practice of alternate nostril yoga breathing involves breathing through both nostrils alternately and deviation in nasal septum may block or reduce airflow from one nostril and (b) tinnitus in case of bumble bee yoga breathing (*bhramari pranayama*)], (iv) history of smoking, using intoxicants, or consuming caffeinated beverages and (v) extra systole in the EKG traces.

Study design

Each participant was assessed for four sessions [i.e., two yoga breathing techniques listed in alphabetical order i.e., alternate nostril yoga breathing (*anulom-vilom pranayama*), and bumble bee yoga breathing (*bhramari pranayama*) and two control sessions (breath awareness and quiet sitting)] on separate days. Hence for 30 participants there were 30×4 sessions = 120 sessions. The participants were allocated randomly to each of the four sessions. Each session was of 38 minutes; 10 minutes 'pre' [5 minutes for the assessment of the P300 event related potential (P300 ERP) and heart rate variability (HRV) and respiration rate + 5 minutes for the assessment of six letter cancellation test (SLCT) and Spielberger's State Trait Anxiety Inventory-State (STAI-s)], 18 minutes during, and 10 minutes post [5 minutes for the assessment of the P300 ERP and HRV and respiration rate + 5 minutes for the assessment of SLCT and STAI].

Assessments

Each participant was assessed for the following measurements

(i) P300 event related potential (auditory oddball paradigm)



(ii) *Heart rate variability and respiration rate*

(iii) *Six letter cancellation test*

(iv) *Spielberger state and trait anxiety inventory (STAI)*

(v) *Self rated quality of intervention session on a 10 cm horizontal visual analog scale*

Intervention

Yoga breathing techniques

Participants were assessed for two voluntarily regulated yoga breathing techniques (*pranayamas*) which have been widely taught and disseminated by the revered founder of Patanjali Yogpeeth, Swami Ramdev. The yoga breathing techniques are listed below:

(i) alternate nostril yoga breathing (*anulom-vilom pranayama*)

(ii) bumble bee yoga breathing (*bhramari pranayama*)

Control sessions

The two control sessions were (i) breath awareness (active control session) and (ii) quiet sitting (control session). Breath awareness was selected as an active control session as directing awareness to breathing is an essential part of each yoga breathing technique.

Data analysis



The data were analyzed with separate repeated-measures analyses of variance (ANOVAs) using PASW version 18.00. For each variable a separate ANOVA was performed. Each ANOVA contained two Within subjects factors i.e., Sessions (with 4 levels i.e., 2 yoga breathing techniques and 2 control sessions) and States (with two levels: Pre and Post). *Post-hoc* analyses with Bonferroni adjustment was carried out for multiple comparisons.

Results

There was a significant increase in P300 amplitude at Pz electrode site ($P < 0.05$) after (i) alternate nostril yoga breathing (ANYB) and (ii) bumble bee yoga breathing (BBYB) when 'post' state was compared with respective 'pre' state. A significant increase ($P < 0.05$) in (i) mean RR interval and (ii) pNN50 (the proportion derived by dividing NN50 by the total number of NN intervals) with a significant decrease in mean heart rate were noted after BBYB. The wrong attempted scores of the six letter cancellation test were decreased significantly ($P < 0.05$) following ANYB. The total and net attempted scores of the six letter cancellation test were increased significantly ($P < 0.05$) following BBYB. State anxiety was reduced significantly ($P < 0.01$; in both cases) after ANYB and BBYB.

Conclusion

One of the two yoga breathing techniques (i.e., BBYB) studied in the present study improved attention (based on P300 event related potential and SLCT scores) with an increase in cardiac parasympathetic activity (based on heart rate variability). The other yoga breathing technique (i.e., ANYB) showed improved attention based on P300 event related potential and SLCT scores. Practice of both of yoga breathing techniques was resulted in reduction in state anxiety based on



STAI-s.

As P300 amplitude closely correlates with neural resources engaged in an attention task, yoga breathing techniques could be useful for enhancing the neural resources required to perform attention tasks. Increased neural resources after the yoga breathing techniques could be result of reduced anxiety levels following the yoga breathing techniques as anxiety has been reported to engage neural resources; which causes fewer neuronal resources available during an attention task.



**EFFECT OF YOGA ON SELF-ESTEEM, STRESS AND
AGGRESSION AMONG ORPHANAGES**

**Thesis submitted for the award of
Doctor of Philosophy, Yoga Science
To the University of Patanjali**

By

AMANDEEP

Under the guidance of

Dr. NARENDRA SINGH



**DEPARTMENT OF YOGA SCIENCE
UNIVERSITY OF PATANJALI
HARIDWAR- 249405 (INDIA)
AUGUST 2022**



ABSTRACT

The increasing potential benefits of yoga were assessed scientifically through this research studies on “Effect of Yoga on Self-Esteem, Stress and Aggression among Orphanages.” A descriptive representation of the philosophical foundation of yoga, the primary elements of a yoga practice, safety concerns, tracking down and estimating a yoga program for Orphanages. Thesis is divided into 6 chapters.

The chapter I Introduction deals with the background details of yoga, rationale, research problem, objectives, and hypotheses. Invariably, the yoga concept is linked to Self-Esteem, Stress and Aggression among Orphanages. The chapter II gives the literature review of 207 research papers including 10 textbooks from various Scopus ranked national and international journals published doctoral theses, conferences /workshops / symposium. The gaps were identified from all the review literature of the research articles.

This chapter III gives overall approach to the research methodology in a special executive frame of reference. The demography of children subjects (children) process of selecting the children, age, sex, demographics, design, inclusion-exclusion criteria. The pre-post has 60 participants are subjected to before and after yoga experimental design of yoga practices. Well established questionnaires were employed to find the self-esteem, stress and aggression factors. We make use of Paired t- test using SPSS Version 25.

The chapter IV gives the results of the data analysis of the participants who participated in the experiment and control tests. The results of the statistical tests are arranged in 11 tables and 3 figures.



In the chapter V, we discussed our findings with earlier studies (eg.; Telles, et al; 2019; Bharadwaj and Telles, 2013; Yoo and Lee, 2013). The present studies indicate improvement in self-esteem.

This chapter VI concludes that all the hypotheses with Yoga in an executive function reference frame that alternative hypotheses were proved to be effective. The objectives could be achieved through integrated yoga methods protocols developed for the Orphanages. The yoga interventions exhibit boosting their cognitive health and contribute to excelling their academic performance. All the 207 references include books, research papers, thesis, and websites in APA style



**EFFECT OF YOGA MODULE ON COGNITIVE
FUNCTIONING OF SCHOOL CHILDREN IN A DYNAMIC
EXECUTIVE REFERENCE FRAME**

Thesis submitted for the award of

Doctor of philosophy, Yoga Science

To the University of Patanjali

By

Ankita Mishra

Under the guidance of

Dr. Paran Gowda, Ph.D., D M R I T., IIT., (Mumbai)

Professor, University of Patanjali, Haridwar, India



**DEPARTMENT OF YOGA SCIENCE
UNIVERSITY OF PATANJALI
HARIDWAR- 249405 (INDIA)
2021**



ABSTRACT

The increasing potential benefits of yoga were assessed scientifically through this research studies on “The effect of Yoga module on Cognitive function of the school children in a dynamic executive reference frame”. A descriptive representation of the philosophical foundation of yoga, the primary elements of a yoga practice, safety concerns, tracking down and estimating a yoga program for children. Thesis is divided into 7 chapters.

The chapter I Introduction deals with the background details of yoga, rationale, research problem, objectives, and hypotheses. Invariably, the yoga concept is linked to cognitive functioning of the mind -attention / concentration, memory, adjustment, cognitive flexibility and self-esteem.

The chapter II gives the literature review of 168 research papers including 10 text books from various Scopus ranked national and international journals, published doctoral theses, conferences /workshops / symposium. The gaps were identified from all the review literature of the research articles.


This chapter 3 gives overall approach to the research methodology in a special executive frame of reference. The demography of children subjects (children) process of selecting the children, age, sex, demographics, design, inclusion-exclusion criteria. A pre-post design is employed s @ 100 each. The pre-post has 100 participants are subjected to before and after yoga experimental design of yoga practices. The control group has another 100 participants and has pre-post design. Well established 5 no. questionnaires were employed to find the AMACS factors. We make use of t- test, RMANOVA using SPSS Version 25.

The chapter 4 gives the results of the data analysis of the participants who participated in the experiment and control tests. The results of the statistical tests are arranged in 23 tables and 6 figures.

In this chapter 5, we discussed our findings with earlier studies (eg.; Telles, et al; 2019; Bharadwaj and Telles, 2013; Yoo and Lee, 2013). The present studies indicate improvement in AMACS in terms of *accuracy, protocol development, wellness of the participants, academic performance a new dynamic executive reference frame,*

This chapter 6 concludes that all 10 no. hypotheses on AMACS with Yoga in an executive function reference frame that alternative hypotheses were proved to be effective. The 5 no. objectives could be achieved through integrated yoga methods protocols developed for the children. The yoga interventions exhibit boosting their cognitive health and contribute in excelling their academic performance.

Chapter 7 shows all 168 references books, research papers, thesis, and websites in APA style


Dr. V.K. KATIYAR
DEAN
(ACADEMICS & RESEARCH)
University of Patanjali, Haridwar

