

OM

**Development of Human Potential through Yogic
Practices assessed by Psychological and Health
Variables**

Thesis Submitted

By

SUSHIL S KHEMKA

Towards the partial fulfillment of

DOCTOR OF PHILOSOPHY (YOGA)

November 2011

Submitted to



SWAMI VIVEKANANDA YOGA ANUSANDHANA SAMSTHANA

(Declared as Deemed-to be University under Section 3 of the UGC Act, 1956)

Ek Nath Bhavan, #19, Gavipuram Circle

K G Nagar, Bangaluru, 560019

INDIA

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Under the Guidance of

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DECLARATION

I, hereby declare that this thesis entitled “**Development of Human Potential through Yogic Practices assessed by Psychological and Health Variables**” is a record of independent research work carried out by me at Swami Vivekananda Yoga Anusandhana Samsthana (University), under the supervision and guidance of Dr. H R Nagendra. This has not been previously submitted for the award of any diploma, degree, associateship or other similar title.

Date: 12-1-2012

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Place: Bangaluru



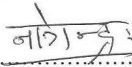
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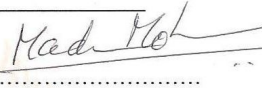
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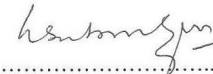
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Sushil S Khemka

Standard International Transliteration Code
(used to transliterate Sanskrit words in the text)

अ	=	a	ड	=	ḍa
आ	=	ā	ढ	=	ḍha
इ	=	i	ण	=	ṇa
ई	=	ī	त	=	ta
उ	=	u	थ	=	tha
ऊ	=	ū	द	=	da
ऋ	=	r	ध	=	dha
ए	=	e	न	=	na
ऐ	=	ai	प	=	pa
ओ	=	o	फ	=	pha
औ	=	au, ou	ब	=	ba
अं	=	m	भ	=	bha
अः	=	ḥ	म	=	ma
क	=	ka	य	=	ya
ख	=	kha	र	=	ra
ग	=	ga	ल	=	la
घ	=	gha	व	=	va
ङ	=	ṅa	श	=	śa
च	=	ca	ष	=	ṣa
छ	=	cha	स	=	sa
ज	=	ja	ह	=	ha
झ	=	jha	क्ष	=	kṣa
ञ	=	ña	त्र	=	tra
ट	=	ṭa	ज्ञ	=	jña
ठ	=	ṭha			

ABSTRACT

BACKGROUND

There are a large number of methods of yoga catering to the needs of different types of people in society to bring about the transformation of the individual. They are broadly classified into four streams. Swami Vivekananda puts them as Work, Worship, Philosophy and Psychic control. One can even achieve highest goal of life either one or more or all of these to get one liberated. Integral Yoga modules included all these four streams of yoga in our study.

Aim

The study was aimed to evaluate the changes in human potential through Yoga practices assessed by quantifying the changes in psychological and health variables.

OBJECTIVES

Study 1.

To evaluate the effect of integral yoga on human potential by assessing sustained attention, emotional intelligence, general health, triguna personality inventory and to find out the correlations of each variable with other variables.

Study 2.

To study the immediate effect of *Kapālabhāti* and Breath awareness on human potential assessed by state anxiety, sustained attention and verbal and spatial memory.

Study 3.

To study the immediate effect of Deep Relaxation Technique vs Supine rest on human potential assessed by state anxiety and sustained attention.

Material and Methods

Study 1.

Effect of integral yoga module practiced for 28 days, by a group of 108 healthy volunteers age ranging from 17 to 63 years, in a pre-post study design was assessed by sustained attention (Six Letter Cancellation (SLC) & Digit Letter Substitution (DLS),

Emotional Intelligence (EQ), General Health (GHQ) and guna personality (Sattva, Rajas, Tamas).

Study 2.

Immediate effect of *Kapālabhāti* (KB) versus Breath Awareness (BA) using self-as-control design on a group of 43 healthy volunteers aged 20-45 years practiced 20 minutes KB and BA over two consecutive days was assessed by state anxiety (SAS), sustained attention, (SLC and DLS) and verbal and spatial memory tests.

Study 3.

Immediate effect of Deep Relaxation Technique (DRT) versus Supine Rest (SR), practiced for 20 minutes each by a group of 86 healthy subjects aged 18 to 64 years divided into two groups (43 volunteers each) was assessed by using state anxiety (SAS) and sustained attention (SLC and DLS) immediately before and after practice.

RESULTS

Study 1.

Integral yoga: The results showed highly significant ($p < .001$) pre-post improvements in sustained attention (SLC & DLS), emotional intelligence (EQ), General health (GH) and reduction in Rajas, while reduction in Tamas ($p < 0.01$) and increase in sattva ($p < 0.05$). In correlation study of variables the EQ, Sattva and general health variables correlated significantly with one another. EQ and Tamas were negatively correlated.

Study 2.

KB VS BA: After *kapālabhāti* scores reduced significantly on state anxiety and increased on both sustained attention and also in verbal and spatial memory ($p < 0.001$). After breath awareness, changes were also significant ($p < 0.001$) in all variables except state anxiety ($p > 0.05$).

Study 3.

DRT *V/S* SR: Highly significant reduction in state anxiety scores ($p < 0.001$) was observed for the group practicing DRT, but not for the group practicing SR. For the sustained attention tests, however there were highly significant increases in scores in both DRT and SR groups ($P < 0.001$).

CONCLUSIONS

Study 1.

The study showed that integral yoga practices impart significant benefits to healthy volunteers in all psychological (SLC, DLS), emotional (EQ), health (GHQ) and personality (PI) variables. Increase in EQ, General health and Sattva and reduction in Tamas were significantly correlated showing innate correlations between them.

Study 2.

KB *V/S* BA: The study suggests that both KB and BA reduce anxiety and improve sustained attention. However KB was significantly more effective than BA. In contrast they act in opposite directions on verbal and spatial memory.

Study 3.

DRT *V/S* SR: Results suggest that both interventions improve attention but that only DRT reduces state anxiety.

Thus these 3 studies show that Yoga practices are instrumental in significant development of human potential as assessed by psychological and health variables in healthy volunteers.

Key words: Yoga, Emotional Intelligence, Psychological, Gunas, Memory, Health.

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1

Introduction

INTRODUCTION

1

The human potential and development section of the ‘Encyclopedia of World Problems and Human Potential’ provides profiles of human development approaches and modes of awareness, and their relationships, as perceived by different belief-systems, disciplines, religions, and cultures. The contrasting approaches to human development in different cultures, and their respective understandings of the modes of awareness associated with different stages, are a challenge to knowledge management and comprehension; it is hoped that a comprehensive overview will provide a valuable resource for dealing with the global challenges.

According to yoga and spiritual lores all human beings are potentially Divine Beings, but we think that we are just human beings with this body-mind complex and give least importance to Divine/Spirit/Self which actually we are. If we are able to Realize/Experience Self by removing all our false notions, beliefs and concepts by stabilizing on a single thought that “I am Divine with tremendous potential and **not this limited body-mind complex** then we will find that we are really that”. As per advaita philosophy of Adi Shankaracharya also, only Brahman exists and other than Brahman nothing exists. This body-mind complex or world which we see also is a manifestation of Brahman only like vapour and ice are two forms of same water.

So if we could understand this Truth and stabilize on that then we become Divine. The Only thing we have to do is to remove our ignorance that “I am this limited body-mind complex”; then we will be able to manifest our human potential fully. The following are some of the Psychological and health variables which are used as measures of our human potential in this study.

General Health: Health as defined by WHO is a state of well-being at physical, mental, social and spiritual levels. Health can also be classified as ill health, normal health, positive health and perfect health. Anxieties mar this state of well-being at all levels. Reduction in anxiety is known to improve the health status.

Emotions: Emotions are nothing but strong feelings. Emotions are also called ‘power thoughts’ because emotions arise due to repeated thoughts. Emotions can be positive or negative like love, compassion, etc and hatred, jealousy etc respectively. Brain researchers have found that the right lobe of brain is the seat of emotions, which we have been calling the ‘heart’. The ‘head ‘representing the intellect has its abode in the left lobe of the brain. The studies done by Gainotti G, (1983, 2011) also point out that emotions have correlations with right brain. Verena Kusstatscher (2005) defines emotion in his book as “mental state of (action) readiness that arises from cognitive appraisals of events, social interactions or thoughts”.

Intelligence; The term intelligence is a very popular term used widely to mean many things - quick understanding, fast learning, accuracy in learning, logical and analytical thinking, clever talking, etc. Intelligence covers all cognitive processes.

Emotional intelligence refers to the ability to use the emotions to help solve the problems and live in a more effective life. Emotion without intelligence and intelligence without emotion are manifestation of one dimensional human potential. The complete solution is head working with the heart for ones own harmonious development. According to Goleman D, (1996) intelligence quotient (IQ) accounts only about 20% of a person’s, success in life. The balance can be attributed to emotional intelligence (EQ).

“Emotional intelligence is simply the intelligent use of emotions. The means of using ones emotional capacity is in combination with ones psychological, intellectual and spiritual capacities.”

Sustained attention is the capacity to attend to a task for a required period of time. To be attentive to a lecture for hours together is an example of sustained attention. There are five types of attention according to Mckay (1989) as mentioned below:

Focused attention: The ability to respond discretely to specific visual, auditory or tactile stimuli.

Sustained attention (vigilance): The ability to maintain a consistent behavioral response during continuous and repetitive activity.

Selective attention: The ability to maintain a behavioral or cognitive set in the face of distracting or competing stimuli. Therefore it incorporates the notion of "freedom from distractibility."

Alternating attention: The ability of mental flexibility that allows individuals to shift their focus of attention and move between tasks having different cognitive requirements.

Divided attention: This is the highest level of attention and it refers to the ability to respond simultaneously to multiple tasks or multiple task demands.

Dharana, Dhyana and Samadhi: To progress on the path of yoga one should move from 'concentration' i.e. single subject with multiple converted thoughts to '*dharanā*' i.e. focusing on single thought which requires intense effort and then to move towards '*dhyāna*' by continuously defocusing on a single thought effortlessly with awareness and thereafter it culminates in '*Samadhi*' which is a superconscious state of bliss, knowledge power and expansion towards our true nature.

Sattva is a quality of virtue and goodness. It creates harmony, balance and stability. It is light and luminous in nature. Sattva provides happiness and contentment of lasting nature. It is the principle of clarity and peace.

Rajas is the most active of the Guṇa and its characteristics are motion, stimulation and overcoming resistance. Rajas denotes the quality of change, activity and turbulence.

Tamas is the quality of dullness, darkness, and veiling or obstructing in its action. It functions as the force of gravity that retards things and hold them in specific limited forms. It possesses a downward motion that causes decay and disintegration. Tamas brings about ignorance and delusion in the mind and promotes insensitivity, sleep and loss of awareness in individuals dominant in tamas.

“The term **Yoga** has its verbal root ‘*Yuj*’ in Sanskrit. *Yuj* means joining. Full sentence is ‘*Yujyate anena iti yoga*’. Yoga is that which joins. In the traditional terminology it is joining of *jīvātmā* with *paramātmā*, the individual self with the SELF. It is an expansion of the narrow constricted egoistic personality to an all-pervasive, eternal and blissful state of Reality. There are many **methods of yoga** catering to the needs of different persons in society to bring about the transformation of the individual. They are broadly classified into four streams. Swami Vivekananda puts them in the following important statement:

‘Each soul is potentially divine. The goal is to manifest this divinity within, by controlling nature, internal and external. Do this either by **work, or worship, or psychic control, or philosophy** — by one, or more, or all of these — and be free. This is the whole of religion. Doctrines, or dogmas, or rituals, or books, or temples, or forms, are but secondary details’.

Literary Research

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LITERARY RESEARCH

2.1 CONCEPT OF HUMAN POTENTIAL IN SCRIPTURES

2.1.1 HUMAN POTENTIAL IN VEDAS

The quintessence of the Vedantic philosophy is found in the four great declarations of the four Vedas. They are ranged in the following ascending order:

1. तत् त्वम् असि ॥ Tat Tvam Asi (That thou art). [SĀMA VEDA]
2. अहम् ब्रह्म अस्मि ॥ Aham Brahma Asmi (I am Brahman). [YAJUR VEDA]
3. अयम् आत्मा ब्रह्म ॥ Ayam Ātmā Brahma (This Self is Brahman). [ATHARVA VEDA]
- 4 ॥ सर्वं खल्विदं ब्रह्म ॥ Sarvaṁ khalvidam brahma ॥ (Everything indeed is Brahman). [SĀMA VEDA]

The first *Mahā Vākya* is addressed by a Master to a disciple after having defined that Brahman is Consciousness. He declares the greatest “That thou Art”; Oh! Disciple that Brahman which is nothing but Consciousness is not yonder in the clouds to be achieved as a posthumous reward, but it is right here and now to be experienced as the Atman, your real Self.

After hearing the definition of Brahman and after having understood from the words of his Master that he is in essence nothing other than Brahman, the seeker retires to a quiet place, shut off from worldly shares, to meditate upon the objective truth that “I am Brahman”. Ere long he realizes that “This Self is Brahman”. Having decided for himself from his own personal solitary and tranquil meditation that this Atman is Brahman, the student comes back to the Master and, to the looks of enquiry of master answers with the cheer that beams out of his limpid eyes of peace and serenity, that he had intimately experienced the Truth and he is living with the constant awareness of the Truth—“I am Brahman”.

Thus in the first two *Mahā Vākyas* we find the definition of Truth and the relationship between Truth and Man. The other two give us an assurance that Truth is realized not partially but totally. (Swami Chinmayananda 1983). This process is called Jnana Yoga.

As mentioned in the *Māṇḍūkya upaniṣad* (which is a part of *Atharva Veda*) beside three states i.e. waking state, dreaming state, sleep state there is pure consciousness, which is called *turīya*. It comes into being only when in meditation the ordinary self is left behind and the *Ātman*, or true Self, is fully realized. It is pure unitary consciousness, wherein awareness of the world and of multiplicity is completely gone. It is ineffable peace. It is Self. Know it alone. This Self is Brahman in other words “*Ayam Ātma Brahma*”. (Swami Prabhavananda)

In the Chandogya upaniṣad there is a dialogue between son and father. The son Śvetaketu went to a teacher and studied for twelve years. After committing to memory all the Vedas, he returned home full of pride in his learning. His father, noticing the young man’s conceit said to him: ‘Śvetaketu have you asked for that knowledge by which we

hear the unhearable, by which we perceive the unperceivable, by which we know the unknowable?’ The son asked what that knowledge sir is.

Then the father Uddālaka explained ‘as by knowing one lamp of clay or gold all things made of clay or gold are known, the difference being only in name and arising from speech and the truth being that all are clay/gold – exactly so is that knowledge, knowing which we know all.’ Father further explained “In the beginning there was existence, one only, without a second. Some say that in the beginning there was non-existence only, and that out of that the universe was born.

But how could such a thing be? How could existence be born of non-existence? No my son, in the beginning there was Existence alone –one only, without a second. He, the One, thought to himself: let me be many, let me grow forth. Thus out of himself he projected the universe: and having projected, he entered into every being and everything. All that is has its self in him alone. He is the truth. He is the subtle essence of all He is the Self. and that, Śvetaketu ‘That art Thou’. Like that he gave number of examples of various things and beings of this world and explained how everything and being in essence is indeed Brahman/Self only. (Swami Prabhavananda 2000).

2.1.2 HUMAN POTENTIAL IN UPANIṢADS

HUMAN POTENTIAL IN TAITTIRĪYA UPANIṢAD

One can also reach to the highest state of potential doing internal research through tapas (Meditation) as clearly mentioned in the story of *Taittirīya upaniṣad*. Here the teacher Varuṇa the father is guiding the student Bhṛgu in his search for reality. The son asks the father to tell him about the most fundamental stuff of this universe from which all creation has come. The father leads him on through hints to perform Tapas (internal research) to find out an experiential answer to the question.

The son goes into silence and comes back to the father with the answer that the entire universe is made of ‘Anna’ (matter). Everything in the universe is sustained by Anna and everything dissolves Anna. Father is very happy that the son has been able to arrive at one common principle of the external universe. This matter (Anna) based aspect of our physical personality is called Annamaya Kośa.

Further Varuṇa says ‘my dear son there is something more subtle than what you have discovered, please go on and carry on with your research’. Bhṛgu after a long research comes back and says ‘O Father it is the *Prāṇā*- the life energy from which even the gross Annamaya Kośa comes out.

Bhṛgu is now guided by his father to go back for Tapas. He returns after long penance and says ‘Oh my Guru, I realize that Manas (mind) is the source of everything’. As Bhṛgu reports to Varuṇa about this wonderful discovery, the master is happy but he says ‘Please move on you have just a few steps to go ahead, you are in the right direction.’

Now through intense long tapas, Bhṛgu realizes that it is all the *vijñāna* (knowledge) from which the entire creation has happened and that could be the final reality. *Vijñānamaya* Kośa is the fourth layer of our existence. It is the discriminating faculty.

Varuṇa now directs the son to go back to tapas and this time Bhṛgu never returns. The master goes to check why the son has not comeback. He was surprised to see that Bhṛgu is completely engrossed in deep *Ānanda* (bliss). There is no individual ‘I of the *vijñāna* or *manomaya* that can report to the father about his realization.

Bhṛgu is now established in the knowledge of the final truth that *Ānanda* is the basic stuff of this universe from which everything has been created. This is the most subtle aspects of our existence which is a state of total silence- a state of complete harmony and perfect health.

Here Bhṛgu the son and disciple of Varuṇa cross *Panch Kośas* existence one by one by experiencing and analyzing them through called “*Panch Kośa Viveka*”. He transformed himself gradually by getting relieved from the bondages and constrictions of each *Kośa*.

This way he reached to the highest state of potential i.e. blissful state from where he did not come to his father/guru for any further guidance. (Nagarathana & Nagendra 2004).

2.1.3 HUMAN POTENTIAL IN PRAŚNOPANIṢAD

This *Upaniṣad* talks about the powers, glory and splendor of *Prāṇā* in answer to the second and third questions rishi *Bhargava* asked to the sage *Pippalada*. It is said that it is the *Prāṇā* the life force that supports the microcosm and thus the best of all. It is *Prāṇā* dividing itself fivefold support this body and keep it. In all 72 lakhs *nāḍīs* it moves. Breathing and thoughts are expressions of *Prāṇā* only. *Prāṇā* is the most important fundamental principle in the body and Nature. Therefore *Prāṇā* is called Brahma. The individual prana is a part of the universal *Prāṇā* or cosmic energy. Like spokes in the nave of wheel, so all is centered in *Prāṇā*, the verses of the *Ṛgveda*, *Sāmaveda*, sacrifices, *Kṣatriyas* and the *Brahmaṇas*. *Prāṇā* is the basic fabric of entire creation.

This *Prāṇā* is born of the Ātman. As is this shadow in the man, so is this *Prāṇā* in the Ātman. By the action of the mind it enters into the body. It is the highest potential state from where *Prāṇā*, which essentially is a movement, takes birth. From it emerges all creation. (Swami Sivananda 1997).

The speeding up and the grossification of *Prāṇā* is called creation; the slowing down and expansion of *Prāṇā* are the essential features of growth towards its source, reality or perfection. The highest growth is the state of total freedom, bliss, knowledge and power at the level of *Brahman* or perfection. (HR Nagendra 2003).

HUMAN POTENTIAL IN KATHOPANIṢAD

In this *Upaniṣad* the *Nachiketā* asked boon/question to Lord Death that some schools of thinkers say that death is the end of all and there is nothing left beyond it. While some other schools of thinkers say that there is existence even beyond the grave so what is the truth. The lord of death in reply to this says when all the desires that dwell in the heart are destroyed, than the mortal becomes immortal/eternal/free even in this mortal body and attains *Brahman*/perfection (*Katho.* 6.14). But others lead differently i.e. some souls enter the womb to have a body, others to the animals, plants stone etc, just according to their work (*karma*) and according to their knowledge. (*Katho.*5.7), (Swami Chinmayananda, 1963).

2.1.3 HUMAN POTENTIAL IN BHAGAVAD GĪTĀ

Lord Krishna in the Bhagavad Gita from verses 2.55 to 2.72 describes who is the man of perfection in other words how one can reach to that highest state of potential through **Jñāna Yoga**. Some of the most important verses which depict human potential are mentioned below.

श्रीभगवानुवाच ।

प्रजहाति यदा कामान् सर्वान्पार्थ मनोगतान् ।

आत्मन्येवात्मना तुष्टः स्थितप्रज्ञस्तदोच्यते ॥ २ ॥५५ ॥

Śrī bhagavānuvāca

*Prajaḥāti yadā kāmān sarvān pārtha manogatān ।
Ātmanyevātmnā tuṣṭḥ sthitaprajñastadocyate ॥2.55*

The Lord said:

“When a man completely casts off all the desires of the mind and is satisfied in the Self by the Self, than he is said to be the man of steady wisdom”.

यः सर्वत्रानभिस्नेहः तत्तत्प्राप्य शुभाशुभम् ।
नाभिनन्दति न द्वेष्टि तस्य प्रज्ञा प्रतिष्ठिता ॥ २ ॥५७

Yaḥ sarotrānabhisnehastatatprāpya śubhāśubham ।

Nābhinandati na dveṣṭi tasya prajñā pratiṣṭhitā ॥ 2।57।

“He who is everywhere without attachment, on meeting with anything good or bad, who neither rejoices nor hates, is man of steady wisdom”.

Further through **Karma Yoga** way also one can attain ones highest potential/perfection. The following verses of Bhagavad Gita depict the same beautifully:

योगस्थः कुरु कर्माणि सङ्गं त्यक्त्वा धनञ्जय ।

सिद्धयसिद्धयोः समो भूत्वा समत्वं योग उच्यते ॥ २ ॥४८ ॥

Yogasthaḥ kuru karmāṇi saṅgam tyaktvā dhanañjaya।

Siddhyasiddhyoḥ samo bhūtvā samatvam yoga ucyate ॥2।48॥

“Perform action, being steadfast in Yoga (Dwelling in union with the Divine/establishing in Silence), by abandoning attachment and being balanced in success and failure. The evenness of mind is called Yoga.”

बुद्धियुक्तो जहातीह उभे सुकृतदुष्कृते ।

तस्माद्योगाय युज्यस्व योगः कर्मसु कौशलम् ॥ २ ॥५० ॥

Buddhiyukto jahātīha ubhe sukrutaduskṛte।

Tasmādyogāya yujyasva yogaḥ karmasu kauśalam ॥2।50॥

“Endowed with wisdom (evenness of mind), one casts off in this life both good and evil deeds; therefore thyself to Yoga; Yoga is skill in action (The yogi of poised reason attributes all actions to the Divine Actor within (Isvara or God))”.

Further through **Rāja Yoga** way also one can attain ones highest potential/perfection which following verses of Bhagavad Gītā beautifully depict.

युञ्जन्नेवं सदात्मानं योगी नियतमानसः ।

शान्तिं निर्वाणपरमां मत्संस्थामधिगच्छति ॥ ६ ॥१५ ॥

Yuñjannevaṁ sadātmānaṁ yogī niyatamānasaḥ ।

Śāntim nirvāṇaparamāṁ matsaṁsthāmadhigacchati ॥ 6.15॥

“Thus always keeping the mind balanced, the Yogi with the mind controlled, attains to the peace abiding in God, which culminates in liberation.

यदा विनियतं चित्तमात्मन्येवावतिष्ठते ।

निःस्पृहः सर्वकामेभ्यो युक्त इत्युच्यते तदा ॥ ६ ॥१८ ॥

Yadā viniyataṁ cittamātmanyevāvatiṣṭhate ।

Niḥsṛhaḥ sarvākāmebhyo yukta ityucyate tadā ॥ 6.18॥

“when the perfectly controlled mind rests in the Self only, free from longing for all the objects of desires, then it is said He is united (with the Self)”.

Further through **Bhakti yoga** way also one can attain ones highest potential/perfection which following verses of Bhagavad Gita beautifully depict.

अभ्यासेऽप्यसमर्थोऽसि मत्कर्मपरमो भव ।

मदर्थमपि कर्माणि कुर्वन्सिद्धिमवाप्स्यसि ॥ १२ ॥१० ॥

Abhyāse'pyasamartho'si matkarmaparamo bhava ।

Madarthamapi karmāṇi kurvaṁsiddhimavāpsyasi ॥ 12.10॥

“If thou are unable to practice even this Abhyāsa Yoga, be thou intent on doing actions for God sake; even by doing actions for God sake, thou shall attain perfection.

तमेव शरणं गच्छ सर्वभावेन भारत ।

तत्प्रसादात्परां शान्तिं स्थानं प्राप्स्यसि शाश्वतम् ॥ १८ ॥६२ ॥

Tameva śaraṇaṁ gaccha sarvabhāvena bhārata ।

Tatprasādātparāṁ śāntiṁ sthānaṁ prāpsyasi śāśvatam ॥ 18.62 ॥

“Take refuge in Him alone with all your being. By His mere grace you will attain supreme peace and the eternal abode”. (Swami Sivananda 1995).

2.1.4 INVOKING THE HUMAN POTENTIAL - PATAÑJALI YOGA

Patañjali (1961) defines in his second and third aphorisms how one can reach to the highest potential state through Yoga.

योगश्चित्तवृत्तिनिरोधः ॥ प । यो । सू । १ । २

yogaścittavṛttinirodhaḥ ॥ pa | yo | sū | 1 | 2

“Yoga is a process of gaining control over the mind by cessation of the modifications of mind”.

तदा द्रष्टुः स्वरूपेवस्थानम् ॥

Tadā draṣṭuḥ svarūpevasthānam ॥ p.y.s.1.3

“Then the Seer establishes himself in his original state”.

This way through Yoga as and when chitta vrittis are annihilated, the sustained attention/Awareness would increase on the object of meditation which will slowly leads to pure Consciousness/Self.

तस्यापि निरोधे सर्वनिरोधान्निर्बीजः समाधिः ॥

Tasyāpi nirodhe sarvanirodhānnirbījaḥ samādhiḥ | p.y.s. 1.51

‘On suppression of even that owing to suppression of all (modifications of the mind)
‘Seedless’ Samadhi (is attained)’.

तदभावात् संयोगाभावो हानं तद् द्रशेः कैवल्यम् ॥

Tadabhāvāt saṁyogābhāvo hānam tad draśeḥ kaivalyam | p.y.s.2.25

‘The dissociation of Puruṣa and Prakṛti brought about by the dispersion of Avidhyā is the
real remedy and that is the liberation of the Seer’.

तस्य सप्तधा प्रान्तभूमिः प्रज्ञा ।

tasya saptadhā prāntabhūmiḥ prajñā | p.y.s. 2.27

‘In his case the highest stage of Enlightenment is reached by seven grades of knowledge’

तारकं सर्वविषयं सर्वथा विषयक्रमं चेति विवेकजं ज्ञानम् ।

*Tāraḥ sarvaviṣayaṁ sarvathā viṣayakramam ceti vivekajam jñānam | p.y.s.
3155*

‘Transcendental (highest) knowledge born of the awareness of Reality includes the
knowledge of all objects beyond all orders of succession and is born of viveka. That is
all’.

सत्त्वपुरुषयोः शुद्धिसाम्ये कैवल्यमिति ।

sattvapuruṣayoḥ śuddhisāmye kaivalyamiti | p.y.s.3.56

‘Kaivalya is achieved by equalizing and purifying the illumination of puruṣa and chitta’.

2.1.5 HUMAN POTENTIAL IN YOGAVĀSIṢṬHA

This scripture ‘*Yogavāsiṣṭha*’ mentions the story of *Rama*. How *Rama* came out of depression and got enlightenment through the teachings of sage *Vāsiṣṭha*. From this story one can understand how any human being also can reach to such state of enlightenment (Potential state) though he or she may be any lower state of mind. Sage *Vāsiṣṭha* mentioned **three** ways of getting enlightenment/liberation.

1. Through practicing oneness principle thoroughly i.e. only Reality/Brahman exists other than that nothing exists. No other objects exist. He and He only exists. This Self is Brahman and everything is Brahman only. This is the highest state. In *Yogavāsiṣṭha* following seven stages called ‘*Yoga Sapta Bhūmika*’ (seven stages for Union) are mentioned to reach to this highest state:

1. Śubhecchā: desire for truth.

To be away from unedifying associations and desire, knowledge of the Supreme is the first plane called *Śubhecchā*.

2. Vichārṇā: investigation into the truth

To associate with enlightened sages, learn from them and reflect on the truth, is called investigation.

3. Tanumānasī: pure and attenuated mind

To be free from desires by meditating on the truth with faith is the attenuation of the mind.

4. Sattvāpatti: the realization of the truth

The shining forth of the highest knowledge in the mind owing to the development of the foregoing conditions is realization.

5. Asamsakti: a detached outlook on the universe and its contents

To be free from illusion by firm realization of truth is the detached outlook on the universe.

6. Padārthabhāvanī: untainted awareness of Self.

The bliss of the non-dual Self, devoid of triads (knower, knowing, known and so on) is untainted awareness of Self.

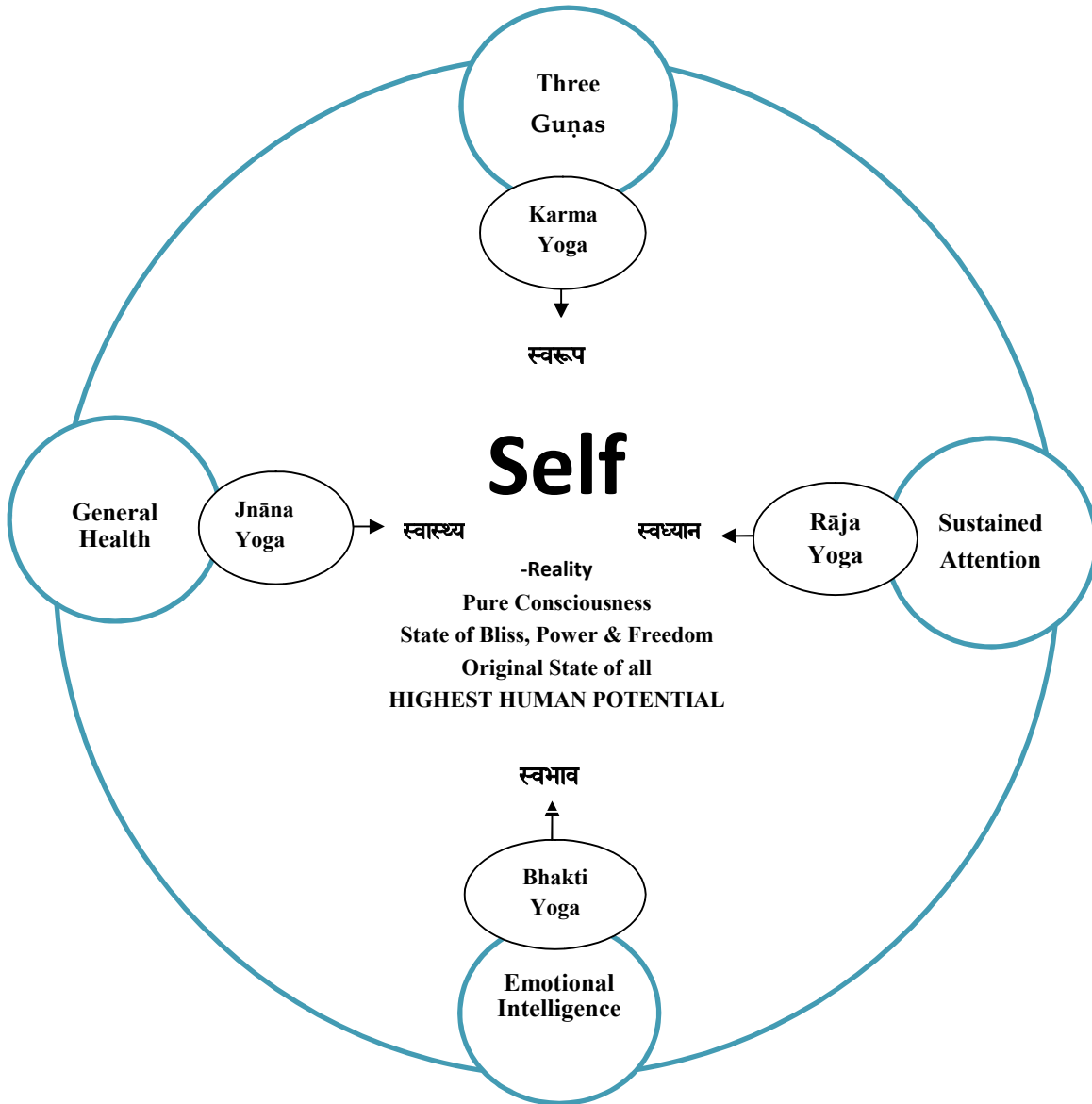
7. Turiyā: the highest and indescribable state

Sublime silence of the very nature of Self is *turiya*.

2. The second method *Yogavāsiṣṭha* mentioned is that of controlling the speed of *Prāṇā* (Breath), by practicing pranayama. This way through reducing of speed of breath one can have control over mind also as both are interconnected and can reach to the highest potential state.

3. The third method mentioned in the *Yogavāsiṣṭha* is that of merger/destruction of mind through the knowledge based **mental** techniques/practices/attitudes; by being without *Sankalpa* (resolve), by detachment towards objects of enjoyment, controlling senses, removal of desires, removal of ego, practicing detachment towards everything and being, by having equanimity, leaving aside sense of doership, and by practicing of Samadhi, one can reach to the highest state of bliss. (Bhikhanlal Atreya 1989).

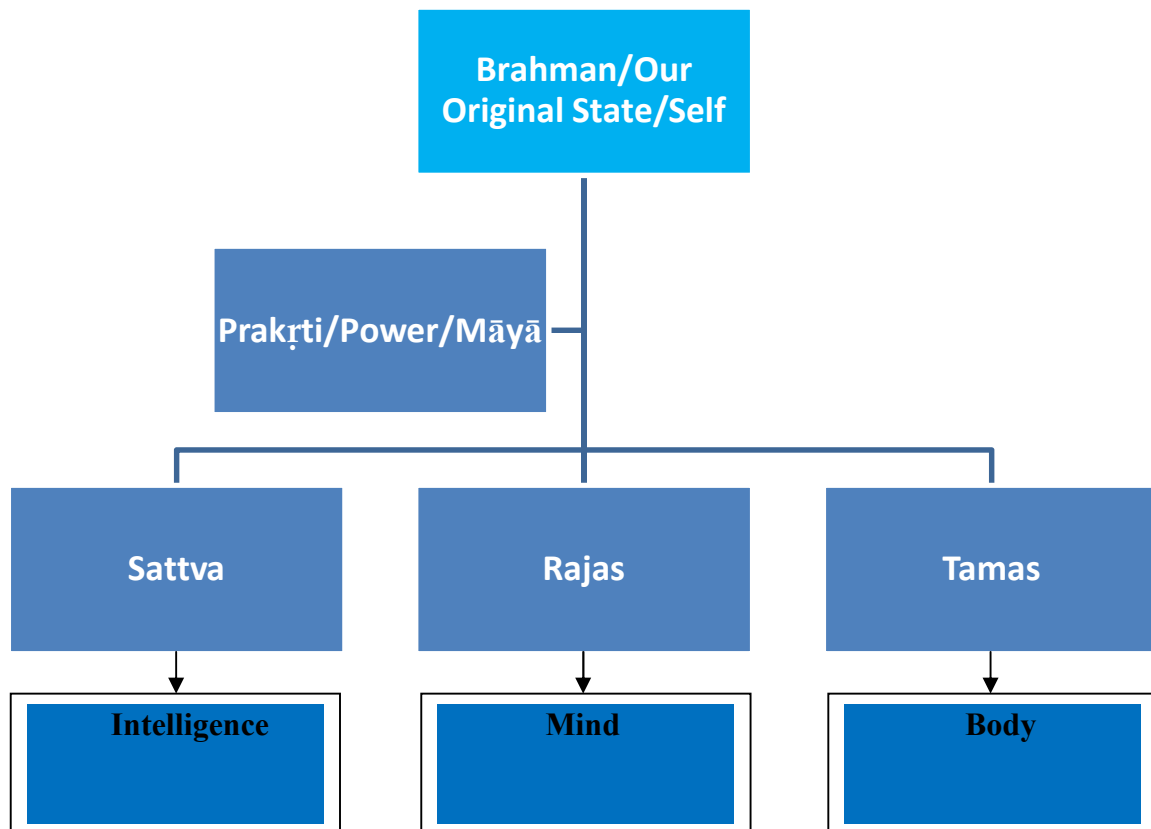
2.2 ORIGINAL MODEL OF HIGHEST HUMAN POTENTIAL DEVELOPMENT WITH FOUR MAIN VARIABLES & FOUR YOGAS:



2.2 ORIGINALMODEL OF HIGHEST HUMAN POTENTIAL DEVELOPMENT WITH FOUR HUMAN DIMENSIONS AND FOUR YOGAS:

Highest human potential is to be in state of infinite Bliss, Freedom, Knowledge, Power; our original state devoid of thoughts or Silence. This highest state can be only experienced and cannot be described in words. But to make the mankind realize their highest Goal of life our saints, sages and seers who were Realized, enlightened and experienced beings attempted to put it in different kinds of words. Like Pure Consciousness, Awareness, Higher intelligence, pure Being, Truth, Love, Reality, Original state, Brahman, all-pervading, all knowledgeable, all powerful being, Self (ĀTMA), *Paramātmā*, *Īshvara* (God), *Parameśvara*, Supreme force, Supreme intelligence, state of *Kaivalya*, *Nirvāna*, *Mokṣa* (Liberation), *Omkāra* etc. this way long list can be mentioned. In short we have to understand that this is our Original state from which whole universe/creation come out to whom we have given different names and forms including we human beings.

This can be explained in the following **Original Model of CREATION:**



From the above model we can see that our Body-Mind-Intelligence (BMI) are manifested from our original state call Self/Brahman by our wish/will to play some happy roll in this drama of created universe. So we all are **Self** and this BMI complex is our own creation. This creation we can merge within us by realizing/stabilizing back on our Self. We are finding this thing difficult because we have **forgotten our original state** due to manifestation of our power. And we start thinking that we are this BMI complex only and not Self. In Vedanta it is call Maya or our *prakṛti* which is nothing but our manifested Power. By utilizing our power we have created this BMI complex so same can be get merged within us by our own wish/will, or in other words by remembering/realizing who we are in reality. This way we can be in our original state call **highest potential/perfection**.

Now coming back to our original model where we have shown, four variables/dimensions of human potential (General Health, Emotional intelligence, Sustained Attention, Guna personality) are related to four streams of yoga and one can reach to our highest potential state with all the four paths of yoga. This has been substantiated later with references of original texts of Yoga and spirituality.

As there are different types of people with different personalities like physical, mental, emotional and intellectual, different four paths of Yoga, **Karma yoga, Rāja yoga, Bhakti yoga and Jñāna Yoga** respectively are chosen to suit the individual personality and to reach common highest Goal or potential. But to **begin with** any path one can start with Grace of God or of enlightened Guru by regular **Prayer/surrender to God or to Guru** to achieve highest potential in this life itself.

In other words these four variables/dimensions are **related to our four faculties** call body, mind, emotion, intellect. We have connected general health with intellect, Emotional intelligence with emotion, Sustained attention with mind (will), three gunas personality with body.

Further as **intellect** is the main faculty on the path of *Jñāna Yoga* we have connected it to give further important references from original text of yoga and spirituality.

Similarly **emotion** is the main faculty for the path of *Bhakti Yoga*, we have related it and gave important references from scriptures.

Our **will power** which is nothing but power of mind is a faculty on the path of *Rāja Yoga* and here it is chosen to give important solid references from the text of yoga and spirituality.

Finally the fourth instrument call **body** is very much requires to do *Karma Yoga* hence selected for the same for further references.

The ultimate purpose of relating these **four** human dimensions with **four** main faculties call body, mind, emotion and intellect and with **four** respective streams of yoga is to establish our highest human potential at the level of Self/Brahman/Divinity.

One can do this only at the level of Self which is nothing but universal Self or Brahman. we cannot progress on any path of Yoga for achieving this highest potential without **turning inward**. If you want to achieve this highest goal or potential with these four dimensions/paths, you have to **purify** yourself first. Whether it is the path of Jñāna yoga or path of Bhakti yoga or path of Rāja yoga or path of Karma yoga you have to purify yourself.

On the path of Jñāna yoga you can purify by removing your **ignorance**. On the path of Bhakti yoga you can purify by removing evil qualities like **ego** and acquiring Divine qualities. On the path of Rāja yoga you can purify your **mind** by following ashtānga yoga of Patañjali and on path of Karma yoga you can purify by sacrifice and service/removing **Ego**. **This way one has to be introvert to get one self purify to get the mind steady by**

slowing down/calming down and silencing it, to progress further on the path of Yoga and to have Union with Self/Brahman which is the ultimate aim of our study. Our all major **Upaniṣads** also talk about the same that if we really serious about achieving Goal of life/highest potential than one has to turn finally **inward only in all the paths of Yoga** and to see Him revealed in one's own soul which is our highest human potential. This has been narrated in beautiful words of Sanskrit as under, for all the four dimensions of our study.

- **Sva-stha** means to be steady in one's Self only finally, on the path of intellect or Jnāna Yoga.
- **Sva-bhāva** means one's own original Nature which is nothing but Silence/Ānanda/Self.
- **Sva-dhyāna** means meditating on one's own Self which is nothing but Brahman only in other word.
- **Sva-rūpa** means one's own real form i.e. Self/Brahman.

All the above explanations are summarized in the following ways:

1. General Health- with intellect (Awareness)-Jnāna yoga – *Sva-stha* (Steady on Self) - Highest potential Health
2. Emotional Intelligence- with Mind (Emotions) - Bhakti Yoga – *Sva-bhāva* (Ānanda)- Highest potential Ānanda
3. Sustained Attention- with Mind (Will) - Rāja Yoga – *Sva-dhyana* (Meditation on Self)- Highest potential state
4. Three Guṇas – with Body (Action) – Karma yoga – *Sva-rūpa* (Self) - Highest potential state

JÑĀNA YOGA AND GENERAL HEALTH:

The oneness of body, mind and spirit is called ***Svasthya***. It means to be steady in One 's Self. Healthy person is one who is steady in one Self. Holistic health can be defined as well-being at the physical, mental, social and spiritual level.

As yoga is conscious process of evolution, we can define health as **living in Awareness**. When person is in conscious process of awareness all the time then we can say he/she is healthy. Otherwise we live the life without awareness of the present moment and live either in past or future. **The person who lives in present/awareness can be called a healthy person in yoga.**

BHAKTI YOGA AND EMOTIONAL INTELLIGENCE

When **emotions** are used intellectually for higher purpose i.e. towards oneness/union with Self/God then it is called devotion or Bhakti. So devotion/Bhakti is the science of using our emotions for God-realization. To progress on the path of emotions/devotions we have to remove our negative emotions like greed, jealousy, lust, etc. and to develop positive emotions like love, compassion, forgiveness etc. Like this one can move from ***Kāma (desires) to Prema (love) to Bhakti (devotion)*** by channelizing our emotions in right direction for achieving higher purpose of life.

In other words emotions are nothing but “*Bhāva*” as it is said in Sanskrit. We have to move from ***Kāmya bhāva to Prema bhāva to Svabhāva*** i.e. from selfishness to selflessness to *Ānanda* (Self) itself on the path of emotion/devotion/Bhakti.

RĀJA YOGA AND SUSTAINED ATTENTION

Through Yoga as and when ***chitta vrittis*** are annihilated, the sustained attention/Awareness would increase on the object of meditation which will slowly leads to pure Consciousness/Self (***Sva-dhyāna***). In other words it is through the process of ***Dhāraṇa-Dhyāna-Samādhi-Samyama-Dharma megha Samādhi***.

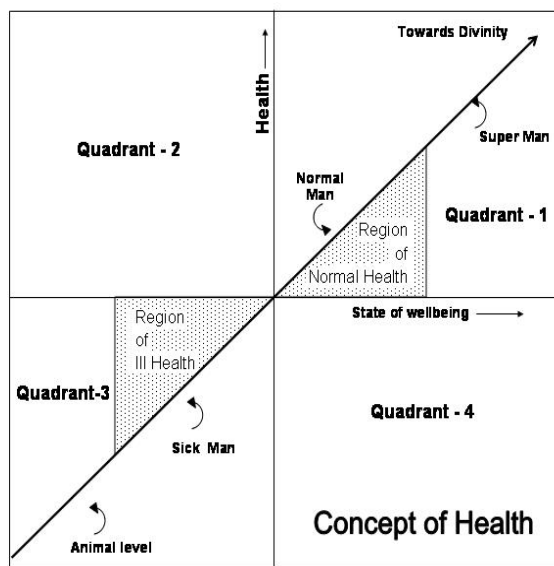
KARMA YOGA AND THREE GUNĀS PERSONALITY

Human mind/body is nothing but three gunas. i. e. Sattva, Rajas and Tamas. In other words it is called *prakṛti* or nature. Originally they were in equilibrium. But due to **disequilibrium in gunas**, evolution started.

Sometime one guna is predominant, sometime another; and a man's mood and character vary accordingly. But man can cultivate any one of the gunas by his actions and thoughts and way of living. We are taught that tamas can be overcome by cultivation of Rajas and Rajas by the cultivation of Sattva. However ultimate aim is to bring these gunas in **equilibrium (evenness of mind)** by *Sādhana* (practice) so that one can reach beyond to the highest state of potential i.e. Yoga/union or perfection (*Sva-rūpa*).

2.2.1 JÑĀNA YOGA AND GENERAL HEALTH

Modern Yogis/Gurus Nagarathna and Nagendra beautifully explained how one can elevate oneself from illness to normal health, normal health to positive health, positive health to perfect health/Divinity as shown in the following diagram and in their words,



“According to the World Health Organization (WHO) the state of Health is defined as a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity. WHO also suggests a fourth dimension spiritual well-being. It is clear from this definition that health and ill-health are not two discrete entities as commonly understood but health should be conceived as a continuous function indicating the state of well-being. In the diagram, the 3rd

quadrant ‘the region of ill-health’ represents what normally we designate as ‘Sickness’. Below this, man acts instinctively and is akin to animal man. Coming to the first quadrant, the region of ‘Normal Man’ the state of normal health is indicated. As he moves along the line further up, he becomes healthier featured by the dormant faculties

expressing more vividly in man. This is shown as the region of Superman. In this state, the limitations of normal man namely the strong urges of thirst, hunger, fear and sex are reduced greatly and are fully under control and then one can move towards Divinity/Perfect health” by stabilizing in the Self. (Nagarathna & Nagendra HR. 2004)

The oneness of body, mind and spirit is called *Svasthya*. It means to be steady in one’s Self. Healthy person is one who is steady in one’s Self. Holistic health can be defined as well-being at physical, mental, social and spiritual level.

As **Yoga is conscious process** of evolution, we can define health as living in Awareness. When person is in awareness all the time then we can say he/she is healthy. Otherwise we live the life without awareness of the present moment and live either in past or future. The person who lives in present/awareness can be called a healthy person in yoga.

ĀYURVEDA'S DEFINITION OF HEALTH AND YOGA

Sama dosha sama agnischa sama dhatu mala kriyaaha|

Prasanna ātma indriya manaha swastha iti abhidheeyate || Sushruta Samhita

Svasthya/perfect health, as defined in *Sushruta Samhita*, one of the primary works on Ayurveda, is "When *doshas* are in balance, appetite is good, all tissues of the body and all natural urges are functioning properly, and when mind, body and spirit are cheerful..."

As we have seen in our model description body is made from *tamas* quality of Nature, which can be classified as five elements. So when there is imbalance in these elements all the problems of body start from there. Hence it is necessary to have balance/moderation in everything in life as mentioned in the **Bhagavad Gītā** verse No.6.17 below.

Yuktāhāravihārasya yuktaceṣṭasya karmasu |

Yuktasvapnāvabodhasya yogo bhavati duḥkhahā || 6.17||

“Yoga becomes the destroyer of pain for him who is always moderate in eating and recreation (such as walking, etc.), who is moderate in exertion in actions, who is moderate in sleep and wakefulness”.

The following Verses of the *Bhagavad Gītā and Patañjali Yoga* say how one can progress from causative lowest state of health to positive health to highest state of health by adopting Yoga way of life.

In Verses 2.62, 2.63 of *Bhagavad Gītā* the Lord says when man thinks of the objects, attachment for them arises; from attachment desire is born; from desire anger arises, from anger arises delusion; from delusion loss of memory; from loss of memory the destruction of discrimination; from the destruction of discrimination he perishes/in **lowest state of health**.

ध्यायतो विषयान्पुंसः सङ्गस्तेषूपजायते ।

सङ्गात संजायते कामः कामात्क्रोधोऽभिजायते ॥ २ । ६२ ॥

क्रोधाद्भवति संमोहः संमोहात्स्मृतिविभ्रमः ।

स्मृतिभ्रंशाद् बुद्धिनाशो बुद्धिनाशात्प्रणश्यति ॥ २ । ६३ ॥

Dhyāyato viṣayānpunṁsaḥ saṅgasteṣūpajāyate ।

saṅgātasāññajāyāte kāmaḥ kāmātkrodho bhijāyate ॥ 2 । 62॥

Krodhādbhavati sammohaḥ sammohātsmṛtīvibhramaḥ ।

smṛtibhramśād buddhināśo buddhināśātpraṇaśyati ॥ 2 । 63॥

“When man thinks of the objects, attachment for them arises; from attachment, desire is born; from desire, anger arises, from anger, arises delusion; from delusion, loss of memory; from loss of memory, the destruction of discrimination; from the destruction of discrimination, he perishes”.

In Verses 2.64, 2.65 of the *Bhagavad Gītā* the Lord says but the self-controlled man, moving among the objects with the senses under restraint and free from attraction and repulsion attains to peace. In that peace all peace all pains are destroyed; for the intellect of the tranquil-minded soon becomes steady. In other words he is in **perfect health**.

रागद्वेषवियुक्तैस्तु विषयानिन्द्रियैश्चरन् ।
आत्मवश्यैर्विधेयात्मा प्रसादमधिगच्छति ॥ २ । ६४ ॥
प्रसादे सर्वदुःखानां हानिरस्योपजायते ।
प्रसन्नचेतसो ह्याशु बुद्धिः पर्यवतिष्ठते ॥ २ । ६५ ॥

*Rāgadveṣaviyuktaistu viṣayānindriyeeścaran ।
ātmaśyairvidheyātmā prasādamadhigacchati ॥ 2। 64॥
Prasāde sarvaduḥkhānām hānirasyopajāyate ।
prasannacetaso hyāśu buddhiḥ paryavatiṣṭhate॥ 2।65॥*

“But the self-controlled man, moving among the objects with the senses under restraint and free from attraction and repulsion attains to peace. In that peace all pains are destroyed; for the intellect of the tranquil-minded soon becomes steady”.

Patañjali Yoga Sūtra 2.3 says the lack of awareness of Reality, the sense of egoism, attractions and repulsions towards objects and strong desire of life are the afflictions or causes of all miseries in life/**unhealthy life**.

अविद्यास्मितारागद्वेषाभिनिवेशाः क्लेशाः ॥

Avidyāsmītārāgadveṣābhiniveśāḥ kleśāḥ ॥ p.y.s. 2.3

“The lack of awareness of Reality, the sense of egoism, attractions and repulsions towards objects and strong desire of life are the afflictions”.

Patanjali Yoga sutras 1.2 and 1.12 say **Yoga/perfect health** is the inhibition of the modification of mind which is brought about by persistent practice and non-attachment.

योगश्चित्तवृत्तिनिरोधः ॥ प । यो । सू । १ । २

yogaścittavṛttinirodhaḥ ॥ pa | yo | sū | 1 | 2

“Yoga is the inhibition of the modification of mind”.

अभ्यासवैराग्याभ्याम् तन्निरोधः ॥

Abhyāsavairāgyābhyām tannirodhaḥ | p.y.s.1.12

“Their suppression (is brought about) by persistent practice and non-attachment”.

2.2.2 BHAKTI YOGA AND EMOTIONAL INTELLIGENCE

When emotions are used intellectually for higher purpose i.e. towards oneness/union with Self/God than it is called devotion or Bhakti. So devotion/Bhakti is the science of using our emotions for God-realization. To progress on the path of emotions/devotions we have to remove our negative emotions like greed, jealousy, lust, etc. and to develop positive emotions like love, compassion, forgiveness, etc. Like this one can move from kāma (desires) to prema (love) to Bhakti (devotion) by channelizing our emotions in right direction for achieving higher purpose of life.

In other words emotions are nothing but “*Bhāva*” as it is said in Sanskrit. We have to move from *kāmya bhāva* to *nishkāma bhava* to *Svabhāva* i.e. from selfishness to selflessness to Ānanda (Self) itself on the path of emotion/devotion/Bhakti.

By having emotions/ devotion intellectually on Self/God constantly by surrendering totally one can reach to ones highest potential state (Self) gradually as mentioned in the *Bhagavad Gītā*. The following important verses depict how by removing demonical qualities and acquiring Divine qualities one can **purify emotions** and gradually having our emotions/devotions/faith on the Self/God alone one can reach to the highest state of happiness.

दम्भो दर्पोऽभिमानश्च क्रोधः पारुष्यमेव च ।

अज्ञानं चाभिजातस्य पार्थ संपदमासुरीम् ॥ १६ ॥४ ॥

*Dambho darpo 'bhimānaśca krodhaḥ pāruṣyameva ca ।
ajñānaṁ cābhijātasya pārtha sampadamāsurīm ॥ 16.4॥*

“The hypocrisy, arrogance and self-conceit, anger and also harshness and ignorance,
belong to one who is born for a demonical state”.

दैवी संपद्विमोक्षाय निबन्धायासुरी मता ।

मा शुचः संपदं दैवीमभिजातोऽसि पाण्डव ॥ १६ ॥५ ॥

*Daivī sampadvimokśāya nibandhāyāsūrī matā ।
mā śucaḥ sampadam daivīmabhijāto 'si pāṇḍava ॥ 16.5 ॥*

“The Divine nature is deemed conducive to liberation and the demonical to bondage.
Grieve not you are born with Divine endowments”.

भक्त्या मामभिजानाति यावान्यश्चास्मि तत्त्वतः ।

ततो मां तत्त्वतो ज्ञात्वा विशते तदनंतरम् ॥ १८ ॥५५ ॥

*Bhaktiyā māmabhijānāti yāvānyaścāsmi tattvataḥ ।
tato māṁ tattvato jñātvā viśate tadanantaram ॥ 18.55॥*

“By devotion he knows Me in truth, what and who I am; and knowing Me
in truth, he forthwith enters into the Supreme”.

तमेव शरणं गच्छ सर्वभावेन भारत ।

तत्प्रसादात्परां शान्तिं स्थानं प्राप्स्यसि शाश्वतम् ॥ १८ ॥६२ ॥

*Tameva śaraṇaṁ gaccha sarvabhāvena bhārata ।
tatprasādātparāṁ śāntiṁ sthānaṁ prāpsy śāśvatam॥ 18.62॥*

“Fly unto Him for **refuge** with all your being, O Arjuna! By His **Grace** you shall obtain supreme peace and the eternal abode”.

In the **Nārada Bhakti Sūtras** 2, 3, 4 and 6 Sage Narada says beautifully, ‘**devotion (Bhakti)** is of the form of **Supreme love** (*param premarupa*) towards God’ and ‘it is of the nature of *Amritam* (Immortality)’, ‘by attaining which man become perfect, immortal and fully satisfied’, ‘after that the devotee becomes like an intoxicated person, becomes ecstatic, quiet and finds all joy in his own Self’. (Swami Shivananda, 2000).

सा त्वस्मिन् परमप्रेमरूपा ॥ना । भ । सू । २

Sā tvasmin paramapremarūpā ||nā| bh| sū| 2

‘It is of the form of **Supreme Love** towards God’.

अमृतस्वरूपा च ॥ना । भ । सू । ३

Amrutasvarūpā ca ||nā| bh| sū| 3

‘And it is of the nature of Nectar’.

यल्लब्ध्वा पुमान् सिद्धो भवति अमृतो भवति तृप्तो भवति ॥ना । भ । सू । ४

Yallabdhvā pumān siddho bhavati amruto bhavati trupto bhavati ||nā| bh| sū| 4

‘By attaining which man becomes perfect, immortal and fully satisfied’.

यज्ज्ञात्वा मत्तो भवति स्तब्धो भवति आत्मरामो भवति ॥ना । भ । सू । ६

Yajñātvā matto bhavati stabdho bhavati ātmarāmo bhavati ||nā| bh| sū| 6

‘By knowing which he becomes ecstatic, quiet and happy in his own Self’.

2.2.3 RĀJA YOGA AND SUSTAINED ATTENTION

By having gradual systematic sustained attention as mentioned in the *Patañjali Yoga* one can reach to the highest. The following sutras speak about *Dhāraṇa*, *Dhyāna*, *Samādhi*, *Samyamā* and *Dharmamegha Samādhi*:

देशबन्धश्चित्तस्य धारणा ॥

Deśabandhaścittasya dhāraṇā || P.Y.S. 3.1.

‘Dharana (Focussing) is the confining of the mind within a limited mental area (object of focussing)’.

तत्र प्रत्ययेकतानता ध्यानम् ॥

Tatra pratyayaikatānatā dhyānam || P.Y.S. 3.2

‘Uninterrupted (effortless) flow (of the mind) towards the object (chosen) is meditation’.

तदेवार्थमात्रनिर्भासं स्वरूपशून्यमिव समाधिः ॥

Tadevārthamātranirbhāsam svaruapaśūnyamiva samādhiḥ ||P.Y.S. 3.3

“The same (meditation) when there is consciousness only of the object of meditation and not of itself (the mind) is Samadhi”.

त्रयमेकत्र संयमः ॥

Trayamekatra samyamah || P.Y.S.3.4

“The three taken together constitute Samyama”.

प्रसंख्यानेप्यकुसीदस्य सर्वथा विवेकख्यातेर्धर्ममेघः समाधिः ॥

Prasaṅkhyānepyakusīdasya sarvathā vivekakhyāterdharmameghaḥ samādhiḥ

||P.Y.S. 4.29

“In the case of one, who is able to maintain a constant state of *Vairagya* even towards the most exalted state of enlightenment and to exercise the highest kind of discrimination, follows *Dharma-Megha-Samadhi*”.

By having sustained attention (meditation) regularly on Self one can reach to one’s highest potential state (Self) gradually as mentioned in the *Bhagavad Gītā*. In the following important verses, we see by having sustained attention (mind) on the Self alone one can reach to the highest state of potential/perfection.

तत्रैकाग्रं मनः कृत्वा यतचित्तेन्द्रियक्रियाः ।

उपविश्यासने युञ्ज्याद्योगमात्मविशुद्धये ॥ ६ ॥१२ ॥

*Tatraikāgraṁ manaḥ kṛtvā yatacittendriyakriyāḥ ।
Upaviśyāsane yuñjyādyogamātmaviśuddhaye ॥ 6.12 ॥*

“There, having made the **mind one-pointed**, with the actions of the mind and the senses controlled, let him, seated on the seat, practice Yoga for the purification of the self”.

शनैः शनैरुपरमेद् बुद्ध्या धृतिगृहीतया ।

आत्मसंस्थं मनः कृत्वा न किञ्चिदपि चिन्तयेत् ॥ ६ ॥२५ ॥

*Śanaiḥ śanairuparamed buddhyā dhṛtigrhītayā ।
Ātmasamsthaṁ manaḥ kṛtvā na kiñcidapi cintayet ॥ 6.25 ॥*

“Little by little let him attain to quietude by the intellect held firmly;
having made the **mind establish itself in the Self**, let him not think of anything”.

यतो यतो निश्चरति मनश्चंचलमस्थिरम् ।
ततस्ततो नियम्यैतदात्मन्येव वशं नयेत् ॥ ६ ॥२६ ॥
*Yato yato niścarati manaścañcalamasthiram ।
tatastato niyamyaitadātmanyeva vaśam nayet ॥ 6.26॥*

“From whatever cause the restless, unsteady mind wanders away, from that let him restrain it and bring it **under the control of the Self alone**”.

2.2.4 KARMA YOGA AND THREE GUNAS PERSONALITY

Human mind is nothing but three gunas. i.e. sattva, rajas and tamas. In other words it is called prakriti or nature. Originally they were in equilibrium. But due to disequilibrium in gunas, evolution started.

“Sometime one guna is predominant, sometime another; and a man’s mood and character vary accordingly. But man can cultivate any one of the gunas by his actions and thoughts and way of living. We are taught that tamas can be overcome by cultivation of rajas and rajas by the cultivation of sattva. However ultimate aim is to bring these gunas in equilibrium (evenness of mind) *by Sādhana* (practice) so that one can reach beyond to the highest state of potential i.e. Yoga/union or perfection”. (Swami Prabhavananda, 1978)

The following verses of the *Bhagavad Gītā* beautifully defines **Tamas, Rajas** and **Sattva** with type of actions and tell us how one can reach to **perfection/yoga**.

अनुबन्धं क्षयं हिंसामनपेक्ष्य च पौरुषम् ।
मोहादारभ्यते कर्म यत्तत्तामसमुच्यते ॥ १८ ॥२५ ॥
*Anubandhan kśayaṁ hiṁsāmanapekśya ca pauruṣam ।
Mohādārabhyate karma yattattāmasamucyate ॥ 18.25॥*

“That action which is undertaken from delusion, without regard to the consequences of loss, injury and (one’s own) ability—that is declared to be **Tāmasic**”.

यत्तु कामेप्सुना कर्म साहंकारेण वा पुनः ।

क्रियते बहूलायासं तद्राजसमुदाहृतम् ॥ १८ ॥२४ ॥

*Yattu kāmepsunā karma sāhaṅkāreṇa vā punaḥ ।
kriyate bahulāyāsaṁ tadrājasamudāhṛtam ॥ 18.24॥*

“But that action which is done by one longing for the fulfilment of desires or gain, with egoism or with much effort—that is declared to be **Rājasic**”.

नियतं सङ्गरहितमरागद्वेषतः कृतम् ।

अफलप्रेप्सुना कर्म यत्तत्सात्त्विकमुच्यते ॥ १८ ॥२३ ॥

*Niyataṁ saṅgarahitamarāgadveṣataḥ kṛtam ।
Aphalaprepsunā karma yattatsāttvikamucyate ॥ 18.23॥*

“An action which is ordained, which is free from attachments, which is done without love or hatred by one who is not desirous of any reward—that action is declared to be **Sāttwic**”.

गुणानेतानतीत्य त्रीन्देही देहसमुद्भवान् ।

जन्ममृत्युजरादुःखैर्विमुक्तोऽमृतमश्नुते ॥ १४ ॥२० ॥

*Guṇānetānatītya trīndehī dehasamudbhavān ।
Janmamṛtyujarāduḥkhairvimukto’mṛtamaśnute ॥ 14.20॥*

“The embodied one, having crossed **beyond these three Guṇas** out of which the body is evolved, is freed from birth, death, decay and pain, and attains to immortality”.

योगस्थः कुरु कर्माणि सङ्गं त्यक्त्वा धनञ्जय ।

सिद्धयसिद्धयोः समो भूत्वा समत्वं योग उच्यते ॥ २ ॥४८ ॥

*Yogasthaḥ kuru karmāṇi saṅgī tyaktoā dhanañjaya |
Siddhyasiddhyoḥ samo bhūtoā samatvaṁ yoga ucyate ||2|48||*

“Perform action, O Arjuna, being steadfast in Yoga, abandoning attachments and balanced in success and failure! **Evenness of mind** is called Yoga”. (Nagendra HR, 2000).

In the **Patañjali Yoga Sūtrā** 4.34 Patanjali says when one goes beyond three gunas, i.e. when gunas are reabsorbed in oneself one become enlightened and established in his Real Nature a state of highest potential i.e. *Kaivalya* or pure Consciousness. (Swami Satyananda, 1989).

पुरुशार्थशून्यानाम् गुणानां प्रतिप्रसवः कैवल्यम् स्वरूपप्रतिष्ठा वा चितिशक्तिरिति ॥

*Puruśārthaśūnyānām guṇānām pratiprasavaḥ kaivalyam svarupapraṭiṣṭhā vā
citiśaktiriti ||p.y.s. 4.34*

“*Kaivalya* is the state (of Enlightenment) following re-mergence of the Gunas because of their becoming devoid of the object of the *Purusha*. In this state the *Purusha* is in his Real nature which is pure Consciousness”.

Sāṅkhya kārikā in verse 12 says The gunas are of the nature of pleasure, pain and delusion; they serve the purpose of illumination, action and restraint and they are mutually dominating and supporting, productive and cooperative. Further verse 64 says “Thus from the practice of Truth- *tattvabhāsa* that produced the wisdom in the form: I am not,’ ‘nothing is mine,’ and ‘not-I,’ which is final, on account of the absence of error and having absolute knowledge that I am pure Consciousness become liberated”. (Swami Virupakshananda, 1995).

प्रीत्यप्रीतिविषादात्मकाः प्रकाशप्रवृत्तिनियमार्थाः ।

अन्योन्याभिभवाक्षयजननमिथुनवृत्तयश्च गुणाः ॥१२॥

Prītyapṛitiviṣādātmakāḥ prakāśapravrutitinyamārthāḥ।

Anyonyābhibhavākṣrayajananamithunavrutayaśca guṇāḥ॥12॥

“The gunas are of the nature of pleasure, pain and delusion; they serve the purpose of illumination, action and restraint and they are mutually dominating and supporting, productive and cooperative”.

एवं तत्त्वाभ्यासान्नास्मि न मे नाहमित्यपरिशेषम् ।

अविपर्ययाद्विशुद्धं केवलमुत्पद्यते ज्ञानम् ॥६४॥

Evam tatvābhyāsānnāsmi na me nāhamityapariśeṣam।

Aviparyayādvīśuddham kevalamutpadyate jñānam॥64॥

“Thus from the practice of Truth- *tattvabhyasa* that produced the wisdom in the form: I am not, ‘nothing is mine,’ and ‘not-I,’ which is final, on account of the absence of error and having absolute knowledge that I am pure Consciousness become liberated”.

A recent **book on Yoga** says “We all are permutations and combinations of these three *guṇas*. Yoga is to move from *tamas* to *rajas* to *sattva* and beyond towards *guṇatita sthitis*. The steps of progress in yoga is detached action, duty sense and reduction of likes and dislikes, sacrifice and service, recognition of silence, working in silence (awareness) removal of stagnation by living in awareness with a sense of instrumentality and finally living in pure consciousness to reach highest state of perfection”. (Nagendra HR, 2003).

Four dimensions of human potential relevant to modern society have been brought out in this chapter i.e. General Health through Jnāna yoga, Emotional intelligence through Bhakti yoga, Sustained attention through Raja yoga and guṇa personality through Karma yoga. The ultimate goal of all these is to reach the original state of infinite bliss, knowledge, power and freedom called Brahman. As we purify ourselves, we move towards this ultimate state of perfection manifesting more and more of happiness, knowledge, freedom, power and total personality development. Through this literary research we have tried to cull out these four dimensions of human personality/potential with four streams of yoga from our original texts of Yoga and Spirituality.

Review of scientific literature

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REVIEW OF SCIENTIFIC LITERATURE

3.1 GENERAL HEALTH

3.1.1 WHAT IS HEALTH?

According to World Health Organization (WHO 1966) the state of health is defined as a state of complete physical, mental, social well-being and not merely an absence of disease or infirmity.

According to the World Health Organization, the main determinants of health include the social and economic environment, the physical environment, and the person's individual characteristics and behaviors. (WHO 2011).

3.1.2 STATE ANXIETY

State anxiety is characterized as a temporary change in a person's emotional state due to an outside factor, according to the Linden Centre UK. For example, a person may become worried, apprehensive or tense if he sees a large, threatening dog. In this case, the autonomic nervous system becomes heightened. State anxiety is a normal physiological response; the feeling of anxiety eventually subsides, and the person will then feel "normal" again, according to the Linden Centre UK.

State anxiety reflects transitory emotional states characterized by subjectively perceived feelings of tension apprehension and heightened ANS activity. Intensity may fluctuate overtime. (Spielberger CD, 1968).

3.1.3 FACETS OF MEMORY

Memory is defined as the process or processes of storing and preserving newly acquired information for later recall. Otherwise it is also referred to the process of recalling a specific experience or the total collection of remembered experiences stored in an individual's brain (Crooks, 1991).

Memory is the capacity to retain the known or learnt things and reproduce whenever needed. The function involves past experiences. It is the totality of past experiences that can be remembered (Lyon, G. 1996).

There are three distinct memory systems that allow an individual to process, store and recall information. i) Sensory memory ii) Short-term memory iii) Long-term memory (Atkinson 1968).

The left hemisphere is more involved with verbal memory, while the right hemisphere is more involved with the recall of non-verbal, spatial information (Blakeslee, 1980).

3.1.4 EFFECTS OF YOGA ON GENERAL HEALTH

A study done by Deshpande et al (2008) on 226 healthy subjects found significant reductions in all the four aspects of general health i.e. Somatic symptoms, Anxiety and insomnia, Social dysfunctions and Severe depression in both yoga and control groups.

The study done by Khemka (2008) on 144 patients of mental disorders found significant reduction in all the four aspects of general health i.e. somatic symptoms (56%), anxiety and insomnia (66.24%), social dysfunction (73.23%), severe depression (72.16%) due to effect of integrated approach of yoga therapy.

In a study done by Sharma et al (2005) on a small randomized control trial of *Sahaja Yoga* evaluated effects on depressive disorders and showed Anxiety and depression scores reduced significantly more in the yoga group of 15 volunteers.

A review of Sudarshan Kriya Yoga for stress, anxiety, and depression done by Brown et al (2005) and another study by Vedmurtachara et al (2006) on 17 volunteers showed significant reduction of stress and depression as a effect of *sudarshan kriya*.

A study of Hatha yoga's effects in 107 healthy adults, found improved physical and mental health and well-being. (Hadi N 2007) A controlled pilot study evaluating a comprehensive yogic breathing program observed reduced anxiety, depression, and stress, and increased optimism in the experimental group. (Kjellgren A 2007).

An RCT comparing meditation stress-management and education programs as adjuncts to pharmacotherapy for anxiety disorder found reduced anxiety and depression. (Lee SH 2007).

A control study done by Gupta et al (2005) on effect of yoga based lifestyle intervention on state and trait anxiety on 175 volunteers found state and trait anxiety reduced significantly.

In another study done by Shapiro et al (2007) on effect of yoga on anxiety and depression on 17 volunteers and found significant reduction in both anxiety and depression.

Similarly 5-week control study done by Woolery et al (2004) on 28 volunteers on effect of Iyenger yoga on symptoms of anxiety and depression and found significant reduction in symptoms of anxiety and depression as a result of yoga.

King JV (1988) in his study found Relaxation with Guided Imagery (RGI) script yields short-term reduction in State-Trait Anxiety Inventory (STAI) scores, as shown in each of three tests on nursing students.

A study conducted by Naveen et al (1997) on effect of yoga breathings on 108 volunteers showed that *significant* increase in spatial memory (84%) but found no change in verbal memory.

In a study done by Manjunath et al (2004), the *Yoga* group showed significant increases in spatial memory test scores, while verbal memory test scores remained the same in all subjects.

These results consistently find that professionally administered yoga programs improve many health variables.

3.2 EMOTIONAL INTELLIGENCE

3.2.1 MODELS OF EMOTIONAL INTELLIGENCE

Substantial disagreement exists regarding the definition of EQ, with respect to both terminology and operationalizations. Currently, there are three main models of EQ:

1. Ability EQ model, 2. Mixed models of EQ (usually subsumed under trait EI), 3. Trait EI model.

A. Ability model

Salovey and Mayer's conception of EQ strives to define EQ within the confines of the standard criteria for a new intelligence. Following their continuing research, their initial definition of EQ was revised to "The ability to perceive emotion, integrate emotion to facilitate thought, understand emotions and to regulate emotions to promote personal growth."(Mayer, J 2001).

B. Mixed models

The model introduced by Daniel Goleman focuses on EQ as a wide array of competencies and skills that drive leadership performance. Goleman's model outlines four main EQ constructs: 1. Self-awareness 2. Self-management 3. Social awareness 4. Relationship management (Goleman, D 1998).

C. Trait EI model

Soviet-born British psychologist Konstantin Vasily Petrides proposed a conceptual distinction between the ability based model and a trait based model of EQ and has been developing the latter over many years in numerous scientific publications. Trait EQ is "a constellation of emotional self-perceptions located at the lower levels of personality." (Petrides, K 2007).

The Mayor Salvay Caruso Emotional Intelligence Test (MSCEIT) is the measure for the ability model of emotional intelligence. Its internal consistency reliability for the normative sample are reported is .93. While Bracket & Mayor (2001) found test retest reliability for the full scale MSCEIT V2.0 of .86 based on sample of 62 people.

One study explicitly examined the face validity of the MSCEIT in the workplace and concluded that " In general the MSCEIT has good face validity" (Pusay,2000).

However according to Bradberry, T (2003) the ability EQ model has been criticized in the research for lacking face and predictive validity in the workplace.

3.2.2 EFFECTS OF YOGA ON EMOTIONAL INTELLIGENCE

A study of 170 subjects by Kumari et al (2007), assessed the effects of a six week part-time Self Management of Excessive Tension (SMET) program for managers on their emotional well-being. They found emotional intelligence (EQ) scores increased significantly in yoga group (12.20%) compared to control group (-8.70%) where EQ scores decreased significantly. In another study by Kumari et al (2007) it was indicated that SMET intervention contributed significantly to the enhancement of emotional competence levels of the managers in yoga group (5% to 18% in subscale scores).

The study done by Adhia et al (2010) on impact of adoption of yoga way of life on the emotional intelligence of 60 managers showed enhancement in EI, (7.87%).

In another study by Tikhe et al (2011) assessed the effects of a five days Self Management of Excessive Tension (SMET) program on 72 managers on their emotional well-being and found significant increase (72%) in emotional intelligence (EQ).

3.3 SUSTAINED ATTENTION

3.3.1 ATTENTION AND ITS FACETS

Most healthy teenagers and adults are unable to sustain attention on one thing for more than about 20 minutes at a time, although they can choose repeatedly to re-focus on the same thing. This ability to renew attention permits people to "pay attention" to things that last for more than a few minutes, such as long movies. (Dianne D 2009).

Attention span, as measured by sustained attention, or the time spent continuously on task, varies with age. Older children are capable of longer periods of attention than younger children. (Ruff, 1990).

Focused attention is the capacity to perform a task in the presence of distracting stimuli. To be able to study in a noisy hostel is an example of focused attention. (Rao et al. 2004).

Sustained attention is the capacity to attend to a task for a required period of time. Sustained attention is closely associated with task difficulty or task complexity. While it is easier for simple tasks, it is more difficult for complex task. To be attentive to a lecture for hours together is an example of sustained attention. (Rueckert & Graffman, 1996).

Divided attention is the capacity to attend to two or more tasks simultaneously. The concept of divided attention explains dual tasking, wherein two tasks require and attention. (Corbetta et al. 1991).

3.3.2 EFFECTS OF YOGA ON SUSTAINED ATTENTION

Patil and Telles measured the effects of two yoga-based relaxation techniques on Six Letter Cancellation (SLC) test performance. The study indicates Yoga improves sustained attention and reduces anxiety. (Patil et al 2007).

In a self-controlled study on 20 male volunteers measured immediate effects of three yoga-breathing techniques, the authors concluded that anxiety-reducing effects of *pranayama* might have contributed to better LCT performance, since this requires selective attention. (Telles et al 2007).

Schenfere (2000) compared progressive relaxation and classical music on measures of attention, relaxation and stress responses, finding decreased physiological arousal and heart rate. In another study of attention, Rutschman found relaxation and 'receptive meditation' equally effective in improving performance on a divided attention task. (Rutschman 2004).

Donna (1984) reported that chanting OM for even 5 minutes calms down unruly kids, deepens their sense of self-control, and adds their ability to be attentive. Kids with the same level of ability who chant half an hour prior to an exam will score higher, according to research published in neuro image journal.

Rangan (2009) concluded that both modern education system and gurukula education system improve sustained attention in school boys, but gurukula education system is more effective. Sripad (2006) found that vedic chanting improves sustained attention compared to non-chanting group.

Balaram (2009) concluded in his study on teenagers that both cyclic meditation and Supine rest lead to improvement in performance on the attention but lead to more cancellation errors. In another study (2010) he found both CM and SR led to improvement in attention but the change caused by CM was larger than SR. In another

study by Telles et al. (2008) on immediate effect of high frequency yoga breathing on attention showed improvement in attention in all the three age groups after the kapalabhati.

3.4 GUNĀ PERSONALITY

3.4.1 GUNĀ PERSONALITY INVENTORIES

The Vedic Personality Inventory (VPI) was developed by Wolf (1998) to assess three gunas. It has 30, 28, and 32 items for sattva, rajas and tamas respectively. VPI has good internal consistency and reliability with Cronbach's alpha ranging from 0.85 for sattva, 0.92 for rajas and 0.90 for tamas. In terms of discriminant validity, all but one facet had significant differences.

The original 90 items VPI was shortened to 56 items on the basis of reliability and validity analysis. The Cronbach's alpha ranging from .93 to .94 for three sub-scales. And also provide evidence for the construct validity of the instrument. (Das DG, 1999)

Gita Inventory of personality (GIN) is based on the concept of gunas (personality) from Bhagavad Gita, a traditional text of Yoga, which was developed by Das in 1991. This measure of the three gunas contains ten questions that have three response choices. The coefficients of correlation indicating validity and reliability were .32 and .60 respectively, both significant at .01 levels of confidence. (Das RC, 1991).

Eysenck's Personality Questionnaire (EPQ-R) was devised by the psychologists Hans Jürgen Eysenck and Sybil B. G. Eysenck. It contains 100 questions. It measures three important personality dimensions i.e. Psychoticism, Extraversion and Neuroticism. The coefficients are above .80 with only p-scale reliabilities falling below this value. (Eysenck, 1975).

In contemporary psychology, the "Big Five" factors (or Five Factor Model; FFM) of personality are five broad domains or dimensions of personality which are used to describe human personality.

The Big Five framework of personality traits from Costa & McCrae, 1992 has emerged as a robust and parsimonious model for understanding the relationship between personality and various academic behaviors. The Big Five factors are openness, conscientiousness, extraversion, agreeableness, and neuroticism.

The internal consistency reliabilities were adequate for all five Big Five Inventory (BFI) scales (mean α values were .77, .78, and .81; all test-retest correlations were greater than .75 in both adult participant subsamples. The BFI scales showed adequate convergent-discriminant validity coefficients in all three samples. (Andrea et al, 2011).

However the recent research findings pointed out the inadequacy of using broad domains of Big Five in defining the personality variables and validity of five factor model in Indian context. Hence based on philosophy given in the Bhagavad Gita, gunas questionnaire containing 160 questions is developed by Ammineedu, which include the three guna factors explained through 36 (12 facets each in 3 gunas) dimensions with good reliability and discriminative properties. (Ammineedu, 2008).

3.4.2 EFFECTS OF YOGA ON GUNA PERSONALITY

Guna personality variables are consist of three gunas; *sattva*, *rajas* and *tamas*.

A study done by Deshpande et al (2008) on 226 healthy subjects found Sattva scores increased significantly in both yoga and control group (physical exercise group). While Rajas and Tamas were decreased significantly in both yoga and control group. Compared to yoga group they decreased more in control group.

A similar study by Dasa (1999) conducted by use of *Mahamantra* in a three armed, randomized prospective , controlled study on 62 volunteers showed that the *Mahamantra* group had increased Sattva and decreased Tamas with no significant change in Rajas scores on the vedic personality inventory questionnaire after a month of chanting of *Mahamantra*, 20 minutes daily for four weeks.

A group study done by Khemka (2008) on 144 patients of mental disorders found Sattva scores increased significantly and Rajas and Tamas reduced too significantly due to the effect of Integrated Approach of Yoga Therapy.

3.5 CORRELATIONAL STUDIES

Correlational study evaluated the effects of Integral yoga practices on psychological and general health variables. The study confirmed that EQ and general health variables correlates significantly with each other and negatively with Tamas. EQ and Tamas form positive and negative predictors of health respectively. Sattva correlates positively with EQ suggesting that a sattvic personality indicates better self-control. This suggests that, by improving guna personality, long-term yoga practice may stabilize EQ.

3.6 SUMMARY OF THE SCIENTIFIC REVIEW ON PSYCHOLOGICAL & HEALTH VARIABLES AND EFFECTS OF YOGA

Author/Year	Design	Intervention	Result
			Result/General health
Deshpande et al 2008	N=226, RCT , 8 weeks	Integral yoga	↑Significantly in all four aspects
Khemka et al 2008	N=144, 2 weeks pre-post	Integral yoga	↑Significantly in all four aspects
Sharma et al 2005	N=15/15 control, 8 weeks	Sahaj yoga	↓Significantly, anxiety and depression
Vedamutachar et 2006	N=60 pre-post 20 classes	Sudarshan Kriya	↓Significantly, depression and stress
Gupta et al, 2006	N=175/50 10 days pre-post	IAYT	↓ State & trait anxiety significantly
Shapiro et al, 2007	N==17 pre-post 20, classes	Iyenger yoga	↓ Anxiety, depression significantly
Miller et al, 1995	N=22, 8 weeks pre-post	Mindfulness/meditation	↓ Anxiety & depression significantly
Woolery et al 2004	N=28, 5 weeks, RCT	Iyenger yoga	↓Symptoms of anxiety depression significantly
Naveen et al 1997	N=108 four group 10 days	Yoga breathings	↑Significantly spatial memory 84%
Manjunath et al 2004	N=30/30 control, 10 days	Integral yoga	↑Verbal memory 43%

Jella et al 1993	N=51, pre-post	Unilateral breathing	↑Significantly spatial memory only
			Result/ EQ
Kumari et al 2007	N=170, 6 weeks, control study	SMET	↑Significantly (20%)
Kumari et al 2007	N=131, 6 weeks, control study	SMET	↑Significantly emotional competence 5% to 18% in five subscales
Tikhe et al 2011	N=77 pre-post one group	SMET	↑Significantly (72%)
Adhia et al 2010	N=30/30 pre-post control	Integral yoga	↑Significantly (7.87%)
			Result/sustained Attention
Sarang et al 2007	N=40, control, 3 months pre-post	Cyclic meditation	↑ increase in sustained attention 26%
Donna 1984	Article	Om chanting	↑Sustained attention 20%
Telles et al 2007	N=20 self controlled study	Three Yoga breathings	↑Significantly in two groups
Sripad et al 2006	N=35/35 control 2 years	Vedic chanting	↑Significant reduction in total error
Rangan et al 2009	N=49/49 control 10 months pre-post	Integral yoga	↑Significant increase 12%
Balaram et al 2009	N=253 10days control	CM	↑Significant increase 4%
Balaram et al 2010	N=208	CM	↑Significant increase 14.5%
Telles et al 2008	N=46/48/16 three groups, control	Kapalabhati	↑Significant increase 32.5%,16.4%, no change
			Result/ Three Gunas
Deshpande et al 2008	N=226, RCT 8 weeks study	Integral yoga	↑Significantly Sattva increase
			↓Significantly Rajas tamas decrease
Dasa 1999	N=62, RCT 4 weeks study	Chanting/Mahamantra	↑Significant increase in sattva
			↓Significant decrease in tamas
Khemka et al 2008	N=144 14 days pre-post study	IAYT	↑Significant increase in Sattva and
			↓Significant decrease in Rajas and Tamas

From the above summary of the various scientific studies it was observed that there was not a single study on effect of **integral yoga** on **residential set up** and further very few studies had been done on emotional intelligence and Guna personality to measure the effect of integral yoga on healthy people, hence this study was taken for further research.

4

Aims and Objectives

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AIM AND OBJECTIVES

4

4.1 AIM:

The study was aimed to evaluate the changes in human potential through Yoga practices, assessed by quantifying the changes in psychological and health variables.

4.2 OBJECTIVES:

Study 1.

To evaluate the effect of integral yoga on human potential by assessing sustained attention, emotional intelligence, general health, triguna personality inventory and to evaluate the correlations of each variable with other variables.

Study 2.

To study the immediate effect of *Kapālabhāti* and Breath awareness on human potential assessed by state anxiety, sustained attention and verbal and spatial memory.

Study 3.

To study the immediate effect of Deep Relaxation Technique vs Supine rest on human potential assessed by state anxiety and sustained attention.

4.3 RESEARCH QUESTIONS

1. Can integral yoga program improve general health, emotional intelligence, sustained attention and triguna personality of healthy volunteers?.
2. Can a Yoga based stimulation '*kapālabhāti*,' immediately reduce State Anxiety, improve sustained attention, improve verbal and spatial memory better than the 'Breath awareness' in healthy volunteers?
3. Can a Yoga based "Deep Relaxation Technique" (DRT) immediately reduce State Anxiety and improve sustained attention better than the supine rest technique in healthy volunteers?

4.4 HYPOTHESES

1. Integral yoga program is associated with improvement in general health, emotional intelligence, sustained attention and *triguṇa* personality of healthy volunteers.
2. Kapālabhāti, and Breath awareness are associated with reduction in anxiety, improvement in sustained attention and improvement in verbal and spatial memory in healthy volunteers.
3. Relaxation techniques are associated with reduction in anxiety and improvement in sustained attention in healthy volunteers.
4. Integral yoga program is associated with psychological and health variables in consistency of correlations between them before and after yoga practices.

4.5 NULL HYPOTHESES

1. No improvement in general health, emotional intelligence sustained attention and triguna personality of healthy volunteers after integral yoga practices.
2. No reduction in anxiety, improvement in sustained attention, and improvement in verbal and spatial memory would take place in healthy volunteers following *kapālabhāti* and Breath awareness.
3. No reduction in anxiety and improvement in sustained attention would take place in healthy volunteers following relaxation techniques.
4. No consistency of correlations between psychological and health variables before and after yoga practices.

4.6 RATIONALE FOR THE STUDY

The rationale for this study is to show the efficacy of **Integral Yoga especially in a residential set up** on healthy volunteers in development of one's overall personality and potential with psychological and health variables. Integral Yoga module in a residential set up for Human Potential manifestation is done by investigating four main dimensions

i.e. General health, Emotional intelligence, Sustained attention, and *Guṇa* personality related to four streams of Yoga.

According to yoga human potential consists of basic personality factors, called Gunas and attention at mental level, emotional intelligence at emotional level and memory at subconscious level and health by level of anxiety. This study was aimed at evaluating the effect of yoga in enhancing these four aspects of human potential by quantifying the changes as follows. The health by state anxiety, memory and general health tests, the Emotional Intelligence by EQ test, the Sustained attention by six letter cancellation and digit letter substitution tasks and the Personality by guna inventory of tamas, rajas and sattva.

Each aspect of human personality/potential is connected with one stream of yoga. Hence four aspects/measures of human personality/potential are chosen in our study to suit four streams of yoga which is called Integral Yoga in other words.

Materials and Methods

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MATERIALS AND METHODS

5

5.1 SUBJECTS

5.1.1 **STUDY 1:** Subjects comprised 108 healthy volunteers (male or female, aged 17-63 years, mean 31 ± 10.75) who came for attending one-month, residential, integral yoga courses due to their interest in yoga at Swami Vivekananda Yoga Anusandhana Samsthana (S-VYASA), Bangaluru in August 2005 or February 2006. (Sample size taken as per calculation of effect size = .33 (stat software), alfa = .05 and power = .80).

Group	Male	Female	Total	Age Range	Mean±SD
Integral Yoga	N=53	N=55	N=108	17 to 63 years	31 ± 10.75

Inclusion criteria: Healthy student volunteers attending Yoga instructors course.

Exclusion criteria: Poor health as indicated by personal data, taking medication or initial GHQ value over 5. As per this criterion out of total 198 subjects, 108 subjects were selected and 90 were excluded.

5.1.2 **STUDY 2:** 43 healthy males aged 20-45 yrs (mean 28 yrs) volunteered from groups completing S-VYASA one month residential *yoga* courses. Self-control group of 43 males labeled as *Kapālabhāti*, (KB) and Breath Awareness (BA) groups. (Sample size taken as per calculation of effect size = .58(stat software), alfa = .05 and power = .80)

Group	Male	Female	Total	Age Range	Mean±SD
KB VS BA	N=43	----	N=43	20 to 45 years	28 ± 6.91

Inclusion criteria: Only healthy volunteers who enrolled in monthly residential yoga course with 15 days of KB, BA training program.

Exclusion criteria: Poor health as indicated by personal data, taking medication and whose GHQ score was more than 5 (GHQ > 5). As per this criterion, out of 54 subjects, 43 subjects were selected and balances 11 were excluded.

5.1.3 STUDY 3: The 86 subjects, consisting of 56 male and 30 female volunteers from a group who had joined a one-month residential yoga course at S-VYASA University, Bangaluru, were divided randomly into two groups of 43 each for (i) Deep Relaxation Technique (DRT) and (ii) Supine Rest (SR). The aims and methods of the study were explained and informed consent was obtained. Ages ranged from 18 to 64 for both groups, mean ages being 30.14 and 28.35 respectively. (Sample size taken as per calculation of effect size=.62(stat software), alfa=.05 and power =.80)

Group	Male	Female	Total	Age Range	Mean±SD
DRT	N=28	N=15	N=43	18 to 64 years	30.14 ±13.66
SR (control)	N=28	N=15	N=43	18 to 64 years	28.35±8.20

Inclusion criteria: Healthy volunteers who enrolled in monthly residential yoga course.

Exclusion criteria: Poor health as indicated by personal data, taking medication and whose GHQ score was more than 5 (GHQ > 5). As per this criterion, out of 50 subjects, 43 subjects were selected and balance 7 subjects were excluded.

5.2 INFORMED CONSENT

All volunteers of three different experimental studies i.e. of integral yoga, KB VS BA and DRT VS SR groups gave their informed consent to participate in the research study. The institutional review board including the ethical committee of S-VYASA approved the study protocol. (See appendix 11, 12, 13).

5.3 DESIGN

5.3.1 STUDY 1: INTEGRAL YOGA

Subjects were assessed in a single group before and after the yoga practice. As there is limitation involved in Randomized Control Trial (RCT) double blind study this design was selected without the same. Further there is a recent trend is of integral yoga (Gupta et al 2006), this study also designed for integral yoga but in a residential set up. As integral yoga program works holistically and not like symptomatic relief at physical level as seen in modern medicine. Integral Yoga works on all layers of personality.

Schematic representation of design:

Pre- Assessment 1 st day	Integral Yoga 28 days n=108	Post-Assessment 29 th day
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5.3.2 STUDY 2: KAPALABHATI VS BREATH AWARENESS

This was a one group crossover self-control study. The self-control group was labelled into two groups as *Kapālabhāti group*, and Breath awareness group. Almost half of the KB group volunteers did *kapālabhāti*, on the sixteenth day and half on the seventeenth day; similarly for the BA group, the order was reversed as mentioned below in schematic. The group was trained for 15 days KB and BA and thereafter the pre-post one time assessment done with intervention of KB and BA in two consecutive days as mentioned above and in schematic representation below.

Schematic representation of design:

16th day

Pre-Assessment	Kapalabhati n=22 20 minutes (1m KB – 1m rest)	Post-Assessment
Pre-Assessment	Breath Awareness n=21 20 minutes (continuous awareness of breath)	Post-Assessment

17th day

Pre-Assessment	Breath Awareness n=22 20 minutes (continuous awareness of breath)	Post-Assessment
Pre-Assessment	Kapalabhati n=21 20 minutes (1min. KB – 1min. Rest)	Post- Assessment

5.3.3 STUDY 3: DEEP RELAXATION TECHNIQUE VS SUPINE REST

The two separate groups of 43 subjects each were assessed immediately before and after intervention sessions. The first group was guided through a 20 minute DRT session on the first day, while the second group practiced supine rest for an equal time period, next day.

Schematic representation of design:

16th day group of 43 volunteers

Pre-Assessment	Deep Relaxation Technique (DRT) 20 min.	Post-Assessment
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17th day separate group of 43 volunteers

Pre- Assessment	Supine Rest (SR) 20 minutes	Post-Assessment
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5.4 INTERVENTION

5.4.1 STUDY 1: INTEGRAL YOGA

An Integral Yoga module includes yogasanas, pranayama, meditation, kriyas, lectures, singing, and yogic games. (For detailed schedule see appendix 1 & 16). This set of yoga practices are taken to have effect on all the five layers of human existence to bring about the quickest and holistic results and not only at physical level but also at pranic, mental, intellect and at blissfulness level.

5.4.2 STUDY 2: KAPĀLABHĀTI VS BREATH AWARENESS

To find out effect of stimulation (*kapālabhāti*) VS relaxation (breath awareness) these two interventions were chosen. Instructions were delivered by audiotape for the 20 minutes performance of both practices; one minute practice was followed by one minute relaxation, repeated 10 times. Subjects sat with their spine straight. For *kapālabhāti*, and breath awareness instructions were as per the format given. (see appendix 2).

5.4.3 STUDY 3: DEEP RELAXATION TECHNIQUE VS SUPINE REST

DRT is performed with eyes closed, in five, slowly practiced relaxation phases, guided by an audiotape. (see appendix 3) .

5.5 ASSESSMENT

5.5.1 STUDY 1: INTEGRAL YOGA

1. The SLC test specifies six target letters to be cancelled on a test worksheet, consisting of 22 rows by 14 columns of randomly arranged letters (20). Subjects have to cancel as many target letters as possible in the 90 second test time. The six letter cancellation task has been used in similar design in an Indian population indicating the validity of the task to study immediate effects. (Natu & Agarwal, 1997). (See appendix-4).
2. Similarly, the DLS test gives a 'Key' specifying the digits 1-9 paired with letters of the alphabet. The test sheet consists of 12 rows by 8 columns of randomly arranged

digits (Natu 2004). Subjects have to substitute as many target digits as possible in the 90 second test time. The digit letter substitution task has been used in similar design in an Indian population indicating the validity of the task to study immediate effects. (Natu 2004). (See appendix-5).

3. Chadha's EQ test consists of 15 questions, based on 15 socially neutral situations, offering five possible answers for each carrying scores 0-20. Total scores are converted into percentiles. Interpretation is as follows:

Score	Percentile	Interpretations
285 and above	<i>p</i> -90	Extremely high EQ
250 to 274	<i>p</i> -75	High EQ
200 to 249	<i>p</i> -50	Moderate EQ
150 to 199	<i>p</i> -40	Low EQ
149 and below	<i>p</i> -15	Try some other day

The test was standardized on broad populations in Indian society, hence it is used here. Retest reliability: 0.94; test validity 0.78. (Singh D, 2006), (See appendix-6).

4. The GHQ 28 questionnaire provides individual diagnostic profile information: four 7-item sub-scales are based on factor analysis, with factor structures consistent with the original studies. (Killic C 1997). Internal consistency and reliability: Cronbach's alpha, 0.85, and validity, 0.76. (Laxmibai A 1975, Goldberg D, 1979).

It has no thresholds for individual sub-scales. Hence, the total of all sub-scales was used. All items have a 4-point scoring system: 'better than usual', 'same as usual', 'worse than usual', and 'much worse than usual', scored: 0-0-1-1. Goldberg D, 1997). (See appendix-7).

5. Pathak et al (1992) developed a Triguna-based personality test, with items taken from guna depictions in Sankhya Karika. (Virupakshananda S. 1995). It consists of 88 items: 24 sattva, 34 rajas and 30 tamas, scored on a five point scale ranging from 'not at all' to 'very much'. Low between scale correlations were reported. Test reliability coefficients were reported: sattva $r = 0.62$, rajas $r = 0.83$ and tamas $r = 0.70$. Population norms, percentiles and categorizations were given. (See appendix-8).

5.5.2 STUDY 2: KAPĀLABHĀTI VS BREATH AWARENESS

1. The STAI-A State test comprises four statements describing four different kinds of feelings. Subjects state how often they experience that feeling: almost never, sometimes, often, or almost always. The scores have a direct interpretation: high scores mean more state anxiety; low scores mean less. A state anxiety scores have high degrees of internal consistency. Their point-biserial r (P_b) correlations are 0.60 and 0.73, respectively. (Spielberger CD 1968), (See appendix-9).

2. The SLC test specifies six target letters to be cancelled on a test worksheet, consisting of 22 rows by 14 columns of randomly arranged letters. Subjects have to cancel as many target letters as possible in the 90 seconds test time. The six letter cancellation task has been used in similar design in an Indian population indicating the validity of the task to study immediate effects. (Natu & Agarwal, 1997), (See appendix-4).

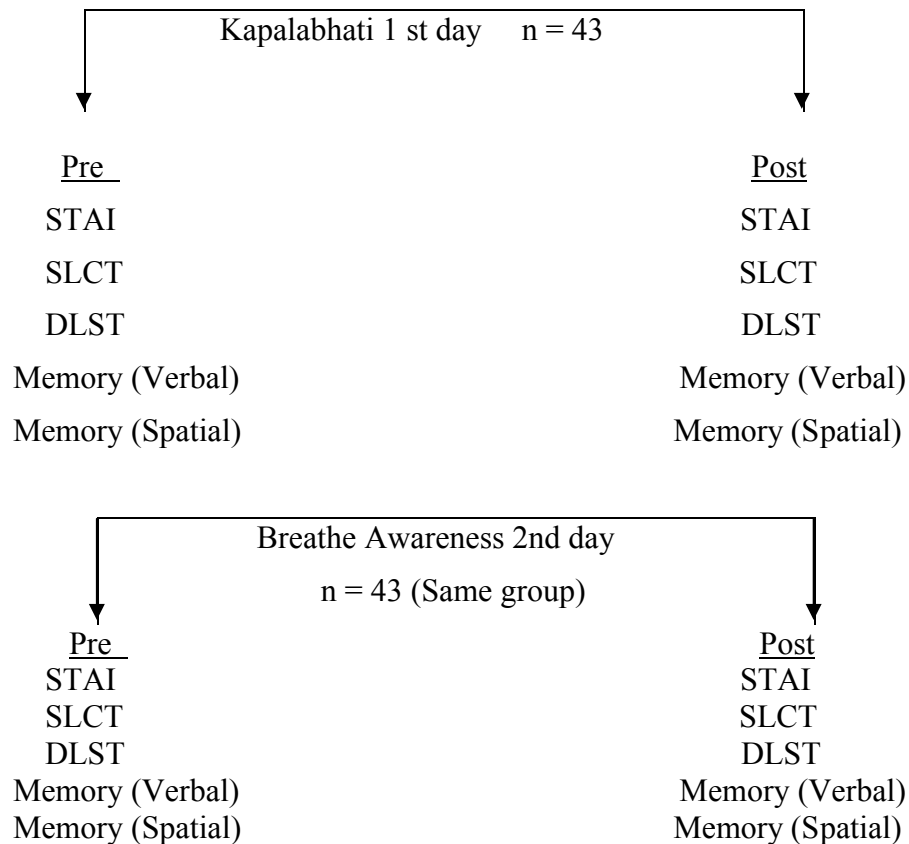
3. Similarly, the DLS test gives a 'Key' specifying the digits 1-9 paired with letters of the alphabet. The test sheet consists of 12 rows by 8 columns of randomly arranged digits. Subjects have to substitute as many target digits as possible in the 90 seconds test time. The digit letter substitution task has been used in similar design in an Indian population indicating the validity of the task to study immediate effects. (Natu 2004), (See appendix-5).

4. The verbal memory test consists of 4 different sets of 10 nonsense syllables, e.g. ZOC enough to be presented both pre and post the KB and BA interventions. The spatial memory test consists of 10 line drawings of easily described geometrical or other shapes, that are simple and reproducible (not square or circle). As for verbal memory, 4 similar sets of drawings are used, one each, pre and post KB and BA interventions. (Baddelay A, 1993, Manjunath N, 2004).

Each test is projected on a laptop for the subjects allowing 10 seconds for each slide. Immediately after the slides, subjects are shown a mathematical problem on the screen to answer at the end. (e.g. $3+5-2+4-2-5+6-3$). Subjects are then asked to recall and write down (or draw in the case of spatial memory) as many of the 10 test items as they can within 60 seconds. For both verbal and memory tests a correct answer was scored as "1"

and a wrong answer was scored “0”. (See appendix-10).

Schematic representation of assessments made in sequence as shown below:



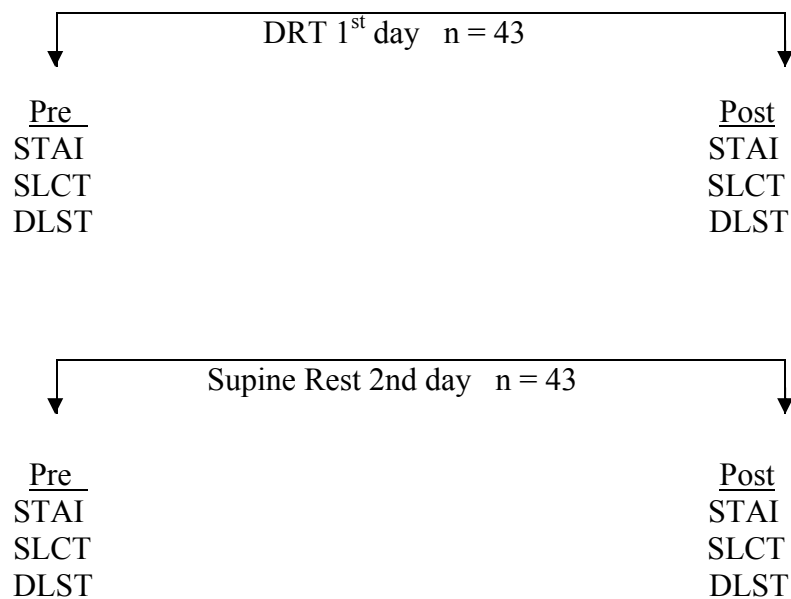
5.5.3 STUDY 3: DEEP RELAXATION TECHNIQUE VS SUPINE REST

1. The STAI-A State test comprises four statements describing four different kinds of feelings. Subjects state how often they experience that feeling: almost never, sometimes, often, or almost always. The scores have a direct interpretation: high scores mean more state anxiety; low scores mean less. A state anxiety scores have high degrees of internal consistency. Their point-biserial r (P_b) correlations are 0.60 and 0.73, respectively. (Spielberger CD 1968), (See appendix-9).
2. The SLC test specifies six target letters to be cancelled on a test worksheet, consisting of 22 rows by 14 columns of randomly arranged letters (Lezak M, 1995). Subjects have to cancel as many target letters as possible in the 90 second

test time. The six letter cancellation task has been used in similar design in an Indian population indicating the validity of the task to study immediate effects. (Natu & Agarwal, 1997), (See appendix-4).

3. Similarly, the DLS test gives a 'Key' specifying the digits 1-9 paired with letters of the alphabet. The test sheet consists of 12 rows by 8 columns of randomly arranged digits (Natu M, 2004). Subjects have to substitute as many target digits as possible in the 90 seconds test time. The digit letter substitution task has been used in similar design in an Indian population indicating the validity of the task to study immediate effects. (Natu 2004), (See appendix-5).

Schematic representation of assessments made in sequence as shown below:



6

Data Collection and Analysis

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DATA COLLECTION AND ANALYSIS

6

6.1 DATA COLLECTION

STUDY 1: INTEGRAL YOGA:

Data of SLCT, DLST, EQ and Guna personality were collected by administrating the tests in sequence one after another giving specific time period for each test.

STUDY 2: KAPĀLABHĀTI VS BREATH AWARENESS:

Data of STAI-A State (SAS), SLCT, DLST, Verbal and Spatial Memory were collected by administrating the tests in sequence one after another giving specific time period for each test.

STUDY 3: DEEP RELAXATION TECHNIQUE VS SUPINE REST

Data of STAI-A State (SAS), SLCT, DLST, were collected by administrating the tests in sequence one after another giving specific time period for each test.

For all the above 3 studies the tests were administrated by experienced yoga instructors under the guidance of a psychologist. Sufficient precautions were taken to see that subjects are not exposed to the test before actual timing of the test starts. Also as the specific time period for the test was over, they were asked to stop immediately and tests were collected immediately from them without giving further time period. The same timing of the tests were maintained during pre and post administration of the tests. The tests were administered after breakfast in the morning around 9 am.

The tests were scored manually as per standard criteria. Whether the scoring method was correct or not was verified with the expert in the field. Thereafter data were computerized in microsoft excel and downloaded in SPSS-10 directly. Scoring of earlier studies were checked to assure correctness of the scoring of the tests.

6.2 DATA ANALYSIS

6.2.1 STUDY 1: INTEGRAL YOGA

Data analysis was done using SPSS-10. Data were first analyzed for normality using the Kolmogorov-Smirnov test and compared with pre values. This found SLC, EQ, Tamas, Rajas and Sattva pre-data to be normally distributed ($p > 0.05$), while those of DLS, EQ, and GHQ were not normally distributed ($p < 0.05$). We used non-parametric test the Wilcoxon signed rank test to compare means of the data collected before (pre) and after (post) the integral program. Finally, Non-Parametric Spearman's Rho test was used to evaluate correlations between sustained attention, EQ, GHQ and guna personality scores.

Table 1 Pre-post changes in Variables of Integral Yoga

n=108		Table 1 Pre-post mean, SD, % change, p value of variables				
Variable		Mean	SD	Mean%	% C	p < value
Sustained attention-SLC	Pre	34.32	11.41	48.34		
	Post	41.35	13.64	58.24	20.48	0.001
Sustained attention-DLS	Pre	59.43	18.50	61.91		
	Post	63.22	15.19	65.85	6.38	0.003
Emotional Intelligence	Pre	199.81	48.89	66.60		
	Post	211.85	46.18	70.61	6.03	0.001
General health- GHQ	Pre	1.78	1.90	6.36		
	Post	1.17	1.54	4.18	-34.27	0.001
Sattva	Pre	59.12	12.05	36.55		
	Post	59.95	13.58	38.89	6.40	0.442
Rajas	Pre	63.36	16.23	39.17		
	Post	57.68	14.28	37.41	- 4.49	0.000
Tamas	Pre	39.26	16.51	24.27		
	Post	36.54	16.13	23.70	-2.35	0.014

Table 1 presents pre-post differences between the different variables. Sustained attention, emotional intelligence and general health improved significantly. GHQ is scored according to negative health findings, so negative percentage value indicated tendencies to better health. Both rajas and tamas decreased significantly, but the change in sattva did not reach significance.

Table 2: Pre-pre correlation values

Correlations

	SLC_B	DLS_B	EQ_B	PHY_B	EMNL_B	BHVL_B	SEST_B	TOTAL	TMS_B	RJS_B	STV_B
Spearman SLC_E Correlation Co	1.000	.616*	.191*	.093	-.118	-.013	-.128	-.065	-.215*	-.030	.186
Sig. (2-tailed)	.	.000	.047	.340	.223	.897	.187	.503	.025	.758	.054
N	108	108	108	108	108	108	108	108	108	108	108
DLS_E Correlation Co	.616*	1.000	.068	-.063	-.153	.070	-.036	-.044	-.132	-.072	-.026
Sig. (2-tailed)	.000	.	.486	.517	.114	.472	.715	.655	.173	.456	.788
N	108	108	108	108	108	108	108	108	108	108	108
EQ_B Correlation Co	.191*	.068	1.000	-.010	-.053	.077	-.217*	-.104	-.284*	-.076	.251*
Sig. (2-tailed)	.047	.486	.	.919	.585	.426	.024	.285	.003	.437	.009
N	108	108	108	108	108	108	108	108	108	108	108
PHY_E Correlation Co	.093	-.063	-.010	1.000	.299*	.172	.139	.682*	.026	.108	.032
Sig. (2-tailed)	.340	.517	.919	.	.002	.075	.150	.000	.788	.267	.746
N	108	108	108	108	108	108	108	108	108	108	108
EMNL_ Correlation Co	-.118	-.153	-.053	.299*	1.000	.340*	.110	.651*	.191*	.178	-.010
Sig. (2-tailed)	.223	.114	.585	.002	.	.000	.258	.000	.048	.065	.917
N	108	108	108	108	108	108	108	108	108	108	108
BHVL_ Correlation Co	-.013	.070	.077	.172	.340*	1.000	.194*	.572*	.051	-.066	-.101
Sig. (2-tailed)	.897	.472	.426	.075	.000	.	.045	.000	.603	.497	.300
N	108	108	108	108	108	108	108	108	108	108	108
SEST_ Correlation Co	-.128	-.036	-.217*	.139	.110	.194*	1.000	.499*	.174	.098	-.083
Sig. (2-tailed)	.187	.715	.024	.150	.258	.045	.	.000	.071	.313	.393
N	108	108	108	108	108	108	108	108	108	108	108
TOTAL Correlation Co	-.065	-.044	-.104	.682*	.651*	.572*	.499*	1.000	.129	.071	-.066
Sig. (2-tailed)	.503	.655	.285	.000	.000	.000	.000	.	.185	.466	.500
N	108	108	108	108	108	108	108	108	108	108	108
TMS_E Correlation Co	-.215*	-.132	-.284*	.026	.191*	.051	.174	.129	1.000	.468*	-.224*
Sig. (2-tailed)	.025	.173	.003	.788	.048	.603	.071	.185	.	.000	.020
N	108	108	108	108	108	108	108	108	108	108	108
RJS_B Correlation Co	-.030	-.072	-.076	.108	.178	-.066	.098	.071	.468*	1.000	-.008
Sig. (2-tailed)	.758	.456	.437	.267	.065	.497	.313	.466	.000	.	.935
N	108	108	108	108	108	108	108	108	108	108	108
STV_E Correlation Co	.186	-.026	.251*	.032	-.010	-.101	-.083	-.066	-.224*	-.008	1.000
Sig. (2-tailed)	.054	.788	.009	.746	.917	.300	.393	.500	.020	.935	.
N	108	108	108	108	108	108	108	108	108	108	108

**Correlation is significant at the .01 level (2-tailed).

*Correlation is significant at the .05 level (2-tailed).

6.2.2 STUDY 2: KAPĀLABHĀTI VS BREATH AWARENESS

Statistical analysis was done using SPSS (version 10.0). The Kolmogorov–Shapiro tests of normality showed pre-data of SAS, SLC and DLS tests were normally distributed for both groups, while pre-data of the two memory tests were not normally distributed. Paired 't' tests and R M ANOVA tests were used to assess significance within and between groups respectively. The P values between the groups were for SAS- 0.023, SLC- 0.007, DLS-0.01, MMR-VBL-0.001, MMR-SPL-0.001.

Table 3- Pre-Post Changes in Variables of KB VS BA

Test	n=43	KAPĀLABHĀTI					BREATH AWARENESS				
		Mean	±SD	P-Value	Mean %	Post-Pre %Ch	Mean	±SD	P-Value	Mean%	Post-Pre %Ch
SAS	Pre	8.16	2.44	0.001	81.60	11.32	7.79	2.05	0.142	77.90	3.04
	Post	7.33	2.01		73.30		7.56	2.11		75.60	
SLC	Pre	40.65	9.93	0.001	57.25	23.69	39.86	11.27	0.001	56.14	14.83
	Post	50.28	9.62		70.82		45.77	12.81		64.46	
DLS	Pre	56.53	11.15	0.001	58.89	14.89	54.67	9.64	0.001	77.0	6.73
	Post	64.95	12.1		67.66		58.35	9.77		82.18	
MMR	Pre	3.05	1.84	0.001	27.73	33.44	3.67	2.04	0.001	33.36	-36.51
	Post	4.07	2.27		37.0		2.33	1.71		21.82	
VBL	Pre	4.56	1.14	0.001	41.45	34.20	4.81	1.72	0.001	43.73	-16.84
	Post	6.12	1.28		55.64		4.00	1.46		36.36	

SAS-Stai A State, SLC-Six Letter Cancellation, DLS-Digit Letter Substitution, MMR VBL-Verbal, & MMR SP-Spatial Memory. Legend: Table 3 presents Pre-Post Mean±Standard Deviations, significance p values and percentage changes in value for all measured variables (state anxiety, sustained attention, and verbal and spatial memory) before and after *Kapalabhati* (KB) and Breath Awareness (BA)). The contrasting increase and decrease in memory scores are of great significance.

6.2.3 STUDY 3: DEEP RELAXATION TECHNIQUE VS SUPINE REST

Statistical analysis was performed using SPSS-16. The Shapiro- Wilk test of normality showed that the data were normally distributed. For our two groups, pre-post, design, all variables were analyzed using repeated measures analysis of variance, which is equivalent to an independent samples t-test for comparison of the two groups and also equivalent to paired samples t-tests for pre-post comparisons of results of each group.

Results are summarized in Table 5.

Table 4 Pre-post changes in Variables of DRT VS SR

		Deep Relaxation Technique					Supine Rest				
Test		Mean	SD	P value	Mean %	% Ch	Mean	SD	P value	Mean %	% Ch
SAS	Pre	8.3	2.48		83.0		7.98	2.1		79.8	
	Post	7.05	2.27	0.001	70.5	17.73	7.79	2.08	0.395	77.9	2.43
SLC	Pre	34.42	9.9		48.48		37.84	9.85		53.30	
	Post	42.95	12.69	0.001	60.49	24.78	41.86	10.67	0.001	58.96	10.62
DLS	Pre	53.53	14.75		55.76		58.49	10.06		60.93	
	Post	62.09	15.12	0.001	64.68	15.99	64.19	11.39	0.001	66.86	9.75

SAS=Stai A State, SLC=Six Letter Cancellation, DLS=Digit Letter Substitution test

Legend: Table 4 summarizes mean values and standard deviations (pre-and post-practice), p values, and percentage change in values for each test on both groups.

7

Results

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7.4	SUMMARY OF RESULTS: STUDY 1: INTEGRAL YOGA	85
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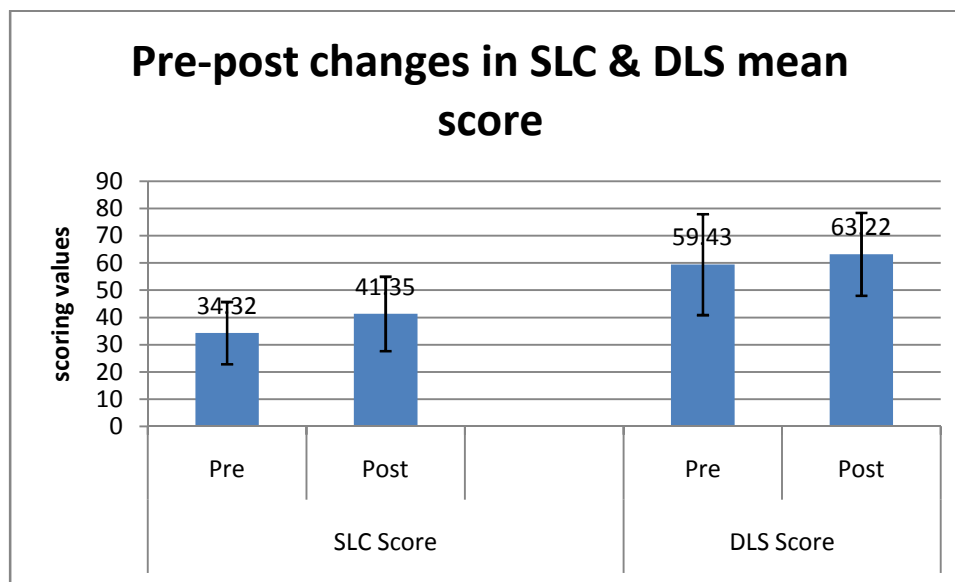
RESULTS

7.1 STUDY 1: INTEGRAL YOGA

Data were first analyzed for normality using the Kolmogorov-Smirnov test. This found SLC, EQ, Tamas, Rajas and Sattva pre-data to be normally distributed ($p > 0.05$), while those of DLS, EQ, and GHQ were not normally distributed ($p < 0.05$). The effect of integral yoga on each variable is shown in table 1.

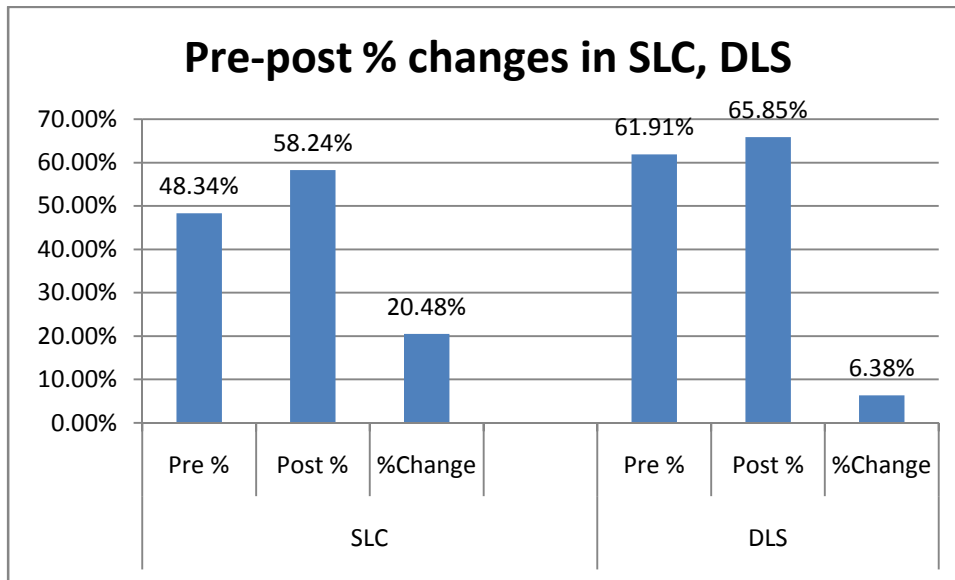
The effects of integral yoga practices show significant improvement in all the variables but not much in Sattva. Improvement in sustained attention, emotional intelligence, general health and rajas changes were at $p < 0.001$ significant level while tamas at $p < 0.01$ significant level and sattva at $p < 0.447$ insignificant level after integral yoga practices as shown in table 1.

FIGURE 1 Changes in SLC & DLS mean score (Integral Yoga)



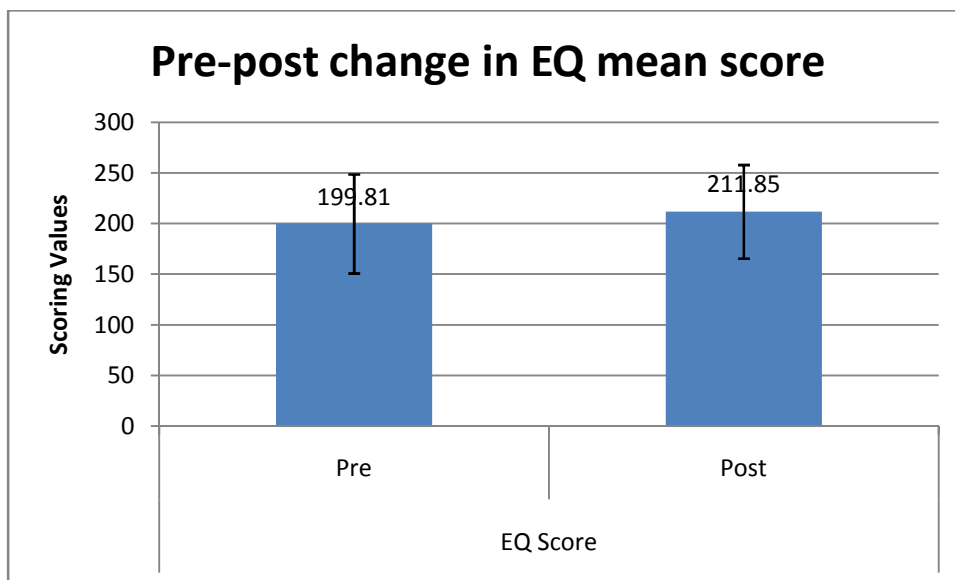
Significant increase in sustained attention ($p < 0.001$) in SLC & DLS

FIGURE 2 Percentage changes in SLC & DLS score (Integral Yoga)



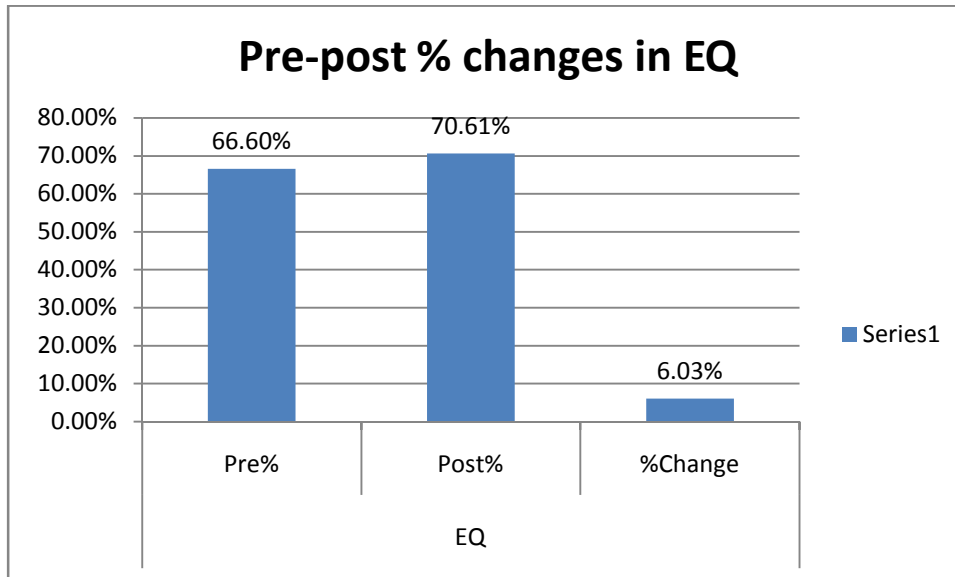
Pre-post percentage and %change in sustained attention net score of SLC & DLS tests

Figure 3 Changes in EQ mean score (Integral Yoga)



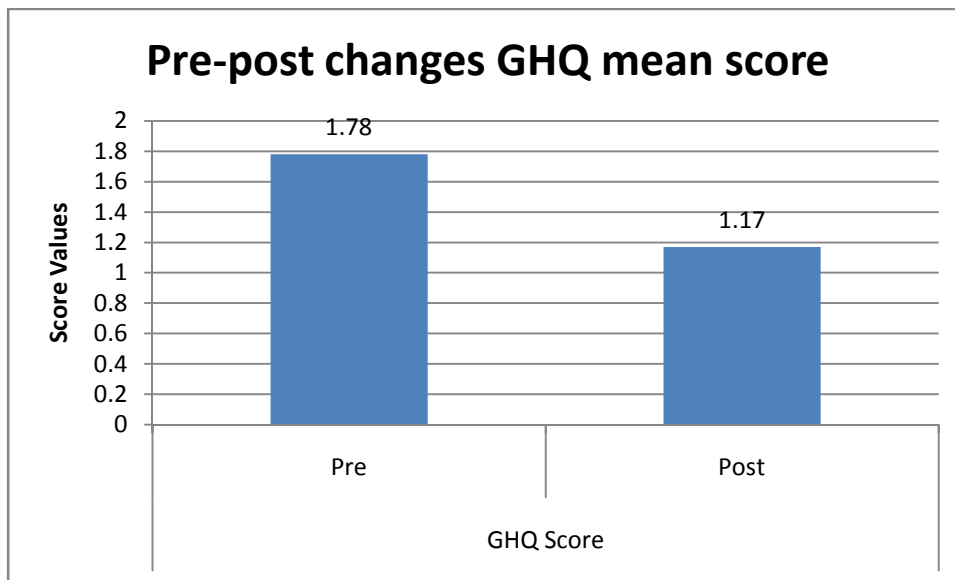
Significant increase in emotional intelligence ($p < 0.001$) in EQ test

FIGURE 4 Percentage change in EQ score (Integral Yoga)



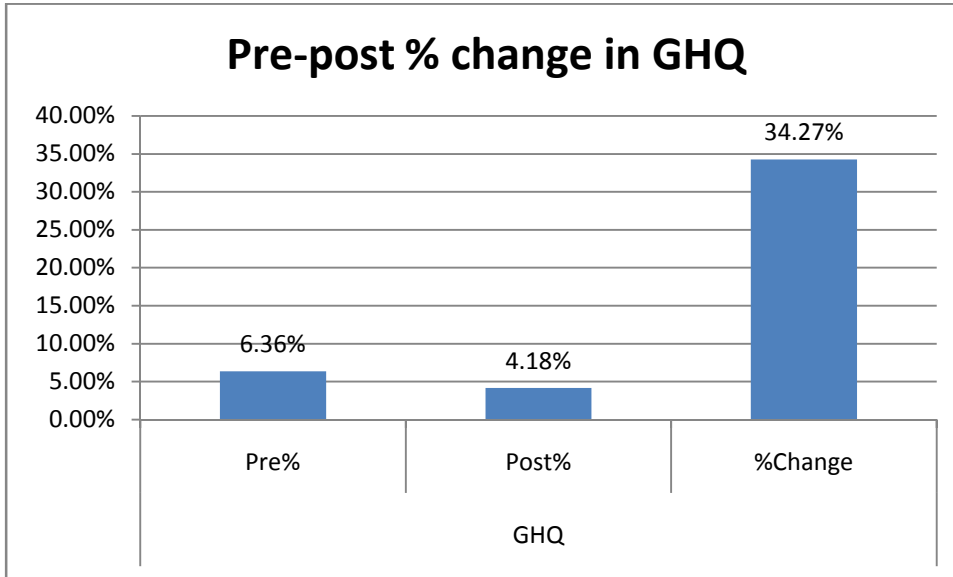
Significant change in percentage score of EQ

FIGURE 5 Changes in GHQ mean score (Integral Yoga)



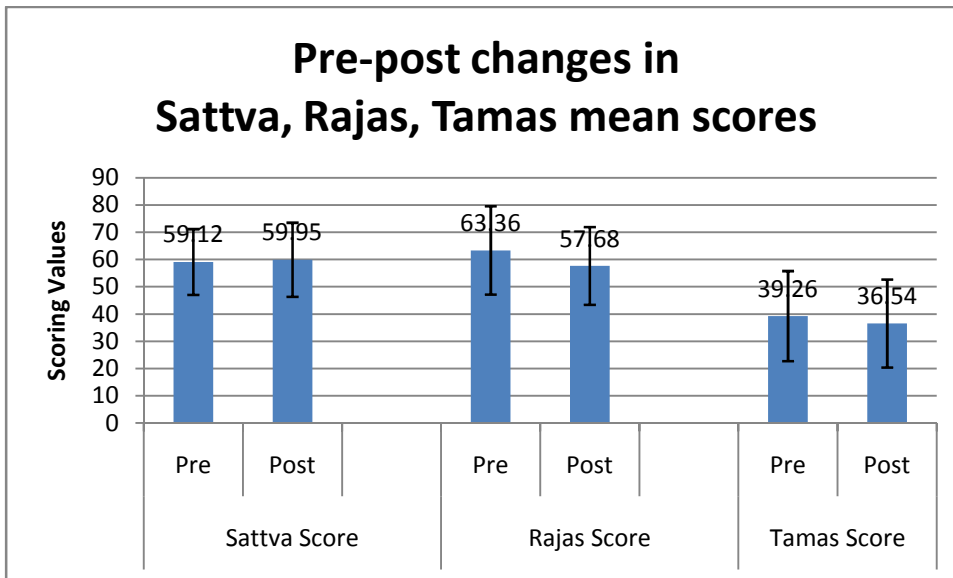
Significant improvement in General health ($p < 0.001$). GHQ is scored according to negative health findings, so reduction in value indicate better health.

FIGURE 6 Percentage Change in GHQ score (Integral Yoga)



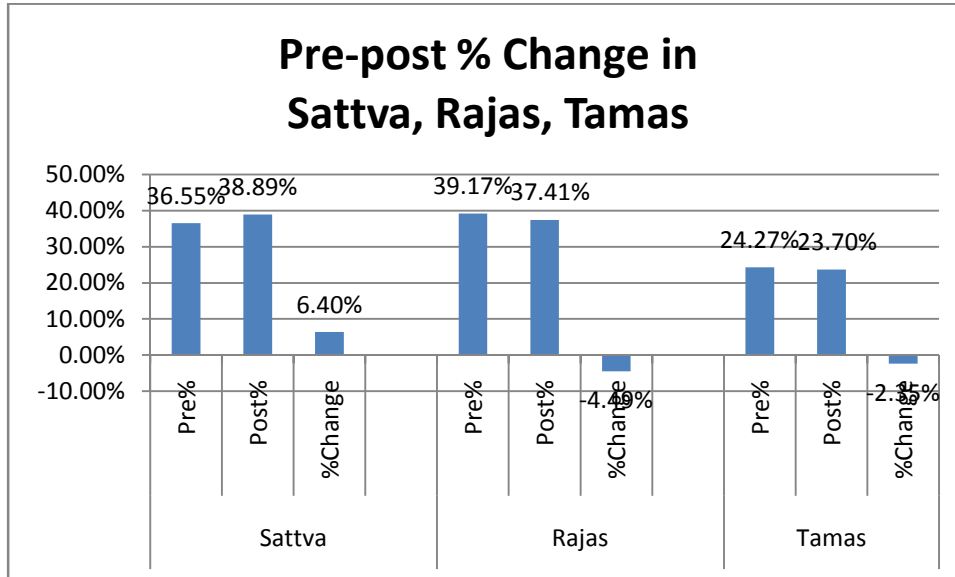
Significant improvement in general health ($p < 0.001$). In GHQ negative percentage value indicated tendencies to better health

FIGURE 7 Changes in Sattva, Rajas, Tamas score (Integral Yoga)



Significant reduction in Rajas ($p < 0.001$) and Tamas ($p < 0.01$) and increase in sattva did not reach to significant level.

Figure 8 Percentage change value of Sattva, Rajas, Tamas



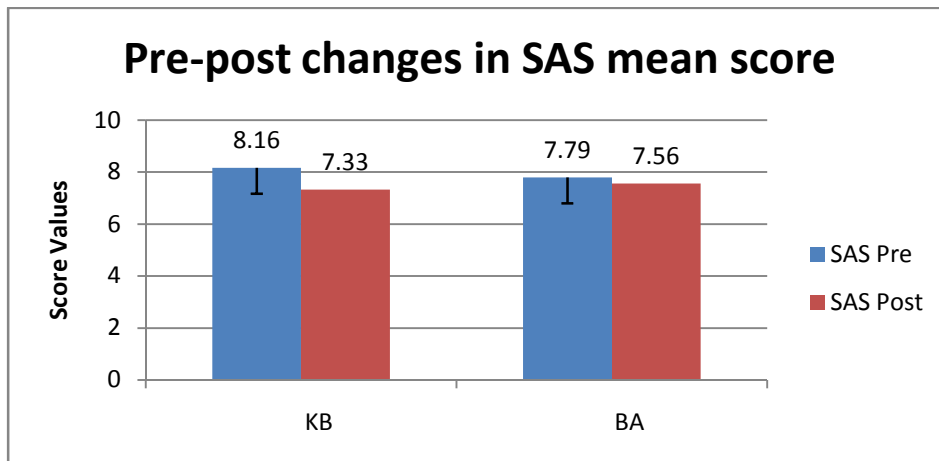
Pre-post percentage value is calculated out of total values of all three gunas

7.2 STUDY 2: KAPĀLABHĀTI VS BREATH AWARENESS

State Anxiety (SAS)

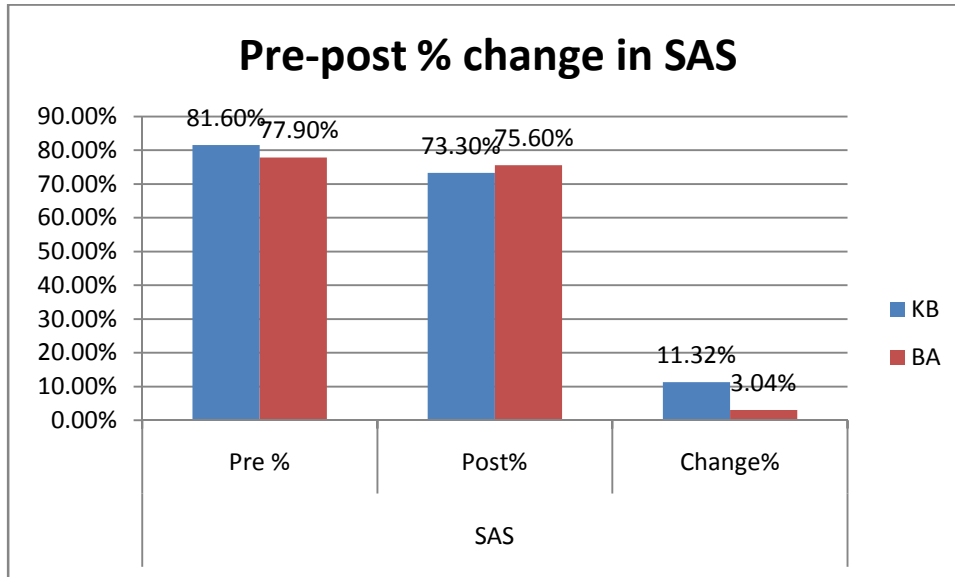
The STAI A-State (SAS) test of 'state anxiety', was significantly reduced after *Kapālabhāti*, practice ($p < 0.001$), but the reduction after breath awareness practice did not reach significance ($p = 0.142 > 0.05$) (Paired 't' Test).

FIGURE 9 Changes in SAS score (KB VS BA)



Significant reduction of anxiety in KB ($p < 0.001$) while reduction in BA is not significant.

FIGURE 10 Percentage change in SAS score (KB VS BA)

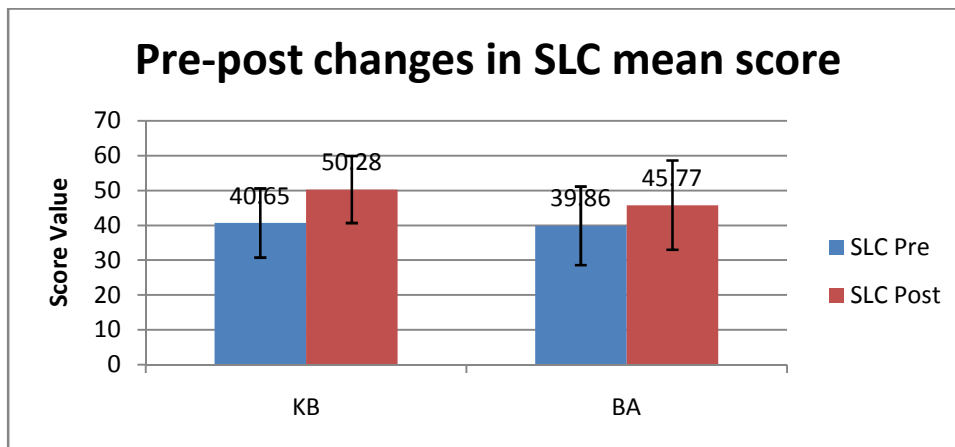


Significant reduction in anxiety in kapālabhāti group but not in breath awareness group.

Sustained Attention (SLC and DLS)

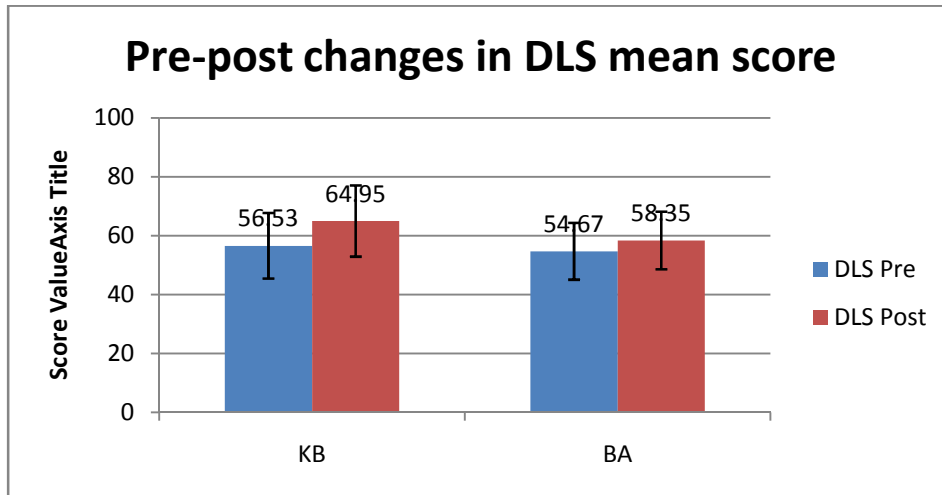
Scores on the SLC and DLS tests of sustained attention were significantly increased for both groups ($p < 0.001$) (Paired 't' Test).

FIGURE 11 Changes in SLC mean score (KB VS BA)



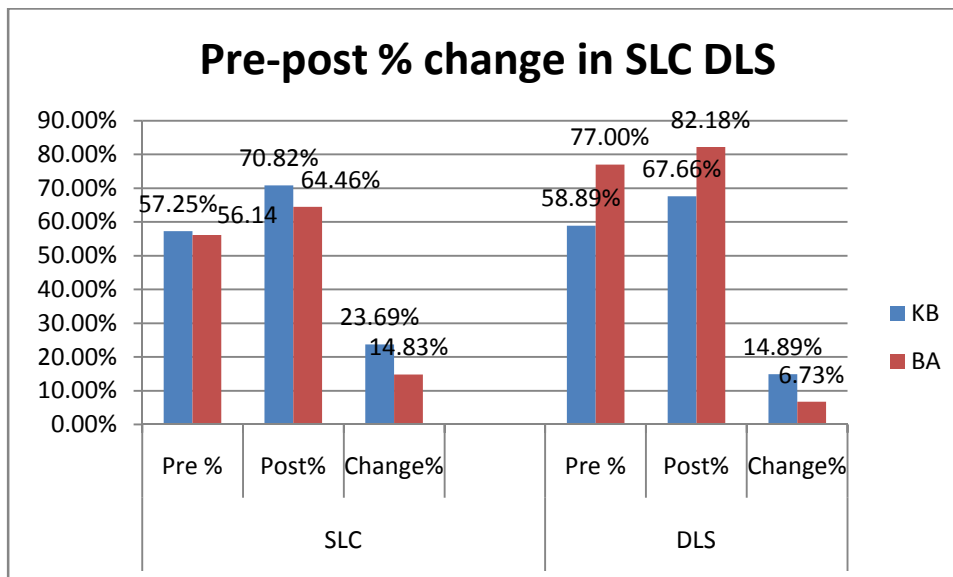
Significant increase in sustained attention in both KB & BA ($p < 0.001$).

FIGURE 12 Changes in DLS score (KB VS BA)



Significant increase in sustained attention in both KB & BA ($p < 0.001$).

FIGURE 13 Percentage change in SLC & DLS score (KB VS BA)

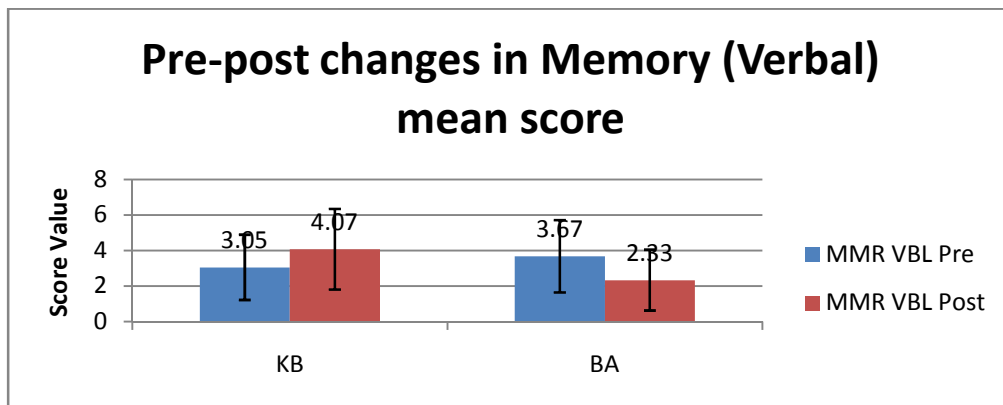


Significant increase in sustained attention in both KB & BA ($p < 0.001$).

Memory Verbal and Spatial

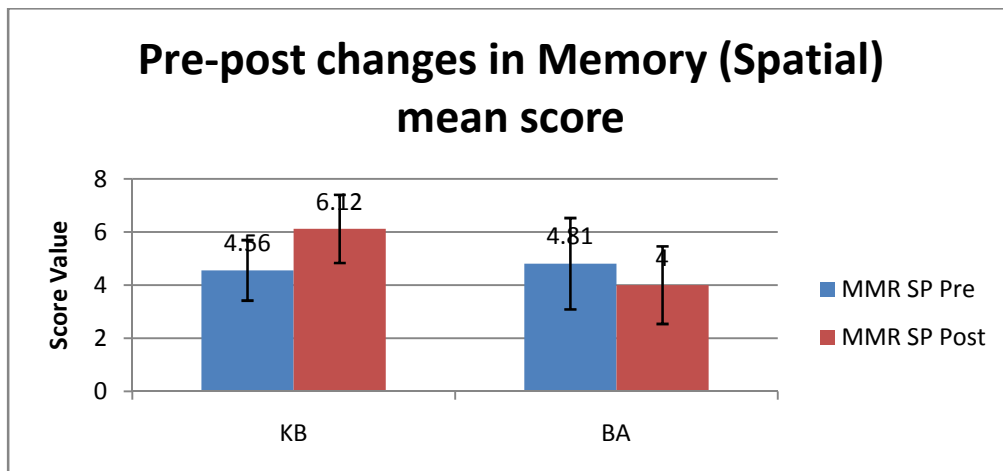
Scores on both the verbal (MMR VBL) and spatial memory (MMR SP) tests showed significant but *opposite* changes. For the *Kapālabhāti* group, both significantly increased ($p < 0.001$), but for the breath awareness group, both significantly decreased ($p < 0.001$) (Paired 't' Test).

FIGURE 14 Changes in memory verbal score (KB VS BA)



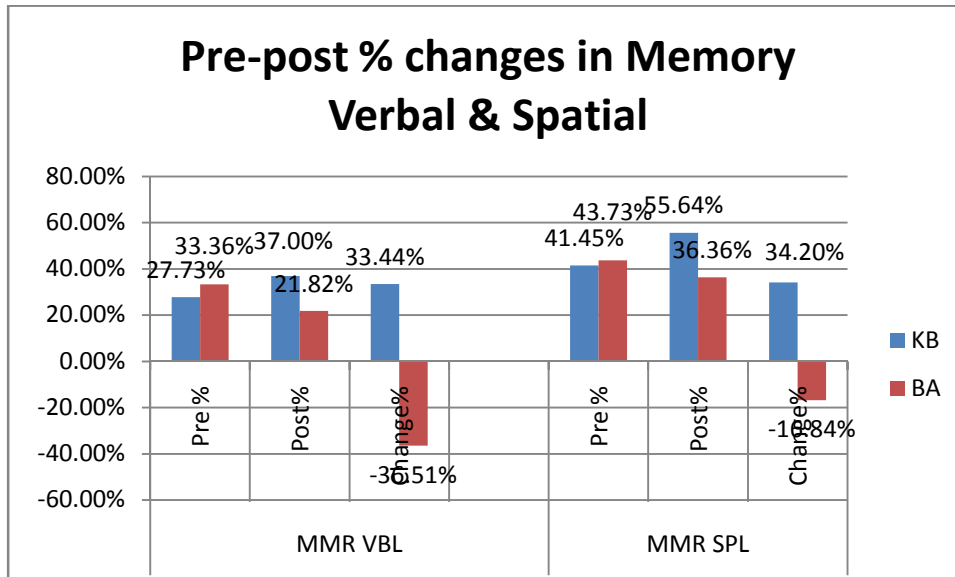
Significant improvement verbal memory in KB but significant reduction in BA.

FIGURE 15 Changes in memory (spatial) score (KB VS BA)



Significant increase in Memory spatial scores of KB ($p < 0.001$). But significant decrease in Memory spatial scores of BA ($p < 0.001$).

FIGURE 16 % changes in Memory Verbal & Spatial (KB VS BA)



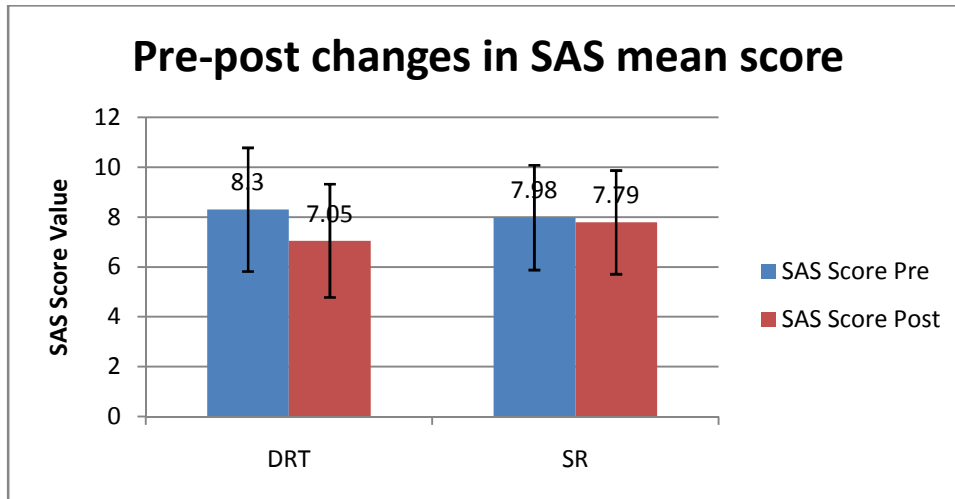
**Significant percentage increase in Verbal & Spatial memory in KB
But significant decrease in BA**

7.3 STUDY 1: DEEP RELAXATION TECHNIQUE VS SUPINE REST

State Anxiety (SAS)

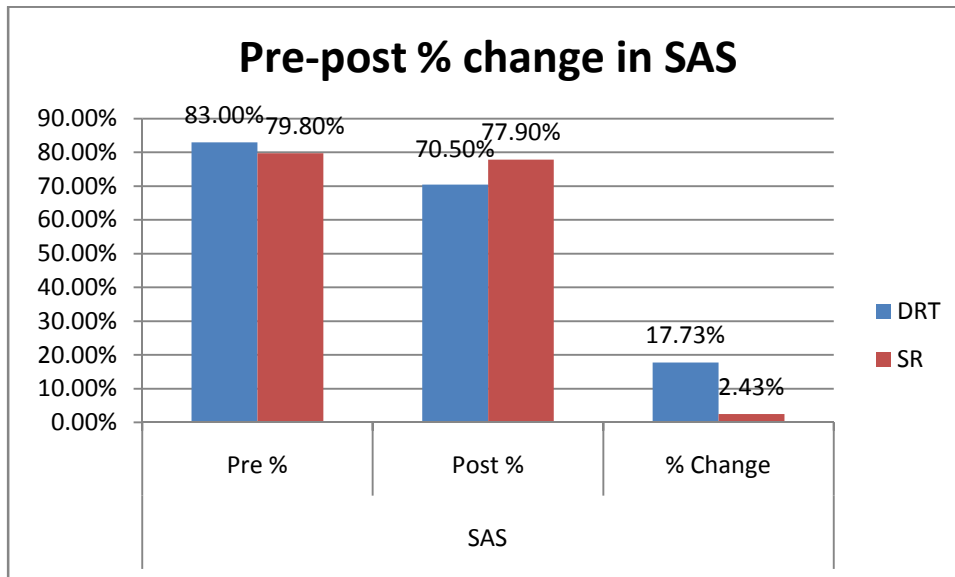
The DRT group showed a significant ($p < 0.001$) decrease in state anxiety score (17.73%). The decrease of 2.43% shown by the SR control group is not significant (Table-1). Differences between these two change scores (post-pre) are significant ($p < 0.001$) between the two groups.

FIGURE 17 Changes in SAS mean score (DRT VS SR)



Significant reduction of anxiety score in DRT ($p < 0.001$) but not in SR.

FIGURE 18 Percentage change in SAS score (DRT VS SR)

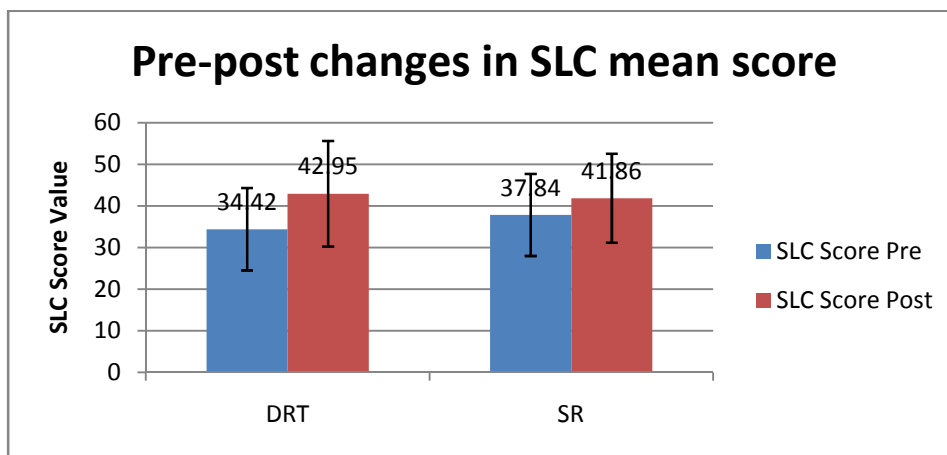


Significant reduction of anxiety score in DRT ($p < 0.001$) but not in SR.

Sustained Attention (SLC)

Both DRT and SR groups showed a significant ($p < 0.001$) increase in scores (Table-1). Differences in change scores (post-pre) between the two groups are also significant ($p < 0.008$). Percentage change in DRT is 24.78% while in SR it is 10.62%.

FIGURE 19 Changes in SLC mean score (DRT VS SR)

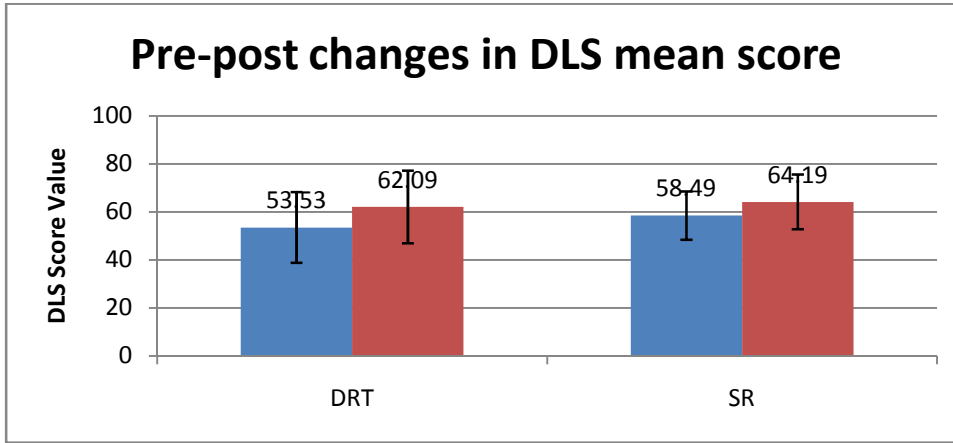


Significant increase in sustained attention in both DRT and SR ($p < 0.001$).

Sustained attention (DLS)

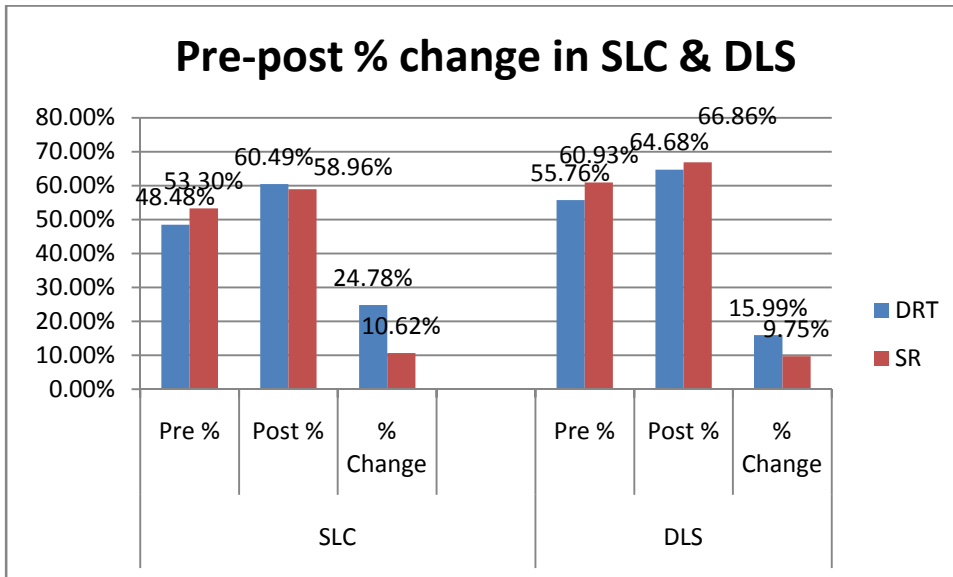
Both DRT and SR groups showed a significant ($p < 0.001$) increase in scores (Table-1). The differences between the two groups' (post-pre) scores are not significant. Percentage change in DRT is 15.99% while in SR it is 9.75%.

FIGURE 20 Changes in DLS mean score (DRT VS SR)



Significant increase of sustained attention in both DRT & SR ($p < 0.001$)

FIGURE 21 Percentage change SLC & DLS score (DRT VS SR)



Significant increase in sustained attention in both DRT and SR ($p < 0.001$).

7.4 SUMMARY OF RESULTS: STUDY 1: INTEGRAL YOGA

Test		Integral Yoga		
		Mean±SD	P value	% Change
GHQ	Pre	1.78±1.90		
	Post	1.17±1.54	0.001**	34.27
EQ	Pre	199.81±48.89		
	Post	211.85±46.18	0.001**	6.03
SLC	Pre	34.32±11.41		
	Post	41.35±13.64	0.001**	20.48
DLS	Pre	59.43±18.50		
	Post	63.22±15.19	0.003**	6.38
SATTVA	Pre	59.12±12.05		
	Post	59.95±13.58	NS	6.40
RAJAS	Pre	63.36±16.23		
	Post	57.68±14.28	0.001**	-4.49
TAMAS	Pre	39.26±16.51		
	Post	36.54±16.13	0.014*	-2.35

NS = Non-significant, p value = Significance, ** = P < 0.001, % Ch =Percentage Change, SD = Standard Deviation, GHQ= General Health, EQ = Emotional Intelligence, SLC= Six Letter Cancellation, DLS= Digit Letter Substitution

7.5 SUMMARY OF RESULTS: STUDY 2: (KB VS BA)

		Kapālabhāti VS Breath awareness					
		Kapālabhāti			Breath awareness		
Test		Mean±SD	P value	% ch	Mean±SD	P value	% ch
SAS	Pre	8.16±2.44			7.79±2.05		
	Post	7.33±2.01	0.001**	11.32	7.56±2.11	NS	3.04
SLC	Pre	40.65±9.93			39.86±11.27		
	Post	50.28±9.62	0.001**	23.69	45.77±12.81	0.001**	14.83
DLS	Pre	56.53±11.15			54.67±9.64		
	Post	64.95±12.1	0.001**	14.89	58.35±9.77	0.001**	6.73
MMR V	Pre	3.05±1.84			3.67±2.04		
	Post	4.07±2.27	0.001**	33.44	2.33±1.71	0.001**	-36.5
MMR S	Pre	4.56±1.14			4.81±1.72		
	Post	6.12±1.28	0.001**	34.20	4.00±1.46	0.001**	-16.8

NS = Non-significant, p value = Significance, ** = P < 0.001, % Ch =Percentage Change, SD = Standard Deviation, SAS=State anxiety, SLC= Six Letter Cancellation, DLS= Digit Letter Substitution, MMR V= Memory Verbal, MMR S = Memory Spatial

7.6 SUMMARY OF RESULTS: STUDY 3: (DRT VS SR)

		Deep Relaxation Tech VS Supine Rest					
		Deep Relaxation Tech			Supine Rest		
Test		Mean±SD	P value	% ch	Mean±SD	P value	% ch
SAS	Pre	8.30±2.48			7.98±2.1		
	Post	7.05±2.27	0.001**	17.73	7.79±2.08	NS	2.43
SLC	Pre	34.42±9.9			37.84±9.85		
	Post	42.95±12.69	0.001**	24.78	41.86±10.67	0.001**	10.62
DLS	Pre	53.53±14.75			58.49±10.06		
	Post	62.09±15.12	0.001**	15.99	64.19±11.39	0.001**	9.75

NS = Non-significant, p value = Significance, ** = P < 0.001, % Ch =Percentage Change, SD = Standard Deviation, SAS=State anxiety, SLC= Six Letter Cancellation, DLS= Digit Letter Substitution

8

Discussions

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DISCUSSIONS

8.1 INTEGRAL YOGA

The results of the effect of the integral yoga practices on psychological and health variables showed significant improvement in all measures except the *tamas* which showed significant reduction at ($P < 0.01$) and *sattva* guna where improvement did not reach significant level.

8.1.1 COMPARISON WITH EARLIER STUDIES

Gupta et al, 2006 found in their study anxiety scores, both state and trait anxiety were significantly reduced after a *Yoga*-based lifestyle intervention consisting of *āsanas*, *prānāyāma*, relaxation techniques, group support, individualized advice, and lectures and films on various yoga topics. While our study also showed much significant reduction of anxiety and depression in similar type of interventions.

Deshpande et al had measured GHQ in a randomized control trial in normal healthy volunteers in Bangaluru city and found significant ($P < 0.001$) improvement on all the four domains in both *Yoga* and exercise groups after the intervention in a non-residential set up with daily one hour classes for 8 weeks (Deshpande et al, 2008).

The results after intervention were similar in our study and of Deshpande study of GHQ. In both studies reduction in the four domains of GHQ were significant ($P < 0.001$).

Javnbakht et al, 2009 in their study sought to evaluate the influence of *Yoga* in relieving symptoms of depression and anxiety in women who were referred to a *Yoga* clinic showed that women who participated in *Yoga* classes had a significant decrease in state anxiety ($p=0.03$) and trait anxiety ($p<0.001$) after two-month of *Yoga* classes. Hadi & Hadi studied the effects of *hatha yoga* on well-being in 107 healthy adults, with improved physical and mental health and well-being (Hadi et al, 2007).

The above studies showed improvement in general health by reduction of anxiety and improvement of physical and mental health similarly in our present study also we found

significant reduction of anxiety and other health variables ($p < 0.001$) as shown in the result of GHQ test due to effect of integral yoga.

Wolf & Abell found that chanting the *Hare Krishna Mahamantra* had a significant effect, increasing *Sattva* and decreasing *Rajas* and *Tamas* (Wolf et al, 2002).

Deshpande et al in a randomized control trial on the effect of Integrated module of *Yoga* on *Guṇas* (Personality) and self-esteem in normal healthy volunteers found there were significant number of persons who showed improvement in *Sattva* and decrease in *Tamas* in *Yoga* group but not in physical exercise group. While in our present study also there was improvement in *Sattva* and decrease in *rajas* and *tamas* due to effect of yoga.

8.1.2 MECHANISMS

The upward trend in the central tendency of the scores on one of the guna test called the G-INVENTORY seems to be quite consistent with the *Gītā* concept. This concept proposes that the *Guṇas* initially vary in their dominance in determining the personality of an individual, but that gradually the individual's personality mostly settles on one of the *Guṇas*. In the *Gita* Sri Krishna says 'Everyone is helplessly driven to action by the *Guṇas* born of *prakṛti*'. Ultimately, though very slowly, through a conscious moral evolution, moves from *Tamas* and *Rajas* to *sattva* and finally goes beyond the *Guṇas* and attains liberation/highest state.

According to modern understanding and research in integral yoga one can improve one's health and develop one's personality and potential by practicing yoga regularly whether it is yogasanas or pranayamas or meditation or cleansing kriyas, or devotional practices, or moving consciously from *tamas* to *rajas* to *sattva* (selfless services) or acquiring discrimination and wisdom through self-enquiry. One can adopt one or more practices according to one's nature or tendencies and can progress on the path of Yoga as proclaimed by Swami Vivekananda also.

Sustained attention is the capacity to attend to a task for a required period of time. It is closely associated with the task difficulty or task complexity. While it is easier for simple tasks, it is more difficult for complex tasks. The ability to sustain attention may be considered an aspect of steadiness of mind, which in turn is a sign of mental stability. Thus we may in general consider sustained attention to depend on emotionality.

8.1.3 YOGIC PERSPECTIVES

In the *Bhagavad-Gita*, the *Yoga śāstra* (scripture of the science of *Yoga*) presents this whole process of elevating oneself to the highest state through this model of practice of yoga in a wonderful narration:

Traiguṇyaviśayā vedā nistraiguṇyo bhavārjuna!

Nirdvandvo nityasattvastho niryogakṣema ātmavān

Yogasthaḥ kuru karmāṇi sandgamṁ tyaktvā dhanañjaya!

Siddhyasiddhyoḥ samo bhūtvā samatvam yoga ucyate || (Gītā 2/45, 48)

The Vedas deals with the three Gunas of Nature; be thou above these three gunas (*nistraiguṇyo*) and free yourself from the pairs of opposites, and ever remain in the quality of Sattva (goodness) freed from the thought of acquisition and preservation (*niryogakṣema*) and to be established in the Self (*ātmavan*).

Lord Krishna further says to Arjuna that now perform action by establishing yourself in the Self/Silence (In YOGA) *yogasthaḥ*, perform actions abandoning all attachments *sangam tyaktva* and being balanced in success and failure. This type of evenness of mind is called Yoga (Union with Divine) *samatvam yoga ucyate* that means it will take you to the highest state of perfection.

We have seen from previous studies and the present study that integral yoga plays very important role in increasing of Sattva *guṇa* and in reduction of Rajas and Tamas *guṇas* and brings improvement in sustained attention, emotional intelligence and in all dimensions of general health as assessed and hypothesized in the present study.

8.2 KAPĀLABHĀTI VS BREATH AWARENESS

The present study found significant reduction in anxiety and significant improvement in sustained attention and verbal and spatial memory after the practice of kapālabhāti by healthy volunteers. While after the practice of breath awareness by self controlled group found there was insignificant reduction in anxiety and significant increase in sustained attention but not similar to the kapālabhāti. In case of verbal and spatial memory there was significant reduction which is contrary to the effect of kapālabhāti.

8.2.1 COMPARISON WITH EARLIER STUDIES

A study done by King J (1988) on 33 nursing students found that state anxiety levels were reduced at .001 levels of confidence due to the relaxation with guided imagery. While in present study also we found that there was significant reduction of **state anxiety** ($p < 0.001$) after the practice of kapālabhāti which is similar to result of King study

Previous studies done by Patil et al (2007) found significant improvement in **sustained attention** in two relaxation techniques i.e. after practice of cyclic meditation and supine rest. He found change in sustained attention 24.9% and 13.6% respectively which is similar to our present study.

Similarly a study done by Telles et al (2008) found increase in sustained attention (SLC) by 32.5%, 16.5% after kapālabhāti in middle aged adults and older persons respectively and no change in young medical students. The mechanism underlying the changes in three different groups is not known. But result of middle aged adults and older persons is similar to our study

For the SLC and DLS tasks, present results suggest that kapālabhāti augments attention, both enhancing performance, and reducing distraction. The study found increases in sustained attention scores after practice of both *kapalbhāti* (23.69% & 14.89% for SLC & DLS tasks respectively) (both $p < 0.001$), and breath awareness (14.83% & 6.73% for SLC & DLS respectively) (both $p < 0.001$), but, again, significantly more after kapālabhāti than breath awareness (both SLC & DLS $p < 0.001$). These results support the idea that kapālabhāti is more effective in increasing subjects' sustained attention span than breath awareness.

Manjunath N (2004) assessed the effect of yoga on group of 30 healthy subjects and found significant increase in of 43% in spatial memory scores which is similar to the result of our present study.

While study done by Naveen et al 1997 showed significant increase in spatial memory but not in verbal memory after the practice of four breathing practices (pranayama practice). Blakeslee (1980) stated that the left hemisphere is more involved with verbal memory while the right hemisphere is more involved with the recall of non-verbal spatial information. In this study of Naveen et al it appears that there was no specific lateralized effect of breathing through a particular nostril. The performance also did not appear to be related to the nostril.

8.2.2 MECHANISMS

While in our study kapālabhāti was with the both nostrils which showed significant increase in both verbal and spatial memory which is inconsistent with the result of Naveen et al where increase was only in spatial memory and not in verbal memory after practices of single and alternate nostril breathing practices. This is matter of further research that how forceful both nostril kapālabhāti over other breathing practices i.e. left, right and alternate nostril breathing without any effort (Chandra Anuloma viloma, Surya Anuloma viloma and Nadi shudhi pranayama) is useful in improvement of verbal memory.

In this light, the present study's findings that verbal and spatial memory scores both increased significantly after kapālabhāti practice (33.44% & 34.20%, respectively, both $p < 0.001$), but decreased significantly after breath awareness practice (-36.51% & -16.84% respectively, $p < 0.001$), is very important. We found that kapālabhāti does not produce a lateralized effect.

Sustained attention is the capacity to attend to a task for a required period of time. It is closely associated with the task difficulty or task complexity. While it is easier for simple tasks, it is more difficult for complex tasks. The ability to sustain attention may be considered an aspect of steadiness of mind, which in turn is a sign of mental stability.

Thus we may in general consider sustained attention to depend on anxiety free, calm and stable mind.

8.2.3 YOGIC PERSPECTIVES

According to *Māṇḍūkya Upaniṣad* which contains this wonderful verse:

*laye sambodhayet citam vikṣiptam śamayet punaḥ |
sakaṣāyam vijānīyāt samaprāptam na cālayet || (Man. Karika-111-44)*

When the mind becomes lethargic, stimulate and awaken it: when it speeds up and distractions set in, calm it. Thereafter as you progress recognize the dirt within us in the form of past impressions and desires *sakashayam* (*samskaras* and *vasanas*) by observing the mind while practicing yoga and once it reaches to balance, do not disturb it.

With the above method of practicing yoga in any form which involve stimulations and relaxation one can reach to the heights of human potential. For further and deeper understanding of the above principle one can refer to the book written by Dr. H.R. Nagendra, “New Perspectives in Stress Management”, lesson-1 Stimulation and Relaxation Combine –The Core. The book reference (Nagendra H.R. 1998).

In our present study we have given intervention of one minute *kapālabhāti* one minute relaxation like that ten cycles form the effect of stimulation and relaxation combined. Whatever few assessments done in state anxiety, sustained attention, and verbal and spatial memory showed significant improvement in all these variables which prove that yoga works even on healthy people with this principle of stimulation relaxation combine which is core method of all *sadhanas* to progress on the path of yoga. It also proved the hypothesis made in the present study.

8.3 DEEP RELAXATION TECHNIQUE VS SUPINE REST

The present study found significant reduction in state anxiety and significant improvement in sustained attention ($P < 0.001$), in healthy subjects after the practice of deep relaxation technique in comparison of supine rest. While supine rest showed

insignificant reduction in state anxiety and significant improvement in sustained attention but in comparison to deep technique it is not that much significant as shown in table 4.

8.3.1 COMPARISON WITH EARLIER STUDIES

Barber L R (1995) in his study on the effect of a relaxation with guided imagery on anxiety showed significant decline of anxiety ($P < .05$) in 60 subjects over the 4 weeks period. Similarly a study done by King J (1988) on 33 nursing students found that **state anxiety** levels were reduced at .001 levels of confidence due to the relaxation with guided imagery. While in present study also we found that there was significant reduction of state anxiety ($p < 0.001$) after the practice of deep relaxation technique which is similar to result of King study.

Schenfere P M (2000) in his study on effects of progressive relaxation on measurement of attention, relaxation and stress response on 67 normal male volunteers showed reduction in physiological arousal following the stress management technique. In another study by Rutschman J R (2004) on effects of meditation and relaxation on attention in two groups found meditation was not found to enhance overall attention capacity more than relaxation. ($p < 0.001$). However it did lead to **increased attention** flexibility and sustainment.

A another study done by Patil et al (2007) on effect of two relaxation technique on sustained attention found significant improvement in sustained attention after practice of cyclic meditation and supine rest. He found change in sustained attention 24.9% and 13.6% respectively ($p < .001$). Our result of deep relaxation technique on sustained attention in comparison to Patil study found equally beneficial i.e. change in sustained attention was 24.78% and in Supine rest it was 10.62 ($p < 0.001$). Therefore we can conclude that DRT is equally good as of cyclic meditation.

According to modern trends there are various techniques of relaxation are there like Autogenic training (visualization relaxation), Biofeedback method of relaxation, Self hypnosis, Deep breathing, Relaxation Meditation, Progressive Muscle relaxation etc. which can give relaxation to mind sufficiently.

8.3.2 MECHANISMS

In contrast, the measures of sustained attention, the Six Letter Cancellation and Digit Letter Substitution tests were improved by both DRT and SR, though the latter seemed to produce a distinctly smaller effect. The question now arises as to the possible relationship between the findings on anxiety and those on sustained attention. The conclusion of following study will help us to find out the possible reasons in changes of anxiety and sustained attention.

A self-controlled study by Telles et al (2007) on immediate effects of three yoga breathing techniques on performance of a letter cancellation task (LCT) improved significantly in Nadi suddhi pranayama and in Surya Anuloma pranayama but no significant change was observed following left nostril breathing and simple breath awareness. The authors concluded that anxiety reducing effects of pranayama might have contributed to better LCT performance, since this requires selective attention. Similarly in our study also we can say that anxiety reducing effects of deep relaxation might have contributed to better SLC and DLS performance.

8.3.3 YOGIC PERSPECTIVES

In *Yogavāsishtha* one of the best texts on Yoga the essence of Yoga is beautifully portrayed as under:

Manah Prashamanopayah Yoga Ityabhidhiyate (Y. V.3.9.32)

Yoga is skilful methodological trick to calm down the mind. It is an *upaya* a skilful subtle process and not brutal, mechanical, gross effort to stop the thoughts in the mind or relax the mind.

As we have seen in *Yogavāsishtha* the definition of mind, that yoga is trick to calm down the mind, our present study prove the same as our yogic deep relaxation technique (DRT) reduced the anxiety and improved the sustained attention significantly as in other studies. So it proved our hypothesis of the study.

Summary, Conclusions and Appraisal

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9 SUMMARY, CONCLUSIONS AND APPRAISAL

9

9.1 SUMMARY OF THE STUDY

9.1.1 STUDY 1: INTEGRAL YOGA

The integral yoga practices imparts significant benefits to healthy volunteers in all psychological and health variables as shown in table no.1. Correlations between different variables have shown significant relations between most of the variables.

9.1.2 STUDY 2: KAPĀLABHĀTI VS BREATH AWARENESS

The Kapālabhāti was significantly more effective in reduction of anxiety, in improvement of sustained attention, and in improvement of verbal and spatial memory than breath awareness as shown in table no. 3.

9.1.3 STUDY 3: DEEP RELAXATION TECHNIQUE VS SUPINE REST

The deep relaxation technique was significantly more effective in reduction of state anxiety and in reduction of sustained attention than supine rest as shown in table no. 4.

9.2 CONCLUSIONS

9.2.1 STUDY 1: INTEGRAL YOGA

A single month of integral yoga practices imparts significant benefits to healthy volunteers in all psychological and health variables. It also improves all dimension of general health. It improves emotional intelligence (EQ). It improves sustained attention. It improves the personality of the healthy person by increasing sattva and decreasing rajas and tamas.

The correlation studies have shown significant correlation between psychological and health variables

9.2.2 STUDY 2: KAPĀLABHĀTI VS BREATH AWARENESS

The study suggests that both kapālabhāti and breath awareness reduce anxiety and improve sustained attention. However, kapālabhāti was significantly more effective in

doing so than breath awareness. In contrast, they act oppositely on verbal and spatial memory, whereas kapālabhāti significantly increases both, scores on these variables significantly declined after breath awareness. This suggests that breath awareness is intrinsically dulling to the mind, though further experiment is needed determine whether verbal instructions yield better results than the repeated audiotape instructions used in the present experiment. This would be a significant experiment, because breath awareness and related techniques are considered important components of many systems of psycho-spiritual development.

9.2.3 STUDY 3: DEEP RELAXATION TECHNIQUE VS SUPINE REST

In summary: Only the deep relaxation technique was found to reduce state anxiety, whereas both DRT and supine rest improved sustained attention, the former apparently being more effective in this regard. The observed anxiety reduction would seem to account for no more than about 50% of the improvement in the sustained attention tests. Although differences between DRT and SR groups in improvements on the DLS test were observed, a larger group is needed to establish significance.

9.3 APPRAISAL

9.3.1 STRENGTH OF THE STUDY

The strength of the present study is that it studied effect of integral yoga as well as immediate effects of kapālabhāti vs breath awareness and deep relaxation technique vs supine rest in different three experimental settings.

Further it could measure the effects of these yoga practices on various variables in a residential set up which is conducive to yoga practices.

9.3.2 LIMITATIONS OF THE STUDY

1. The effect of integral yoga could not be carried out with control study. In a residential yoga set up the study was intended to assess the total effect of yoga way of life with integrated yoga module. As there is limitation involved in Randomized Control Trial (RCT) double blind study, this design selected without the same.

2. In yoga practices like kapālabhāti and deep relaxation technique audiotape were used in place of verbal instructions.
3. Larger group could not be taken to establish clear significance of yoga practices like kapālabhāti and deep relaxation technique *vs* control studies.

9.3.3 IMPLICATIONS OF THE STUDY

1. The benefits of yoga practices are seen as
 - In improvement of general health, emotional intelligence, sustained attention and guna personality and
 - Reduction in state anxiety and improvement in verbal and spatial memory.
2. Above benefits adds evidence to adopt yoga based lifestyle to promote positive health and human potential.
3. Systematic and longer duration of yoga practice could help in developing one's personality and hidden potential to the maximum.

9.3.4 SUGGESTIONS FOR FUTURE WORK

1. Randomized control studies in integral yoga will provide more authentic evidence to compliment the results of the study.
2. Larger group can be assessed to measure effect of individual yoga practices like kapālabhāti and deep relaxation techniques to establish clear significance of yoga practices over control studies.
3. Separate studies can be taken for each path of yoga i.e. Rāja Yoga, JñānaYoga, Bhakti Yoga and Karma Yoga to establish that each path can raise human personality and potential to the maximum.

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Appendices

APPENDIX -1

INTERVENTION SCHEDULE FOR INTEGRAL YOGA

S. No.	Time	Yoga group
1	05.00-05.30 am	OM meditation - 30 minutes
2	05.30-06.30 am	Yogasanas - 60 minutes
3	06.30-07.30 am	Bath & wash
4	07.30-08.15 am	Chanting of yogic hymns – 45 minutes
5	08.15-08.45 am	Breakfast
6	08.45-10.00 am	Karma yoga and rest
7	10.00-11.00 am	Lecture (on yoga) – 60 minutes
8	11.00-12.00 noon	Pranayama (yogic breathing) – 60 minutes
9	12.00-01.00 pm	Yogasanas - 60 minutes
10	01.00-02.00 pm	Lunch (vegetarian diet)
11	02.00-02.30 pm	Deep Relaxation Technique – 30 minutes
12	03.00-04.00 pm	Lecture (on yoga) – 60 minutes
13	04.00-05.00 pm	Cyclic meditation – 60 minutes
14	06.15-06.45 pm	Divine hymns session (Bhajan) – 30 minutes
15	06.45-07.45 pm	Lecture/Trataka
16	07.45-08.30 pm	Dinner (vegetarian diet)
17	08.30-9.00 pm	Happy assembly
18	09.00-10.00pm	Self Study

APPENDIX -2

INTERVENTION DETAILS OF KB & BA

KAPÁLABHÁTI

Sthiti: Daiāásana

- 1 Sit in any meditative posture.
- 1 Keep your spine and neck erect perfectly vertical to the ground.
- 1 Close the eyes and collapse the shoulders.
- 1 Relax the whole body completely.

PRACTICE



- 1 Practice rapid breathing with active and forceful exhalation and passive inhalation.
- 1 During each exhalation, blast out the air by vigorous flapping movements of the abdomen in quick succession.
- 1 Inhale passively by relaxing the abdominal muscles at the end of each exhalation.
- 1 Repeat the exhalation as quickly as possible at the rate of 60 strokes per minute.
- 1 At the end of one minute, stop the practice.
- 1 Now observe an automatic suspension of breath. In fact, there will be no urge for breathing for a few seconds.
- 1 Simultaneously the mind may experience a deep state of silence. Enjoy this state of deep rest and freshness.
- 1 Wait until the breathing comes back to normal .

KB VS BA Interventions

Instructions were delivered by audiotape for the 20 minutes performance of both practices; one minute practice was followed by one minute relaxation, repeated 10 times. Subjects sat with their spine straight. For *kapalbhati*, instructions were as follows:

*Sit straight keeping your head, neck, spine erect. Take a deep inhalation, exhale forcibly, blast out the air using abdominal muscle, inhale passively relaxing the abdominal muscles, and repeat these movements as quickly as possible starting with 60 strokes per minutes and increasing gradually up to 80 strokes per minute. There is no holding of breath. The rapid active exhalation with passive effortless inhalation is accomplished by flapping movement of the abdomen, continued at a uniform speed of 80 strokes per minute. It is continued for 1 minute, slowing down gently at the end. Following each minute's KB practice, **relaxation** instructions were given as follows:*

Relax ... relax ...yourself. Allow your abdominal muscles to relax; relax your whole body and mind, enjoy the deep silence of the mind, relax...relax...!

Breath awareness practice was performed similarly: one minute practice was followed by one minute relaxation, repeated ten times. Instructions were as follows: *Sit comfortably, relax yourself, become aware of your breathing, just observe your breathing pattern, simply observe, do not manipulate, just go on observing, maintain your awareness towards breathing, just observe, now relax, relax yourself totally from toes to head, allow relaxation to continue all your body and mind..!* The same relaxation instructions were used as in the KB session.

APPENDIX-3

INTERVENTION DETAILS OF DRT VS SR

4. DEEP RELAXATION TECHNIQUE

Sthiti: Ûavásana.

1 Gently move your whole body, make yourself comfortable and relax completely.



PRACTICE

Phase-I

1 Bring your awareness to the tip of the toes, gently move your toes and relax. Sensitize the soles of your feet, loosen the ankle joints, relax the calf muscles, gently pull up the knee caps release and relax, relax your thigh

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muscles, buttock muscles, loosen hip the joints, relax the pelvic region and the waist region. Totally relax your lower part of the body. **R..e..l..a..x** .. . Chant A-kára and feel the vibration in your lower parts of the body.

Phase-II

1 Gently bring your awareness to the abdominal region and observe the abdominal movement for a while, relax your abdominal muscles and relax the chest muscles. Gently bring your awareness to your lower back, relax your lower back,

loosen all the vertebral joints one by one. Relax the muscles and nerves around the back bones. Relax your middle back, shoulder blades and upper back muscles, totally relax. Shift our awareness to the tip of the fingers, gently move them a little and sensitize. Relax your fingers one by one. Relax your palms, loosen the wrist joints, relax the forearms, loosen the elbow joints, relax the hind arms-triceps, biceps and relax your shoulders. Shift your awareness to your neck, slowly turn your head to the right and left, again bring back to the center. Relax the muscles and nerves of the neck. Relax your middle part of the body, totally relax. **R..e..l..a..x .. .** Chant Ukára and feel the vibration in the middle part of your body.

Phase-III

¹ Gently bring your awareness to your head region. Relax your chin, lower jaw and upper jaw, lower and upper gums, lower and upper teeth and relax your tongue. Relax your palateshard and soft, relax your throat and vocal chords. Gently shift your awareness to your lips, relax your lower and upper lips. Shift your awareness to your nose, observe your nostrils, and feel the warm air touching the walls of the nostrils as you exhale and feel the cool air touching the walls of the nostrils as you inhale. Observe for a few seconds and relax your nostrils. Relax your cheek muscles, feel the heaviness of the cheeks and have a beautiful smile on your cheeks. Relax your eye balls muscles, feel the heaviness of eye balls, relax your eye lids, eye brows and in between the eye brows. Relax

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your forehead, temple muscles, ears, the sides of the head, back of the head and crown of the head. Relax your head region, totally relax. **R..e..l..a..x .. .** and chant M-kára feel the vibration in your head region.

Phase-IV

¹ Observe your whole body from toes to head and relax, chant an Om-ka+ra. Feel the resonance throughout the body.

Phase-V

1 Slowly come out of the body consciousness and visualize your body lying on the ground completely collapsed.

Phase-VI

1 Imagine the vast beautiful blue sky. The limitless blue sky. Expand your awareness as vast as the blue sky. Merge yourself into the blue sky. You are becoming the blue sky. You are the blue sky. Enjoy the infinite bliss. **E..N..J..O..Y..** the blissful state of silence and all pervasive awareness.

Phase-VII

1 Slowly come back to body consciousness. Inhale deeply. Chant an "AUM-kára". Feel the resonance throughout the body. The soothing and massaging effect from toes to head.

Phase-VIII

1 Gently move your whole body a little. Feel the lightness, alertness and movement of energy throughout the body. Slowly bring your legs together and the hands by the side of the body. Turn over to the left or the right side and come up when you are ready.

CLOSING PRAYER

Sarve bhavantu sukhinaç

Sarve santu nirámayaç

Sarve bhadráii paùyántu

Má kaùcit duçkça bhágbhavet

Om Ùántiç Ùántiç Ùántiç

May all be happy. May all be free from diseases. May all see things auspicious. May none be subjected to misery.

Om Peace Peace Peace

APPENDIX-4

SIX LETTER CANCELLATION TEST

Instructions:

1. Search out the target letters given below and cancel them by slash (/).
2. Cancel as many as possible within the given time.
3. Start and stop only when told.

Target Letters: **J, T, K, M, U, F**

J G Y L S E T B L U V G K H A W U J M K R B
X N O D F C K N E H W Z L J S D Q L N H U O
U K W A I M P G Q X M F Y B I R X G F P J K
Z V B H J S Y D K O S Q T M P O E I A T L E
T L Y R O Z L F A U I N Z G W T J K D R Y A
D S Q C E T R W Z J A E H L U Y V Z S O N X
E W K F H M N C P X R O K I C R F G P I K S
G U A P S V I O B D C S F X E H W Q M L O R
H T Y G D L U Q G Y W A B Z D Y V U A E Q P
L V O E J Z F T L E M H Q J A X R D B Z N J
S W N Q K H C A Z N O I S M L E J S H G T F
A P F X O R I J B D P K W I J K O R I B Z A
R T Y B V D X S U F R X O Q B T B X W D S Z
M I G U W K O C E N V T H Z M N C U Y P K E

Total attempted:

Wrongly attempted:

Net attempted:

APPENDIX-5

DIGIT LETTER SUBSTITUTION TEST

1. Substitute the digits with corresponding letter as per the given key.
2. Substitute as many possible letters within the given time
3. Start and stop only when told.

Substitute Letters:

1	2	3	4	5	6	7	8	9
L	H	Y	N	R	E	D	T	J

6	2	4	1	5	7	9	3	2	6	8	5

5	4	7	8	1	2	3	4	9	6	3	7

2	4	6	7	8	9	3	1	2	3	7	4

2	9	4	6	8	1	2	5	9	3	4	7

9	7	4	2	3	8	1	5	6	2	9	1

8	6	2	3	9	4	5	7	1	4	3	9

3	5	9	1	2	5	6	2	7	8	9	1

5	4	9	2	7	1	3	2	8	9	5	6

Total attempted:

Wrongly attempted:

Net score:

APPENDIX-6

1. EQ QUESTIONNAIRE

Your name:

Age:

Gender:

Profession:

This test measures some areas of your personal and professional life. This is a psychological test, which will help you learn more about yourself. This questionnaire given below will measure your emotional reaction to different situations. Answer the questions on the basis of how you FEEL and not what you THINK. There are no right and wrong answers. Answer honestly and do not spend too much time on any one item. Usually your first response is the best response. Do not leave any question; unanswered and complete the test in a single sitting. Use a separate response sheet for your answers.

The Questionnaire

1. You have just learnt that you have been ignored for a promotion by the management for which you were eligible. Moreover, one of your juniors has been selected for the same promotion. You are upset and feeling frustrated. What do you do?
 - Ignore it-it was your bad luck.

- Talk it over with your boss, bringing out the facts about your contribution and ask for reconsideration of the management's decision.
 - Start abusing the colleagues who superseded you, leveling allegation of manipulation and corruption against him and instigate the union leaders to organize protests against the management.
 - Move to court and obtain a stay order and vow to teach befitting lesson to management through legal battle.
 - Resign from the organization.
2. A freshly recruited smart first class professional graduate joins your organization as a Management Trainee. After a few weeks she complains to you that her superiors and Subordinates were not taking her seriously. What will you suggest her?
- Suggest that she handles the situation herself and not to bother you for trivial matters.
 - Tell her that such behavior is typical of most organizations and she should ignore it.
 - Suggest that she undergo behavioral training to learn interpersonal skills.
 - Empathize with her and help her figure out ways to get others to work with her.
 - Tell her to look for another job.
3. As a production manager you are taking a weekly review meeting, which also has some women employees. You overhear a male employee telling an offensive joke about women employees. What do you do?
- Ignore it-it is only a joke.
 - Call the employee in your office after the meeting and pull him up.

- Send the employee to attend a sensitivity training programme for changing his prejudices.
 - Ask the women employees to protest in writing so that you can take appropriate action.
 - Announce on the spot that such jokes are inappropriate and shall not be tolerated in your organization.
4. In a fit of anger, you have got into an argument with your colleague that has led to personal attacks from both sides. The entire office is witness to the unpleasant episode you and your colleague actually never intended to tarnish the image of each other. How will you tackle this ugly situation?
- Sit calmly and consider what triggered that argument between you and your colleague and was it possible to control your anger at that point of time.
 - Avoid arguments and leave the scene.
 - Apologize and ask your colleague to apologize too.
 - Continue with the argument till you reach at some definite conclusion.
 - Complain to the management against your colleague.
5. Imagine you are an insurance salesperson approaching prospective clients to purchase insurance policies, a dozen people in a row have shut the door on your face and you are feeling frustrated. What will you do?
- Blame yourself and stop work for the day.
 - Reassess your capabilities as an insurance salesperson
 - Come out with fresh strategies to overcome similar failures in future.

- Think of changing your job.
 - Contact the client again some other day.
6. Imagine you are a site engineer of a large construction company. A worker suddenly slips down and dies. There is a violent reaction and you are surrounded by agitated workers. What will you do?
- Call the police/management and let them decide further the course of action.
 - Threaten the agitating workers with dire consequences if they do not cool down immediately.
 - Reason with the workers and explain the safely measures you had taken to prevent such incidents.
 - Call the agitated workers for a dialogue and ask for their suggestion so that such incidents do not occur in future.
 - Find an opportunity to slip away from the scene.
7. You are accompanying your friend from Delhi to Agra in his car. You notice another car loaded with children suddenly overtaking your car and cutting sharply in front of you abruptly. Your friend, who is driving the car, gets nervous, as he had to apply the brakes immediately to avoid hitting the other car. What would be your reaction at that time?
- Tell your friend to stop and relax for some time rather than continue driving.
 - Tell your friend to chase the other car and stop it.
 - Yell at the driver of the other car.
 - Tell your friend to smile and thank God that everyone is safe.

- Just ignore what had happened as a very minor incident.
8. You are on an aircraft and suddenly the pilot announces that it has been hijacked by terrorists. Everyone is in a state of shock, nervousness, and utter confusion. What will be your reaction?
- Blame yourself for choosing an inauspicious day for travelling.
 - Attend to the instructions of the pilot/airhostess and ask the other fellow passengers to do the same.
 - Continue to read your magazine and pay little attention to the incident.
 - Cry out vow not to travel by air in future.
 - Falsely claim that you are a heart patient needing medical attention and beg hijackers to release you.
9. Imagine you are a police officer posted in a sensitive area. You get information that there have been violent ethnic clashes between two religious communities and a large number of people have been killed from both sides and the property has been damaged. What action will you take?
- Decide not to visit the spot personally as there may be danger to your life from the fury of the public.
 - Take your time to respond –in any case this is not the first- time riots have occurred.
 - Try to handle the situation tactfully assuage the feelings of both communities tracking down the reasons for the clash, and taking all desired remedial measures.
 - Send your subordinate inspector to study the situation.

- Arrange to handover the dead to the respective families after getting the postmortem done.

10. You have a grown up son who starts arguing with you every now and then on matters relating to your personal and social life. One day he tells that you have dedicated your terms to the family for very long and cannot continue to exercise the authority anymore. He also tells that as a father you cannot impose your outdated attitudes and irrelevant values on him. He further confronts you and says that he is an adult and henceforth he will take all major decisions. You are disturbed at his defiant behavior. How will you tackle him?

- Accept the statement in helplessness and take a low profile position in the family.
- In disgust, tell him to leave and find a separate place for himself.
- Send him to psychologists to learn to adjust with his environment.
- For the time being delay the arguments, manage your feelings, sit with him and explain your point of view as patiently as possible without making the situation tense.
- Ignore his hostile comments and change the topic of discussion.

11. This morning an old man was driving his old Fiat car on the wrong side with his little grandson on his lap. He was too careless to switch on the indicator before turning the car and in the process dashed onto the bonnet of the Maruti car which you were driving. How will you behave at this time?

- Just smile at the old man and ask him to be grateful to God for his grandson, who was safe.
- Get annoyed at the old man and shout at him.
- Ask for compensation for the damage.

- Give the old man a long lecture on how to drive safely.
- Call the police.

12. Imagine you are a doctor and you have operated upon a cancer patient in the morning.

When you go to home for lunch you receive a call that the patient has developed some complications and you decide to rush back to the hospital. On your way back to the hospital you are held up at the traffic light, as the signal was red. You wait impatiently and when the signal turns green you start your car without noticing a scooterist in front and hit him. He loses his balance but regains it without great difficulties. What will you do now?

- Immediately stop the car, get out, introduce yourself and apologize.
- Ignore him and keep moving.
- Thank God that nothing serious had happened.
- Stop for a moment, collect your thoughts and move towards the hospital.
- Tell the scooterist what has happened and continue driving.

13. You are a general manager of a large production company. On the next week there is a board meeting and your department is expected to prepare the annual report. You get a call from one of the production units in another that there is a strike and your presence is urgently required to negotiate with the union. You delegate the responsibility to your assistant general manager to get the report prepared for the board meeting in time and leave the city. When you are return you are perplexed to

find that your assistant general manager has not prepared the report and the board meeting is scheduled for the next day. What do you do?

- Feel remorse for your decision to delegate the wrong person.
- Get worked up and fire the assistant general manager for failing to carry out your instructions.
- Complete the work yourself to avoid embarrassment before the board.
- Understand the difficulty faced by the assistant general manager in getting the work completed, motivate him saying that it could still be done and make a plan to sit long hours to complete the job in time.
- Send the assistant general manager for further training to sharpen his management skills.

14. You are a professor in a college and while taking a class one of your student comments that your style of teaching is not good, that you have not prepared the topic properly and also that you are just passing time. How will you react?

- Report to the principal of the college about the behavior of the student.
- Ask him to leave the classroom and tell him in strong words that you can not change your teaching style.
- Ask him to meet you after the class in your chamber.
- Listen to the need of the class and promise to prepare the topic properly in future.
- Ignore him and continue with your lecture.

15. As the CEO of the company you are involved in a meeting with the union leaders

on their pending demands. During the meeting one of the leaders shout at you saying that you are a big liar and levels serious allegations of corruption and favoritism against you. You are very upset. How will you react to the remarks of the union leader?

- Just ignore what he said, continue with the discussion and listen to their demands with a cool frame of mind.
- Suspend him from the job.
- Cancel further negotiations and ask him to apologize first.
- Advise him not to make personal remarks.
- Leave the room after assigning the responsibility to your subordinate to continue with the negotiation