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Immediate Effect of Simplified Kundalini Yoga Nine Centre Meditation on Brain Functionality Balance and Chakra Alignment Among College Boys

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Abstract: Research on Simplified kundalini yoga (SKY) Nine Centre Meditation using Bio-well Gas Discharge Visualization (GDV) has not done earlier which motivated the researchers to conduct the study. The purpose of the research was to study the immediate effect of SKY Nine Centre Meditation on brain functionality balance and Chakra alignment. Fourteen yoga college male students underwent SKY Nine Centre Meditation. The Brain Functionality Balance and Chakra Alignment were measured before and after the practice using Bio-Well GDV. The data were analyzed using paired t-test. The post-test mean score of Brain Functionality Balance and Chakra alignment improved but not significantly increased. SKY Nine Centre Meditation showed improvement in Brain functionality Balance and Chakra alignment. The consistent practice of SKY Nine Centre Meditation can improve Brain Functionality Balance and Chakra Alignment of the college students. The study recommends for further studies with randomized controlled trials and large sample.

Keywords: Kundalini Yoga, Meditation, Stress, Endocrine glands, Chakras, Simplified kundalini yoga

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Introduction

Health refers to a state of balance and harmony in mind, body and spirit. The physiological systems of our body are inherently programmed to preserve a steady state. This equilibrium, known as homeostasis, is predefined and has been achieved as a result of the evolutionary process. Homeostasis is necessary for the well-being of a human. Our left and right cerebral hemispheres work in tandem to control the various functions and processes of the body to maintain this

balance. Any threat or challenge to these processes, external or internal is known as a stressor. While stress is unavoidable, the ability to cope with stress has a huge bearing on psychological and physiological well-being.

The WHO defines Stress as any type of change that causes physical, emotional or psychological strain. Physiologically stress can be defined in terms of its effect on homeostasis. Stress is thus a state of disharmony or allostasis. Stress response

or adaptation is any physiological or behavioral response which aims to reestablish homeostasis (Tsigos *et al.*, 2020). Our response to stress and overall well-being are therefore connected. Mental health has been included in the Sustainable Development Goals which shows the increasing awareness and acknowledgement of its importance.

While a little bit of stress is considered good to enhance performance, too much of it can overwhelm and lead to a fight, flight, or freeze response. Therefore, coping with stress is important for both physical and mental well-being. Not being able to adapt to stress can interfere with daily tasks and can lead to anxiety disorder if left unchecked. As per the Stress in America 2020 report by the American Psychological Association (APA), 8 in 10 (78%) Americans report that the coronavirus pandemic is a significant source of stress.

Student life and stress:

Higher education is a stressful period in a student's life. Depression, anxiety and academic stress are major causes for concern among college students. A survey of college students reports that at any given time there will be 10-20% of the student population suffers from psychological problems like stress, anxiety and depression (Bhujade, 2017). A systematic review observed the negative association between stress and quality of life (QOL) in university students and QOL deterioration in turn was associated with insomnia and burnout (Ribeiro, 2018).

A study among 483 university students in France showed that 72.9%, 86.3% and 79.3% were suffering from psychological distress, anxiety and depressive symptoms, respectively. 57.6% of them were suffering from low self-esteem, 56.7% from little optimism and 62.75% from low self-efficacy. The most important predictors of stress were found to be life satisfaction, level of self-esteem, optimism, self-efficacy and psychological distress (Saleh, 2017).

Stress due to academic examination has been observed to increase physiological stress and decrease in immune functioning. The observations were based on the perceived stress scale (PSS), a global measure for stress and saliva samples to test cortisol and salivary immunoglobulin concentration (Murphy, 2010).

Managing stress through yoga:

Yoga and meditation help in stress and anxiety reduction in college students (Lemay, 2019). Yoga with meditation will ensure the physical and mental health of the student by contributing to their best performance (WCSC-Vision 2008). Meditation helps one feel refreshed and recharged enabling one to build greater control over one's thoughts, worries and anxieties (Sharma, 2018).

The first part of this study explores the relationship (and importance) between stress and the balance between the right and left cerebral hemispheres and the balance or alignment of the endocrine glands from the perspective of Chakras. These chakras are energy centres in the body corresponding to the position of endocrine glands. Previous researches on the effect of meditation on these two aspects have been reviewed. The Bio-well instrument which uses Gas discharge visualization (GDV) technology through the fingertips and its reliability to measure the cerebral left-right symmetry and chakra alignment has been discussed.

The second part of the study describes the immediate effect of Simplified Kundalini yoga Nine centre meditation, a practice synthesized by Yogiraj Vethathiri Maharishi which requires focusing on the endocrine glands/chakras on the above two variables as assessed by the Bio-well instrument.

Stress management and Balance between the Left and Right Hemispheres of the Brain:

The Left and Right Hemispheres of the Brain are symmetrical and have distinct functions. The muscles on the right side of the body are

controlled by the left hemisphere while those on the left side are by the right hemisphere. While the Left Hemisphere is commonly known as the 'logical' and 'intelligent' side of the brain, the Right Hemisphere is the 'intuitive' and 'emotional' side. This phenomenon is known as 'hemispheric specialization or lateralization'. Some of the distinct hemispheric functions are listed in Table 1 (Seaward, 2017).

Seaward has observed that in order to overcome problems leading to acute or chronic stress, it is important for the right and left brains to work as a team.

There exists a causal relationship between stress and depression. Stressors like bereavement, separation, loss of self-esteem, precede depression (Hammen, 2005). A major cause of the development of depression is psychological stress (Laugharne *et al.*, 2010). There is evidence of positive and negative mood states being linked with the left and right hemispheres respectively. A greater activity was seen in electroencephalography (EEG) recordings in the frontal cortex of the right hemisphere (RH) during negative mood and depression. The RH was more sensitive to stimuli related to fear, anxiety and stress. The effects of these stimuli as observed through imaging studies were pronounced in the left visual field which is controlled by RH and not in the right visual field (controlled by Left Hemisphere, LH) (Siman-Tov *et al.*, 2009). The hyperactivation of RH was seen during hypnagogia (a transitional state between wakefulness and sleep) which explains sleep disturbances and insomnia, a prevalent symptom of depression (Mottaghy *et al.*, 2006). Patients suffering from pain like migraine or other types of pain are more prone to depression (Victor *et al.*, 2010). Pain processing was also found to be linked more adversely with RH than LH (Klemenz *et al.*, 2009).

While the pathophysiology of depression at a molecular/synaptic level can be described in terms of abnormalities in serotonin, norepinephrine or dopamine secretions

(Chen, 2007), from a cognitive and systems perspective it can be explained in terms of imbalance in functional cerebral hemispheres. The imbalance is seen as hyperactivity in RH and hypoactivity in LH (Hetch, 2010).

A balance between pessimism and optimism is required for survival and well-being. Extreme positions of pessimism or optimism make one miserable or lead to uncalculated risky behaviour respectively. While studying the neurophysiology of these two aspects, it was found that pessimism is associated with RH while optimism to LH (Hecht, 2013).

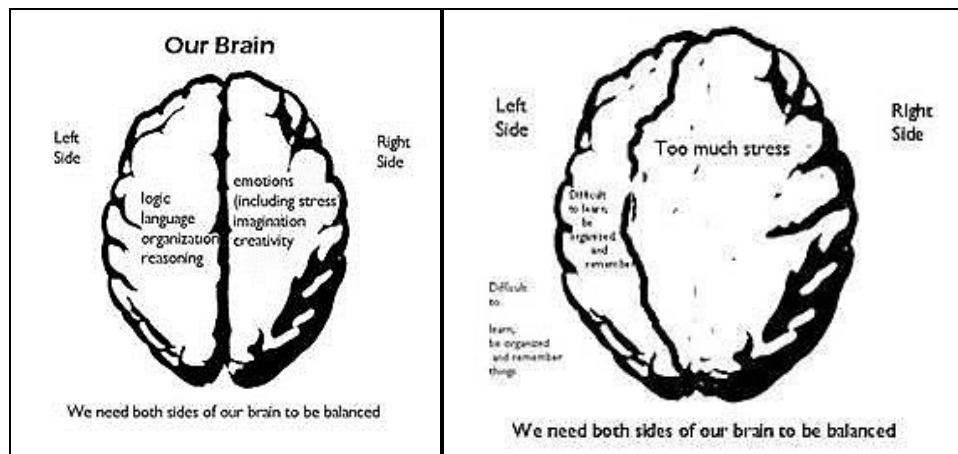
The Prefrontal cortex regulates autonomic functions related to stress perception and response, secretion of adrenocorticosteroid being a major stress response (Cerqueira, 2005). While studying stress related psychopathology, it has been observed that Chronic stress leads to volume shrinkage of the left medial prefrontal cortex hemisphere. This suggests structural loss and more vulnerability of the left medial prefrontal cortex than the right side. Additionally, the right medial prefrontal cortex hemisphere was observed to play a dominant role in facilitating stress hormone response through interactions with the hypothalamic-pituitary-adrenal gland (HPA) axis (Lee 2015). A visualization of the cerebral hemispheres under stress would appear below as against a balanced state of mind. (Fig. 1)

Meditation and Cerebral Hemispheres:

Studies on the effects of meditation on cerebral hemispheres showed neither analytical nor spatial processing was dominant suggesting balance between the right and left hemispheres during meditation (Bennett and Trinder, 2017). Meditation is used as a tool to achieve harmony between the physical, mental, intellectual and spiritual personalities of humans (Fox *et al.*, 2016). During the process of prayer, and meditation, the right and left hemispheres work synchronously making the brain function in resonance with the field of consciousness

Table 1: Cognitive Functions of the left and right hemispheres of the Brain

| Left-Brain Functions | Right Brain Functions |
|------------------------------|-------------------------------|
| Analytical Skills | Synthesis Skills |
| Judgmental Skills | Accepting, receptive nature |
| Verbal Acuity | Symbolic imagery |
| Linear thought progression | Nonlinear thought progression |
| Rational thought process | Irrational thought process |
| Math acuity | Intuition |
| Facts and detail orientation | Music appreciation |
| Logical thought process | Humour |
| | Spatial orientation |
| Time consciousness | Non-time consciousness |



Adapted from New England Literacy Resource centre

Fig. 1: LH and RH cerebral hemispheres during balance and too much stress.

(Tyurina and Stavkova, 2020). Appropriate interhemispheric synchronization and high frequency cerebral activation was observed as an effect of Sudarshan Kriya Yoga. This was measured as modulations in neuronal oscillations in the brain through EEG (Bhaskar, 2020).

Stress and Endocrine Glands:

An understanding of the physiology of the stress system requires an understanding of

endocrinology, a branch dealing with endocrine systems, its diseases, hormones and secretions. Response to stressors triggers a complex and interconnected set of processes in the body involving neuroendocrine, cellular and molecular infrastructure leading to behavioural and physical adaptations Some (Tsigos *et al.*, 2020). Stress is a multi-dimensional phenomenon and stress response involves both the nervous and endocrine systems. The inability to cope with

stress or the persistence of stress for a long time (chronic stress) affects the body in several ways not limiting to one or two organs or systems. Some of the adverse effects due to the increased secretion of corticoids and adrenaline impact the digestive system, circulatory system, immune system and reproductive system (Sharma, 2018).

Stress leads to changes in hormone levels which lead to endocrine disorders like Graves' disease, gonadal dysfunction, Diabetes Mellitus, Obesity and Hyperthyroidism (Ranabir, 2011). The brain is the principal organ for processes related to stress response, coping and recovery. Neural circuitry involving hippocampus, amygdala and the prefrontal cortex regulate the physiological and behavioral stress response. Bi-directional communication between the brain and the autonomic nervous system, cardiovascular system and immune system via the neural and endocrine mechanisms give rise to the processes related to stress (Fig. 2) (McEwen, 2010).

Endocrine Glands and Chakras:

The word 'chakra' is derived from the Sanskrit root word meaning plexus or vortex and finds its earliest mentions in the Vedas. The Chakras are energy centres in the body and are beyond the perception of the human eye. They connect the brain to the endocrine glands via the Vagus nerve. Thus, there is a correspondence between the position and role of the chakras and the endocrine glands (Marathe, 2020). While there are many chakras in the body, seven are considered as principal chakras of which six are situated in the spinal region and the seventh just above the crown of the skull. They are: Root Chakra (Mooladhara), Sacral Chakra (Swadhishtana), Solar Plexus (Manipuraka), Heart Chakra (Anahata), Throat Chakra (Visuddhi), Third Eye Chakra (Aghna) and Crown Chakra (Sahasrara or Thuriya).

The chakras are linked to the nerve plexus along the spine. They appear to be attached to the nerve plexus by their stems. Nerve plexus are areas where one spinal nerve interconnect with

other nerves to form a network. (Sturgess, 2014). The seven chakras are considered to be metaphysical counterparts of the physical endocrine glands in the body (Fig.3) (Gardiner, 2012).

Alignment of Chakras and well-being:

Proper alignment of the chakras is an indication of organ balance while improper alignment indicates problems related to homeostasis of organs and emotional pressure. Also there exists an inverse relationship between emotional pressure and organ balance i.e., when emotional pressure rises the organ balance drops (Sathyan, 2018).

Meditation, stress, Alignment of Chakras and endocrine glands:

Meditation has a major impact in reducing stress, controlling anxiety, promoting emotional health and proper functioning of the chakras (Sathyan, 2018). Meditation reverses the body's fight or flight response, an endocrine response to stress. (Table 2) It helps build a greater control to one's thoughts, worries and anxieties (Sharma, 2018). Meditation helps reduce stress and improve mental health. It influences energy homeostasis, insulin resistance and induces changes in the endocrine function which improve mental and physical well-being (Pascoe, 2020).

Simplified Kundalini Yoga (SKY) Nine Centre Meditation:

Vethathiri Maharishi who synthesized the Simplified Kundalini Yoga (SKY) has formulated the Nine Centre Meditation to improve the functions of the endocrine glands. It involves meditating on nine centres, of which seven of them correspond to the endocrine glands within the physical body and the eighth and ninth are Universal field and Absolute space, respectively. The practice focuses on meditating on the seven chakras: Mooladhara, Swadhishtana, Manipuraka, Anahata, Visuddhi, Aghna, Thuriya and Shakti Kalam (Universal Field) and Shiva Kalam (Absolute space). As per Shri Vethathiri Maharishi the endocrine glands convert the bio-energy

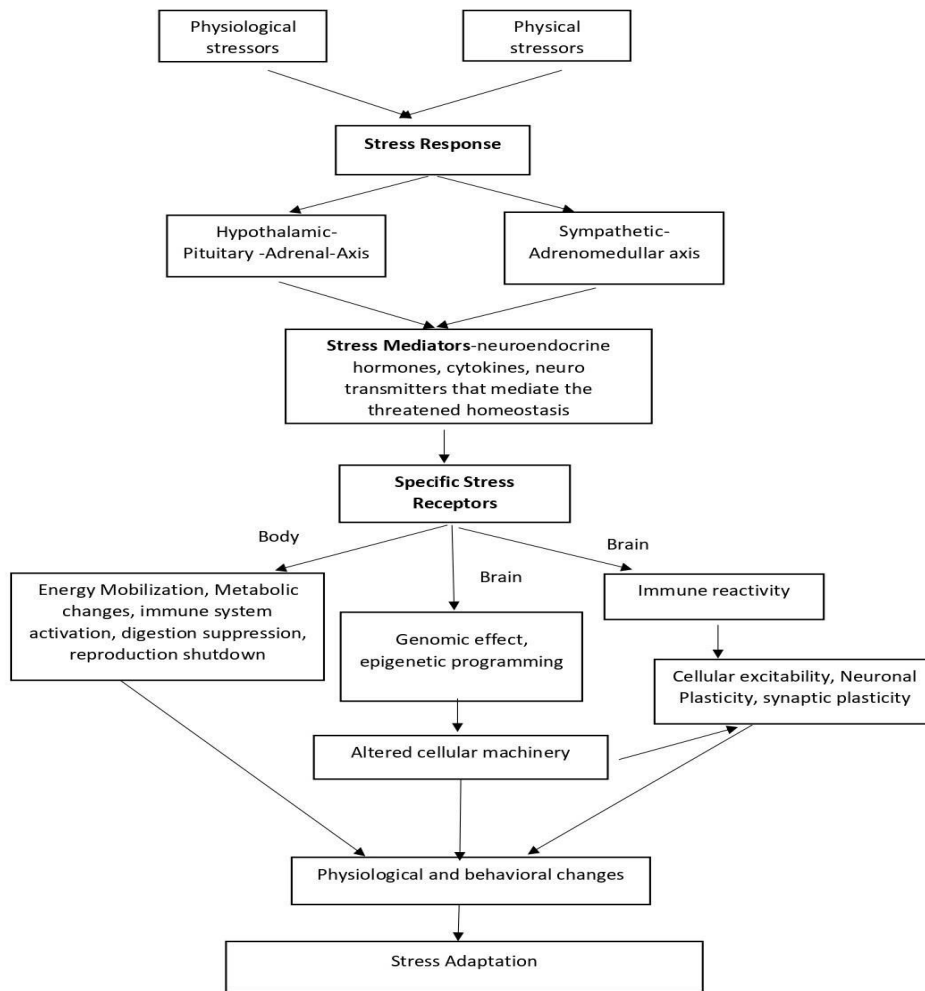


Fig. 2: Stress System.

Table 2: Behavioural and physical adaptation during acute stress

| Behavioural adaptation | Physical adaptation |
|-----------------------------------|--|
| Increased arousal and vigilance | Oxygen and nutrients are directed to stressed body sites and CNS |
| Increased cognition and attention | Increased blood pressure and heart rate |
| Suppression of appetite | Inhibition of growth and reproduction |
| Containment of stress response | Containment of immune/inflammatory response |
| Heightened analgesia | Increased gluconeogenesis and lipolysis |

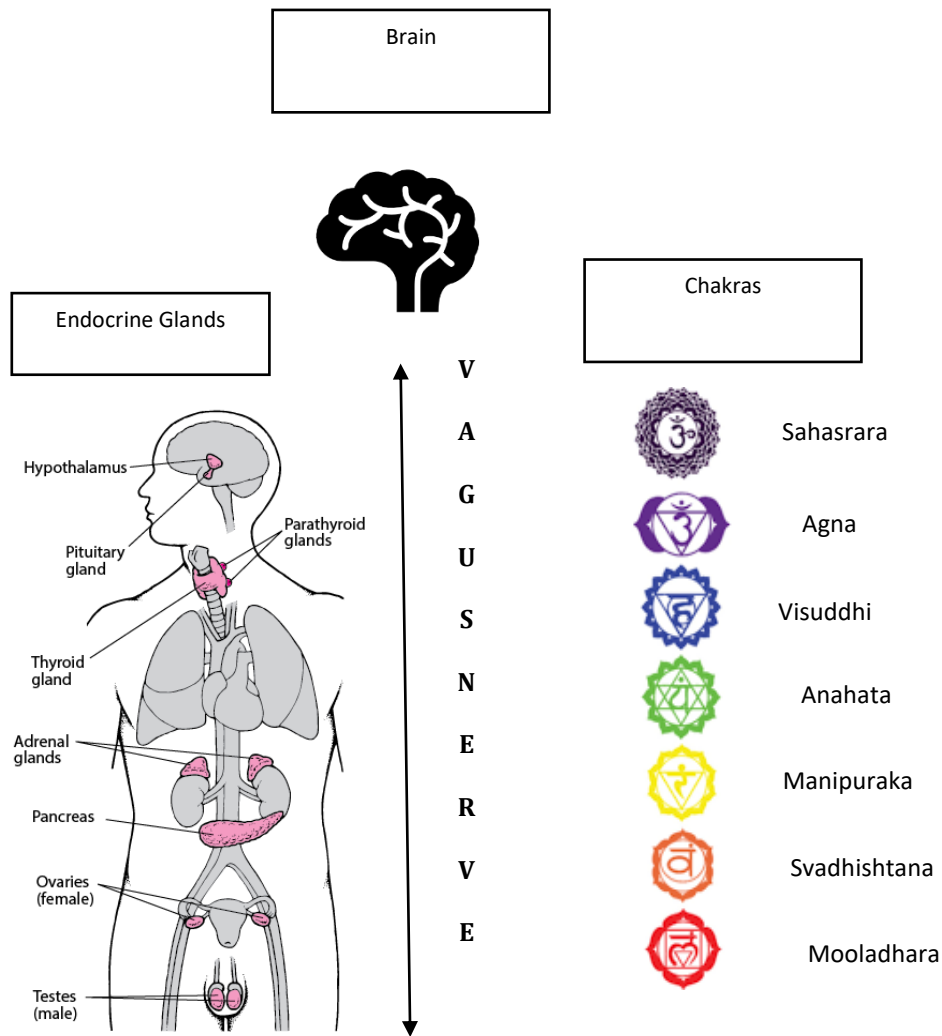


Fig. 3: Relationship between Brain, Endocrine Glands, Vagus Nerve and Chakras.

which is concentrated in these points (also known as biomagnetism) into bio-chemicals (hormones and enzymes) for the physiological functions-metabolism and catabolism.

The practice starts from the Mooladhara chakra and moves up to the Sahasrara through the Svadhishtana, Manipuraka, Anahata, Visuddhi and Agna chakras. From the Sahasrara, the practitioner then expands his mind to the Universal field and the Absolute space (WCSC-Vision 2011).

Assessment tool: Bio-Well:

The Bio-well instrument was developed by Konstantin Korotkov in 1996 and works on the

principle of Electro Photo Image (EPI). The instrument captures, maps and analyzes the electromagnetic field emanating from the human body in response to pulsed electrical field excitation and is used to assess biological well-being (Deo *et al.*, 2015). As per Traditional Chinese medicine, representations of the whole body are found in each organ. The EPI of Bio-well is an example of reflexological diagnosis applied to the fingertips using Pranic energy fields. Hence the instrument is of acceptable quality for research (Korotkov *et al.*, 2004). Figure 4 shows how the finger tips are connected to the chakras (Bista, 2015).

The Bio-well instrument is based on the

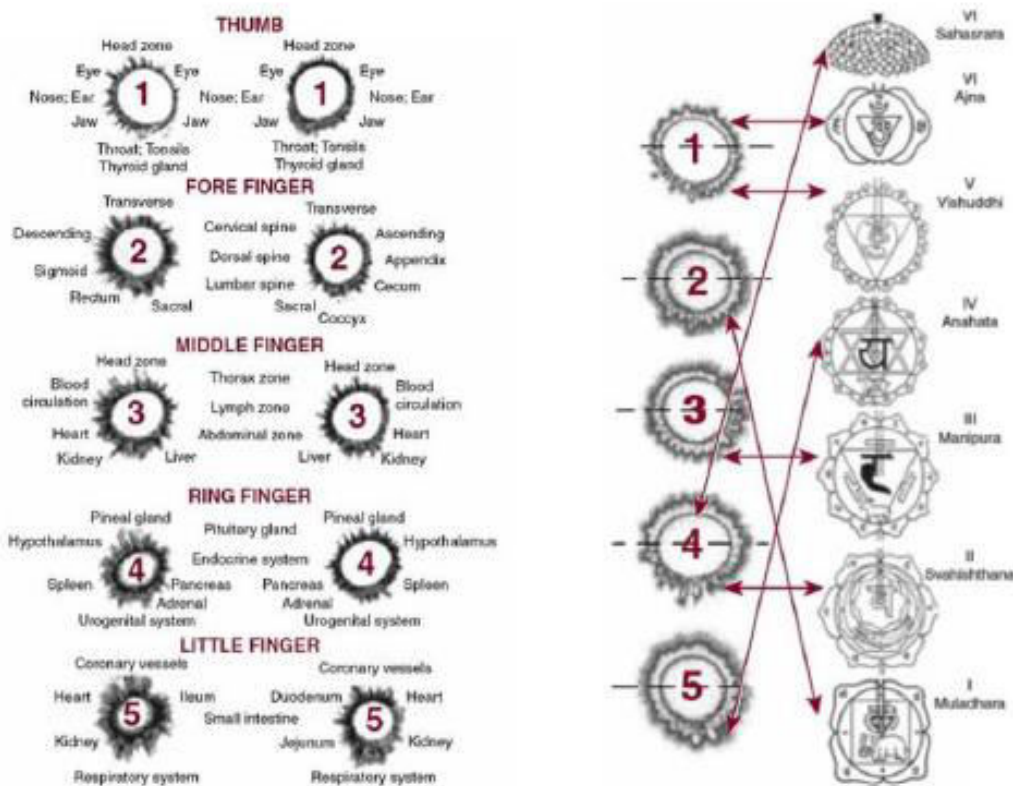


Fig. 4: Relationship between fingertips and chakras.

stimulation of photon and electron emissions called photo-electron emissions. The emitted particles accelerate in the electromagnetic field generating electronic avalanches on the surface of the dielectric (glass) plate. This process is called sliding gas discharge. The discharge causes a glow from the excitement of molecules in the surrounding gas, in this case, air and the parameters of this glow are measured by the Bio-well instrument. Voltage pulses stimulate optoelectronic emission while intensifying this emission in the gas discharge amplified by the electric field created.

The Bio-well measures several parameters like Stress, Energy, Balance between the left and Right parts of the brain, homeostasis, overall and individual alignment of the chakras. For the purpose of this study, we have considered only

two parameters: Balance between the left and right parts of the brain and overall chakra alignment. The balance between the left and right parts of the brain is expressed as Harmony % and is used as an indicator of the ability to cope with stress. For the purpose of this study, the balance between the left and right parts of the brain is referred to as brain functionality balance.

The purpose of the research was to study the immediate effect of Simplified Kundalini Yoga Nine Centre Meditation on Brain Functionality Balance and Chakra Alignment using the GDV technique measured through Bio-well Camera. The objectives of the study are: (i) to study the immediate effect of Simplified Kundalini Yoga Nine Centre Meditation on Brain Functionality Balance among male college students; and (ii) to study the immediate effect of Simplified Kundalini

Yoga Nine Centre Meditation on Chakra Alignment among male college students.

Hypotheses:

1. There is a significant difference in the Brain Functionality Balance of male college students due to the immediate effect of Simplified Kundalini Yoga Nine Centre meditation.
2. There is a significant difference in the Chakra Alignment of male college students due to the immediate effect of Simplified Kundalini Yoga Nine Centre meditation.

Materials and Methods

Study participants:

Participants were male college students who were in the age range of 18 and 30 years, studying B.Sc. and M.Sc. Yoga for Human Excellence at Vethathiri Maharishi College of Yoga, Chennai during April 2022.

Inclusion and exclusion criteria:

Participants expressed their willingness to participate in the study and were not on any medications. Participants with any illness, fever, or injury were excluded from the study. Fourteen male participants were selected for the study.

Approval certificate:

Institutional approval certificate was obtained from Vethathiri Maharishi College of Yoga. All participants signed the informed consent form prior to the study.

Procedure:

The study was formulated as a single group pre- and post-experimental design. Participants were selected for the study with a non-probability convenience sampling technique. All participants were trained in Nine Centre meditation. Assessments were performed before and after the practice.

Assessments:

The participants were instructed not to consume any solid food before the practice. The

intervention was conducted in a clean, quiet and well-ventilated room. The participants were instructed to sit in a meditative posture and the intervention went for 30 min with guided instructions. The practice commenced with prayers and involved meditating on each centre for 2 min and ended with blessings. Assessments on brain functionality balance and chakra alignment were performed before and after the meditation using a Bio-well camera.

Data Analysis:

Paired t-test was used to find out the mean score of each variable with the SPSS tool.

Results and Discussion

The mean score of the Brain Functionality balance in the pre-test was 95.865 and the post-test was 97.2893. The standard deviation before and after practice were 4.87388 and 1.74009, respectively. The paired t-test value was 0.989262 and the significant value was 0.341 which was greater than the 0.05% value of significance (Tables 3, 4). Hence there was no significant difference in Brain functionality balance among male college students due to the immediate effect of Simplified Kundalini Yoga Nine Centre Meditation and Hypothesis 1 was rejected.

The mean score of Chakra alignment in the pre-test was 91.8571 and the post-test was 92.571. The standard deviation before and after practice were 3.73872 and 3.41297, respectively. The paired t-test value was 0.960 and the significant value was 0.355 which was greater than the 0.05% value of significance (Tables 5, 6). Hence there was no significant difference in Chakra Alignment among male college students due to the immediate effect of Simplified Kundalini Yoga Nine Centre Meditation and Hypothesis 2 was rejected.

This was the first study of Simplified Kundalini Yoga Nine Centre Meditation using the Bio-well GDV technique. A previous study on Simplified Kundalini Yoga Nine Centre meditation by Kumar and Valliamma (2015) observed improvement in

Table 3: Pre-post changes in mean and SD Brain Functionality Balance

| Paired sample Statistics | | | | | |
|-----------------------------|-----------|---------|----|----------------|-----------------|
| | | Mean | N | Std. Deviation | Std. Error Mean |
| Brain Functionality Balance | Pre-Test | 95.865 | 14 | 4.87388 | 1.3026 |
| | Post Test | 97.2893 | 14 | 1.74009 | 0.46506 |

Table 4: Brain Functionality Balance

| Paired Samples Test | | | | | | | | | | |
|-----------------------------|------------------|--------------------|----------------|-----------------|---|---------|-------|----|--------------|-------------|
| | | Paired Differences | | | | | t | df | Significance | |
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | One-Sided p | Two-Sided p |
| | | | | | Lower | Upper | | | | |
| Brain Functionality Balance | pretest posttest | 1.42429 | 5.38703 | 1.43974 | -4.53467 | 1.68609 | 0.989 | 13 | 0.170 | 0.341 |

Table 5: Paired sample Statistics

| Paired sample Statistics | | | | | |
|--------------------------|-----------|---------|----|----------------|-----------------|
| | | Mean | N | Std. Deviation | Std. Error Mean |
| Chakra Alignment | Pre-Test | 91.8571 | 14 | 3.73872 | 0.99921 |
| | Post Test | 92.5714 | 14 | 3.41297 | 0.91215 |

Table 6: Paired Samples Test

| Paired Samples Test | | | | | | | | | | |
|---------------------|--------------------|--------------------|----------------|-----------------|---|---------|-------|----|--------------|-------------|
| | | Paired Differences | | | | | t | df | Significance | |
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | One-Sided p | Two-Sided p |
| | | | | | Lower | Upper | | | | |
| Chakra Alignment | Pre-test post-test | 0.71429 | 2.78536 | 0.74442 | -2.32251 | 0.89393 | 0.960 | 13 | 0.177 | 0.355 |

academic marks, a decrease in pulse rate and mind frequencies by giving Simplified Kundalini Yoga (SKY) Nine Centre Meditation among the experimental group of students as compared to the control group. A study on the immediate

effect of Kundalini Yoga and its effect on perceived stress by Garcia-Sesnich *et al.* (2017) among practitioners and non-practitioners concluded that Kundalini Yoga might be a useful tool in the treatment of pathologies directly

related to stress such as cardiovascular disease, hypertension, immune system disorders, insomnia, depression, diabetes and chronic diseases in general. Espinosa *et al.* (2022) conducted a study on undergraduate students in healthcare careers who were divided at random into control and experimental group. The experimental group was given an active meditation program including Kundalini Yoga for three months. It was observed that the control group had increased cortisol levels when compared to the experimental group which led them to conclude that blending active meditation into the daily routine of students might prevent stress in undergraduate students in a healthcare career.

Conclusion

The present study provides preliminary findings on the effect of Simplified Kundalini Yoga Nine Centre Meditation on Brain Functionality Balance and Chakra Alignment among male college students. Further, it was found that the mean of the Brain Functionality and chakra alignment of the post-test was higher than that of the pre-test due to the immediate effect of SKY Nine Centre meditation on the Brain Functionality Balance and Chakra alignment but was not significant. Future studies with changes in long-term intervention, large sample size and different research designs can be encouraged.

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